

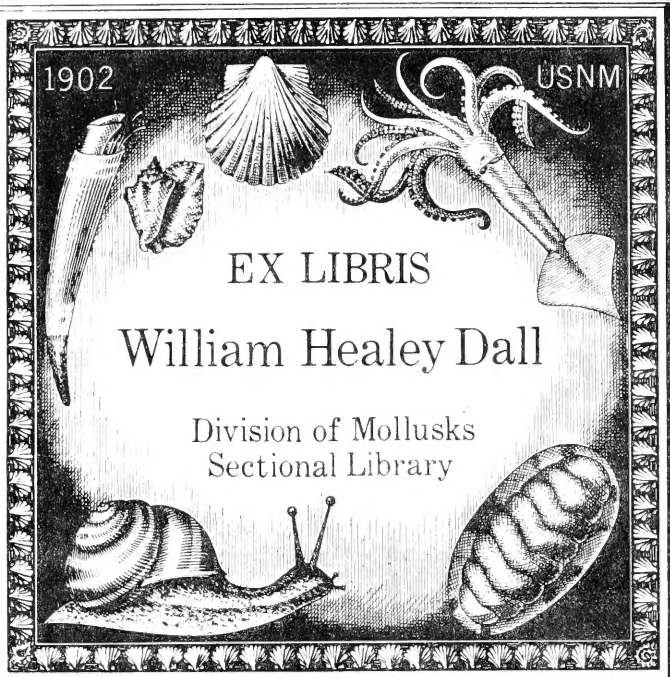
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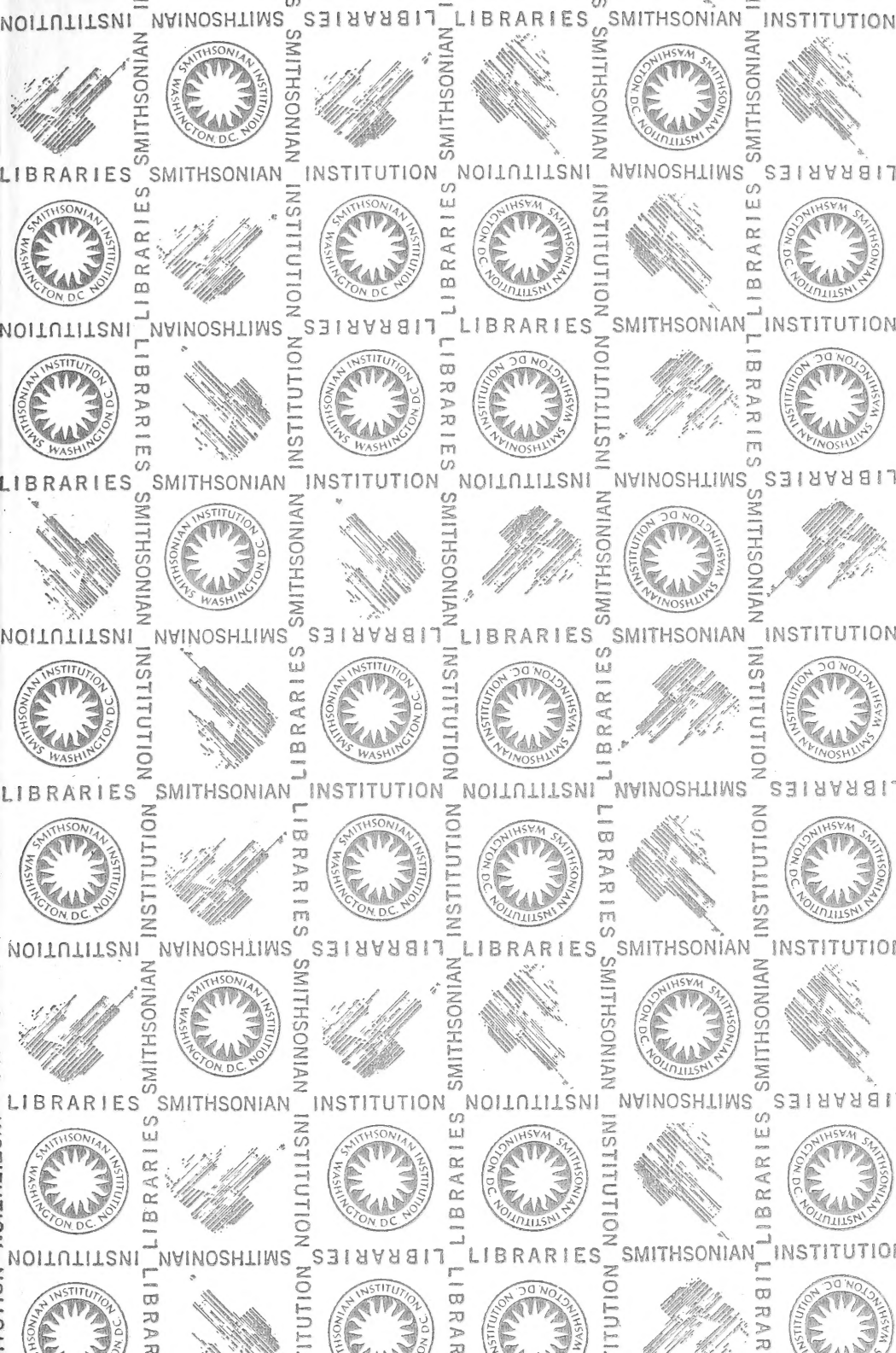
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PROCEEDINGS

OF THE

ZOOLOGICAL SOCIETY

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PART XXVII.

1859.

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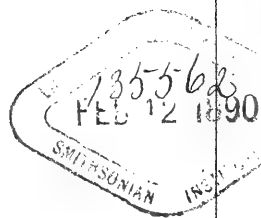
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PROCEEDINGS
OF THE
ZOOLOGICAL SOCIETY
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PROCEEDINGS
OF THE
ZOOLOGICAL SOCIETY OF LONDON.

January 11, 1859.

Dr. Gray, F.R.S., V.P., in the Chair.

The following papers were read:—

1. ON THE GORILLA (*TROGLODYTES GORILLA*, SAV.)*
BY PROF. OWEN, F.R.S., V.P.Z.S., &c.

Before referring to earlier indications of the truly extraordinary animal of which an entire specimen has now been obtained,—indications scarcely more instructive or convincing to the naturalist than those afloat on the Unicorn or Succatyro,—the author proceeded briefly to recapitulate the steps which led to the determination and full knowledge of the great anthropoid Ape of Africa called *Troglodytes gorilla*.

The first authentic information he had received of its existence was by a letter from Dr. Savage, dated 'Gaboon River, West Africa,' April 24, 1847, inclosing a sketch of the cranium, and requesting that the results of Prof. Owen's comparison might be communicated to him. That letter and those results are given in the 'Proceedings of the Zoological Society' for February 22, 1848; together with the description of three skulls, two of male and one of a female, which had been transmitted from the Gaboon to England, and which established the distinction of the species (*Troglodytes gorilla*) from the Chimpanzee (*Troglodytes niger*)†.

The skulls obtained by Dr. Savage, at the Gaboon, were taken by him to Boston, U. S., and were described by the Doctor and Prof. Wyman, in the 'Journal of the Natural History Society of Boston,'

* This paper will be printed in the 'Transactions,' illustrated with several plates.

† 'Transactions of the Zool. Soc.' vol. iii., p. 381, pls. 58–63.

vol. v., 1847, and the name *Troglodytes gorilla* was proposed for the species, the discovery of which is due to Dr. P. S. Savage.

Translations of Dr. Wyman's and Prof. Owen's papers being published in the 'Annales des Sciences Naturelles', the attention of Continental Naturalists was strongly excited toward this unexpected addition to the Mammalian class; and the inducements held out for the collection of specimens speedily led to the acquisition of the requisite materials for completing the zoographical history of the animal which it seems now agreed to call 'Gorilla.' The additional materials which reached London, enabled the author to communicate to the Zoological Society ('Proceedings of the Zool. Soc.' for Nov. 11th, 1851.)* a description of the entire skeleton of the *Troglodytes gorilla*; of which, however, owing to the number and cost of the illustrations, two parts only have yet appeared in the 'Transactions of the Society' (vol. iv., pt. iii., p. 75, pls. 26-30 & pt. iv., p. 89, pls. 31-36.): but the main facts are recorded in the author's Catalogue of the 'Osteological Collection in the Museum of the Royal College of Surgeons,' 4to, pp. 782-804. Entire skeletons of the full-grown *Troglodytes gorilla* are now set up in the Museum of the College, and in the British Museum; and Dr. Gray has finally acquired for the National Collection the stuffed specimen of a nearly adult male Gorilla.

All the foregoing specimens were obtained from a part of the west coast of tropical Africa traversed by the rivers 'Danger' and 'Ga-boon,' in latitudes 1° to 15° S.

A corresponding series of illustrations, first crania, then the skeleton, finally an entire specimen of the *Troglodytes gorilla*, have successively reached the Museum of the Garden of Plants, Paris, and have afforded materials for interesting and instructive memoirs from the accomplished Professors in that noble establishment for extending and diffusing the science of Natural History.

De Blainville had caused a lithograph to be prepared of the skeleton of the Gorilla, shortly before his demise. His successor, Prof. Duvernoy, communicated a description of this skeleton to the Academy of Sciences in 1853, which is published, with some interesting particulars of the anatomy of the soft parts, in the 'Archives du Muséum d'Histoire Naturelle,' tome vii. (1855). The Memoirs and Observations by his accomplished colleague the Professor of Mammalogy and Ornithology, Isidore Geoffroy St. Hilaire, on the Gorilla will be found in the 'Comptes Rendus de l'Académie des Sciences,' January 19, 1852, and subsequent numbers; in the 'Revue de Zoologie,' No. II., 1853; the whole being summed up in the part of his excellent 'Description des Mammifères nouveaux,' &c. 4to, which appeared in vol. x. of the 'Archives du Muséum, 1858.'

The differences in the results of the observations by the American, French, and English authors, relate chiefly to the interpretation of the facts observed. Dr. Wyman agrees with Prof. Owen in referring the Gorilla to the same genus as the Chimpanzee, but he differs

* See also 'Literary Gazette,' Nov. 15, 1851.

from him in regarding the latter as being more nearly allied to the Human kind. Professors I. Geoff. St. Hilaire and Duvernoy regard the differences in the osteology, dentition, and external characters of the Gorilla to be of generic importance, and enter it in the Zoological Catalogue as *Gorilla Gina*, the *nomen triviale* being taken from 'Weggeena;' 'N. Gina' and 'D. jina,' as the name of the beast in the Gaboon tongue, has been diversely written by voyagers*. The French naturalists also concur with the American in placing the Gorilla below the Chimpanzee in the scale. The author returned to the discussion of those questions at the conclusion of his paper, when he also referred to the notion current in some works that the long-armed apes (*Hylobates*), and not the Orangs or Chimpanzees, were the most anthropoid of apes.

Entering upon the description of the exterior characters of the adult male Gorilla, the stuffed skin of which is now in the British Museum, Prof. Owen first called attention to the shortness, almost absence, of the neck, due to the backward articulation of the head to the trunk and the concomitant development of the spines of the neck-vertebræ; also to the chin which, in the usual pose of the head, descends below the *manubrium sterni*; to the great size of the scapulæ, to the elevation of the acromion, and the oblique position of the clavicles which rise from their sternal attachments obliquely to above the level of the angles of the jaw. The brain-case, low and narrow, passes in the old male in an almost straight line from the occiput to the superorbital ridge, the prominence of which gives the most forbidding feature to the physiognomy of the Gorilla. It is a feature strongly marked on the skeleton, but is exaggerated in the stuffed animal by the thick supraciliary roll of integument which forms a scowling penthouse over the small deep-set eyes. The nose is a more prominent feature than in the Chimpanzee or Orang-utan; there is a slight median rise along its upper half, answering to the feeble prominence of the same part of the nose-bones, but the lower or alar part of the nose offers two thick projections, arching, each across its own nostril, and becoming thicker as it subsides in the upper lip. There is a median longitudinal depression between these arched flaps; but their prominence brings them into view in the profile of the face. The point of median confluence of the alæ projects a little beyond the fore part of the 'septum narium.' The resemblance to the lowest form of the negro nose is much closer in the Gorilla than in the Chimpanzee. The mouth is wide, the lips large and thick, but of uniform thickness, the upper one terminating by a straight, almost as if incised, margin; but being relatively shorter than in the Chimpanzee. The dark pigment is continued from the base of the lip to this margin, and

* The main discrepancy, in regard to matter of fact, is that the arms of the Gorilla are stated by Isid. Geoffroy, to be much longer, whilst Prof. Owen found them to be relatively shorter, than those of the Chimpanzee.

"Bras { de proportions presque humaines Genre I. *Troglodytes*.
 { beaucoup plus longs que chez l'homme ... Genre II. *Gorilla*."
 Isid. Geoffr., p. 15.

no part of the red inner lining would be visible when the lips were naturally closed: a little of this lining, which forms what is commonly understood by 'lip' in man, might be shown by the under lip of the Gorilla, but it is obscured by added pigment, as in most negro races. The chin is short and receding, but the whole face is prominent. The circumference of a front view of the head presents an oval with the great end downward and the upper end very narrow, owing to the parietal ridge, in the old male. The superorbital or cranial part is confined to the upper fourth in this view, and the bestial aspect of the visage is much increased when the huge prominent tusks are exposed by opening the lips. The eyelids have eyelashes almost as in man; but the eyebrow is not defined, the hair of the head extending to the supraciliary roll, which is almost devoid of hair. In a direct front view the ears are rather above the level of the eyes: they are as much smaller in proportion to the head, as in the Chimpanzee they are larger, in comparison with man; but in structure they resemble the human auricle more than does the ear of any other ape.

The tragus and anti-tragus, the helix and anti-helix, the concha, the fossa of the anti-helix and the lobulus are distinctly defined: the chief difference is the large size of the concha compared with the fossa of the anti-helix and the lobulus: but though the lobulus is small it is distinctly marked and pendulous, while it is sessile in the Chimpanzee and Orang. Both tragus and anti-tragus are nearly as prominent as in man. The helix is reflected or folded centrally from its origin to opposite the anti-tragus as in man, whereas, in the Chimpanzee the fold subsides opposite the fossa of the anti-helix, and the rest of the margin of the auricle is simple, not folded. The upper part of the helix is more produced in the Gorilla than in man, and the greatest breadth of the ear is above the concha, in which the *incisura intertragica* is less deep than in man.

The skin of the face is naked and much wrinkled; a pretty deep indent divides the nasal ala from the cheek, and becomes shallower as it bends upward, inward, and downward to the median indent between the alæ. The hairy part of the scalp is continued to the superorbital prominence, and thence the hair-clad skin is continued outward and downward upon the sides of the deep cheeks, where the hair is long. The chest is of great proportional capacity, and the shoulders very wide across. The profile of the trunk behind describes a slight convexity from the nape, which projects beyond the occiput, downward to the sacrum: there is no inbending at the loins, which seem wanting. The abdomen is prominent both before and at the sides. The pectoral regions are slightly marked and show the pair of nipples placed as in the Chimpanzee and Man. In the male the penis is short and subconical, the prepuce is devoid of *frænum*; the scrotum is broader and more sessile than in man: the perinæum is longer, the anus being placed further back than in man. There is no trace of ischial callosities. The *glutæi* are better developed and give more of the appearance of nates than in any other anthropoid ape, but they do not project so as to meet beyond the anus and conceal it.

The chief deviations from the human structure are seen in the limbs, which are of great power, the upper ones prodigiously strong, making by comparison the legs, through the want of 'calves', look feeble.

The first characteristic is the almost uniform thickness of each segment of the limb : this is seen in the arm, from below the short deltoid prominence to the condyles, neither biceps nor triceps making any definite swelling ; a like uniform thickness is seen in the antibrachium from below the olecranon to the wrist : the leg a little increases in thickness from the knee to the ankle : the short thigh shows some decrease as it descends : but there is a general absence of those partial muscular enlargements which impart the graceful varying curves to the outlines of the limbs in man. Yet this, upon dissection, is found to depend rather on excess, than defect, of development of the carneous as compared with the tendinous parts of the limb-muscles, which thus continue of almost the same size from their origin to their insertion, with a proportionate gain of strength to the beast. The difference in the length of the upper limbs between the Gorilla and Man is but little in comparison with the trunk ; it appears greater through the arrest of development of the lower limbs. Very significant of the closer anthropoid affinities of the Gorilla is the superior length of the arm (humerus) to the fore-arm, as compared with the proportions of those parts in the Chimpanzee. The hair of the arm inclines downward, that of the fore-arm upward, as in the Chimpanzee. The thumb extends a little beyond the base of the proximal phalanx of the fore-finger ; it does not reach to the end of the metacarpal bone of that finger in the Chimpanzee or any other ape : the thumb of the Siamang (*Hylobates syndactyla*) is still shorter in proportion to the length of the fingers of the same hand : the philosophical zoologist will see great significance in this fact. In man the thumb extends to, or beyond, the middle of the first phalanx of the fore-finger.

The fore-arm in the Gorilla passes into the hand with very slight evidence, by constriction, of the wrist, the circumference of which, without the hair, was fourteen inches, that of a strong man averaging eight inches. The hand is remarkable for its breadth and thickness, and for the great length of the palm, occasioned both by the length of the metacarpus and the greater extent of undivided integument between the digits than in man ; these only begin to be free opposite the middle of the proximal or first phalanges in the Gorilla. The digits are thus short, and appear as if swollen and gouty ; and are conical in shape after the first joint, by tapering to nails, which, being not larger or longer than those of man, are relatively to the fingers much smaller. The circumference of the middle digit at the first joint in the Gorilla is $5\frac{1}{2}$ inches ; in man, at the same part, it averages $2\frac{3}{4}$ inches. The skin covering the middle phalanx is thick and callous on the back of the fingers, and there is little outward appearance of the second joint. The habit of the animal to apply those parts to the ground, in occasional progression, is manifested by these callosities. The back of the hand is hairy as far as the divisions of

the fingers ; the palm is naked and callous. The thumb, besides its shortness, according to the standard of the human hand, is scarcely half so thick as the fore-finger. The nail of the thumb did not extend to the end of that digit ; in the fingers the nail projected a little beyond the end, but with a slightly convex worn margin, resembling the human nails in shape, but relatively less.

In the hind limbs, chiefly noticeable was that first appearance in the quadrumanous series of a muscular development of the gluteus, causing a small buttock to project over each tuber ischii. This structure, with the peculiar expanse, as compared with other *Quadrumana*, of the iliac bones, leads to an inference that the Gorilla must naturally and with more ease resort occasionally to station and progression on the lower limbs than any other ape.

The same cause as in the arm, viz. a continuance of a large proportion of fleshy fibres to the lower end of the muscles, coextensive with the thigh, gives a great circumference to that segment of the limb above the knee-joint, and a more uniform size to it than in man. The relative shortness of the thigh, its bone being only eight-ninths the length of the humerus (in man the humerus averages five-sixths the length of the femur), adds to the appearance of its superior relative thickness. Absolutely the thigh is not of greater circumference at its middle than is the same part in man.

The chief difference in the leg, after its relative shortness, is the absence of a "calf," due to the non-existence of the partial accumulation of carneous fibres in the upper half of the gastrocnemii muscles, causing that prominence in the type-races of mankind. In the Gorilla the tendo-achillis not only continues to receive the "penniform" fibres to the heel, but the fleshy parts of the muscles of the foot receive accessions of fibres at the lower third of the leg, to which the greater thickness of that part is due, the proportions in this respect being the reverse of those in man. The leg expands at once into the foot, which has a peculiar and characteristic form, owing to the modifications favouring bipedal motion being superinduced upon an essentially prehensile quadrumanous type. The heel makes a more decided backward projection than in the Chimpanzee ; the heel-bone is relatively thicker, deeper, more expanded vertically at its hind end, besides being fully as long as in the Chimpanzee. This bone, so characteristic of anthropoid affinities, is shaped and proportioned more like the human calcaneum than in any other ape. The malleoli do not make such well-marked projections as in man ; they are marked more by the thickness of the fleshy and tendinous parts of the muscles that pass near them, on their way to be inserted into parts of the foot. Although the foot be articulated to the leg with a slight inversion of the sole, it is more nearly plantigrade than in the Chimpanzee or any other ape. The hairy integument is continued along the dorsum of the foot to the clefts of the toes, and upon the first phalanx of the hallux : the whole sole is bare.

The hallux (great toe, thumb of the foot), though not relatively longer than in the Chimpanzee, is stronger ; the bones are thicker in proportion to their length, especially the last phalanx, which in

shape and breadth much resembles that in the human foot. The hallux in its natural position diverges from the other toes at an angle of 60 deg. from the axis of the foot; its base is large, swelling into a kind of ball below, upon which the thick callous epiderm of the sole is continued. The transverse indents and wrinkles show the frequency and freedom of the flexile movements of the two joints of the hallux: the nail is small, flat, and short. The sole of the foot gradually expands from the heel forward to the divergence of the hallux, and seems to be here cleft, and almost equally, between the base of the hallux and the common base of the other four digits. These are small and slender in proportion, and their bases are enveloped in a common tegumentary sheath as far as the base of the second phalanx. A longitudinal indent at the middle of the sole, bifurcating—one channel defining the ball of the hallux, the other running towards the interspace between the second and third digit—indicates the action of opposing the whole thumb (which seems rather like an inner lobe or division of the sole), to the outer division terminated by the four short toes. What is termed the “instep” in man is very high in the Gorilla, owing to the thickness of the carneo-tendinous parts of the muscles as they pass from the leg to the foot over this region. The mid-toe (third) is a little longer than the second and fourth; the fifth, as in man, is proportionally shorter than the fourth, and is divided from it by a somewhat deeper cleft. The whole sole is wider than in man—relatively to its length much wider,—and in that respect, as well as by the offset of the hallux, and the definition of its basal ball, more like a hand, but a hand of huge dimensions and of portentous power of grasp.

In regard to the outward coloration of the Gorilla, only from the examination of the living animal could the precise shades of colour of the naked parts of the skin be truly described. Much of the epiderm had peeled off the subject of the present description; but fortunately in large patches, and the texture of these had acquired a certain firmness, apparently by the action of the alcohol upon the albuminous basis. The able taxidermist, Mr. Bartlett, has availed himself of this circumstance in the correct and satisfactory preparation of the specimen now mounted for the British Museum. The parts of the epiderm remaining upon the face indicated the skin there to be chiefly of a deep leaden hue; it is everywhere finely wrinkled, and was somewhat less dark at the prominent parts of the supraciliary roll and the prominent margins of the nasal “alæ:” the soles and palms were also of a lighter colour.

Although the general colour of the hair appears, at first sight, and when moist, to be almost black, it is not so, but is rather of a dusky grey: it is decidedly of a less deep tint than in the Chimpanzee (*Trogl. niger*): this is due to an admixture of a few reddish, and of more greyish hairs, with the dusky-coloured ones which chiefly constitute the “pelage”: and the above admixture varies at different parts of the body. The reddish hairs are so numerous on the scalp, especially along the upper middle region, as to make their tint rather predominate there; they blend in a less degree with the long hairs

upon the sides of the face. The greyish hairs are found mixed with the dusky upon the dorsal, deltoidal and anterior femoral regions; but, on the limbs, not in such proportion as to affect the impression of the general dark colour, at first view. The hairs are wavy, approaching to a woolly character. Near the margin of the vent are a few short whitish hairs, as in the Chimpanzee. The epiderm of the back showed the effects of habitual resting, with that part against the trunk or branch of a tree, occasioning the hair to be more or less rubbed off: the epiderm was here very thick and tough.

It is most probable, from the degree of admixture of different coloured hairs above described, that a living Gorilla seen in bright sunlight, would in some positions reflect from its surface a colour much more different from that of the Chimpanzee than appears by a comparison of the skin of a dead specimen sent home in spirits. It can hardly be doubted, also, that age will make an appreciable difference in the general coloration of the *Troglodytes gorilla*.

The adult male Gorilla measures five feet six inches from the sole to the top of the head, the breadth across the shoulders is nearly three feet, the length of the upper limb is three feet four inches, that of the lower limb is two feet four inches; the length of the head and trunk is three feet six inches, whilst the same dimension in man does not average three feet.

In the foregoing remarks the author had given the results of direct observations made on the first and only entire specimen of the Gorilla which had reached England. At the period when they were made, no other description of its external characters had reached him; and if the majority of them be found to agree with previously recorded observations by naturalists enjoying earlier opportunities of studying similarly preserved specimens, the rarity and importance of the species might excuse, if it did not justify, a second description from direct scrutiny of a new specimen by an old observer of the anthropoid Quadrumana. A much more important labour, however, remained. The accurate record of facts in natural history was one and a good aim; the deduction of their true consequences was a better. Professor Owen proceeded, therefore, to reconsider the conclusions from which his experienced French and American fellow-labourers in natural history differed from him, and in which it seemed he stood alone.

The first—it may be called the supreme—question in regard to the Gorilla was, its place in the scale of nature, and its true and precise affinities.

Is it or not the nearest of kin to human kind? Does it form, like the Chimpanzee and Orang, a distinct genus in the anthropoid or knuckle-walking group of apes? Are these apes, or are the long-armed Gibbons, more nearly related to the genus *Homo*? Of the broad-breast-boned quadrumana, are the knuckle-walkers or the brachiators, *i.e.* the long-armed Gibbons, most nearly and essentially related to the human subject? The author proceeded to discuss the first as the most important question.

At the first aspect, whether of the entire animal or of the skeleton,

he freely admitted that the Gorilla strikes the observer as being a much more bestial and brutish animal than the Chimpanzee. All the features that relate to the wielding of the strong jaws and large canines are exaggerated; the evidence of brain is less, its chamber is more masked by the outgrowth of the strong occipital and other cranial ridges. But the impression so made—that the Gorilla is less like Man—is the same which is derived from comparing a young with an adult Chimpanzee, or some small tailless monkey with a full-grown male Orang or Chimpanzee. Taking the characters that cause that impression at a first inspection of the Gorilla, most of the small South American monkeys are more anthropoid than it; they have a proportionally larger and more human-shaped cranium, much less prominent jaws, with more equable teeth.

Referring to the skeletons of the adult males of the Gorilla, Chimpanzee, Orang, and Gibbon, Professor Owen remarked that the globular cranium of the last, and its superior size compared with the jaws and teeth, seemed to show the Gibbons to be more nearly akin to man than are the larger tailless Apes. And this conclusion had been adopted by a distinguished French palæontologist, M. Lartet, and accepted by a high geological authority at home*. They cite the experienced Professor of Human Anatomy at Amsterdam as supporting this view; but Prof. Owen had failed to find any statement of the grounds upon which it was sustained. In the art. *Quadrumana* of Todd's "Cyclopædia of Anatomy," cited by Lartet,† Prof. Vrolik briefly treats of the osteology of the *Quadrumana* according to their natural families. In "a first genus, *Simia* proper, or ape," he includes the Chimpanzee or Orang, noticing some of the chief points by which these apes approach the nearest to man. He next goes to "the second genus, the Gibbons" (*Hylobates*); he notices their ischial callosities, and the nearer approach of their molars, in their rounded form, to the teeth of *Carnivora* than the molars of the genus *Simia*. Then, comparing the Siamang with other species of *Hylobates*, Vrolik says, "its skeleton approaches most to that of man;" which may be true in comparison with other Gibbons, but certainly is not so as respects the higher *Simiæ*. No details are given to illustrate the proposition even in its more limited application; but the minor length of the arms in the Siamang, as compared with *Hylobates lar*, was probably the character in point.

The appearance of superior cerebral development in the Siamang and other long-armed apes is due to their small size and the concomitant feeble development of their jaws and teeth. The same appearance makes the small platyrrhine Monkeys of South America equally anthropoid in their facial physiognomy, and much more human-like than are the great Orangs and Chimpanzees. It is an appearance which depends upon the precocious growth of the brain as dependent on the law of its development. In all *Quadrumana* the brain has reached its full size before the second set of teeth is acquired, almost before the first set is shed. If, however, a young

* Lyell, Sir C. "Supplement to the Fifth Edition of a Manual of Elementary Geology," 1859, p. 15.

† "Comptes Rendus de l'Académie des Sciences, Juillet 28, 1856."

Gorilla, Chimpanzee, or Orang, be compared with a young Siamang of corresponding age, the absolutely larger size and better shape of brain, the deeper and more numerous convolutions of the cerebrum, and the more completely covered cerebellum in the former, unequivocally demonstrate the higher organization of the shorter-armed Apes. "In the structure of the brain," writes Vrolik,* in accordance with all other comparative anatomists, "they" (Chimpanzee and Orang-utan) "approach the nearest to man." The degree to which the Chimpanzee and Orang so resembled the human type seemed much closer to Cuvier, who knew those great apes only in their immaturity, with their small milk-teeth and precociously developed brain. Accordingly, the anthropoid characters of the *Simia satyrus* and *Simia troglodytes*, as deduced from the facial angle and dentition, are proportionally exaggerated in the "Règne Animal."† As growth proceeds, the milk-teeth are shed, the jaws expand, the great canines succeed their diminutive representatives, the temporal muscles gain a proportional increase of carneous fibres, their bony fulcra respond to the call for increased surface of attachment, the sagittal and occipital crests begin to rise: but the brain grows no more; its cranial box retains the size it showed in immaturity; it finally becomes masked by the superinduced osseous developments in those apes which attain the largest stature and wield the most formidably armed jaws. Yet under this show of physical force, the brain of both Orang and Chimpanzee is still the better and the larger, than is that of the little long-armed ape, which retains throughout life so much more of the characters of immaturity, especially in the structure of the skull.

The Siamang and other Gibbons have smaller, lower but longer upper canines, relatively, than in the Orangs and Chimpanzees; the permanent ones more quickly attain their full size, and are sooner in their place in the jaws; consequently the last molar teeth, *m* 3, come last into place as they do in the human species. But, if this be interpreted as of importance in determining the relative affinity of the longer-armed and shorter-armed apes to man, it is a character in which, as in their seeming superior cerebral development, the *Hyllobates* agree with some much lower *Quadrumanus* with still smaller canines.

The systematic zoologist, pursuing this most interesting comparison with clear knowledge of the true conditions and significance of a globular cranium and small jaws within the quadrumanous order, first determines and takes as his compass or guide-point the really distinctive characters of the human organization.

In respect to the cerebral test, he looks not so much for the relative size of the brain to the body, as for its relative size in the species compared one with another in the same natural group. He inquires what quadrumanous animal shows absolutely the biggest brain? what species shows the deepest and most numerous and winding convolutions? in which is the cerebrum largest, as compared with the cerebellum? If he finds all these characters highest in the Gorilla, he

* Art. *Quadrumanus*, "Cyclopædia of Anatomy," vol. iv. p. 195.

† Ed. 1829, pp. 87, 89.

does not permit himself to be diverted from the just inference because the great size and surpassing physical power attained in that species mask the true data from obvious view.

The comparative anatomist would look to the cæcum and the ischial integument : if he found in one subject of his comparisons (*Troglodytes*) a long "appendix vermiformis cæci," as in man, but no "callosities,"—in another subject (*Hylobates*) the ischial callosities, but only a short rudiment of the cæcal appendix,—he would know which of the two tailless Apes were to be placed next "the Monkeys with ischial callosities and no vermiform appendix," and which of the two formed the closer link toward man. He would find that the anthropoid intestinal and dermal characters were associated with the absolutely larger and better developed brain in the Gorilla, Chimpanzee, and Orang; whilst the lower quadrumanous characters exhibited by the cæcum and nates were exhibited by the smaller-brained and longer-armed but rounder-skulled and shorter-jawed Gibbons.

Pursuing the comparison through the complexities of the bony framework, he might first glance at the more obvious proportions; and such, indeed, as would be given by the entire animal. The characteristics of the limbs in Man are their near equality of length, but the lower limbs are the longest. The arms in Man reach to below the middle of the thigh; in the Gorilla they nearly attain the knee; in the Chimpanzee they reach below the knee; in the Orang they reach the ankle; in the Siamang they reach the sole; in most Gibbons the whole palm can be applied to the ground without the trunk being bent forward beyond its naturally inclined position on the legs. These gradational differences coincide with other characters determining the relative proximity to Man of the apes compared. In no *Quadrumana* does the humerus exceed the ulna so much in length as in Man; only in the most anthropoid, viz. the Gorilla and Chimpanzee, does it exceed the ulna at all in length; in the rest, as in the lower quadrupeds, the fore-arm is longer than the arm.

The humerus, in the Gorilla, though less long, compared with the ulna, than in Man, is longer than in the Chimpanzee; in the Orang it is shorter than the ulna; in the Siamang and other Gibbons it is much shorter, the peculiar length of arm in those "long-armed" apes is chiefly due to the excessive length of the antibrachial bones.

The difference in the length of the upper limbs, as compared with the trunk, is but little between Man and the Gorilla. The elbow-joint in the Gorilla, as the arm hangs down, is opposite the "labrum ilii," the wrist opposite the "tuber ischii;" it is rather lower down in the Chimpanzee; it is opposite the knee-joint in the Orang; it is opposite the ankle-joint in the Siamang.

Man's perfect hand is one of his peculiar physical characters; that perfection is mainly due to the extreme differentiation of the first from the other four digits, and its concomitant power of opposing them as a perfect thumb. An opposable thumb is present in the hand of most *Quadrumana*, but is usually a small appendage com-

pared with that of Man. It is relatively largest in the Gorilla. In this ape the thumb reaches to a little beyond the base of the first phalanx of the fore-finger; it does not reach to the end of the metacarpal bone of the fore-finger in the Chimpanzee, Orang, or Gibbon; it is relatively smallest in the last tailless ape. In Man the thumb extends to or beyond the middle of the first phalanx of the fore-finger. The philosophical zoologist will see great significance in the results of this comparison. Only in the Gorilla and Chimpanzee are the carpal bones eight in number, as in man; in the Orangs and Gibbons they are nine in number, as in the tailed monkeys.

The scapulæ are broader in the Gorilla than in the Chimpanzee, Orang, or long-armed apes; they come nearer to the proportions of that bone in Man. But a more decisive resemblance to the human structure is presented by the iliac bones. In no other ape than the Gorilla do they bend forward, so as to produce a pelvic concavity; nor are they so broad in proportion to their length in any ape as in the Gorilla. In both the Chimpanzee and Orang the iliac bones are flat, or present a concavity rather at the back than at the fore part. In the Siamang they are not only flat, but are narrower and longer, resembling the iliac bones of tailed monkeys and ordinary quadrupeds.

The lower limbs, though characteristically short in the Gorilla, are longer in proportion to the upper limbs, and also to the entire trunk, than in the Chimpanzee; they are much longer in both proportions and more robust than in the Orangs or Gibbons. But the guiding points of comparisons here are the heel and the hallux.

The heel in the Gorilla makes a more decided backward projection than in the Chimpanzee; the heelbone is relatively thicker, deeper, more expanded vertically at its hind end, beside being fully as long as in the Chimpanzee: it is in the Gorilla shaped and proportioned more like the human calcaneum than in any other ape. Among all the tailless apes the calcaneum in the Siamang and other Gibbons least resembles in its shape or proportional size that of Man.

Although the foot be articulated to the leg with a slight inversion of the sole it is more nearly plantigrade in the Gorilla than in the Chimpanzee. The Orang departs far, and the Gibbons farther, from the human type in the inverted position of the foot.

The great toe which forms the fulcrum in standing or walking is, perhaps, the most characteristic peculiarity in the human structure; it is that modification which differentiates the foot from the hand, and gives the character to the order *Bimana*. In the degree of its approach to this development of the hallux the quadrumanous animal makes a true step in affinity to Man.

The Orang-utan and the Siamang, tried by this test, descend far and abruptly below the Chimpanzee and Gorilla in the scale. In the Orang the hallux does not reach to the end of the metacarpal of the second toe; in the Chimpanzee and Gorilla it reaches to the end of the first phalanx of the second toe; but in the Gorilla the hallux is thicker and stronger than in the Chimpanzee. In both, however, it is a true thumb, by position, diverging from the other toes, in the Gorilla, at an angle of 60° from the axis of the foot.

Man has twelve pairs of ribs, the Gorilla and Chimpanzee have thirteen pairs, the Orangs have twelve pairs, the Gibbons have thirteen pairs. Were the naturalist to trust to this single character, as some have trusted to the cranio-facial one, and in equal ignorance of the real condition and value of both, he might think that the Orangs (*Pithecus*) were nearer akin to man than the Chimpanzees (*Troglodytes*) are. But man has sometimes a thirteenth pair of ribs; and what we term "ribs" are but vertebral elements or appendages common to nearly all the true vertebræ in man, and only so called, when they become long and free. The genera *Homo*, *Troglodytes*, and *Pithecus*, have precisely the same number of vertebræ; if *Troglodytes*, by the development and mobility of the pleuro-apophyses of the twentieth vertebra from the occiput, seem to have an additional thoracic vertebra, it has one vertebra less in the lumbar region. So, if there be, as has been observed, a difference in the number of sacral vertebræ, it is merely due to a last lumbar having coalesced with what we reckon as the first sacral vertebra in Man.

The thirteen pairs of ribs, therefore, in the Gorilla and Chimpanzee, are of no weight, as against the really important characters significant of affinity with the human type. But, supposing the fact of any real value, how do the advocates of the superior resemblance of the Siamang's or Gibbon's skeleton to that of man dispose of the thirteenth pair of ribs?

In applying the characters of the skull to the determination of the important question at issue, those must first be ascertained by which the genus *Homo* trenchantly differs from the genus *Simia*, of Linnaeus. To determine these osteal distinctions, the author stated that he had compared the skulls of many individuals of different varieties of the human race together with those of the male, female, and young of species of *Troglodytes*, *Pithecus*, and *Hylobates*; Professor Owen referred to his 'Catalogue of the Osteological Series in the Museum of the Royal College of Surgeons,' 4to, 1853, for the detailed results of these comparisons. On the present occasion he would restrict himself to a few of these results.

The first and most obvious differential character is the globular form of the brain-case, and its superior relative size to the face, especially the jaws, in man. But this, for the reasons he had already assigned, is not an instructive or decisive character, when comparing quadrumanous species, in reference to the question at issue. It is exaggerated in the human child, owing to the acquisition of its full, or nearly full size, by the brain, before the jaws have expanded to lodge the second set of teeth. It is an anthropoid character in which the *Quadrumana* resemble man, in proportion to the diminution of their general bulk. If a Gorilla, with milk-teeth, have a somewhat larger brain and brain-case than a Chimpanzee at the same immature age, the acquisition of greater bulk by the Gorilla, and of a more formidable physical development of the skull, in reference to the great canines in the male, will give to the Chimpanzee the appearance of a more anthropoid character, which really does not belong to it,—which could be as little depended upon in a question of precise affi-

nity as the like more anthropoid characters of the female, as compared with the male, Gorilla or Chimpanzee.

Much more important and significant were the following characters of the human skull :—the position and plane of the occipital foramen ; the proportional size of the condyloid and petrous processes ; the mastoid processes, which relate to balancing the head upon the trunk in the erect attitude ; the small premaxillaries and concomitant small size of the incisor teeth, as compared with the molar teeth. The latter character relates to the superiority of the psychical over the physical powers in man : it governs the feature in which man recedes from the brute ; as does also the prominence of the nasal bones in most, and in all the typical, races of man. The somewhat angular form of the bony orbits, tending to a square, with the corners rounded off, is a good human character of the skull, which is difficult to comprehend as an adaptive one, and therefore the better in the present inquiry. The same may be said of the production of the floor of the tympanic or auditory tube into the plate called “vaginal.”

Believing the foregoing to be sufficient to test the respective degrees of affinity to man within the limited group of *Quadrumana* to which it was proposed, in the present memoir, to apply them, the author would not dilute his argument by citing minor characters. The question at issue was the respective degrees of affinity as between the anthropoid apes and man. Cuvier deemed the Orang (*Pitheculus*) to be nearer akin to man than the Chimpanzee (*Troglo-dytes*) is. That belief has long ceased to be entertained. Professor Owen proceeded, therefore, to compare the Gorilla, Chimpanzee, and Gibbon, in reference to their human affinities.

Most naturalists entering upon this question would first look to the premaxillary bones, or, owing to the early confluence of those bones with the maxillaries in the Gorilla and Chimpanzee, to the part of the upper jaw containing the incisive teeth, on the size and direction of which depends the prognathic or brutish character of a skull. Now the extent of the premaxillaries below the nostril is not only relatively but absolutely less in the Gorilla, and consequently the profile of the skull is less convex at this part, or less “prognathic,” than in the Chimpanzee. Notwithstanding the degree in which the skull of the Gorilla surpasses in size that of the Chimpanzee, especially when the two are compared on a front view, the breadth of the premaxillaries and of the four incisive teeth is the same in both. In the relative degree, therefore, in which these bones are smaller than in the Chimpanzee, the Gorilla, in this most important character, comes nearer to Man. In the Gibbons the incisors are relatively smaller than in the Gorilla, but the premaxillaries bear the same proportional size in the adult male Siamang.

Next, as regards the nasal bones. In the Chimpanzee, as in the Orangs and Gibbons, they are as flat to the face as in any of the lower *Simiæ*. In the Gorilla, the median coalesced margins of the upper half of the nasal bones are produced forward, in a slight degree it is true, but affording a most significant evidence of nearer

resemblance to Man. In the same degree they impress that anthropic feature upon the face of the living Gorilla. In some pig-faced baboons there are ridges and prominences in the naso-facial part of the skull, but they do not really affect the question as between the Gorilla and Chimpanzee. All naturalists know that the Semnopithecus of Borneo have long noses, but the proboscisiform appendage which gives so ludicrous a mask to those monkeys is unaccompanied by any such modification of the nose-bones as gives the true anthropoid character to the human skull, and to which only the Gorilla, in the ape tribe, makes any approximation.

No Orang, Chimpanzee, or Gibbon shows any rudiment of mastoid processes; but they are present in the Gorilla, smaller indeed than in Man, but unmistakeable; they are, as in Man, cellular, pneumatic, and with a thin outer plate of bone. This fact led the author, in a former memoir, to express, when, in respect to the Gorilla, only the skull had reached him, the following inference, viz.: "from the nearer approach which the Gorilla makes to Man in comparison with the Chimpanzee or Orang, in regard to the mastoid processes, that it assumed more nearly and more habitually the upright attitude than those inferior anthropoid apes do."* This inference has been fully borne out by the rest of the skeleton of the Gorilla, subsequently acquired.

In the Chimpanzee, as in the Orangs, Gibbons, and inferior *Simia*, the lower surface of the long tympanic or auditory process is more or less flat and smooth, developing in the Chimpanzee only a slight tubercle, anterior to the stylohyal pit. In the Gorilla the auditory process is more or less convex below, and develops a ridge, answering to the vaginal process, on the outer side of the carotid canal. The processes posterior and internal to the glenoid articular surface are better developed, especially the internal one, in the Gorilla than in the Chimpanzee; the ridge which extends from the ectopterygoid along the inner border of the foramen ovale, terminates in the Gorilla by an angle or process answering to that called "styliform" or "spinous" in Man, but of which there is no trace in the Chimpanzee, Orang, or Gibbon.

The orbits have a full oval form in the Orang; they are almost circular in the Chimpanzee and Siamang, more nearly circular, and with a more prominent rim in the smaller Gibbons; in the Gorilla alone do they present the form which used to be deemed peculiar to man. There is not much physiological significance in some of the latter characters, but on that very account, the author deemed them more instructive and guiding in the actual comparison. The occipital foramen is nearer the back part of the cranium, and its plane is more sloping, less horizontal in the Siamang than in the Chimpanzee and Gorilla. Considering the less relative prominence of the fore-part of the jaws in the Siamang, as compared with the Chimpanzee, the occipital character of that Gibbon and of other species of *Hylobates* marks well their inferior position in the quadrumanous scale.

* Transactions of the Zoological Society, vol. iii. p. 409.

In the greater relative size of the molars, compared with the incisors, the Gorilla makes an important closer step towards Man than does the Chimpanzee. The molar teeth are relatively so small in the Siamang, that, notwithstanding the small size of the incisors, the proportion of those teeth to the molars is only the same as in the Gorilla: in other Gibbons (*Hylobates lar*), the four lower incisors occupy an extent equal to that of the first four molars, in the Chimpanzee equal to that of the first three molars, in the Siamang equal to that of the first two molars and rather more than half of the third, in Man equal to the first two molars and half of the third: in this comparison the term molar is extended to the bicuspid.

The proportion of the ascending ramus to the length of the lower jaw tests the relative affinity of the tailless apes to Man.

In a profile of the lower jaw, the author compares the line drawn vertically from the top of the coronoid process to the horizontal length along the alveoli. In Man and the Gorilla it is about $\frac{7}{10}$ ths, in the Chimpanzee $\frac{6}{10}$ ths, in the Siamang it is only $\frac{4}{10}$ ths. The Siamang further differs in the shape and production of the angle of the jaw, and in the shape of the coronoid process, approaching the lower *Simia* in both these characters. In the size of the post-glenoid process, in the shape of the glenoid cavity which is almost flat, in the proportional size of the petrous bone, and in the position of the foramen caroticum, the Siamang departs further from the human type, and approaches nearer that of the tailed *Simia*, than the Gorilla does, and in a marked degree.

Every legitimate deduction from a comparison of cranial characters makes the tailless *Quadrumanus* recede from the human type in the following order:—Gorilla, Chimpanzee, Orangs, Gibbons, and the last named in a greater and more decided degree.

These comparisons have of late been invested with additional interest from the discoveries of remains of quadrumanous species in different members of the tertiary formations.

The first quadrumanous fossil, the discovery of which by Lieuts. Baker and Durand is recorded in the 'Journal of the Asiatic Society of Bengal,' for November, 1836, has proved to belong, like subsequently discovered quadrumanous fossils in the Sewalik (probably miocene) tertiaries, to the Indian genus *Semnopithecus*. The quadrumanous fossils discovered in 1839, in the eocene deposits of Suffolk, belong to a genus (*Eopithecus*) having its nearest affinities with *Macacus*. The monkey's molar tooth from the pliocene beds of Essex is most closely allied to the *Macacus sinicus*. The remains of the large monkey, four feet in height, discovered in 1839 by Dr. Lund in a limestone cavern in Brazil was shown by its molar dentition ($p \frac{3-3}{3-3}$ $m \frac{3-3}{3-3}$) to belong to the platyrrhine family now peculiar to South America. The lower jaw and teeth of the small quadrumanus discovered by M. Lartet in a miocene bed of the South of France, and described by him and De Blainville, are so closely allied to the Gibbons, as scarcely to justify the generic separation which has been made for it under the name *Pliopithecus*.

Finally, a portion of a lower jaw with teeth and the shaft of a humerus of a quadrumanous animal (*Dryopithecus*), equalling the size of those bones in Man, have been discovered by M. Fontan, of Saint-Gaudens, in a marly bed of Upper Miocene age, forming the base of the plateau on which that town is built. The molar teeth present the type of grinding surface of those of the Gibbons (*Hylobates*), and, as in that genus, the second true molar is larger than the first, not of equal size, as in the human subject and Chimpanzee. The premolars have a greater antero-posterior extent, relatively, than in the Chimpanzee, and in this respect agree more with those in the Siamang. The first premolar has the outer cusp raised to double the height of that of the second; its inner lobe appears from M. Lartet's figure to be less developed than in the Gorilla, certainly less than in the Chimpanzee. The posterior talon of the second premolar is more developed, and consequently the fore and aft extent of the tooth is greater than in the Chimpanzee; thereby the second premolar of *Dryopithecus* more resembles that in *Hylobates*, and departs further from the human type.

The canine, judging from the figures published by M. Lartet*, seems to be less developed than in the male Chimpanzee, Gorilla, or Orang; in which character the fossil, if it belonged to a male, makes a nearer approach to the human type: but it is one which many of the inferior monkeys also exhibit, and is by no means to be trusted as significant of true affinity, supposing even the sex of the fossil to be known as being male.

The shaft of the humerus, found with the jaw, is peculiarly rounded, as it is in the Gibbons and Sloths, and offers none of those angularities and ridges which make the same bone in the Chimpanzee and Orang come so much nearer in shape to the humerus of the human subject. The fore part of the jaw, as in the Siamang, is more nearly vertical than in the Gorilla or Chimpanzee; but whether the back part of the jaw may not have departed in a greater degree from the human type than the fore part approaches it, as is the case in the Siamang, the state of the fossil does not allow of determining. One significant character is, however, present,—the shape of the fore part of the coronoid process. It is slightly convex forwards, which causes the angle it forms with the alveolar border to be less open. The same character is present in the Gibbons. The front margin of the lower half of the coronoid process in Man is concave, as it is likewise in the Gorilla and Chimpanzee. Prof. Owen was acquainted with this interesting fossil, referred to a genus called *Dryopithecus*, only by the figures published in the 43rd volume of the 'Comptes Rendus de l'Académie des Sciences.' From these it appears that the canine, two premolars, and first and second true molars, are in place; the socket of the third molar is empty, but widely open above; from which the author concludes that the third molar had also cut the gum, the crown being completed, but not the fangs. If the last molar had existed as a mere germ, it would more probably have been preserved in the substance of the jaw.

* 'Comptes Rendus de l'Académie des Sciences.' Paris, vol. xliii.

In a young Siamang, with the points of the permanent canines just protruding from the socket, exhibited by Prof. Owen, the crown of the last molar was complete, and on a level with the base of that of the penultimate molar; whence he inferred that the last molar would have cut the gum as soon as, if not before, the crown of the canine had been completely extricated. This dental character, the conformation and relative size of the grinding teeth, especially the fore and aft extent of the premolars, all indicate the close affinity of the *Dryopithecus* with the *Pliopithecus* and existing Gibbons; and this, the sole legitimate deduction from the maxillary and dental fossils, is corroborated by the fossil humerus, fig. 9, in the above-cited plate.

There is no law of correlation, by which, from the portion of jaw with teeth of the *Dryopithecus*, can be deduced the shape of the nasal bones and orbits, the position and plane of the occipital foramen, the presence of mastoid and vaginal processes, or other cranial characters determinative of affinity to Man; much less any ground for inferring the proportions of the upper to the lower limbs, of the humerus to the ulna, of the pollex to the manus, or the shape and development of the iliac bones. All those characters which do determine the closer resemblance and affinity of the genus *Troglodytes* to man, and of the genus *Hylobates* to the tailed monkeys, are at present unknown in respect of the *Dryopithecus*. A glance at fig. 5 (*Gorilla*), and fig. 7 (*Dryopithecus*), of the plate of M. Lartet's memoir, would suffice to teach their difference of bulk, the *Gorilla* being fully one-third larger. The statement that the parts of the skeleton of the *Dryopithecus* as yet known, viz. the two branches of the lower jaw and the humerus, "are sufficient to show that in anatomical structure, as well as stature, it came nearer to man than any quadrumanous species, living or fossil, before known to zoologists*," is without the support of any adequate fact, and in contradiction of most of those to be deduced from M. Lartet's figures of the fossils. Those parts of the *Dryopithecus* merely show—and the humerus in a striking manner—its nearer approach to the Gibbons; the most probable conjecture being that it bore to them, in regard to size, the like relations which Dr. Lund's *Protopithecus* bore to the existing *Myctes*. Whether, therefore, strata of such high antiquity as the miocene may reveal to us "forms in any degree intermediate between the Chimpanzee and man" awaits an answer from discoveries yet to be made; and the anticipation that the fossil world "may hereafter supply new osteological links between man and the highest known *Quadrumana*†" must be kept in abeyance until that world has furnished us with the proofs that a species did formerly exist which came as near to man as does the Orang, the Chimpanzee, or the *Gorilla*.

Of the nature and habits of the last-named species, which really offers the nearest approach to man of any known ape, recent or fossil, the author had received many statements from individuals resident at or visitors to the Gaboon, from which he selected the following as most probable, or least questionable.

* Lyell (Sir Charles), 'Supplement to the Fifth Edition of Manual of Elementary Geology,' 8vo, 1859, p. 14.

† Ibid.

Gorilla-land is a richly-wooded extent of the western part of Africa, traversed by the rivers Danger and Gaboon, and extending from the equator to the 10th or 15th degree of south latitude. The part where the Gorilla has been most frequently met with presents a succession of hill and dale, the heights crowned with lofty trees, the valleys covered by coarse grass, with partial scrub or scattered shrubs. Fruit trees of various kinds abound both on the hills and in the valleys; some that are crude and uncared for by the Negroes are sought out and greedily eaten by the Gorillas; and as different kinds come to maturity at different seasons, they afford the great denizen of the woods a successive and unfailing supply of indigenous fruits. Of these Professor Owen specified the following sources:—

The palm-nut (*Elaeis guiniensis*) of which the Gorillas greatly affect the fruit and upper part of the stipe, called the “cabbage.” The Negroes of the Gaboon have a tradition that their forefathers first learnt to eat the “cabbage,” from seeing the Gorilla eat it, concluding that what was good for him must be good for man.

The “ginger-bread tree” (*Parinarium excelsum*), which bears a plum-like fruit.

The papau tree (*Carica papaya*).

The banana (*Musa sapientum*), and another species (*Musa paradisiaca*).

The *Amomum afzelii* and *Am. grandiflorum*.

A tree, with a shelled fruit, like a walnut, which the Gorilla breaks open with the blow of a stone.

A tree, also botanically unknown, with a fruit like a cherry.

Such fruits and other rich and nutritious productions of the vegetable kingdom, constitute the staple food of the Gorilla, as they do of the Chimpanzee. The molar teeth, which alone truly indicate the diet of an animal, accord with the statements as to the frugivorous character of the Gorilla: but they also sufficiently answer to an omnivorous habit to suggest that the eggs and callow brood of nests discovered in the trees frequented by the Gorilla might not be unacceptable.

The Gorilla makes a sleeping place like a hammock, connecting the branches of a sheltered and thickly-leaved part of a tree by means of the long tough slender stems of parasitic plants, and lining it with the broad dried fronds of palms, or with long grass. This hammock-like abode may be seen at different heights, from 10 to 40 feet from the ground, but there is never more than one such nest in a tree.

They avoid the abodes of man, but are most commonly seen in the months of September, October, and November, after the negroes have gathered their outlying rice-crops, and have returned from the “bush” to the village. So observed, they are described to be usually in pairs; or, if more, the addition consists of a few young ones, of different ages, and apparently of one family. The Gorilla is not gregarious. The parents may be seen sitting on a branch, resting the back against the tree-trunk—the hair being generally rubbed off the back of the old Gorilla from that habit—perhaps

munching fruit, whilst the young Gorillas are at play, leaping and swinging from branch to branch, with hoots or harsh cries of boisterous mirth.

If the old male be seen alone, or when in quest of food, he is usually armed with a stout stick, which the negroes aver to be the weapon with which he attacks his chief enemy the elephant. Not that the elephant directly or intentionally injures the Gorilla, but, deriving its subsistence from the same source, the ape regards the great proboscidian as a hostile intruder. When, therefore, he discerns the elephant pulling down and wrenching off the branches of a favourite tree, the Gorilla, stealing along the bough, strikes the sensitive proboscis of the elephant with a violent blow of his club, and drives off the startled giant trumpeting shrilly with rage and pain.

In passing from one detached tree to another, the Gorilla is said to walk semi-erect, with the aid of his club, but with a waddling awkward gait; when without a stick, he has been seen to walk as a biped, with his hands clasped across the back of his head, instinctively so counterpoising its forward projection. If the Gorilla be surprised and approached while on the ground, he drops his stick, betakes himself to all-fours, applying the back part of the bent knuckles of his fore-hands to the ground, and makes his way rapidly, with an oblique swinging kind of gallop, to the nearest tree. There he awaits his pursuer, especially if his family be near, and requiring his defence. No negro willingly approaches the tree in which the male Gorilla keeps guard. Even with a gun the experienced negro does not make the attack, but reserves his fire in self-defence. The enmity of the Gorilla to the whole negro race, male and female, is uniformly attested.

The young men of the Gaboon tribe make armed excursions into the forests, in quest of ivory. The enemy they most dread on these occasions is the Gorilla. If they have come unawares too near him with his family, he does not, like the lion, sulkily retreat, but comes rapidly to the attack, swinging down to the lower branches, and clutching at the nearest foe. The hideous aspect of the animal, with his green eyes flashing with rage, is heightened by the skin over the prominent roof of the orbits being drawn rapidly backward and forward, with the hair erected, causing a horrible and fiendish scowl. If fired at and not mortally hit, the Gorilla closes at once upon his assailant, and inflicts most dangerous, if not deadly wounds, with his sharp and powerful tusks. The commander of a Bristol trader told the author he had seen a negro at the Gaboon frightfully mutilated by the bite of the Gorilla, from which he had recovered. Another negro exhibited to the same voyager a gun-barrel bent and partly flattened by the bite of a wounded Gorilla, in its death-struggle. Negroes, when stealing through the gloomy shades of the tropical forest, become sometimes aware of the proximity of one of these frightfully formidable apes by the sudden disappearance of one of their companions, who is hoisted up into the tree, uttering, perhaps, a short choking cry. In a few minutes he

falls to the ground a strangled corpse. The Gorilla, watching his opportunity, has let down his huge hind-hand, seized the passing negro by the neck, with vice-like grip, has drawn him up to higher branches, and dropped him when his struggles had ceased.

The strength of the Gorilla is such as to make him a match for a lion, whose tusks his own almost rival. Over the leopard, invading the lower branches of the Gorilla's dwelling-tree, he will gain an easier victory; and the huge canines, with which only the male Gorilla is furnished, doubtless have been assigned to him for defending his mate and offspring.

The skeleton of the old male Gorilla obtained for the British Museum in 1857, shows an extensive fracture, badly united, of the left arm-bone, which has been shortened, and gives evidence of long suffering from abscess and partial exfoliation of bone. The upper canines have been wrenched out or shed some time before death, for their sockets have become absorbed.

The redeeming quality in this fragmentary history of the Gorilla is the male's care of his family, and the female's devotion to her young.

It is reported that a French natural-history collector, accompanying a party of the Gaboon negroes into the Gorilla woods, surprised a female with two young ones on a large boabdad (*Adansonia*), which stood some distance from the nearest clump. She descended the tree with her youngest clinging to her neck, and made off rapidly on all fours to the forest, and escaped. The deserted young one on seeing the approach of the men began to utter piercing cries: the mother, having disposed of her infant in safety, returned to rescue the older offspring, but before she could descend with it her retreat was cut off. Seeing one of the negroes level his musket at her, she, clasping her young with one arm, waved the other, as if deprecating the shot: the ball passed through her heart, and she fell with her young one clinging to her. It was a male, and survived the voyage to Havre, where it died on arriving. Professor Owen had examined the skeleton of this young Gorilla in the museum of natural history at Caen, and was indebted to Professor Deslongchamps, Dean of the Faculty of Sciences in that town, for drawings of the skeleton of this rare specimen.

There might be more difficulty in obtaining a young Gorilla for exhibition than a young Chimpanzee; but as no full-grown Chimpanzee has ever been captured, we cannot expect the larger and much more powerful adult Gorilla to be ever taken alive.

A bold negro, the leader of an elephant-hunting expedition, being offered a hundred dollars if he would bring back a live Gorilla, replied, "If you gave me the weight of yonder hill in gold coins, I could not do it!"

All the terms of the aborigines in reference to the Gorilla imply their opinion of his close kinship to themselves. But they have a low opinion of his intelligence. They say that during the rainy season he builds a house without a roof. The natives on their hunting excursions light fires for their comfort and protection by night; when they have gone away, they affirm that the Gorilla will come

down and warm himself at the smouldering embers, but has not wit enough to throw on more wood, out of the surrounding abundance, to keep the fire burning,—“the stupid old man!”

Every account of the habits of a wild animal obtained at second hand from the reports of aborigines has, commonly, its proportion of “apocrypha.” The author had restricted himself to the statements that had most probability and were in accordance with the ascertained structures and powers of the animal, and would only add the averment and belief of the Gaboon negroes, that when a Gorilla dies, his fellows cover the corpse with a heap of leaves and loose earth collected and scraped up for the purpose.

A most singular phenomenon in natural history, if one reflects on the relations of things, is this Gorilla! Limited as it is in its numbers and geographical range, one discerns that the very peculiar conditions of its existence—abundance of wild fruit—needs must be restricted in space; but concurring in a certain part of Africa, there lives the creature to enjoy them.

The like conditions exist in Borneo and Sumatra, and there also a correlative human-like ape, of similar nature, tooth-armour, and force, exists at their expense. Neither Ourangs nor Gorillas however minister to man’s use either directly or indirectly. Were they to become extinct, no sign of the change or break in the links of life would remain. What may be their real significance?

Reverting finally to the ancient notices which might relate to the great anthropoid ape of Africa, Prof. Owen referred to his first Memoir, of February, 1848, in which was quoted (Trans. Zool. Soc., vol. iii. p. 418) Dr. Falconer’s ‘Translation of the Voyage of Hanno,’ (London, 1797) with his dissertation vindicating the authenticity of the “Periplus.” Professor Owen had lately been favoured by the venerable Bishop Maltby, the first amongst our Greek scholars, with the following translation of the passage supposed to allude to the species in question:—“On the third day, having sailed from thence, passing the streams of fire, we came to a bay called the Horn of the South. In the recess there was an island like the first, having a lake, and in this there was another island full of wild men. But much the greater part of them were women, with hairy bodies, whom the interpreters called ‘Gorillas.’ But, pursuing them, we were not able to take the men; they all escaped, being able to climb the precipices, and defended themselves with pieces of rock. But three women (females), who bit and scratched those who led them, were not willing to follow. However, having killed them, we flayed them, and conveyed the skins to Carthage; for we did not sail any further, as provisions began to fail.” This encounter indicates, therefore, the southernmost point on the west coast of Africa reached by the Carthaginian navigator.

To the inquiry by Bishop Maltby, how far the newly-discovered great ape of Africa bore upon the question of the authenticity of the Periplus, Prof. Owen had replied:—“The size and form of the great ape, now called ‘Gorilla,’ would suggest to Hanno and his crew no other idea of its nature than that of a kind of human being; but

the climbing faculty, the hairy body, and skinning of the dead specimens, strongly suggest that they were large anthropoid apes. The fact that such apes, having the closest observed resemblance to the negro, being of human stature and with hairy bodies, do still exist on the west coast of Africa, renders it highly probable that such were the creatures which Hanno saw, captured, and called 'Gorullai.' "

The brief observation made by Battell in west tropical Africa, 1590, recorded in Purchas's "Pilgrimages, or Relations of the World," 1748, of the nature and habits of the large human-like ape which he calls "Pongo," more decidedly refers to the Gorilla. Other notices, as by Nieremberg and Bosman, applied by Buffon to Battell's Pongo, were deemed valueless by Cuvier, who altogether rejected the conclusions of his great predecessor as to the existence of any such ape. "This name of Pongo or Boggo, given in Africa to the Chimpanzee or to the Mandril, has been applied," writes Cuvier, "by Buffon to a pretended great species of Ourang-utan, which was nothing more than the imaginary product of his combinations." After the publication of Cuvier's 'Règne Animal,' the supposed species was, by the high authority of its author, banished from natural history; it has only been authentically reintroduced since the intelligent attention of Dr. Savage was directed to the skull which he first saw at the Gaboon in 1847, and took Professor Owen's opinion upon.

2. DESCRIPTIONS OF TWENTY-SEVEN NEW SPECIES OF LAND-SHELLS, FROM THE COLLECTION OF H. CUMING, ESQ. BY DR. LOUIS PFEIFFER.

(Mollusca, Pl. XLIII.-XLIV.)

1. *HELIX PATRICIA*, Pfr. (Pl. XLIV. fig. 4.) *T. imperforata*, subdepressa, solida, carinata, superne oblique striata et irregulariter malleato-impressa, alba; spira convexa, apice obtusa; sutura linearis; anfr. $4\frac{1}{2}$ regulariter accrescentes, convexiusculi, ultimus superne convexior, antice deflexus, infra carinam prominentem, acutam, antice funiformem minus convexus, iris spiralibus et plicis radiantibus sculptus; apertura diagonalis, rotundato-rhombea; perist. album, nitidum, expansum et breviter reflexum, marginibus callo albo junctis, columellari intrante, declivi, dilatato planiusculo.

Diam. maj. 63, min. 55, alt. 35 mill.

Hab. Unknown.

2. *HELIX FARRISI*, Pfr. (Pl. LXIV. fig. 3.) *T. imperforata*, ocatodepressa, tenuiuscula, spiraliter striata et foveolis impressis reticulata, fulva, fasciis 4 nigricantibus et maculis punctisque luteis variegata; spira brevis, conoidea, apice obtusula; anfr. vix ultra 4 rapide accrescentes, ultimus ventrosus, antice deflexus, medio impressus, castaneus; apertura perob-

liqua, truncato-ovalis; perist. albolabiatum, margine dextro expanso, columellari dilatato, plano, adnato.

Diam. maj. 35, min. 27, alt. 19 mill.

Hab. Province of Patas, Andes of Peru (*Dr. Farris*).

3. *HELIX PATASENSIS*, Pfr. (Pl. XLIII. fig. 6.) *T. late umbilicata, depressa, solidula, striata et foveolis minutis undique sculpta, fulvida, castaneo-unifasciata; spira vix elevata; anfr. 5½ convexiusculi, regulariter accrescentes, ultimus depresso-rotundatus, antice deflexus; apertura perobliqua, lunato-elliptica; perist. albidum, marginibus conniventibus, supero breviter expanso, basali reflexo, versus insertionem sensim dilatato.*

Diam. maj. 36, min. 29, alt. 13 mill.

Hab. Province of Patas, Andes of Peru (*Dr. Farris*).

4. *HELIX JASPIDEA*, Pfr. (Pl. XLIV. fig. 5.) *T. late umbilicata, depressa, carinata, solidula, oblique costulato-striata, carneo-albida, pallide corneo flammulata et subfasciata; spira vix elevata, apice cornea; sutura levis, marginata; anfr. 5 planiusculi, regulariter accrescentes, ultimus utrinque convexior, antice descendens; umbilicus fere ¼ diametri occupans; apertura perobliqua, transverse oblonga, intus carnea, albofasciata; perist. albidum, marginibus approximatis, supero recto, basali reflexo, ad insertionem dilatato.*

Diam. maj. 31, min. 26, alt. 10 mill.

Hab. Province of Patas, Andes of Peru (*Dr. Farris*).

5. *HELIX ENTODONTA*, Pfr. (Pl. XLIII. fig. 2.) *T. umbilicata, depressa, discoidea, solidula, dense striata, pellucida, albidohyalina; spira plana, subimmersa; anfr. 7½ convexi, angustissimi, ultimus irregularis, 4 mill. pone aperturam complanatus et intus dentibus 3 perlucetibus munitus, antice dilatatus, vix descendens; umbilicus dimidium diametri occupans; apertura diagonalis, obauriformis; perist. breviter reflexum, marginibus remotis, dextro flexuoso.*

Diam. maj. 6½, min. 5½, alt. 2 mill.

Hab. Cuenca, republic of Ecuador (*Mr. Fraser*).

Nearly allied to *Helix pollodonta*, Orb.

6. *HELIX VIPERA*, Pfr. (Pl. XLIV. fig. 6.) *T. peranguste umbilicata, depressa, solidula, superne irregulariter striata et dense granulata, pallide fulvida, fasciis 2 albidis rufo anguloso-maculatis (altera ad suturam, altera supra peripheriam) et inter illas strigis rufulis ornata; spira convexa, obtusa; anfr. 5 convexiusculi, ultimus subcarinatus, ad partem peripheriæ aperturæ oppositam sulco 1 notatus, antice non descendens, subtus irregulariter tumidus et impressus, radiato-striatus, fasciis moniliformibus pictus; apertura diagonalis, subtriangulari-lunaris; perist. album, marginibus remotis, supero ex-*

panso, basali incrassato, subreflexo, umbilicum lamina dilatata semioccultante.

Diam. maj. 37, min. 31, alt. 18 mill.

Hab. Brazils.

7. *HELIX MONACHA*, Pfr. (Pl. XLIII. fig. 7.) *T. imperforata, globoso-conica, solida, rugoso-striata et sub lente minute granulata, castanea; spira conoideo-elevata, obtusula; anfr. 5½ modice convexi, lente accrescentes, ultimus antice vix descendens, medio obsolete subangulatus; apertura fere diagonalis, rotundato-lunaris, intus livida, nitida; perist. carneum, undique breviter expansum, marginibus remotis, columellari ad insertionem in laminam triangularem, adnatam dilatato.*

Diam. maj. 27, min. 23, alt. 19 mill.

Hab. Australia.

8. *HELIX HYSTRICELLA*, Pfr. *T. umbilicata, discoidea, tenuiuscula, subconferte costato-plicata, albido et rufo irregulariter radiata; spira plana vel medio immersa; anfr. 6 infra suturam turgidi, ultimus rotundatus, non descendens; umbilicus ⅓ diametri occupans; apertura obliqua, rotundato-lunaris, lamellis 6 acutis coarctata,—2 æqualibus in ventre anfr. penultimi, 4 in margine basali et dextro; perist. simplex, rectum.*

Diam. maj. 6, min. 5½, alt. 2½ mill.

Hab. Sandwich Islands (*Dr. Frick*).

9. *HELIX REJECTA*, Pfr. (Pl. XLIII. fig. 1.) *T. umbilicata, depressa, tenuis, striatula, nitida, fusco-cornea; spira vix elata, vertice subtili, prominulo; sutura submarginata; anfr. fere 5 vix convexiusculi, ultimus latus, depressus, circa umbilicum angustissimum vix pallidior; apertura obliqua, late lunaris; perist. simplex, rectum, margine columellari superne in laminam parvam triangularem reflexo.*

Diam. maj. 12, min. 10, alt. 5 mill.

Hab. North of China (*Mr. Fortune*).

10. *HELIX CILIOSA*, Pfr. (Pl. XLIII. fig. 8.) *T. umbilicata, depressa, tenuiuscula, carinata, striatula et pilis brevissimis obsita, diaphana, fusca; spira brevissime conoidea; anfr. fere 6 convexiusculi, lente accrescentes, ultimus carina distinctius ciliata munitus, circa umbilicum latum (⅓ diametri æquantem) subcompresso-inflatus; apertura fere diagonalis, rotundato-lunaris; perist. tenue, breviter expansum, marginibus convergentibus, columellari superne subdilatato.*

Diam. maj. 10, min. 8½, alt. 4 mill.

Hab. North of China (*Mr. Fortune*).

11. *HELIX BREVIBARBIS*, Pfr. (Pl. XLIII. fig. 4.) *T. umbilicata, subtrochiformis, carinata, tenuiuscula, irregulariter striata et lineis spiralibus confertis decussatula, diaphana, corneo-albida, ad carinam acutam, breviter barbatam castaneo unifas-*

ciata; spira convexoconica, acutiuscula; anfr. $6\frac{1}{2}$ fere plani, ultimus non descendens, circa umbilicum mediocrem, pervium convexior; apertura diagonalis, angulato-lunaris; perist. albidum, marginibus vix convergentibus, supero expanso, basali reflexo, ad insertionem dilatato, patente.

Diam. maj. 14, min. 13, alt. 17 mill.

Hab. North of China (Mr. Fortune).

12. *HELIX PLAGIOGLOSSA*, Pfr. (Pl. XLIII. fig. 3.) *T. anguste et pervie umbilicata, conoideo-semiglobosa, solida, arcuato-striata, fulvo-cornea; spira conoidea; anfr. $5\frac{1}{2}$ planiusculi, ultimus antice descendens, subtus valde constrictus, basi convexior; apertura magna, diagonalis, rotundato-lunaris; paries aperturalis dente obliquo linguaeformi munitus; perist. albo-callosum, margine supero expanso, basali reflexo, bidentato — dentibus approximatis, sinistro parvulo, nodiformi, altero majore, sursum producto.*

Diam. maj. $12\frac{1}{3}$, min. 11, alt. 7 mill.

Hab. Near Oajaca, Mexico (M. Sallé).

13. *HELIX APHRODITE*, Pfr. (Pl. XLIV. fig. 2.) *T. imperforata, depressa, tenuis, striatula et sub lente obsolete decussatula, pellucida, nitida, pallide straminea; spira parum elevata, vertice minuto, obtuso; sutura albo-marginata; anfr. $3\frac{1}{2}$ rapide accrescentes, convexiusculi, ultimus acute albo-carinatus, antice vix descendens, constrictus, subtus convexus; apertura obliqua securiformi-lunaris; columella plana, compressa, arcuatim descendens; perist. candidum, breviter reflexum, marginibus convergentibus, supero subflexuoso, columellari dilatato, adnato.*

Diam. maj. 36, min. $27\frac{1}{2}$, alt. 15 mill.

Hab. New Caledonia.

14. *BULIMUS CANDIDISSIMUS*, Pfr. *T. subperforata, oblongo-turrita, solida, irregulariter striatula, nitida, candidissima; spira turrita, apice acutiuscula; anfr. $7\frac{1}{2}$ convexi, ultimus $\frac{2}{5}$ longitudinis subæquans, basi vix attenuatus; apertura vix obliqua, oblonga, intus subcarnea; perist. simplex, rectum, margine columellari verticali, sursum dilatato, sublibero.*

Long. $16\frac{1}{2}$, diam. 8 mill.

Hab. Island of Socotora.

15. *BULIMUS CUENCANUS*, Pfr. *T. subperforata, oblongo-turrita, solidula, cordato-costulata, pellucida, virenti-albida; spira regulariter turrita, apice obtusula; anfr. 6 convexiusculi, ultimus $\frac{1}{3}$ longitudinis subæquans, basi vix compressus; columella verticalis; apertura verticalis, truncato-ovalis; perist. simplex, rectum, margine columellari breviter reflexo, sublibero.*

Long. 8, diam. $3\frac{1}{4}$ mill.

Hab. Cuenca, republic of Ecuador (Mr. Fraser).

16. *ACHATINA LAYARDI*, Pfr. (Pl. XLIII. fig. 5.) *T. subfusiformi-ovata*, tenuis, longitudinaliter plicatula, strigis plumbeo-fuscis et rufis necnon maculis crebris fuscis sæpe pallide cinctis ornata; spira conica, obtusula; sutura leviter marginata, subcrenata; anfr. fere 8 convexiusculi, superi leviter decussati, ultimus spiram superans, ventrosus, basi attenuatus; columella leviter arcuata, subtorta, late truncata, purpurea; apertura parum obliqua, angulato-ovalis, intus cærulescenti-margaritacea; perist. simplex, marginibus callo purpurascente junctis, dextro intus rubro-limbato.

Long. 139, diam. 66 mill.

Hab. Oïbo, East Coast of Africa (*Mr. Layard*).

17. *ACHATINA FULGENS*, Pfr. *T. oblongo-ovata, solidula, levigata, pellucida, nitida, corneo-fulva*; spira ovato-conica, apice obtusula; anfr. 6 convexiusculi, ad suturam anguste marginatam striatuli, ultimus $\frac{3}{4}$ longitudinis subæquans, basi rotundatus; columella perarcuata, albo-callosa, oblique sublate truncata; apertura verticalis, sinuato-elliptica; perist. rectum, obtusum.

Long. $12\frac{1}{2}$, diam. $5\frac{2}{3}$ mill.

Hab. Unknown.

18. *OLEACINA BOUCARDI*, Pfr. *T. ovato-oblonga, tenuis, levigata, nitida, pellucida, fulvo-cornea, varicibus nonnullis leviter impressis castaneis, antrorsum pallide marginatis, instructa*; spira conica, obtusa; anfr. 6 convexiusculi, ad suturam anguste marginatam breviter plicati, ultimus spiram subæquans; columella subtorta, basi breviter truncata; apertura verticalis, sinuato-semiovalis; perist. simplex, margine dextro antrorsum arcuato.

Long. 13, diam. 6 mill.

Hab. S. Martin, Mexico (*M. Boucard*).

19. *CYCLOSTOMA SUBCONICUM (LEPTOPOMA)*, Pfr. *T. angustissime umbilicata, globoso-conica, tenuis, liris filiformibus subconfertis cincta et striis lamellaribus oblique decussata, vix nitidula, castanea, ad suturam luteo-flammulata*; spira conica, acutiuscula; anfr. 6 convexi, ultimus spira brevior; apertura parum obliqua, ovali-rotundata, intus cærulescenti-margaritacea; perist. tenue, vix expansum, marginibus approximatis. Operc.?

Diam. maj. $8\frac{1}{3}$, min. $7\frac{1}{3}$, alt. 7 mill.

20. *CYCLOSTOMA PRINCIPALIS (CYCLOSTOMUS)*, Pfr. (Pl. XLIV. fig. 7.) *T. aperte et mediocriter umbilicata, globoso-turbinata, solidula, liris subacutis, crebris cincta, albida, fasciis 2 violaceo-fuscis infra medium ornata*; spira gradato-conica, vertice minuto, acutiusculo; anfr. 5 convexi, ultimus basi et in umbilico liris æqualibus subdistantibus munitus; apertura pa-

rum obliqua, ovalirotundata, intus castaneo-bifasciata; perist. incrassatum et reflexiusculum, marginibus approximatis, collo lunari junctis, columellari adnato. Operc.?

Diam. maj. $21\frac{1}{2}$, min. 17, alt. 16 mill.

Hab. Madagascar.

21. — FRASERI (BOURCIERA), Pfr. (Pl. XLIV. fig. 1.) *T. obtecte umbilicata, depresso conoideo-globosa, solidula, sub lente decussatula, fulvo-carnea; spira mediocris, conoidea, acutiuscula; anfr. $4\frac{1}{2}$ convexi, ultimus rotundatus, non adscendens, pone columellam profunde excavatus, callosus; apertura parum obliqua, angulato-ovalis, intus citrina; columella brevissima, retrorsum in dentem acutum terminata; perist. subincrassatum, albidum, æqualiter patens et reflexiusculum. Operc. tenue, corneo-purpurascens, arcuato-plicatum.*

Diam. maj. vix 11, min. $8\frac{1}{2}$, alt. $6\frac{1}{2}$ mill.

Hab. Province of Cuenca, republic of Ecuador (Mr. Fraser).

22. *HELICINA INÆQUALIS* (LUCIDEILA), Pfr. *T. conica, solida, oblique striata et conferte lirata (liris 5 in anfr. ultimo fortioribus, acutis), pallide flavida; spira convexo-conica, mucronata; sutura subcanaliculata, albo-marginata; anfr. 6, vix convexiusculi, ultimus basi planiusculus, spiraliter dense striatus, antice constrictus; apertura perobliqua, bisinuato-triangularis, angulo dextro rotundato; perist. album, callosum, late expansum et reflexiusculum, margine supero et basali prope insertionem unidentatis. Operc.?*

Diam. maj. $6\frac{1}{2}$, min. $5\frac{1}{2}$, alt. $4\frac{1}{2}$ mill.

Hab. Jamaica.

23. *HELICINA ELECTRINA*, Pfr. *T. conico-globosa, tenuis, lævigata, oleoso-micans, pellucida, corneo-lutescens; spira conoidea, acutiuscula; anfr. 5 convexiusculi, ultimus rotundatus, spira paulo altior; columella brevissima, callum emittens tenuem; apertura parum obliqua, semicircularis, ad columellam angulata et plica levi munita; perist. tenue, breviter expansum. Operc.?*

Diam. maj. 8, min. 7, alt. 6 mill.

Hab. Aru Islands.

24. *HELICINA PARAENSIS*, Pfr. *T. globoso-conica, tenuis, sub lente plicatulo-striata, diaphana, albido-lutescens; spira conoidea, obtusula; anfr. 5 vix convexiusculi, ultimus convexior, spiram subæquans; columella brevissima, callum emittens tenue, diffusum; apertura obliqua, integra, semiovalis; perist. tenue, breviter expansum, margine basali prope columellam leviter sinuato. Operc. tenue, albidum.*

Diam. maj. $5\frac{1}{3}$, min. 5, alt. $4\frac{1}{3}$ mill.

Hab. Para, Brazil.

25. *HELICINA BEHNIANA*, Pfr. *T. conoideo-depressa, tenuiuscula, sub lente leviter striatula, oleoso-micans, flavida; spira regulariter conoidea, acutiuscula; anfr. 4½ vix convexiusculi, ultimus peripheria subangulatus; apertura obliqua, integra, triangulari-semiovalis; columella brevissima, subincrassata, callum emittens tenuem, diffusum; perist. sublate expansum, margine columellari leviter arcuato. Operc. solidulum, concolor.*

Diam. maj. $7\frac{1}{3}$, min. $5\frac{2}{3}$, alt. $4\frac{1}{2}$ mill.

Hab. Nicobar Islands.

26. *HELICINA ARUANA*, Pfr. *T. turbinato-depressa, solidula, carinata, superne oblique striata et subregulariter lirata, lutea, albido variegata; spira conoidea, mucronulata; anfr. 4½ convexiusculi, ultimus infra carinam acutam rufo-fasciatus, subtus sublævigatus; columella subtriangularis, nitida, callum emittens latiusculum; apertura diagonalis, triangularis; perist. tenue, vix expansiusculum. Operc.?*

Diam. maj. 11, min. $9\frac{1}{2}$, alt. 6 mill.

Hab. Aru Islands.

27. *HELICINA MINUSCULA* (SCHASICHEILA), Pfr. *T. globoso-conica, tenuis, sublævigata, nitida, pellucida, fulva; spira conoidea, acutiuscula; anfr. 4 convexi, ultimus ventrosus, pone columellam excavatus, callosus; apertura parum obliqua, semiovalis; perist. simplex, tenue, marginibus lamina callosa junctis, dextro superne inciso, tum arcuatim procedente, columellari libero substricto. Operc.?*

Diam. maj. $4\frac{1}{2}$, min. $3\frac{2}{3}$, alt. 3 mill.

Hab. Unknown.

3. DESCRIPTIONS OF TWO NEW SPECIES OF MELAMPUS, FROM MR. CUMING'S COLLECTION. BY DR. L. PFEIFFER.

1. *MELAMPUS FRICKI*, Pfr. *T. subperforata, oblongo-fusiformis, solida, longitudinaliter conferte plicata, rufa; spira convexo-conica, mucronata; sutura linearis, sublacera; anfr. 10 planiusculi, ultimus spiram paulo superans, basi compressus, medio plicis evanidis sublævigatus; apertura angusta, basi rotundata; plica parietalis 1 compressa; plica columellaris dentiformis, extrorsum prolongata; perist. simplex, margine dextro intus plicis 5 subintransitibus munito, columellari calloso, sublibero.*

Long. 12, diam. $5\frac{2}{3}$ mill.

Hab. Sandwich Islands (Dr. Frick).

2. *MELAMPUS SCULPTUS*, Pfr. *T. subperforata, fusiformi-oblonga, solidula, superne distincte costato-plicata, saturate castanea; spira conica, mucronata; sutura distincta, subcrenata; anfr. 10–11 planiusculi, ultimus $\frac{3}{5}$ longitudinis subæquans, sub-*

varicosus, infra suturam et ad basin attenuatam plicatus, medio lævigatus; apertura verticalis, angusta, basi rotundata; plica parietalis unica, levis, profunda; plica columellaris tenuis, obliqua, marginem attingens; perist. simplex, acutum, margine dextro intus obsoletissime transverse plicato.

Long. 10, diam. 5 mill.

Hab. Admiralty Islands.

4. DESCRIPTIONS OF EIGHT NEW SPECIES OF ACHATINELLA, FROM MR. CUMING'S COLLECTION. BY DR. L. PFEIFFER.

1. *ACHATINELLA CONCAVOSPIRA (BULIMELLA)*, Pfr. *T. subperforata, dextrorsa, ovato-turrita, solida, striatula, nitida, albida, fasciis et strigis angustis coffeaceis ornata; spira concavo-turrita, apice acutiuscula, alba; sutura valde marginata; anfr. 7, primi 3 plani, sequentes convexi, ultimus rotundatus, $\frac{2}{5}$ longitudinis subæquans; plica columellaris supera, nodiformis, alba; apertura obliqua, obauriformis; perist. hepaticum, margine dextro expansiusculo, columellari per dilatato, reflexo, subadnato.*

Long. $21\frac{1}{2}$, diam. $11\frac{1}{3}$ mill.

Hab. Sandwich Islands (*Dr. Frick*).

Allied to *A. terebra*, Newc.

2. *A. MORBIDA (BULIMELLA)*, Pfr. *T. subperforata, sinistrorsa, ovato-turrita, solidula, striata et striis confertis spiralibus sub lente decussata, alba, fusco varie strigata et fasciata; spira elongata, gracilis, apice acutiuscula; sutura simplex; anfr. $6\frac{1}{2}$ vix convexiusculi, ultimus spira paulo brevior, convexus; plica columellaris alba, brevis, obliqua; apertura obliqua, obauriformis; perist. incrassatum, breviter expansum, margine columellari per dilatato, late adnato.*

Long. 19, diam. 9 mill.

Hab. Sandwich Islands (*Dr. Frick*).

Allied and similar to *A. sordida*, Newc.

3. *A. FABA (BULIMELLA)*, Pfr. *T. imperforata, dextrorsa, ovata, solidula, irregulariter striata, nitida, alba; spira convexo-conica, apice acutiuscula; sutura simplex; anfr. 5 convexiusculi, ultimus spira paulo longior, rotundatus; plica columellaris supera, valida, nodiformis; apertura parum obliqua, obauriformis; perist. intus crasse labiatum, margine dextro breviter expanso, columellari reflexo, adnato.*

Long. 16, diam. $10\frac{1}{2}$ mill.

Hab. Sandwich Islands (*Dr. Frick*).

Allied to *A. ovata*, *Fricki*, &c.

4. *A. SACCATA (ACHATINELLASTRUM)*, Pfr. *T. subperforata, sinistrorsa, turrita, solidula, striatula, sub lente decussatula, nitida, candida; spira regulariter attenuata, apice acuta; sutura*

anguste marginata; anfr. $6\frac{1}{2}$ planiusculi, ultimus $\frac{2}{5}$ longitudinis æquans, parum convexus, basi subcompresso-saccatus; plica columellaris alta, dentiformis, fusca vel carnea; apertura perobliqua, semiovalis, basi lateraliter producta, intus pallide rosea; perist. simplex, rectum, margine columellari dilatato, sublibero.

Long. 21, diam. $9\frac{1}{2}$ mill.

Hab. Sandwich Islands.

Somewhat allied to *A. casta*, Newc.

5. *A. LILIACEA* (ACHATINELLASTRUM), Pfr. *T. imperforata, sinistrorsa, ovato-conica, solidula, leviter striata, nitida, alba; spira convexiusculo-conica, apice subacuta; sutura anguste marginata; anfr. 6 vix convexiusculi, ultimus parum convexus, peripheria interdum subangulatus, basi saccatus; plica columellaris pallide rosea, alta, torta; apertura obliqua, obauriformi; perist. rectum, acutum, intus sublabiatum, margine columellari vix dilatato, adnato.*

Long. 24, diam. 12 mill.

Hab. Sandwich Islands (Dr. Frick).

This species belongs to the group of *A. fulgens*, Newc.

6. *A. SERICEA* (LAMINELLA), Pfr. *T. imperforata, dextrorsa, ovato-conica, solida, subruditer striata, striis spiralibus minute granulato-decussata, sericea, saturate brunnea; spira convexo-conica, acutiuscula; anfr. fere 6 convexi, ad suturam pallidiores, ultimus $\frac{2}{5}$ longitudinis æquans, circa columellam albidus; columella lamina compressa, brevi, obliqua munita; apertura obliqua, elliptica; perist. simplex, rectum, margine dextro fere semicirculari, cum columellari calloso angulatim juncto.*

Long. 17, diam. $9\frac{1}{5}$ mill.

Hab. Sandwich Islands (Dr. Frick).

Allied to *A. rudis*, Pfr., &c.

7. *A. SUBROSTRATA* (LAMINELLA), Pfr. *T. imperforata, dextrorsa, ovato-conica, solida, irregulariter striata, nitidula, fusca, fulvo-nebulosa; spira ventroso-conica, apice acutiuscula; anfr. 6, superi 4 vix convexiusculi, ultimus rotundatus, $\frac{2}{5}$ longitudinis subæquans; lamina columellaris fere basalis, acuta, obliqua; apertura vix obliqua, irregulariter semielliptica, ad columellam angulata, quasi in rostrum producta; perist. rectum, intus albolabiatum, margine dextro subrepando, columellari parum dilatato, adnato.*

Long. 15, diam. 8 mill.

Hab. Sandwich Islands (Dr. Frick).

Allied to *A. albolabris*, Newc.

8. *A. MICANS* (LAMINELLA), Pfr. *T. subperforata, dextrorsa, turrata, solidula, sub epidermide lutea, glutinoso-micante alba; spira regulariter attenuata, apice acutiuscula; sutura subcrenata; anfr. 7 convexiusculi, ultimus $\frac{1}{3}$ longitudinis vix superans, rotundatus; lamina columellaris parvula, obliqua; apertura vix obli-*

qua, subovalis; perist. simplex, rectum, margine columellari parum dilatato, sublibero.

Long. 16, diam. $7\frac{2}{3}$ mill.

Hab. Sandwich Islands (*Dr. Frick*).

Nearest allied to *A. variegata*, Pfr.

5. NOTES ON THE "MOORUK" (CASUARIUS BENNETTII).

BY GEORGE BENNETT.

On the 26th of October 1858, the 'Oberon' cutter of forty-eight tons arrived in Sydney, having two fine young specimens of the "Mooruk" on board, stated to be male and female. On going on board I found them confined in a very small space, and the Captain informed me he had had them eight months, that he procured them soon after his arrival at New Britain for Sydney, and since that time had been trading about the islands, having these birds on board; they were fed principally upon yams. I observed they were in poor condition, but healthy in appearance, and plumage in good order. They were about half the size of the specimen sent to England; but one, apparently the male bird, appeared a little larger than the other. Captain Devlin informs me that the natives capture them very young, soon after they are hatched, and rear them by hand. The natives rarely or never can capture the adult bird, as they are so very shy and difficult of approach,—the native weapons being ineffectual against so rapid and wary a bird. These birds are very swift of foot and possess great strength in the legs; on the least alarm they elevate the head, and, seeing danger, dart among the thick brush, and thread about in localities where no human being could follow them, and disappear like magic. This bird, with its strong legs and muscular thighs, has an extraordinary power of leaping: it was from this circumstance the first bird brought from New Britain was lost; from its habit of leaping, it one day made a spring on the deck and went overboard; as it was blowing a strong breeze at the time, the bird perished. In warm weather, the Captain informs me, they are fond of having a bucket of salt water thrown over them, and seem to enjoy it very much. I succeeded in purchasing these birds; and Captain Slater (the present commander of the 'Oberon') brought them to my house in a cab; and when placed in the yard, they walked about as tame as turkeys. They approached any one that came into the yard, pecking the hand as if desirous of being fed, and were very docile. They began by pecking at a bone in the yard, probably not having tasted any meat for some time, and would not, while engaged upon it, touch some boiled potatoes which were thrown to them; indeed we found afterwards they fed better out of a dish than from the ground—no doubt, having been accustomed early to be fed in that manner. They were as familiar as if born and bred among us for years, and did not require time to reconcile them to their new situation, but became sociable and quite at home at once. We found them next day rather too tame, or, like

spoilt pets, too often in the way. One or both of them would walk into the kitchen; while one was dodging under the tables and chairs, the other would leap upon the table, keeping the cook in a state of excitement; or they would be heard chirping in the hall, or walk into the library in search of food or information, or walk up stairs, and then be quickly seen descending again, making their peculiar chirping, whistling noise; not a door could be left open, but in they walked, familiar with all. They kept the servants constantly on the alert: if the servant went to open the door, on turning round she found a "Mooruk" behind her; for they seldom went together, generally wandering apart from each other. If any attempt was made to turn them out by force, they would dart rapidly round the room, dodging about under the tables, chairs, and sofas, and then end by squatting down under a sofa or in a corner; and it was impossible to remove the bird, except by carrying it away: on attempting this, the long, powerful, muscular legs would begin kicking and struggling, and soon get released, when it would politely walk out of its own accord. I found the best method was to entice them out, as if you had something eatable in the hand, when they would follow the direction in which you wished to lead them. They sometimes also give a smart kick to any person attempting to turn them out forcibly. The housemaid attempting to turn the bird out of one of the rooms, it gave her a kick and tore her dress whilst she was very politely driving him before her. They walk into the stable among the horses, poking their bills into the manger. When writing in my study, a chirping, whistling noise is heard; the door, which was ajar, is pushed open; and in walk the "Mooruks," who quietly pace round the room, inspecting everything, and then as peaceably go out again. If any attempt is made to turn them out, they leap and dodge about, and exhibit a wonderful rapidity of movement, which no one would suppose possible from their quiet gait and manner at other times. Even in the very tame state of these birds, I have seen sufficient of them to know that, if they were loose in a wood, it would be impossible to catch them, and almost as difficult to shoot them. One day, when apparently frightened at something that occurred, I saw one of them scour round the yard at a swift pace, and speedily disappear under the archway so rapidly that the eye could hardly follow it, upsetting all the poultry in its progress, as they could not get out of the way. The lower half of the stable-door, about 4 feet high, was kept shut to prevent them going in; but this proved no obstacle, as it was easily leaped over by these birds. They never appeared to take any notice of, or be frightened at, the Jabiru or Gigantic Crane, which was in the same yard, although that sedate, stately bird was not pleased at their intrusion. One day I remarked the Jabiru spreading his long wings, and clattering his beak, opposite one of the "Mooruks," as if in ridicule of their wingless condition. "Mooruk," on the other hand, was pruning its feathers and spreading out its funny little apology for wings, as if proud of displaying the stiff horny shafts with which they were adorned. The "Mooruks" often throw up all their feathers, ruffling them; and then they suddenly

fall flat as before : they appear to have great power in raising all the feathers ; and the wings are used to aid them in running, but never seem used for defence. Captain Devlin says, the natives consider them to a certain degree sacred, and rear them as pets ; he is not aware that they are used as food, but if so, not generally ; indeed their shy disposition and power of rapid running, darting through the brake and bush, would almost preclude their capture. It reminds me (from the description) of the habits of the *Memura*, or Lyre bird of Australia ; only it is much larger and more powerful in its actions. The natives carry them in their arms, and are very kind to and have a great affection for them ; this will account for their domesticated state with us.

The noise of these birds, when in the yard, resembled that of the female Turkey ; at other times the peculiar chirping noise was accompanied by a whistling sound also. The contrast of these birds with the Jabiru was very great. The "Mooruks" were sometimes moving about like the female Turkey in rapid motion or excitement, or, when walking quietly, always inquisitive and poking their beaks into everything and familiar with every person. The Jabiru, on the other hand, was a perfect picture of sedate quietness, looking upon all play as injurious to his constitution or derogatory to his dignity, remaining stiff in his gait and serious in his demeanour.

Only one egg was brought, and that was partly broken ; I have it in my possession. The Captain informs me that they can be procured from the natives, and have generally a hole in them about the size of a shilling, through which the contents have been extracted.

The height of the largest or male bird, to the top of the back, was 2 feet 2 inches, and of the female 2 feet. The height of the largest or male bird, when erect, to the top of the head, was 3 feet 2 inches, and of the female 3 feet.

6. DESCRIPTION OF THE ADULT STATE OF *VOLUTA MAMILLA*, GRAY. BY DR. J. E. GRAY, F.R.S., V.P.Z.S., ETC.

(Mollusca, Pl. XLV.)

We have had in the British Museum for years a young specimen of a shell from Van Diemen's Land, which I named *Voluta mamilla*. It is figured under that name in Sowerby's 'Conchological Thesaurus,' t. 50. f. 57, 58 ; it is described by me in my "Observations on the Species of Volutes," Proc. Zool. Soc. 1855, p. 55, under the name of *Scapha mamilla* ; and it is noticed under the genus *Cymbium* by the Messrs. A. and H. Adams, in their 'Genera of Mollusca.'

But many conchologists have been inclined to regard this specimen as only a monstrosity of some other species,—an idea that could only have been entertained by such as were ignorant of the general structure and physiology of molluscous animals.

We have lately received from Van Diemen's Land three fine specimens of this shell,—two of them fully grown, and the other intermediate in size between the young specimen we formerly possessed and the adult state of the species. It may be observed that these shells were all taken while the animals were growing; the shells have consequently the thin edge incident to that state of the animal, and not the rounded thickened edge to the outer lip which the shell assumes while it is in a state of rest after its former growths: though probably the full size of the species, they are none of them what conchologists generally call adult shells. But this form of the outer lip is no proof of the adult state of the shell; for the animal constantly increases the size of the shell after such thickening and periods of rest; thus the thickening of the edge of the lip is only a proof that the shell was taken and the animal destroyed while the animal and shell were not increasing its size.

The adult shell greatly resembles *Scapha magnifica* in form and colouring; but the apex is much larger, irregular, with the apex of the whorl on one side of the tip; and the system of colouring is much broader, and coarser in its character.

SCAPHA MAMILLA. (Mollusca, Pl. XLV.)

Shell ovate; nucleus very large, spire rather irregular, one-coloured, orange, with the apex on one side; the last whorl irregularly marked with dark purple-brown lines having triangular pale spots, and with a subcentral and broad posterior sutural colourless band. Pillar dark orange, with three oblique plaits. Throat yellow.

This form of the nucleus is found in another species of the genus *Scapha*, but not in such a highly developed state, viz. in *Scapha fusiformis*, also inhabiting Van Diemen's Land; and it is also found in the genus *Fulgoraia*.

Several conchologists, for example the Messrs. Adams, have supposed that this shell, on account of the size of the nucleus, ought to be referred to the genus *Cymbium*, which is characterized by having an irregular callous tip to the nucleus; but if the nucleus of *F. mamilla* is properly examined, it will be found that it is distinctly spiral, but has the apex of the first whorl of the nucleus excentric or bent on one side; and this is not very uncommon in several species of *Chrysostoma* and *Fusus*, &c.

The species of *Scapha* may be thus divided, according to the form and surface of the whole of the nucleus:—

I. *Spire of nucleus regular, with a central apex.*

a. *Nucleus large; whorls crenulated near the suture.*

S. vesperilio.
S. nivosa.
S. sophia.

S. rutila.
S. magnifica.

b. *Nucleus large ; whorls smooth.*

S. aulica.

S. leucostoma.

S. deshayesii.

c. *Nucleus moderate or small ; spire often subcylindrical, generally truncated or deciduous.*

S. punctata.

S. ferussacii.

S. colocyntha.

S. pacifica.

S. magellanica.

S. concinna.

S. javanica.

II. *Spire of nucleus rather irregular ; the apex excentric, lateral.*

S. fusiformis, apex moderate.

S. mamilla, apex very large.

7. NOTICE OF NOTOPTERIS, A NEW GENUS OF PTEROPINE BAT FROM THE FEEJEE ISLANDS. BY DR. JOHN EDWARD GRAY, F.R.S., V.P.Z.S., ETC.

(Mammalia, Pl. LXVII.)

Among a large collection of the skins of Mammalia, Birds, Fishes, Crustacea, &c., sent to the British Museum by the Lords of the Admiralty, which were collected by Mr. Rayner, Dr. Macdonald, and the Medical Officers of H.M. Ship 'Herald,' during the voyage to the Feejee and other Pacific Islands, under the direction of Captain Denman, R.N., there are two specimens of a small Pteropine Bat from the island of Viti, which has the elongated face and the general appearance of the *Kiodote* (*Macroglossus*), but is provided with an elongated, free, slender, tapering tail, nearly as long as the hind legs, which, like the tail of most Bats having this member enclosed in the interfemoral membrane, is arched, the tip being bent ventrally or downwards.

Considering that the best genera of Bats are those established on the external conformation of the members, I am inclined to propose for this animal a new generic designation ; and I have no doubt that, when its habits and manners are known, they will be found to differ considerably from those of *Macroglossus* and *Cephalotes*, to which it is most nearly allied.

NOTOPTERIS.

Head elongate ; muzzle produced, subcylindrical ; nose simple, muffle narrow, bald between the nostrils, with a deep central notch. Ears small, lateral. Body covered with rather crisp hair. Wings broad, short, arising from the middle of the back, bald, only separated by a very narrow line of hair down the vertebral line, and with soft hair on the under side near the body. Thumb elongate ; lower

joint half the length of the upper, and enclosed in a web. The index-finger, of three bony joints; the last joint short, clawless. Interfemoral membrane deeply cut out, fringing the hind legs to the heel, hairy above and on the under side near the body, bald at other parts. Tail elongate, slender, tapering, many-jointed, arising from, and with the base attached to, the under side of the narrow interfemoral membrane; as long as the hind legs. The skull elongate, produced and slender in front.

Cutting teeth $\frac{1-1}{1-1}$; canines $\frac{1-1}{1-1}$; grinders $\frac{4-4}{5-5}$.

The cutting teeth conical, far apart; the upper are very small, rudimentary, on the middle of the intermaxillary bone between the end of the nose and the canine teeth; the lower rather larger, conical, blunt, separated from each other by a broad lunate space near the front edge of the canine teeth; canine larger, grooved; grinders compressed, blunt.

The upper cutting teeth are conical, small, far apart, placed on the middle of the slender produced intermaxillary bones, which have a small depression near the anterior extremity, like a cavity, whence a second chisel-shaped tooth might be developed; but as there is no appearance of the tooth in either of the skulls, perhaps it may be where a tooth of this kind has been shed.

The lower teeth are small and blunt, placed near the front of the base of the canine tooth. The edge of the front of the jaw between these teeth is rather produced and sharp-edged, and is nicked near the cutting tooth, giving the jaw somewhat the appearance of a second tooth, but it is not enamelled.

The canines elongate, conical, acute, curved.

The grinders are reniform, compressed, gradually diminishing in size towards the back of the jaws; the front one on each side in each jaw is largest, higher than the rest, and crenated on the crown; the rest have a flat smooth crown.

The tongue was not preserved; but, from the form of the muzzle and of the cutting teeth, I think it is very probably elongate, like that of the genus *Macroglossus*.

In the absence of the claw on the index-finger, this animal agrees with the genus *Cephalotes* from Timor, as it also does with the account of the wings and the teeth given in the systematic works; but it differs from that genus very essentially when the specimens of the two animals are compared. The head of *Cephalotes* is much shorter and broader. The cutting teeth are exceedingly different; in *Cephalotes* the cutting teeth are close together, the upper ones chisel-shaped, the lower ones rather conical, entirely filling up the very narrow space between the base of the large canines; while in *Notopteris* they are only two far apart, small and isolated.

The wings of the two genera arise from the centre of the back; and the bases of the wings, which cover the back, are naked. But in *Cephalotes* the nakedness extends over the shoulders to a line even with the front edge of the wings; in *Notopteris* the naked

part only occupies the hinder half of the back or loins, the shoulders being exposed and covered with hair like the rest of the body.

The tail in *Cephalotes* is short and rudimentary, flattened, and formed of four or five very short joints, and not elongated and incurved as in the new genus.

I may observe that, though the index-finger of the *Cephalotes peronii* from Celebes (in the British Museum, received from the Leyden Collection) is not provided with any distinct, well-developed claw, the end of the bone is curved upwards and rather produced into a resemblance of a claw,—there being no indication of such an appendage in the animal from Viti.

Pteropus amplexicaudatus, from Timor, has a rather elongated head, a short free tail; and the wings arise from the sides of the back, with a broad hairy space between their bases; but this differs from *Cephalotes* in having a small distinct claw on the end of the index-finger, and in having four chisel-shaped cutting teeth in the lower jaw, occupying the whole of the rather wide space between the base of the large canines; and it has four rather conical cutting teeth in the upper jaw.

NOTOPTERIS MACDONALDII. (Pl. LXVII.)

Pale-reddish brown above, rather greyer beneath; the hinder half of the back, which is covered by the bases of the wings, bald, with a very narrow line of short hair down the vertebral line. The rump and upper surface of the base of the interfemoral membrane covered with hair.

Hab. The Island of Viti Leon, Feejees. September 1857. Male and female. Iris dark hazel. (*John D. Macdonald.*)

Male. Length of head and body $4\frac{1}{2}$, tail 2, fore-arm bone $2\frac{1}{2}$, leg bone $1\frac{1}{8}$ inch.

Female rather smaller: arm-bone $2\frac{1}{8}$ inches.

8. NOTICE OF A NEW GENUS OF LOPHOBRANCHIATE FISHES FROM WESTERN AUSTRALIA. BY DR. JOHN EDWARD GRAY, F.R.S., V.P.Z.S., ETC.

(Pisces, Pl. VII.)

Among the collections made by the Medical Officers of H.M.S. 'Herald,' above referred to, is a curious and apparently new species of *Syngnathidæ*, of which I give a brief description.

HALIICHTHYS.

Mouth elongate, quadrangular, with a spine on the middle of each side of the upper edge. Body six-sided. Tail quadrangular. The shields of the head and body with a more or less elongated spine, each ending in a very long slender filiform beard. Under side of

body and tail flat, with a very slightly raised central ridge. Pectoral and dorsal fin distinct. Caudal fin none, or very rudimentary. Egg-pouch — ? ; none apparent in the specimen.

HALIICHTHYS TÆNIOPHORA.

The head compressed, spinose, with a high, arched, central ridge armed with spines, each having an elongated slender filiform beard in front of its base ; the eye-brows produced, crested, with two large curved spines on the upper edge ; the front spine furnished with a very long filiform beard on the front edge ; the lower edge of the orbit with two spines, the base of the operculum with one, and the upper edge with a prominent ridge armed with two unequal spines, the hinder one largest and compressed. The head at the back edge of the operculum with an arched ridge armed with four large compressed conical spines ; and there is a compressed bifid one on the nape between these two arched ridges. Body hexangular, or subheptangular from the obscure ventral keel, formed of nineteen rings ; the lower lateral angles are narrower than the rest, which are subequal ; each plate of the rings is armed with a subcentral spine ; and the spines on the three or four darker rings of the body are furnished with elongated filiform beards. The tail is quadrangular ; the under side is rather the widest and flat, the others are concave ; each shield is furnished with a spine like those of the body, and the greater part of the spines are furnished with a filiform elongated beard. Caudal rings about forty-five, the apical one obscure. Dorsal fin over the vent 26-rayed.

The dry fish is black above, pale beneath, with three distant black spots on each side of the body, and distant black cross bands on the under side of the base of the tail.

Hab. Freycinet harbour, Shark's Bay, W. Australia.

Mr. Gould read the following extract from a Letter addressed to him by George Bennett, Esq., of Sydney, dated October 15th, 1858 :—

“The semipalmated Goose, I have seen domesticated in Sydney in a poultry-yard, having been hatched by a common hen. This bird in its anatomy evidently approaches the Cranes, and in habits also. Especially when you see it running about the poultry-yard, it resembles one of the *Gruidæ* more than a Goose. The bird I allude to was one of many hatched under a hen from eggs procured from the blacks at a station on the Mooruya River, near Broulee, south of Sydney. Ten eggs were procured and placed under two hens, five for each, and in three days less than a month produced seven young Geese, which were reared by the foster-mother. The eggs are said to be cream-coloured, not larger than a small-sized goose-egg. The birds lay their eggs close to the water in the lagoons ; they commence to lay about September. The bird was an adult, and differed materially from your drawing, which I consider to represent

either a distinct species or, from the peculiarity of the bill and feet, a bird of the first year. The bill, feet, and legs were of a *flesh-colour*; the plumage of the head, neck, wings, centre of the back, tail, and thighs glossy-black; remainder of the plumage white. These birds are readily domesticated, and run about the poultry-yard in the most amicable manner possible. The colour of the beak, feet, and legs were of the same colour when hatched; and the bird, dating from the time it was brought forth, would be one year and eight months old."

Mr. Gould exhibited a drawing of a Pheasant, said to come from the Mountains of Siam, which he considered identical with that lately described by Mr. Blyth under the name of *Diardigallus fasciolatus*, Journ. As. Soc. Beng. xxvii. p. 115.

January 25th, 1859.

E. W. H. Holdsworth, Esq., F.L.S., in the Chair.

The following papers were read:—

1. DESCRIPTIONS OF NEW SPECIES OF THE AMERICAN FAMILY
TYRANNIDÆ. BY PHILIP LUTLEY SCLATER.

1. *ATTILA CITRINIVENTRIS*.

Rufescens, capite obscuriore et cinereo tincto, dorso imo dilutiore, uropygio citrino-flavo: alis nigricantibus, extus rufescente limbatis; gula cinerascens; pectore rufo, ventre cum crisso citrino-flavo, hypochondriis et tectricibus subalaribus rufis: cauda clare rufa unicolore, basin versus dilutiore: rostro nigricante, pedibus plumbeis.

Long. tota 6·75, alæ 3·2, caudæ 2·6, rostri a rictu 1·0.

Hab. In valle Amazonum superiore ad ripas fl. Ucayali (*Hauxwell*).

This species of *Attila* comes nearest to *Attila spadiceus* of Cayenne and Northern Brazil, and is of about the same size, but may be distinguished by its darker and more cinereous head and yellow belly, as well as minor differences. An example in my own collection was received from MM. Verreaux of Paris. One belonging to Mr. Gould was procured by Hauxwell on the Ucayali.

As to the position of this genus of birds and the synonymy of the species, I agree with the views of M. de Lafresnaye, as given in his article in the 'Revue Zoologique' (1848, p. 39).

The species of the group, of which I possess specimens, may be arranged as follows, beginning with those with the strongest bills :—

(1.) *ATTILA CINEREUS* (Gm.).—*Muscicapa cinerea*, Gm., Max. Beitr. iii. 853 ; Spix, Av. Bras. ii. t. 26. f. 2.—*Dasycephala cinerea*, Sw. ; Burm. Syst. Ueb. iii. 85.—*Attila rufus*, Lafr. Rev. Zool. 1848, p. 46.

Hab. In Brasil. merid.

(2.) *ATTILA CITREOPYGIUS** (Bp.).—*Dasycephala citreopyga*, Bp. Compt. Rend. xxxviii. p. 657 ; Notes Orn. p. 86 ; Sclater, P. Z. S. 1857, p. 227.

Hab. In Mexico merid., Guatemala, et Nicaragua.

(3.) *ATTILA BRASILIENSIS*, Less. Tr. d'Orn. p. 360 ; Lafr. Rev. Zool. 1848, p. 45.—*Muscicapa uropygiata*, Max. Beitr. iii. 868.—*Myiarchus* (!) *uropygiatus*, Burm. Syst. Ueb. iii. 472.

Hab. In Brasilia.

(4.) *ATTILA THAMNOPHILOIDES* (Spix).—*Muscicapa thamnophiloides*, Spix, Av. Bras. ii. pl. 26. fig. 1 ; Burm. Syst. Ueb. ii. p. 86.

Hab. In Brasil. int.

(5.) *ATTILA SPADICEUS* (Gm.), Lafr. Rev. Zool. 1848, p. 46.—*Musc. spadicea*, Gm. — *Tyrannus rufescens*, Sw. Quart. Journ. Sc. xl. p. 278.—*Dasycephala uropygialis*, Cab. in Schomb. Guian. iii. 686.

Hab. In Cayenna.

(6.) *ATTILA CITRINIVENTRIS*, Sclater.

Hab. In valle fl. Amazonum sup.

I am not acquainted with *Attila bolivianus*, Lafr. (*Tyrannus rufescens*, Lafr. et D'Orb. ; D'Orb. Voy. p. 308).

Next to *Attila*, I think, must be placed the curious type *Casiornis* of Bonaparte, of which the earliest specific name appears to be *rubra* of Vieillot. Its synonymy is very much confused ; but I am inclined to refer *Suiriri roxa*, Azar. sp. 188 ; *Muscicapa rubra*, Vieill. Diet. xxi. 457, et Enc. p. 831 ; *Muscicapa hæmatodes*, Licht. ; *Dasycephala hæmatodes*, Cab. in Wiegmann. Arch. 1847, i. p. 222 ; *Dasycephala rubra*, Burm. Syst. Ueb. iii. 87 ; *Tyrannula rufula*, Hartl. Rev. Zool. 1852, p. 6, and, probably, *Tyrannus thamnophiloides* of D'Orbigny (Voy. p. 309), to this bird. MM. de Castelnau and Deville obtained examples of it at Goyaz during their American travels, and it has recently been described and figured by M. Des Murs in the Ornithology of their Expedition under the name *Casiornis typus*. Its general structure is very much that of *Attila* ; but the bill is quite short and much more feeble, and the feet are not nearly so strong.

* Were it not that M. de Lafresnaye gives "*Colombie*" as the habitat of his *Attila flammulatus*, I should be inclined to consider his species the same as this.

2. MYIODYNASTES LUTEIVENTRIS.

Tyrannus audax, Sclater, P. Z. S. 1856, p. 297.

Myiodynastes luteiventris, Bp. Compt. Rend. xxxviii. p. 657, et Notes Orn. p. 87 (sine descript.).

Similis *M. audaci* ex Amer. merid., sed alis longioribus, collo antico prorsus albo, et abdomine toto cum subalaribus citrino-flavis diversus.

Long. tota 8·5, alæ 4·5, caudæ 3·4.

Hab. In Mexico merid., Guatemala, et America centrali.

Mus. P. L. S.

This is the representative of *M. audax* in the northern province of the Neotropical region. Examples of it first came under my notice in M. Sallé's first collection from Vera Cruz, when, although referring it to *audax*, I noticed the probability of its being really distinct. M. Botteri's series from Orizaba likewise contained specimens, some of which are now in my possession; and Mr. Skinner has transmitted skins from Guatemala. Prince Bonaparte, in his 'Notes Ornithologiques,' bestowed a couple of new names upon this bird (at least we have no doubt it was this species), without assigning any specific characters to it. The examples to which he alludes were from Delattre's Nicaraguan collection.

3. MYIODYNASTES NOBILIS, sp. nov.

Supra ochracecenti-rufus, nigro variegatus; plumis medialiter nigris, ochracecenti-rufo undique marginatis: crista brevi verticali interne aurea: loris et macula post-oculari cum striga rictali nigris: fronte et linea superciliari flavicantibus: alis nigricantibus; tectricibus ochracecenti-rufo, secundariis albo, primariis rufo extus limbatis: cauda ferruginea, rectricum omnium parte mediali, scapam marginante, nigra: subtus albus, abdomine et crisso citrino indutis, pectore et lateribus nigro flammulatis: subalaribus citrino-flavis: rostro corneo, mandibulæ inferioris basi alba; pedibus nigris.

Long. tota 8·5, alæ 4·5, caudæ 3·7, rostri a rictu 1·2, tarsi 0·74.

Hab. In litt. reipublicæ Nov. Grenadæ in vicinitate urbis S. Marthæ.

This fine *Myiodynastes* is a close ally of *M. audax* and *M. luteiventris*, but is readily distinguishable by its stronger bill, longer tail, which is slightly forked, and the lighter surface of the body below; this is nearly pure white on the throat and middle of the belly, being rather sparingly flammulated on the breast and sides, which latter parts, along with the crissum, are tinged with yellow.

The example of this bird in my own collection was obtained from MM. Verreaux of Paris, and was received from their collector at Santa Martha.

The true type of the genus *Myiodynastes*, Bp. (a generic term published by the Prince, like many others, without characters, or even the indication of any exact type), was intended, I believe, to have been the *Tyrannus audax*, Auct. The name first appeared in

print in the 'Comptes Rendus' for April 3, 1854, in connexion with *M. luteiventris*, which I have described above; but it also occurs in the catalogue of birds collected in Cayenne by M. Desplanches* (p. 11), where it is applied to *T. audax*. The division seems a natural one, connecting *Pitangus* and *Tyrannus*. I possess specimens of six species, namely—

1. *Myiodynastes audax* (Gm.): ex Cayenna, Brasil., Nov. Grenad., ins. Trinit., et Peruv. int.

2. *Myiodynastes luteiventris*.

3. *Myiodynastes solitarius* (Vieill.), Azara, sp. 1960: ex Brasil. merid. et Paraguayana.

4. *Myiodynastes nobilis*.

5. *Myiodynastes atrifrons* (*Tyrannus atrifrons*, Sclater, P. Z. S. 1857, p. 274): ex rep. Equat.

6. *Myiodynastes chrysocephalus* (Tsch.).—*Scaphorhynchus chrysocephalus*, Tsch. Faun. Per. pl. 8. fig. 1; Lafr. Rev. Zool. 1848, p. 5.

The last species has the bill rather more flattened, and leads off towards *Scaphorhynchus*.

4. CONTOPUS MESOLEUCUS, sp. nov.

Obscure cineraceus, olivaceo vix tinctus, pileo alis et cauda nigricantibus, secundariis dorso proximis albo extus marginatis: subtus obscure cineraceus, vitta longitudinali a mento corpus descendente cum ventre toto albo, flavicante tincto, hypochondriis et crisso cineraceo adumbratis: fasciculo plumarum utrinque ad latera uropygii, alis oblecto, albo: rostro nigro, mandibula inferioris basi flavida: pedibus nigris.

Long. tota 6·75, alæ 4·0, caudæ 2·7.

Hab. In Mexico meridionali, et in rep. Guatemala (*Skinner*).

This bird is easily recognizable by the creamy-white medial line, which passes from the chin to the crissum, expanding greatly on the belly. My examples are from Orizaba, collected by Botteri. Mr. Gould possesses a specimen from Guatemala of the same species. The form is quite typical,—the wings being very long, and the second primary, which is the longest, considerably (by 0·15 inch) exceeding the first and third, which are equal. The curious white tufts at the side of the uropygium, covered by the wings, are very noticeable in this species—more so than in my examples of *C. borealis*.

5. CONTOPUS SORDIDULUS.

Obscure cineraceus, tectricum majorum et secundariorum marginibus dilutioribus, fere albicantibus: loris albidis: subtus pal-

* This little tract is extracted, I believe, from the Mémoires of a learned Society, published at Caen. The only copy I have ever seen was given to me by the author himself in 1857, shortly before his death. In it is established a new genus of *Tyrannidæ*—*Planchesia*—for *Muscicapa fuliginosa*, Gm. (Pl. Enl. 574. fig. 1); and the generic term *Syrichtha*, the type of which appears to have been unknown to Mr. Gray, is used for *Tyrannus curtipes*, Sw.

lide cinereus, gutture medio albescente, ventre medio et crisso albis : rostri nigri basi inferiore pallida : pedibus nigris.

Long. tota 6·0, alæ 3·2, caudæ 2·5.

Hab. In Mexico meridionali et Guatemala.

This *Contopus* much resembles the preceding, but is considerably smaller in its dimensions, of a rather purer cinereous above, and much lighter cinereous below. This colour passes into whitish on the throat, and nearly pure white on the belly and crissum, without showing the continuous white medial stripe, which renders *Contopus mesoleucus* so noticeable. In structure it is identical with *Contopus virens*; but it has no trace of olive on its plumage.

I regard *Contopus* as a very natural division of the *Tyrannidæ*, characterized by its long wings and short tarsi. My collection contains examples of the following species, which I refer to it:—

1. *Contopus borealis* (Sw.), Baird, Rep. p. 188. — *T. cooperi*, Nutt.: ex America bor., Mexico, et Guatemala.

2. *Contopus mesoleucus*.

3. *Contopus sordidulus*.

4. *Contopus virens*: ex Am. bor., Mex., et Guat.

5. *Contopus bogotensis*. — *Tyrannula bogotensis*, Bp. Consp. p. 190: ex Nov. Grenada et rep. Equat.

6. *Contopus ardesiacus* (Lafr.). — *Tyr. ardesiaca*, Lafr. R. Z. 1841, p. 80: ex Nov. Grenad. et rep. Equat.

Besides these, I have one bad specimen of a S. American species allied to *C. mesoleucus*, but which, I have no doubt, is distinct.

Near *Contopus*, must be placed, I think, Prince Bonaparte's genus *Planchesia*, referred to above.

6. MITREPHORUS PHÆOCERCUS.

Empidonax — ?, Sclater, P. Z. S. 1858, p. 302.

Tyrannula — ?, Sclater, P. Z. S. 1856, p. 296.

Supra fuscescenti-olivaceus ; capitis plumis productis ; alis caudaque obscure nigricantibus, alarum tectricibus rufescente terminatis, fasciam duplicem alarem constituentibus, secundariis olivaceo extus marginatis : capitis lateribus et corpore subtus cum subalaribus ferrugineis : rostro inferiore flavo, superiore cum pedibus nigris : remige tertia longissima, secunda quartam æquante, prima sextam vix excedente.

Long. tota 4·8, alæ 2·7, caudæ 2·4, tarsi 0·52.

Hab. In Mexico merid. et in Guatemala.

This little Tyrant was one of several species of this difficult group in M. Sallé's first collection from Cordova, for which I failed in finding descriptions*. Nor have I been more successful since that time, although I have often had the species under my observation in

* Although I have examined many specimens of Mexican *Tyrannidæ*, I have never succeeded in reconciling any of them to the descriptions given by Mr. Swainson of *Platyrhynchus pusillus*, *Tyrannula affinis*, *T. obscura*, and *T. barbirostris* in his 'Synopsis of Mexican Birds.' Is it possible the present species can be *T. affinis*—"beneath pale fulvous"?

collections received from Mexico and Guatemala, and particularly in M. Sallé's last collection from Oaxaca, where both sexes again occurred; and in M. Botteri's series from Orizaba. Finally, I have determined on giving a name to the bird, to serve at all events as a temporary designation; and (rather unwillingly, I must confess) I have felt myself obliged to make a new generic appellation for it, not knowing any recognized section to which it can be strictly referred. It differs in form from *Myiobius* (or *Tyrannula*) in its shorter, flatter, and broader beak, with the rectal bristles but slightly developed; and from *Empidonax*, to which I was afterwards inclined to refer it, in its much shorter and more slender tarsi and longer wings. I have chosen its name from its slightly-crested head, which gives it rather a *capped* appearance. A second species of the genus, and near ally, is Giraud's *Muscicapa fulvifrons* (*Empidonax fulvifrons*, mihi, P. Z. S. 1858, p. 301), which will stand as *Mitrephorus fulvifrons*.

7. PYROCEPHALUS MEXICANUS.

Pyrocephalus rubineus, Cassin, B. Cal. pl. 18. p. 127; Sclater, P. Z. S. 1856, p. 296; Baird, Report, p. 201.

I believe the Mexican *Pyrocephalus*, which visits Texas and New Mexico in the summer, and is now included in the ornithology of the United States, is no exception to the general rule, that the species of *Tyrannidae*, as indeed of other families of *Insectores*, although often closely allied to, and representatives of, southern forms, will, upon strict comparison, be generally found to present essentially distinct characters, sufficient to render it necessary to constitute of them distinct species. Thus we have—

In Mexico and Central America,	representing in S. America,
<i>Muscivora mexicana</i> ,	<i>Muscivora regia</i> .
<i>Cyclorhynchus brevirostris</i> ,	<i>Cyclorhynchus olivaceus</i> .
<i>Myiobius sulphureipygius</i> ,	<i>Myiobius barbatus</i> .
<i>Mionectes assimilis</i> ,	<i>Mionectes oleagineus</i> .
<i>Myiozetetes texensis</i> ,	<i>Myiozetetes cayennensis</i> .
<i>Myiodynastes luteiventris</i> ,	<i>Myiodynastes audax</i> .
<i>Pitangus derbianus</i> ,	<i>Pitangus sulphuratus</i> .
<i>Scaphorhynchus mexicanus</i> ,	<i>Scaphorhynchus pitangua</i> .

and, when the American Fauna is more completely worked out, many other instances will be found. Indeed, I am inclined to believe that there are very few South American birds, except in the more widely-diffused *Accipitres*, *Grallæ*, and *Anseres*, which are really to be met with in Mexico and Central America.

My specimens of *Pyrocephalus mexicanus* differ from the common *P. rubineus* of Brazil, Cayenne, Guiana, and Trinidad in the lighter shade of the brown colouring and less intense red colour, as well as in the longer bill and generally larger dimensions. In the female of the Mexican bird also the colours are much paler, the fore part of the body below more white, and the belly, instead of being of a full red, is of a pale ochraceous yellow. According to Professor Baird,

however, the shade of colouring on the belly of the female varies considerably.

The only other species of the genus of which I possess specimens, are *P. nanus* of Gould, from the western coast of S. America, extending to the Galapagos (which may be recognized by its inferior size, and the broad white edging of the outer rectrix and pale termination of the others); and *P. obscurus*, Gould, which I cannot help thinking is a female of a red species.

8. ELAINIA PLACENS.

Elania —?, Sclater, P. Z. S. 1856, p. 297.

Supra olivacea, pileo cineraceo, crista interna flava: alis caudaque obscuris olivaceo extus limbatis: capitis lateribus cum gutture albescenti-cinereis, ciliis oculorum albis: abdomine et tectricibus subalaribus flavis: rostro nigro, mandibula inferioris basi albida: pedibus obscure carneis.

Long. tota 5·5, alæ 2·7, caudæ 2·6, tarsi 0·65.

Hab. In Mexico merid. et in Guatemala.

This is the only species of true *Elainia* which I have yet met with from Mexico, the *Elania texensis* of my Mexican lists being strictly a *Myiozetetes**, and the *Elania variegata* belonging to a section which I intend to denominate *Legatus* (type, *Legatus albicollis* (Vieill.) = *Muscicapa legatus*, Licht.). M. Sallé has lately kindly sent me for re-examination the specimen of this bird, which I noticed without naming it, in his Cordovan collection; and I have been thus enabled to determine its identity with a Guatemalan specimen in the possession of Mr. Gould.

The *Elainiæ* are very abundant in S. America; and I have specimens of at least twelve or fourteen species of the genus as restricted, among which I may mention *Elainia pagana* (Licht.), *E. modesta* (Tsch.), *E. albiceps* (Lafr. et D'Orb.), *E. olivacea* (Lafr. et D'Orb.), *E. luteiventris*, mihi, *E. agilis* (Gm.), *E. stictoptera*, mihi, and *E. griseigularis*, mihi.

9. MIONECTES ASSIMILIS, sp. nov.

Mionectes oleagineus, Sclater, P. Z. S. 1856, p. 296, nec Licht.

Olivacea, alis caudaque fusco-nigricantibus, pallido fulvescenti-viridi extus limbatis: abdomine et tectricibus alarum inferioribus fulvis: gutture et cervice cinerascanti-olivaceis: rostri nigri basi rufescente, pedibus fuscis.

Long. tota 5·0, alæ 2·7, caudæ 2·1, rostri a rictu 0·7.

Hab. In Mexico merid., Cordova (Sallé), et Guatemala (Skinner).

Assimilis *M. oleagineo*, sed statura majore, rostro longiore, et gutture et cervice antica cinerascanti-olivaceis distinguendus.

* I so correct this name from "*Myiozeta*, Bp.," as given in Mr. G. R. Gray's List, p. 146. The name was published in Pr. Bonaparte's 'Conspectus Systematis Ornithologiæ' (Ann. des Sc. Nat. vol. iv. 1854) without indication of type; but from specimens in my own collection, marked in the Prince's own handwriting, I am enabled to state that this was intended to be *Elainia cayennensis*, Auct.

2. NOTES ON THE HABITS OF THE MYCTERIA AUSTRALIS OR
NEW HOLLAND JABIRU (GIGANTIC CRANE OF THE COLO-
NISTS). BY GEORGE BENNETT.

A short time since, I purchased this rare bird, which was brought alive to Sydney from Port Macquarie, and so little being known respecting its habits, I considered the following notes might be interesting to the Society. It appears to be a young male, and walks about the yard of the house quite domesticated, making no attempt to fly, nor showing any inclination to leave its domicile. These birds have a wide range over the colony, more particularly about the northern coasts of Australia, and are seen occasionally within the heads and about the sand-banks of the Clarence and Macleay Rivers; they are very difficult of approach, and consequently but few have been obtained, this being the first specimen ever brought alive to Sydney. Among the principal residents in the interior, some inform me that they have only seen four, others only one, during a residence of from twenty-five to thirty years in different parts of the colony. In Leichhardt's Expedition (according to the account of Mr. Murphy, now residing in Sydney) only two were seen; and these could not be approached sufficiently near to be shot. In 1839 a specimen was shot on Hunter's River, and another on the north shore near Sydney about three years since, both of which were presented to the Australian Museum. The person who shot the last bird had the greatest difficulty in procuring it, from its being so very shy and watchful: he was obliged to follow it for several days in its haunts about the salt-water creeks, until he could get sufficiently near to shoot it, which, being a good marksman, he achieved as soon as he could approach within range. Both these specimens were full-grown males, and in fine and brilliant adult plumage. These birds being so rarely seen, and difficult to procure when seen, are valuable as specimens when dead, and much more so when alive. Many of the residents of the northern districts had seen the bird, but rarely, and at a distance, and were aware how difficult it was to procure them; but none had ever seen it in captivity before, and it was therefore regarded with great interest. The number of skins of this bird I have seen during my residence of twenty-two years in the colony only amounts to four. The bird is very graceful: its attitudes, and bearing, whether in a state of repose, stalking rapidly, or walking gently over a lawn or yard with its measured, noiseless steps, have a combination of grace and elegance, and it displays an independence of manner that might be expected in a bird so wild and roaming in its habits. It is gentle and good-tempered, soon gets reconciled to captivity, and seems to take pleasure in being noticed and admired, remaining very quiet to be looked at—keeping a bright eye upon the spectator, however, during the time. Although, when first seen, it has an uncouth appearance, from the large size of the mandibles in proportion to the body, yet on a closer acquaintance its manner wins upon you, and a feeling of attachment arises towards it from its placid, tame, domesticated manner, elegance of form, graceful

carriage, and beautiful metallic brilliancy of plumage, more especially over the head and neck.

This bird had been in captivity four months previous to its arrival in Sydney, having been captured by the blacks. It permits any one to approach it, only timidly moving away when an attempt is made to touch it. It sometimes stands quite erect, or on one leg, with the other thrown out; or rests upon the tarsi, like the Emeu and Mooruk, and again upon one leg, with the bill inclined upon the breast. It was very hungry on its arrival at my house, and with the greatest facility devoured $1\frac{1}{2}$ lb. of beef cut into small pieces, placed in a tub of water, or caught the meat in the mandibles when thrown to it. It also feeds on fish and reptiles. When the food is hard or gristly, it is rejected from the mandibles after trying to masticate it, and bruised with the point of the beak until it becomes sufficiently soft to be swallowed. It feeds generally in the mornings and evenings; and although the mandibles look so large, it picks up the smallest object with great readiness, and clatters the mandibles with a loud noise when catching flies. It preens its feathers, and removes any dirt or insects from them very neatly with the bill, accompanying the action with a degree of ease and grace pleasing to observe. When a tub of water was placed near it, it placed one leg in it; and after drinking, filled its bill with water and threw it out again, as if washing out the mandibles. The eye is very large and remarkably brilliant, and yet imparts to the bird a great docility of expression, making it appear—what it is—an amiable bird, familiar with all around it, liking to court admiration, yet on the watch for any act of aggression. It appears pleased to see any stranger, and evinces but little fear. The horses coming into the yard even close to it, or any noise, does not seem to annoy it; it only moves gently out of the way. When suddenly startled, it will flap its long and powerful wings as if preparing for flight; and it may be regarded as a bird of flight, the whole bulk of the body being so light in comparison with its powerful organs of volition. This bird is partial to salt-water creeks and lagoons. It is usually seen in such localities on the Hunter, Macleay, and Clarence Rivers, which consist, near the entrance and for some miles distant, of salt water with numerous sand-banks, where these birds may be occasionally observed busily engaged in fishing. The beak of this bird is large, broad, conical, and pointed; the lower mandible is slightly curved upwards; the colour is black. The head is large, and neck thick; both the head and neck are of a rich deep glossy green, changing when it reaches the occiput into beautiful iridescent colours of violet and purple, which, when viewed under a brilliant sunshine or in a changing light, display the iridescent tints in a most brilliant manner, shining with a metallic effulgence equal to that seen in the Peacock. The greater wing-coverts, scapularies, lower part of the back and tail, dark brown mixed with rich bluish green, which changes in the adult to a rich glossy green tinged with a golden lustre. The smaller wing-coverts, lower part of the neck and back, and upper part of the breast white speckled with ashy brown, which becomes white in the adult; lower part of

the breast, thighs, and inner part of the wings white. Eyes brilliant, and dark hazel in colour. The legs are blackish with a dark tinge of red, becoming in the adult of a bright red colour, which, as I have been informed, when the bird flies with the legs stretched out, looks like a long red tail. The legs are usually dirty with excremental matter, imparting to them a white appearance, so that the natural colour is seldom seen, except when they just emerge from the water. It is a large feeder, and these birds must consume, in their native haunts, a great quantity of fishes and reptiles. It measures 3 feet 10 inches to the top of the head, and is not yet full-grown; they are said to attain 4 to 5 feet in height. It is shy in disposition and difficult of approach in its wild state; this can readily be supposed when it is observed in captivity; for although very docile and readily tamed, still the keen, watchful eye appears always upon you, with a brilliant and piercing look, which causes a feeling of the impossibility of escaping its penetrating glance. Its feeding-grounds and places of rest being about sand-pits, sand-banks, and exposed morasses near the sea-coasts, it is impossible to approach this wary bird without being seen. The first evening it was at my house, seeking for a roosting place, it walked into the hall, gazed at the gas-lamp which had just been lighted, and then proceeded to walk up-stairs, but not liking the ascent, quietly walked down again and returned into the yard, and afterwards went to roost in the coach-house between the carriages, to which place it now retires regularly every evening soon after dark. It is always observed to face the sun, and moves about the yard, following the course of that luminary; it may always be found in that part of the yard where the sun is shining, and with the face invariably towards it. When hungry, it follows the cook about (who usually feeds it); and if she has neglected its food, looks into the kitchen as if to remind her of the neglect, and waits quietly, but with a searching eye, during the time the meat is cutting up, until it is fed. It is amusing to observe this bird catch flies: he remains very quiet, as if asleep, and on a fly passing him, it is snapped up in his beak in an instant. The only time I observed any manifestation of anger in him was when the "Mooruks" were introduced into the yard where he was parading about: these rapid, fussy, noisy birds running about his range excited his indignation; for on their coming near him, he slightly elevated the brilliant feathers of the head, the eyes became very brilliant, he ruffled his feathers, and clattered his mandibles as if about to try their sword-like edge upon the intruding "Mooruks;" but his anger subsided with these demonstrations, except an occasional flapping of his powerful wings. One day, however, on one of the "Mooruks" approaching too near him, he seized it with his mandibles by the neck, on which the "Mooruk" ran away and did not appear in any way injured.

3. LIST OF MAMMALS AND BIRDS COLLECTED BY MR. JOSEPH LEYLAND IN HONDURAS, BELIZE, AND GUATEMALA. BY THOMAS J. MOORE, KEEPER OF THE DERBY MUSEUM, LIVERPOOL.

(Aves, Pl. CL., CLI.)

The collection, of which the following is a list, was made in 1855-56 by Mr. Joseph Leyland, successor to Mr. Mather, a well-known naturalist of this town. Mr. Leyland collected chiefly in the district of Omoa, but occasionally visited Belize, and in one instance proceeded as far as Lake Peten in Guatemala, in order to obtain the *Meleagris ocellata*. In addition to the free use of his collection, he has kindly furnished me with observations on the habits of many of the species.

I am much indebted to Mr. Selater for naming the *Dendrocolap-tinæ*, *Formicarinæ*, and others indicated by his initials (P. L. S.) placed after them.

MAMMALIA.

1. CYCLOTHURUS DIDACTYLUS (Linn.). "Night Walker."

Chilomo River.

Not common, or at any rate, owing to their nocturnal habits, not often seen, being principally met with in the early morning. The Spanish residents say they feed on bananas, in search of which they frequent the gardens. Mr. Leyland had a mother and young alive for a short period; but being kept in a box, he had no opportunity of noticing their habits, beyond the fact of the young one continually nestling under the belly of its parent; but he did not observe that it clung to her.

2. SCIURUS BOOTHIÆ, Gray, Voy. Sulph. pl. 13. f. 1.

Common about Omoa; leave the trees when hunted or shot at, and take to their heels on the ground, where they are otherwise often met with.

There is some variation in different examples of this species: of three specimens in the Derby Museum, collected by Mr. Leyland, one has a decided black longitudinal stripe on the sides, dividing the mottled brown and black colour of the upper from the pure white of the under part; in the second this is absent; and in the third a broad rufous band extends across the chest, while the hairs of the tail are much more sparingly tipped with white than in the other two.—(T. J. M.)

3. SCIURUS MOLLIPILOSUS, Aud. & Bachm. Quad. N. Amer. pl. 19. p. 157.

Omoa.

Rare; shy, frequenting the bush and smaller trees.

4. *GALERA BARBARA* (Linn.).

Pine Ridges of Belize.

Go in troops of fifteen or twenty; frequenting trees, to which they betake themselves when hunted by dogs, and are thus easily shot.

5. *LUTRA* — ?

From a river to the west of Comayagua.

6. *LEOPARDUS ONCA* (Linn.).

Omoa and Belize, occasionally.

7. *LEOPARDUS PARDALIS* ? (Linn.).

Imperfect skins of one, if not two species of Ocelot, were obtained from muleteers, who brought them from the interior of Honduras. They were not observed near Omoa.

8. *VULPES* — .

An imperfect skin of a small Fox from Comayagua, closely allied to the *V. Azaræ*.

In addition to the Mammals enumerated above from skins brought home by Mr. Leyland, he mentions the following:—

LEOPARDUS CONCOLOR, met with occasionally near Comayagua.

DICOTYLES TORQUATUS, common in troops of sixteen or eighteen near Omoa.

TAPIRUS AMERICANUS, called the Mountain Cow, frequents swamps in the district of Omoa.

CERVUS (CARIACUS?) — ?

CERVUS (COASSUS?) — ?

LEPUS — ? Met with occasionally at Omoa.

DASYPUS FEBA. One specimen seen near Comayagua; they are spoken of by the natives as occasionally to be obtained, and are esteemed by them as articles of food.

AVES*.

1. *GYPARCHUS PAPA* (Linn.).

Specimens were procured at Omoa and from the mountains of San

* *CATHARTES AURA* ? (Linn.).

Frequent in the more secluded parts of the district of Omoa.

CATHARTES ATRATUS ? (Bartham).

Occurs in great numbers about Omoa.

Mr. Leyland did not bring home specimens of the above.

Pedro. Single adult birds often seen in flocks of the Black Vulture (*Cathartes atratus*), more rarely two. They are not common about Omoa; but are more frequently seen in the less inhabited districts in the centre of Vera Paz frequenting the higher regions.

2. *HERPETOTHERES CACHINNANS* (Linn.).

Omoa.

Tolerably abundant. They have a peculiarly shrill cry, which may be heard for miles, beginning before daybreak, subsiding during the day, but heard again in full force at evening, and continuing till long after sunset.

3. *TINNUNCULUS SPARVERIUS* (Linn.).

Omoa.

Rare; flies high, chasing smaller birds.

4. *ROSTRHAMUS SOCIABILIS* (Vieillot).

Peten.

Rare; only two seen, which were shot among the trees bordering the Lake.

5. *SPIZAËTUS ORNATUS* (Daudin).

From Porto Caballos, near Omoa.

Rare; shot only two specimens: these were met with in a very solitary place, and sat so quietly on the tree that it was necessary to move back to shoot them. The crop of one was full, and contained small reptiles.

6. *URUBITINGA ANTHRACINA* (Nitzsch).

Omoa.

Rare.

7. *CYMINDIS CAYENNENSIS* (Gm.).

Honduras.

Rare; shot only one specimen, which was met with in the San Pedro Mountains.

8. *ASTURINA MAGNIROSTRIS* (Latham).

Omoa.

Common. Prey on mice.

9. *PHAROMACRUS PARADISEUS*, Bp.

(*Calurus resplendens*, Gould.)

The specimens in Mr. Leyland's collection, and all seen by him, were stated to be from Quezaltenango in the State of Guatemala. He did not meet with them himself. A common method of procuring these and other birds is by stunning them with clay pellets blown from light tubes of 8 or 10 feet in length.

10. *TROGON MASSENA*, Gould.

Omoa and San Pedro.

These birds are met with in pairs; they are very active, making a chattering noise, varied occasionally by a great outcry.

11. *TROGON CALIGATUS*, Gould.

Omoa.

Rare; saw only one, which was very shy.

12. *TROGON MELANOCEPHALUS*, Gould.

Omoa.

Found in pairs; not so noisy as the *T. massena*.

13. *CERYLE TORQUATA*.

Peten and Omoa.

14. *CERYLE ALCYON* (L.).

Omoa.

15. *CERYLE AMERICANA* (Gm.).

Old River, Belize.

16. *CERYLE AMAZONA* (Gm.).

Omoa.

17. *CERYLE SUPERCILIOSA* (Linn.).

Lake Peten.

None of the above species appeared to be common.

18. *GALBULA MELANOGENIA*, Sclater.

An extremely solitary bird; frequents the deep ravines overhung with trees, on the road from Omoa to Comayagua, the only place where the species was observed. They feed on insects, have a quick darting flight, and utter no cry. When disturbed, they fly at once to the bush, and not, like many other birds, to the open country.

19. *CÆREBA LUCIDA*, Sclater & Salvin, Ibis, 1859, p. 14.

Omoa.

Common.

20. *EUGENES FULGENS* (Swains.).

Guatemala.

21. *FLORISUGA MELLIVORA*.

Belize.

22. *CAMPYLOPTERUS DELATRII* (Less.).

Guatemala.

23. *CHRY SOLAMPIS MOSCHITUS* (L.) ?

Omoa.

24. *MOMOTUS LESSONI*, Lesson.

Omoa.

Common; found always in solitary places, never coming very near the towns. They frequent the low bushes in swampy places, in which it is very difficult to discover them till they betray their presence by their call. Found sometimes in pairs, but generally singly.

Mr. Leyland, from frequent observation of the living birds, is strongly of opinion that the denudation of the middle rectrices is caused by the birds themselves.

25. *HYLOMANES MOMOTULA*, Licht.

Omoa.

Very rare. Leyland saw only the one specimen, which he procured; it was very shy.

26. *EUMOMOTA SUPERCILIARIS* (Jard. & Selby): Sclater, P.Z.S. 1858, p. 257.

Omoa.

Found chiefly in swampy places, about the Chilomo River, on a kind of Sycamore tree very bare of leaves. They are there more plentiful than in the neighbourhood of Omoa itself, where they are rare. They are shy and difficult of approach; but have a very peculiar cry or whistle, not so loud as piercing, by means of which you may ultimately discover them hiding behind the foliage.

27. *DENDROCOLAPTES SANCTI THOMÆ*, Lafr. (P. L. S.).

Dense forests in the district of Omoa; also found at Belize.

28. *PICOLAPTES* — ?

Omoa.

29. *DENDROCINCLA ANABATINA*, Sclater, sp. nov. (Pl. CL.)

Supra olivaceo-brunnea, nucha rufescente variegata: alis extus late rufis, tectricibus dorso concoloribus, sed harum marginibus obscurioribus: primariorum et secundariorum vitta laterali nigra: cauda rufa unicolore: subtus dilutior, gutture flavicantiore et striolis indistinctis notata, crisso rufescentiore: rostro albicanti-corneo, pedibus obscure corylinis.

Long. tota 6·5, alæ 3·4, caudæ 2·7, rostri a fronte 0·85.

Omoa, 1 ex.

This curious species might be mistaken for an *Anabates* were it not for its stiff spiny tail. In its bill it more resembles some birds of the latter genus than any *Dendrocolaptine*. For the present I am content to place it in the genus *Dendrocinccla*, to which it appears to be more nearly allied than to any other section of the group. (P. L. S.)

30. *GYMNOCICHLA NUDICEPS*, Sclater, P. Z. S. 1858, p. 274 (P. L. S.).

Omoa.

Rare; saw only two or three, and those only at Omoa. They frequent the thickets, and make a noise like the breaking of small twigs. The head of this specimen is only partially bald, but it otherwise agrees with *G. nudiceps*.

31. *FORMICIVORA BOUCARDI*, Sclater, P. Z. S. 1858, p. 27 ♀ (P. L. S.).

Omoa.

Solitary; found in thickets. "Above blackish cinereous; large concealed interscapular spot, small round spots at the tips of the lesser wing-coverts, and larger spots at the tips of the greater wing-coverts, and ends of tail-feathers white; under-surface chestnut."

32. *CERCOMACRA TYRANNINA*, Sclater, P. Z. S. 1858, p. 245 (P. L. S.).

Belize.

Solitary, and found as the preceding, in thickets. Does not seem to differ from New Granadian specimens.

33. *SIURUS AURICAPILLUS* (Linn.).

Omoa.

Not common; found on brambles in the flats and marshes, generally in pairs.

34. *TURDUS MUSTELINUS*, Gmelin.

Omoa.

Not common; found solitary in the thickets.

35. *MIMUS GRACILIS*, Cab. (P. L. S.).

Belize.

Common; not found near Omoa. Very shy; its mocking powers, if it have any, are not striking.

36. *MELANOPTILA GLABRIROSTRIS*, Sclater, P. Z. S. 1857, p. 275.

Omoa.

37. *TYRANNUS MELANCHOLICUS*, Vieill.

Omoa.

38. *TYRANNUS INTREPIDUS*, Vieill.

Omoa.

Migratory; arrives in flocks of two or three hundred, and stays only a short time before departing south. Very wild, and flies high.

39. *MILVULUS TYRANNUS* (Linn.).

Frequents the Old River and pine ridges of Belize; plentiful on the

flats near Peten ; and occasionally found at Comayagua and Omoa, at which last place at least it is migratory.

40. *MYIOZETETES TEXENSIS* (Giraud.) (P. L. S.).

Omoa.

41. *PITANGUS DERBIANUS* (Kaup).

Belize and Omoa.

Common ; always in motion, darting after insects.

42. *MYIODYNASTES LUTEIVENTRIS*, Sclater, *anteà*, p. 42.

Peten.

Rather rare, frequenting high trees.

43. *PYROCEPHALUS MEXICANUS*, Sclater, *anteà*, p. 45.

Common on the flats near Peten, and found on the pine ridges near Belize.

These birds have a singular habit of spinning round and round on the wing, and then dropping suddenly with wings loose and fluttering as though shot, apparently done for amusement. They lay three or four light-coloured eggs in a small nest composed of light grass and lined with cottony materials.

44. *MUSCIVORA MEXICANA*, Sclater, *P. Z. S.* 1856, p. 295.

Mr. Leyland shot, but did not bring home, a single specimen of a bird at Chilomo, which he believes to have belonged to this species. He met with it sitting on a bough in a solitary ravine ; the crest was so little elevated as, though the bird allowed him to approach closely, not to be observed till after it was shot. Though he searched carefully, he did not succeed in meeting with another specimen.

45. *TITYRA PERSONATA* (Jard. & Selby).

Pine ridges, Belize.

Common. These are quiet, inactive birds, sitting quietly perched on the broken limbs of the pines ; they are found in company with the Provident Woodpeckers.

46. *TITYRA ALBITORQUES*, Du Bus.

Psaris Fraseri, Kaup.

Peten.

Rare.

47. *PACHYRAMPHUS POLYCHROPTERUS* (Vieill.).

Omoa, close to the town.

Much smaller than the Brazilian bird.

48. *MANACUS CANDÆI* (Parzudaki) ♀.

Peten.

49. *CYANOCITTA CRASSIROSTRIS*, Bp.

Old River, Belize.

Migratory.

50. *CYANOCORAX GUATEMALENSIS* (Bp.).

Omoa.

Not common, migratory, arriving in October and making only a short stay. They are shy, noisy, and restless, going in flocks of five or six.

51. *PSILORHINUS MORIO* (Licht.).

Omoa and Belize.

Very common, in small flocks ; very noisy, and annoys the hunter by quickly giving an alarm.

Mr. Leyland brought home no samples of this species, but identifies it from specimens in the Derby Collection.

52. *THAMNOPHILUS DOLIATUS*?, Linn.

Omoa.

53. *THAMNOPHILUS MELANURUS*, Gould ?

Omoa, in the thick bush.

Differs from the figure (P. Z. S. 1855, Aves, pl. 83) in having two distinct white bars on the greater wing-coverts, and the tips of the smaller coverts also white.

54. *OCYALUS WAGLERI* (G. R. Gray).

Chilomo.

55. *CACICUS MONTEZUMÆ*, Less.

Omoa.

Common ; resorts to the mountains and high forest trees in company with the Toucans.

56. *CASSICULUS PREVOSTI* (Less.).

Omoa and Peten.

57. *HYPHANTES BALTIMORENSIS* (Linn.).

A single specimen, adult, shot on one of the Keys or small islands between Omoa and Belize.

58. *CASSIDIX ORYZIVORA* (Gm.).

Chilomo.

Frequents the corn fields in great numbers ; are very good eating.

59. *CASSIDIX CRASSIROSTRIS* (Swains.) ?

Omoa.

Common.

60. *QUISCALUS MAJOR*, Vieill.

Omoa.

61. *ICTERUS MESOMELAS*, Licht.

Omoa.

62. *ICTERUS MELANOPTERUS*, Hartl.

Omoa.

Migratory.

63. *ICTERUS PROSTHEMELAS*, Strickland (P. L. S.).

Comayagua.

Common.

64. *STURNELLA HIPPOCREPIS*, Wagl.?

Rather common on the pine ridges near the town of Mexico, fourteen or fifteen miles from Belize.

65. *AGELÆUS PHÆNICEUS* (Linn.)?

Peten, rather common; Belize, rarer.

During a month's stay at Peten these birds were never seen in larger flocks than three or four, and sometimes singly. They keep to the neighbourhood of rivers and swamps, darting among the rushes, in which they are difficult to discover till they rise again.

Somewhat smaller than the United States' birds, as pointed out (P. Z. S. 1857, p. 205); the dimensions of the male specimen being as follows:—Total length 8'0"; wings $4\frac{1}{4}$ '; tail $3\frac{1}{2}$ '; the bill is somewhat longer, measuring an inch from the tip to the termination of the culmen.

66. *SPIZA CIRIS* (Linn.).

Omoa; Old River of Belize; Peten.

Nowhere common.

67. *HEDYMELES LUDOVICIANUS* (Linn.).

Omoa.

Rare.

68. *SALTATOR GRANDIS* (Licht.).

Omoa.

Common.

69. *SALTATOR ATRICEPS*, Less.

Omoa.

Not common.

70. *PHENICOTHAUPIS RUBICOIDES* (Lafr.).

Found on the high road from Omoa to Chilomo, in flocks of three or four; not common.

71. *RAMPHOCELUS PASSERINII*, Bp.

Omoa.

Common all through the year ; occurs sparsely at Duck Run, forty or fifty miles up the Old River of Belize ; but neither this nor the following is met with in the intervening country.

72. *RAMPHOCELUS SANGUINOLENTUS* (Less.).

Omoa and Peten.

Restless and timid. Not common : migratory.

73. *TANAGRA DIACONUS*, Less.

Omoa, Peten, and Belize.

Common.

74. *TANAGRA VICARIUS*, Less.

Omoa, Peten, and Belize.

Common.

75. *ARA ARACANGA* (Gmel.).

Honduras, generally distributed.

Very common near Omoa, where six or eight pairs may be seen of an evening flying from their feeding haunts to their roosting places.

76. *CHRYSTIS AUTUMNALIS*, Linn.

Omoa.

Occasionally met with.

77. *CHRYSTIS* — ?

Omoa.

78. *CONURUS ASTEC*, Souancé.

Common near Belize River and the pine ridges, in small flocks of sixteen or twenty. Not found near Omoa.

79. *RAMPHASTOS CARINATUS*, Sw.

Honduras.

Very common ; confine themselves generally to the tops of the very highest trees, so as mostly to be beyond gun shot.

80. *PTEROGLOSSUS TORQUATUS*, Wagler.

Honduras.

Not common ; make a screeching whistle ; found in larger numbers and on lower branches than the preceding ; restless and shy.

81. *CROTOPHAGA SULCIROSTRIS*, Sw.

Omoa.

Common in flocks, feeding on ticks of cattle, sheep, and goats.

82. *PIAYA MEXICANA* (Sw.).

Peten and Omoa.

Rather common, but very shy.

83. *DIPLOPTERUS EXCELLENS*, Slater, P. Z. S. 1857, p. 228 (P. L. S.).

San Pedro, Honduras.

Rare.

84. *CENTURUS PUCHERANI*, Malherbe (P. L. S.).

Common near the town of Omoa. Very lively and restless; scarcely ever still, flying from tree to tree. Shy, secreting themselves behind the boughs when approached.

85. *CENTURUS SANTACRUZI*, Bp. (P. L. S.).

Omoa.

Rarer than the preceding.

86. *DRYOCOPUS SCAPULARIS*, Vigors (P. L. S.).

Omoa.

Common. May be heard for half a mile pecking at the trees, and may readily be mistaken for a woodman felling timber; their strokes are slower and more deliberate than those of the smaller kinds; they frequent the large timber.

87. *MELANERPES FORMICIVORUS* (Swains.), Cassin, Ill. Birds Californ. pl. 2.

Pine ridges of Belize and Chilomo; more plentiful at the former than at the latter.

These interesting birds carry on their provident habit of picking holes in the bark of the pines for the storing of acorns at the expense of the pines themselves, most of the trees dying after the acorns are extracted.

88. *CHLORONERPES YUCATANENSIS*, Cabot.

The specimens from Honduras and Guatemala seem nearly intermediate between the Mexican *C. æruginosus* and the more southern *C. rubiginosus*.—(P. L. S.)

89. *CELEUS CASTANEUS* (Wagl.).

Picus badioides, Less.

Omoa.

Not common; frequent the smaller timber; appear to feed on insects creeping on the surface of the trees; and not to chip the bark for those beneath.

90. *CHLORONERPES SANGUINOLENTUS*, ScL., sp. n. (Pl. CXLI.).

Olivascenti-brunneus: pileo coccineo: dorso toto aurescente,

colore sanguineo perfuso : alarum superficie inferiore nigricante, albo tessellata : rostro et pedibus nigris.

Long. tota 5·8, alæ 3·4, caudæ 2·6.

Omoa.

Rare ; frequents smaller and denser bushes than the preceding.

1 ex.

This apparently unnamed *Chloronerpes* is closely allied to *C. oleagineus* of Mexico and *C. fumigatus* of S. America, but distinguished by its blood-stained back and smaller size.—(P. L. S.)

91. COLUMBA LEUCOCEPHALA, Linn. ; Bp. Consp. Gen. Av. ii. p. 54.

This species was observed only on the islets or keys between Omoa and Belize ; they fly in flocks from island to island, but were not met with on the mainland.

92. LEPIDOENAS SPECIOSA, Bp. Consp. Gen. Av. ii. p. 54.

Columba speciosa, Gmel.

Peten, where they are domesticated, becoming very tame.

93. MELOPELIA LEUCOPTERA, Bonap. Consp. Gen. Av. ii. p. 81.

Columba leucoptera, Linn.

Omoa.

Not common.

94. SCARDAFELLA INCA, Bp.

San Pedro (Honduras) and Peten.

Common, in flocks with *Chamæpelis rufipennis*.

95. PERISTERA CINEREA (Temm.).

Omoa.

Rare.

96. CHAMÆPELIA RUFIPENNIS (Gray).

San Pedro (Honduras) and Peten.

Common, in flocks.

97. CRAX ALECTOR, Linn. ?

Common in Peten, and on the ridges of Chilomo ; not so shy as many birds, being apparently too bewildered, when it finds itself discovered, to take to immediate flight.

98. PENELOPE PURPURASCENS, Wagler.

Gleanings from the Men. & Av. Knowsley, pl. 11.

Honduras.

Generally distributed.

99. *ORTALIDA VETULA* (Wagler)?

Found plentifully near Omoa.

Very noisy and pugnacious. Being very good eating, they are much sought after by the Spanish residents, and the eggs and young taken and placed under hens. The home-reared ones remain domesticated and are masters of the poultry, their lightness of wing enabling them to buffet the cocks so effectually as to become masters of the field.

100. *MELEAGRIS OCELLATA*, Temm.

Formerly these birds descended the Old River towards Belize; as the country has become more occupied, they have retired further to the interior, and are now only sparsely met with about half-way from Belize to Peten; beyond Peten they are more plentiful. Three wild birds were observed in the summer of 1856 by Mr. Burns, mahogany-cutter, residing at the Boom on the Old River, some thirty miles from the town of Belize. They came to the river, near his house, to drink, but took to flight before they could be secured; they had not previously been seen in the neighbourhood for many years.

They are extremely shy, and keep to the thick woods, except when they go to the outskirts to feed. When thus occupied, their heads may just be discerned above the grass; but should they see any one a mile off, they become alarmed and retreat to the woods. The Spaniards shoot them by night during the pairing time in March, when they betray themselves by their cries while at roost. Their flesh is most delicious eating. The wild cocks tread the hen Turkeys of the residents at Peten, the produce being a very fine cross. The wild race is called the *Pavo del Monte* by the Spanish residents, and the domestic race the *Pavo Real*.

101. *ORTYX LEYLANDI*, Moore, sp. nov.

General colour wood-brown; crest short, brown, darker at the tips; ear-coverts brown; chin black, each feather longitudinally striped with white; stripe above and another below the eye cream colour, bordered posteriorly with black; nape chestnut; an irregular band of black feathers spotted on each web with white surrounds the neck; interscapulum minutely barred with black and brown; back black, each feather having three narrow rufous bands; rump and upper tail-coverts mottled with black and wood-brown, and banded and tipped with white. Breast, belly, sides, and under tail-coverts rich brown, with prominent irregularly oval white spots bordered with black. Tail ash-brown, with four or five irregular bands of whitish. Primaries ash-brown; secondaries the same, but freckled on the outer webs; tertiaries rich chestnut-brown, largely blotched with black, banded and tipped with white, with which colour the inner webs are broadly edged. Bill small and black. Feet greyish horn-colour.

Total length $6\frac{1}{2}$ inches, wings $3\frac{5}{8}$, tail 2, bill to end of gape $\frac{7}{16}$, tarsi 1, middle toe and claw $1\frac{1}{4}$.

The specimen from which the above description is taken was the only one seen. It was shot as it sprang from the long grass at Flores on the road from Omoa to Comayagua.

The species is dedicated to its discoverer, Mr. Leyland. Its nearest ally is *O. parvicristata*, Gould, of New Granada; but it is much darker below.

102. *ORTYX NIGROGULARIS*, Gould.

Found in the pine ridges of Belize in flocks of six or eight. Shy, but do not take readily to the wing; on the contrary, they run together and try to escape by running.

103. *TINAMUS MAJOR* (Gm.)?

Ground Partridge of the English mahogany-cutters.

Omoa. Common throughout the district; also met with, but more rarely, at Belize.

They lay their eggs about eight or ten in number in a slight depression scratched in the angles formed by the projecting buttress-like roots of the mahogany trees. They are very shy, and when they find themselves discovered, they try to hide by diving their heads amongst the brambles.

[This is one of the large Tinamous allied to *T. major*, remarkable for the roughness of the plates on the back of the tarsus, whence Cabanis has called them *Trachypelmus*. It is coloured very much like *T. major* of Brazil and *T. suberistatus* of Guiana, but will probably prove ultimately to be distinct.—P. L. S.]

104. *CHARADRIUS VOCIFERUS*, Linn.

Omoa.

Common; arrive with the autumnal gales.

105. *HOPLOPTERUS CAYANUS*, Lath.

Aloor River, Honduras.

106. *TIGRISOMA BRASILIENSE* (Linn.).

Barking Garling of the mahogany-cutters.

Common in rivers and swamps at Aloor River and Omoa, at which last place it remains throughout the year.

107. *NYCTICORAX GARDENI* (Gmel.).

Omoa, common; Peten.

A specimen collected by Mr. Dyson of *Nycticorax violaceus* (Linn.) is in the Derby Collection, and labeled "Honduras."

108. *FLORIDA CÆRULEA* (Linn.).

Common in the rivers near Omoa, and on the neighbouring beach; also met with at Belize.

109. *BUTORIDES VIRESCENS* (Linn.).

Swamps of Belize and Omoa.

110. *GARZETTA CANDIDISSIMA* ? (Gm.).

Chilomo river.

In flocks of ten or twelve.

111. *LIMOSA FEDOA* (Linn.).

Belize.

Common.

112. *GALLINAGO WILSONI*, Temm.

Omoa.

Common.

113. *FULICA AMERICANA*, Gmel.

Chilomo.

Rare.

114. *ARAMUS SCOLOPACEUS* (Gmel.)?

Clucking Hen of the mahogany-cutters.

Common at Belize River and the rivers about Omoa.

115. *ARAMIDES CAYANENSIS* (Gm.).

Omoa.

Not common. Make a peculiar noise more like that of a quadruped than a bird.

116. *CORETHRURA CAYENNENSIS* (Gm.)?

Omoa.

Not common. Run like Quails; make a shrill whistle like that of the Tinamoo, for which its cry may easily be mistaken; keeps to the bush.

117. *PORPHYRIO MARTINICA* (Linn.).

On the lagoons near Peten.

Continually on the move, running with their wings expanded to lessen their pressure on the floating leaves, which they only lightly touch, being generally insufficient to support even their slight weight. The young when yet unfledged accompanying their parents on the water, and are very expert.

118. *PARRA GYMNOTOMA*, Wagl.

Very common at Belize and Peten; less so at Omoa, arriving there about September.

Habits similar to those of the preceding species; the young following the old birds nearly as soon as hatched. The males assist the females in rearing the young; they are very pugnacious and bold in their defence, and will approach an intruder within a yard or two, uttering loud cries.

119. *PTEROCYANEA DISCORS* (Linn.).

Omoa, arriving with the periodical northerly winds in October, in

flocks of two or three hundreds, and remaining a month or so. As the swamps dry up, they retire to the neighbouring rivers, where a few remain to breed. They also occur at Belize.

120. *CAIRINA MOSCHATA* (Linn.).

Peten, rare ; Chimalacon and Aloor Rivers, Honduras, common, and probably breed there.

Roost on trees and seldom seen on the water.

121. *QUERQUEDULA CAROLINENSIS* (Gmel.).

Aloor River, Honduras.

122. *PODILYMBUS CAROLINENSIS* (Lath.).

One shot at Lake Peten.

Dived on being alarmed, and continued to do so, giving some trouble to secure it.

123. *PLOTUS ANHINGA*, Linn.

Peten.

Found singly or in parties of two or three with the following, perching on the same trees, but on higher branches ; very wild.

124. *PHALACRACORAX MEXICANUS* (Brandt.).

Peten.

In flocks of several hundreds ; stretched in long rows on the margin of the islands of the lake. On approaching in a canoe they dive together, rise again quickly, and retreat, spread out in a long line abreast.

125. *LARUS* — ?

Belize.

Liverpool, Jan. 10th.

4. ON A SPECIES OF *EOLIS*, AND ALSO A SPECIES OF *LOMANOTUS* NEW TO SCIENCE ; WITH THE DESCRIPTION OF A SPECIMEN OF *EOLIS CERULEA* OF MONTAGU. BY WILLIAM THOMPSON. COMMUNICATED BY DR. J. E. GRAY.

My dredging labours in Weymouth Bay have again been rewarded by the acquisition of two new species of the Nudibranchs, and by the rediscovery of one of Montagu's lost species. This last acquisition is very pleasing to me, believing, as I do, that all the species described by Montagu still exist. On a former occasion I was fortunate enough to obtain his *Thecacera pennigera*.

The species described in this paper I was anxious should not rest on my sole authority ; added to which, I was not sufficiently versed in their anatomy to give an equally full description with those in the

valuable work on the Nudibranchs published by the Ray Society. After I had taken my notes, I accordingly despatched them to Messrs. Alder and Hancock, who have kindly placed their descriptions at my disposal, and, in the interest of zoological science, I use their descriptions in preference to my own.

EOLIS ADELAIDÆ, mihi, n. sp.

“Body nearly half an inch long, slender, tapering to a fine point behind, pellucid orange-red. Dorsal tentacles moderately long, smooth, tapering, divergent, and set a little apart at the base; orange-red with yellow tips, and a pale line down the back of each, terminating in a clear oval spot on each side behind the tentacles, on which the minute eyes are placed. Oral tentacles a little shorter than the dorsal pair, and of the same colour, the pale line on their surface also extending backward to the clear spot. Branchiæ elliptical, inflated, of the same colour as the body, a little deeper towards the top, apices white; the central gland is yellowish, rather wide, and irregularly foliculated or lobated; they are arranged in twelve or thirteen rather distant transverse rows of three or four papillæ each, commencing a little behind the tentacles, and divided by a narrow space down the back; the papillæ nearest the dorsal ridge are the largest and the most inflated. Foot pellucid, slightly tinged with orange-red, linear, narrow, tapering gradually to a point a little beyond the branchiæ behind, truncated in front, with the angles rounded off.

“This species most nearly approaches *Eolis farranni*, Ald. & Han., from which it differs in colour, and in the number and form of its papillæ, which are broader towards the apex. The spawn also differs, forming a narrower coil, with the free margin undulated.”

Hab. I obtained two specimens by dredging in six fathoms water in Weymouth Bay; the first, which was white in colour, I obtained in September 1854, and the second specimen was obtained in the following month. The colour of the last was orange-red; and this is described by Messrs. Alder and Hancock as the typical example. In each case the *Eolis* was feeding on *Plumularia*. The difference in the colour here shown is a further evidence of the puerility of considering mere colour as a test of species in the lower animals. I have named this lovely Nudibranch in memory of a little daughter, whose love for zoology, and retentive memory on the subject, promised much.

EOLIS CÆRULEA, Mont. sp.

Doris cærulea, Mont. Linn. Trans. vii. 78. pl. 7. f. 4, 5.

“Body half an inch long, slender, nearly linear, tapering to a fine point behind, of a pale pellucid green. Head small, very short, and rounded in front, with a dark mark in front of the dorsal tentacles, caused by the buccal mass. Dorsal tentacles long, slightly tapering, tinged with green and speckled with opaque yellow; points rather obtuse and spreading; bases closely approximating, with the eyes close to their outer margins. Oral tentacles greenish, very short

and delicate. Branchiæ fusiform, almost linear, stoutish, moderately long; central gland not quite so wide as the sheath, irregularly foliculated and granulated, green below and dark blue above; outer surface of the papillæ above pale blue, below pale green; a few yellow freckles in front; tips strongly capped with rich orange-red, banded below with a rim of bright yellow: the extreme points are colourless and pellucid; they are arranged in ten transverse, rather distant rows of five or six papillæ in each row; the four anterior rows are rather closer together than the rest, and are divided from them by a widish space; the front row contains only two papillæ, placed as far forward as the dorsal tentacles. Foot tinged with green, narrow, slightly lobated in front, with the lateral angles considerably produced and rather obtuse."

This interesting individual was dredged by me in Weymouth Bay, on a rough bottom in six fathoms water, and sent to Mr. Albany Hancock in the latter part of September 1858. In the note accompanying this description, Messrs. Alder and Hancock remark, that "as Montagu's description of this very beautiful species is exceedingly short and incomplete, and as no one appears to have captured it since his time, it has been thought desirable to redescribe it. However, there can be no doubt that this is Montagu's species, and its rediscovery, which is due to Mr. Thompson, of Weymouth, is of great interest."

LOMANOTUS PORTLANDICUS, mihi, n. sp.

"Body upwards of an inch and three-quarters long, depressed, quadrilateral, tapering a little backwards, pellucid white, tinged with brownish yellow on the back, in front pale orange-red. Head rounded in front, covered with a distinct veil, bearing on each side two rather long tentacular processes, the outer ones the longer. Tentacles set well forward and placed apart, elliptical, tapering to a pretty fine produced and truncated apex; closely laminated on the upper portion, which is of a pale yellowish colour, with numerous fine laminæ much inclined backwards and downwards, and divided in front by a narrow line; the lower portion, colourless and smooth, is contained within a tall, narrow sheath, of an orange-red colour above, with the margins divided into six finely-pointed filaments, those in front shortest. The sides of the back are produced into wide pallial margins, which, commencing in front of the bases of the tentacular sheaths, are continuous behind the termination of the tail; these margins are deeply and symmetrically undulated, forming on each side four loops, which meet along the medio-dorsal line, and are fringed with numerous short, pointed, orange-red papillæ tipped with white; the papillæ die out towards the tail, and are reduced in size on the part of the loop next the foot. Foot white, with the margins nearly parallel, obtusely pointed behind, in front bilobed and deeply grooved, with the anterior lamina notched in the centre; the lateral angles much produced and recurved."

I obtained this species on two occasions. The first specimen was obtained by me whilst dredging in Weymouth Bay, on the 15th of

December 1855, and the second specimen in the same month of the following year. Both these individuals, as soon as I had completed my notes, I sent to Mr. Hancock, who received them in good condition, and who, in conjunction with Mr. Alder, I am happy to say, has made drawings of all the species described in this paper,—I trust, in order to enrich, at an early period, another number of their admirable work on the Nudibranchiate Mollusca. Mr. Hancock suggests for this species the specific name of *fimbriata*; but, whilst admitting the propriety of the name, I trust he will fall in with my wish of identifying the district in which it was first taken.

I would here remark the irregular appearance of some of the Nudibranchs. Two species of *Doris*, formerly obtainable in Weymouth Bay in moderate abundance, are now scarce; *Eolis papillosa*, at one time very abundant, is now represented by an occasional specimen: these are all tidal species. *Eolis coronata* and *landsburgi* were never very plentiful, and are not less scarce than formerly; but far different is it with *Polycera 4-lineata* and *Antiopa cristata*. Some three years since, we could obtain a dozen of each of these species any day—I have seen three in one net (both these species appear to be gregarious); whilst during the whole of the past summer my captures have not exceeded half a dozen of both species for the whole year. The dearth was occasioned by the severe winter we had some few years since, and which also destroyed many fish, and rendered *Adamsia palliata* very rare.

5. DESCRIPTION OF SIX HITHERTO UNDESCRIBED SPECIES OF BATS. BY ROBERT F. TOMES.

1. SCOTOPHILUS MICRODON, n. s.

The present species is one having the same subgeneric characters as the common *Pipistrelle* of Europe and the *Scot. greyii* and *S. pumilus* of Australia. To the latter species it is, by the form of its head and ears, most nearly affine, but may at once be distinguished from it by its greater size and by its smaller teeth.

The crown is but little elevated above the facial line; but the muzzle, although short, is more pointed than is usual in the flat-crowned species. The ears are very small, nearly as broad as high, with the outer margin slightly hollowed out about the middle, below which is a faintly developed lobe, and immediately above which is the tip of the ear,—the latter being obtusely angular, and directed outwards. The inner margin is very much rounded, especially at two-thirds of the distance from the base, where the convexity is so prominent as to be quite as high as the tip itself, the portion between this prominence and the tip being nearly horizontal. Altogether the ear bears some resemblance to that of *Miniopterus*. *Scot. pumilus* is the only species which has ears of form similar to those of the present species; but they are, although the species is smaller, rather larger, relatively longer, and have their tips less

outwardly directed, and more rounded. The tragus, as in all others of this group, is curved inwards, and rounded at the end; but it differs from that of some others, in being rather widest in the middle.

In relation to the size of the animal, the wings are rather ample, and rather broad for their length, the fourth finger (that which determines the breadth of the wing) being longer than the two basal phalanges of the longest finger*. All the wing-bones are somewhat slender. The thumb is rather long, not quite half enveloped in the membrane.

The legs are rather long and slender, the tibiæ being quite as long as in *S. gouldii*, a species of greater size than the present; they are just twice the length of those of *S. pumilus*. The feet are large, about the length of those of *S. leisleri* of Europe, the toes taking up half their entire length, and the wing-membranes extending to half the distance between the extremity of the tibia and the base of the toes. Tip of the tail enclosed in the membrane.

The fur of the head extends to rather near the end of the nose; and the upper lips are furnished with moustaches; so that the only naked space is around and in front of the eye. The fur of the back does not extend on to the interfemoral membrane, and only to a very limited extent on those of the wings; but that of the under parts encroaches on the membranes all round the body, especially beneath the arms, where it reaches nearly to the elbow. A straight line from that joint to the knee would pretty accurately define the hairy portions of the wing-membranes.

In quality the fur is soft, and rather long, bicoloured above and beneath. That of the back of a specimen from South Australia is dark brown at the root, with the terminal half of the hairs reddish-brown, uniformly of the latter colour around the rump and on the flanks; beneath, dark brown at the root, with the terminal third light cinnamon-brown, that on the membranes paler and unicoloured. Membranes lightish brown.

Another specimen from Van Diemen's Land differs only from the last in being much darker in colour; the fur of the upper parts black at the root, tipped with sepia-brown; beneath, the same, but the brown tips lighter and more tinged with rufous, especially that on the membranes and around the pubal region, where it is unicoloured and reddish-brown.

In the following table, the dimensions in column 1 are those of

* In many species of this group the fourth finger is not more than equal in length to the two basal phalanges of the longest; and in the more typical species of the genus, such as the common Noctule, it does not extend much further than the middle of the second phalange of the longest finger. In making use of the relative lengths of the wing-bones, either as a generic or specific distinction, it is absolutely necessary that perfectly adult examples be examined; for in those which are not, they vary so much with the age of the individual, as not only to be useless as a means of distinction, but to lead to absolute error and consequent confusion. Judging from the figure given by M. Temminck of *V. brachypterus*, I should expect to find his specimen with the apophyses of the phalanges of the fingers imperfectly ossified.

the South Australian specimen, those in column 2 of the one from Van Diemen's Land, whilst those in the 3rd have been taken from a specimen of *S. greyii* from Port Essington (one of the types in the National Collection), and are added to show the difference in the size of the two species,—*S. greyii* being the only Australian bat appertaining to this restricted group which approaches in size the species here described.

	1.		2.		3.	
Length of the head and body . .	2	6	2	2	2	0
— of the tail	1	8	1	5	1	3
— of the head	0	7?	0	7	0	7
— of the ears	0	3	0	3	0	4
— of the tragus	0	2	0	2	0	2 $\frac{1}{4}$
— of the fore-arm	1	5	1	6 $\frac{1}{2}$	1	4 $\frac{1}{4}$
— of the longest finger . .	2	8	2	10		
— of the fourth finger . . .	2	0	2	1		
— of the thumb	0	4	0	4		
— of the tibia	0	8	0	8 $\frac{1}{2}$	0	6
— of the foot and claws . .	0	4	0	4	0	3 $\frac{3}{4}$
— of the <i>os calcis</i>	0	7	0	7		
Expanse of wings	11	3	11	8	8	6

The teeth of this species, although not sufficiently examined to furnish a comparative description, are nevertheless seen at a glance to be of very small size, not only in reference to the size of the animal, but also actually smaller than those of several other species of much less size, such as *S. trilatitius*, *S. lobatus*, and *S. qbramis*. Hence the specific name of *microdon* here bestowed upon it.

2. SCOTOPHILUS DARWINI.

The next species which I have to describe has been presented to me by Mr. Darwin, with the information that it had been received from the Canary Isles.

In a collection of Bats from Madeira, given to me also by Mr. Darwin, I could only enumerate two species, both European, viz. *S. leisleri* and *S. marginatus*; and I was somewhat surprised to find in the present species one which I had not before met with. None of the descriptions of African species in the works of Temminck, Wagner, Peters, Smith, and others, apply to this species; and I therefore regard it as new, and describe it as follows:—

It is one of the same group as the species just described, and as the *S. kuhlii* and *S. pipistrellus* of Europe. It is characterized by a somewhat more robust make than these species, and has rather broader ears and tragi.

The head is rather broad and flat, the crown being but little raised above the facial line; the glands of the lips are considerably developed, and bulge sufficiently to occasion the nostrils to open nearly straight forward, although the interruption in the outer margins of the latter sufficiently indicates that with a more pointed

muzzle they would open sublaterally ; were the specimen taken from the spirit in which it is preserved and dried, it is probable that this would be the case. In the middle of the face is a kind of hollow, occasioned by the labial glands on each side being developed in an upward direction, thus leaving a depression between them*. Between the nostrils is a space of moderate extent, and but very faintly emarginate. The ears are rather large, triangularly oval, as broad at the base as they are long, and have their tips brought to a rounded point ; about the middle of their outer margin they have a distinct but shallow notch, below which is a lobular portion, as in many other species of this group, but differing from all others which I have seen in having a small but very well-defined notch about its middle. These organs altogether are more like those of *S. kuhlii* than of any other species, but are larger, besides having the double emargination just noticed†. The tragus is rather short and broad, curved inwards, and with the end very much rounded ; on its outer margin, near the base, is a projecting angular point, without any accompanying notch.

The wing-membranes extend to the base of the toes, and the latter are half the length of the foot. The thumb is moderate, with the basal phalange much the shortest. The terminal vertebra of the tail is free.

The fur of the head extends forwards to between the eyes, and thence in a narrow strip towards the nose. Over each eye is a wart bearing a bundle of stiff hairs ; and a similar tuft springs from the top of the labial glands ; the upper lips are also slightly fringed with similar hairs, most conspicuous about the corners of the mouth. The remainder of the face, the ears, and the tragus are naked. The fur of the back spreads on the upper surface of the interfemoral membrane, sparingly, for nearly half its length, as in *S. kuhlii*, and similarly to a small extent on the membranes near the sides of the body. Beneath, the membrane immediately around the pubes is dusted with very short hairs, more abundant on the vertebræ of the tail than elsewhere. On the membrane contiguous to the sides of the body, fur of a much longer kind extends, to a much greater degree than in *S. kuhlii*.

On both surfaces of the body the fur is bicoloured : above, very dark brown at the base, tipped with lighter and more rufous brown, that on the membranes wholly of the latter colour ; beneath, it is dark at the base, tipped with paler brown, with less of the rufous tinge than that of the upper parts. On the under surface of the membranes the fur is uniformly of the same colour as the tips of the hairs on the belly, but on the pubes it is paler. Membranes dark brown.

Such appear to be the colours of the fur, so far as can be gathered from the examination of a specimen in spirit ; but it is necessary to

* In the *Romicia calcarata* of Dr. Gray the lip-glands are so much developed as to leave a deep pit between them. It belongs to the present group.

† I am here comparing a specimen in spirit with others in skin,—a plan not always attended with perfectly satisfactory results.

consult others in skin before this point can be determined with accuracy.

Although in its external appearance *S. darwini* bears considerable resemblance to *S. kuhlii*, it differs, besides having a somewhat differently shaped ear and broader tragus, in the form and arrangement of the fore teeth. In *S. kuhlii* the upper incisors are rather long and slender; the inner ones are deeply forked at their apices, and longer than the outer ones, which are slender and pointed, somewhat like small canines; and there is a visible interval between the points of the inner and outer ones. In *S. darwini*, on the contrary, they are short and obtuse, of nearly equal length, the inner ones faintly cleft at their points, and the outer ones so closely packed to them as to leave no space even between their points. Again in *S. kuhlii* there is a space between the canine and the "carnassier" or sectorial tooth, in which is placed a small and conical premolar, within the line of the teeth, but distinctly visible from the outside; whereas in *S. darwini* the canine and the "carnassier" are contiguous, and there is a very small anomalous premolar placed in the inner angle formed at their bases, visible only from inside.

These differences in the dentition are alone sufficient to distinguish the species from *S. kuhlii*. From *S. marginatus*, *S. ursula*, and *S. nathusii* it may be also recognized by the form of the upper incisors; and these are the only European species with which it could be confounded.

Length of the head and body	2	1
—— of the tail	1	5
—— of the head	0	8
—— of the ears	0	4 $\frac{1}{2}$
—— of the tragus	0	2
Breadth of the tragus	0	1 $\frac{1}{2}$
Length of the fore-arm	1	5
—— of the longest finger	2	6
—— of the fourth finger	1	8
—— of the thumb	0	2
—— of the tibia	0	6 $\frac{1}{4}$
—— of the foot and claws	0	3
—— of the <i>os calcis</i>	0	5
Expanse of wings	9	9

Hab. Palma, Canary Isles.

Obs. The Madeiran species being European ones, and one of them African also (i. e. *S. marginatus*), renders it not unlikely that the species inhabiting the Canaries may also occur in Africa, and perhaps in Europe. With a view to the chance of this, I have compared this species with what now remains of the types of *Vespertilio aristippe*, *V. leucippe*, *A. alcythoe*, *V. vispistrellus*, and *V. savii*, but find nothing which leads me to regard it as referable to any of them; and I have therefore given such a detailed description as will be amply sufficient to distinguish it from all recorded European species.

3. *VESPERTILIO CALIGINOSUS*, n. s.

This is one of the smallest species of the genus, being rather less than the *V. mystacinus* of Europe, which in general appearance it very much resembles. *Vespertilio parvulus*, Temm., is the only species of this restricted group which I have yet seen, that is smaller than the present one.

There are a few Asiatic species of Bats which possess the characters of the group of which *V. mystacinus* is typical, but which have the tragus much shorter and less acute, and not so much bent outwards. *Vesp. trilatitius*, Temm. (not Horsfield), and *V. tenuis* of the same zoologist, may be mentioned as examples; and the species I am about to describe will constitute a third.

The top of the head is rather elevated, about as much so as in *V. mystacinus*; and the muzzle is pointed as in that species, but is considerably shorter. The ears are rather small, and have narrow but rounded tips, are notched at their outer margin near the base, below which is a distinct rounded lobe, which is almost hidden in the long fur of the neck. The tragus is rather short, not quite half the length of the ear; its inner margin is straight; its outer one curves evenly from the base to the tip, in such a manner that it is of pretty uniform breadth for about half its length, from which it narrows to a subacute tip. The tragus of *V. mystacinus* is precisely of this form for two-thirds of its length,—the outer margin being convex, the acute tip being produced, or as it were added, and taking an outward curvature in the dried specimens, but straight when fresh or preserved in spirit. Near the base is a well-defined notch dividing off an angular lobular portion, quite at the base. No such notch appears in the tragus of either *V. mystacinus* or *V. tenuis*.

The wings are proportioned much as in *V. tenuis*, excepting that the thumb is much smaller, whilst the bones of the wings, although this species is considerably less, are quite as stout as in that species. The feet are small, with toes which are rather more than half their entire length. Wing-membranes extending exactly to the base of the outer toe, which is much shorter than the others.

All the membranes are more strongly marked with lines than those of *V. tenuis*, and especially the interfemoral, on which may be counted as many as fifteen or sixteen transverse dotted lines, each dot bearing on the under side of the membrane one or more fine, short, bristle-like hairs. In *V. tenuis* about a dozen such lines may be observed.

Nearly the whole of the face is covered with thick soft hair, wanting only on the end of the snout, the front of the under lip, and immediately around the eye. On the glands of the upper lip it takes the form of two distinct tufts, projecting laterally, having the appearance of whiskers. In front of each eye is a single long hair, and a few other similar but shorter ones project from the upper lip and the chin. The fur of both surfaces of the body extends on to the interfemoral membrane very slightly; but the wing-membranes are free from hair.

On all parts of the body the fur is long and soft, and rather silky ; and it is bicoloured above and beneath. That of all the upper parts is black at the base, more or less tipped with shining yellowish-chestnut, on the head and neck scarcely perceptible, but becoming more marked towards the middle of the back and on the rump, where it is much the brightest. Some of the darker examples of *V. mystacinus* bear some resemblance to the present species in this respect, but are less bright. Beneath, the fur is dead black, with the tips of the hairs greyish-brown, a little paler on the pubes.

Membranes and naked parts dark brown. The complete ossification of the finger-joints indicates that the specimen is adult ; but the sex has not been ascertained.

Length of the head and body	1	$\frac{6}{10}$
——— of the tail, about	1	0
——— of the head	0	6
——— of the ears	0	4
——— of the tragus	0	$2\frac{1}{4}$
——— of the fore-arm	1	$2\frac{1}{2}$
——— of the longest finger	2	2
——— of the fourth finger	1	6
——— of the thumb	0	2
——— of the tibia	0	6
——— of the foot and claws	0	$2\frac{3}{4}$
Expanse of wings	8	6

Hab. I received this with a number of other Indian species from Mr. Warwick, with the statement that they all formed a part of a collection made by Capt. Boys. Amongst them were several specimens of *Scot. coromandelicus* ; and the present species was confounded with them, until they were mounted for the cabinet, when the differences became sufficiently obvious.

4. VESPERTILIO SERICEUS, n. s.

A species remarkable for the great beauty of its fur, which is thick, very soft, and with all the gloss of unspun silk. In size and proportions somewhat similar to *V. nattereri*, and the crown of the head elevated about as in that species ; but the muzzle, although pointed, relatively a little shorter. Unfortunately the ears and tragi have been so much injured as to render it impossible to give an exact description of them ; but it is evident that the ears were rather narrow, and more or less emarginate at their outer margin ; and that the tragus was long and narrow, may be seen from what remains of one of them, the end only being lost.

The organs of flight are of medium size and proportions ; the thumb is rather long, and has the basal phalange short, and the claw long and slender, with but a slight degree of curvature. The wing-membranes spring from the base of the toes. The feet are rather large,—the toes taking up a little more than half their entire length, and armed with claws, which, like those of the thumbs, are

rather long, slender, and but little curved. These parts have much the size and proportions of those of *V. nattereri*.

Nearly the whole of the face is hairy; but there is a naked space around each eye. A thick moustache borders the upper lips, which, extending from the angles of the mouth upwards and forwards, joins the fur of the forehead, which extends nearly to the end of the nose. The chin is destitute of hairs. The fur of the back encroaches to a trifling degree on the interfemoral membrane; and the same may be said of that of the belly; everywhere else the membranes are naked.

On all parts of the body the fur is bicoloured: above dark brown at the root, with the terminal third light reddish-brown; beneath similar, but the brown at the root darker and more extended, the tips of the hairs for one-fourth only of their length being greyish-brown, on the abdomen whitish-brown.

Everywhere the fur maintains its peculiar silky lustre, as much so on the under as on the upper parts of the body. This quality of fur will at once distinguish this species from every other which I have ever seen.

The dentition, as far as it can be studied in a stuffed specimen, is as follows:—Upper incisors in pairs, placed close together, with a considerable interval in the centre between the pairs, and also an interval on each side, between them and the canines. They are rather short and obtusely conical, the inner ones indistinctly bifid at the apex. The canines are rather small and short, and are followed by two small premolars on each side, of a bluntly conical form, the first being the larger of the two. To these succeed the two large premolars, or *carnassiers*, in this species with the point only a little raised above the crowns of the true molars. In the lower jaw the incisors, six in number, are somewhat irregularly ranged and trilobed, the canines short, and the two following premolars on each side of equal size, small and conical. The next premolar is of greater size and more acutely conical. The chief peculiarity in the dentition of this species is the shortness of the teeth, whilst they maintain throughout a medium degree of stoutness.

Length of the head and body, about	2	0
— of the tail	1	5
— of the head	0	9
— of the fore-arm	1	5
— of the longest finger	2	4
— of the fourth finger	1	9 $\frac{1}{2}$
— of the thumb and claw	0	3 $\frac{1}{2}$
— of the tibia	0	8
— of the foot and claws	0	4 $\frac{2}{3}$
Expanse of wings	10	0

Hab. Not known.

5. *PHYLLORHINA AURITA*, n. s.

In size this species about equals *Rhinolophus hippocrepis* of Europe.

It may be readily distinguished from all others of the genus by the great size of its ears, and seems to hold the same position amongst the species of *Phyllorhina* that *Rhinolophus cornutus* does in the genus *Rhinolophus*.

So far as may be learned from the inspection of a specimen in skin, the facial crests greatly resemble those of *Ph. bicolor*, and the general form of the whole head, face, and ears is pretty much as in that species, excepting that the muzzle is relatively a little more compressed, and the ears much larger. These latter organs are one-fourth longer than the head, and of a broadly ovoid form, are somewhat diaphanous, and thickly marked with glandular dots. They have about sixteen transverse sulci, which do not quite extend to the outer margin of the ear, but are bounded by a well-defined line which runs parallel with the margin, and divides off a narrow portion, having the appearance of a distinct border. The inner or front margin of the ear has three such parallel lines, all running from that part of the ear which is near to the face, to near the tip. This peculiarity of having the ears margined as described, and the central part sulcated, is not confined to this species; but it is much more strongly marked in this than in any other which I have seen. *Ph. cervina* and *Ph. caffra* exhibit the same arrangement of lines in the ear, but in a much less degree.

The wings are broad for their length,—the fourth finger, which determines their breadth, being longer than the third*. They are distinctly reticulated, especially near the side of the body. No great peculiarities are exhibited by the posterior extremities.

The fur is strictly confined to the body, with the exception of some on the hinder surface of the ears, at their base, and a narrow fringe on one of the lines bordering their front margin inside the ear.

On all the upper parts the fur is bicoloured, nearly white at the base for three-fourths of its length, then of a medium brown colour, with the extreme tips a little paler, giving a slightly hoary appearance. Beneath, it is somewhat similar, but rather paler, especially on the humeral region and down the sides of the body; but the colours are less clearly made out. On the throat and along the middle of the belly to the pubes it is much lighter in colour, and almost unicoloured. The membranes are of a medium brown colour.

The teeth have not been examined with care, but appear to be

* In *Rhinolophus hippocrepis* these two fingers are of equal length; and the same is the case in *Ph. caffra*, *Ph. speoris*, *Ph. labuanensis*, and *Ph. cervina*: in *Ph. nobilis* and *Ph. insignis* the third is a little longer than the fourth, whilst in *Ph. bicolor* and the present species, the fourth is the longer of the two. Of course this difference in the relative lengths of the fingers determines the comparative breadth of the wings.

rather long, especially the canines. They are longer than those of *Ph. cervina*, which is a slightly larger species.

Length of the head and body	1	9
—— of the tail	1	0
—— of the head	0	8
—— of the ears	0	9 $\frac{1}{2}$
Breadth of the ears, nearly	0	9
Length of the fore-arm	1	5 $\frac{1}{2}$
—— of the longest finger	2	3
—— of the third finger	1	9
—— of the fourth finger	1	11
—— of the thumb	0	4
—— of the tibia	0	8
—— of the foot and claws	0	3 $\frac{1}{2}$
—— of the <i>os calcis</i>	0	4 $\frac{1}{2}$
Expanse of wings.	9	9

Hab. Unknown.

6. EMBALLONURA FULIGINOSA, n. s.

In general form this species somewhat resembles *E. monticola*, but differs in several important particulars. It is larger; and it has the fur of a uniform sooty brown, whilst in that species it is marked bicoloured, being nearly white at the root.

In its general outline the head is very similar to that of the other species of the genus; but the snout, although small and elongated, is not so pointed as in the American species, but is nevertheless more so than in the African *E. afra*, judging from the figure given by Dr. Peters. The nostrils are small and rather near together; the ears triangularly oval, longer than broad, with the outer margin entire and produced at the base along the face in a line midway between the cleft of the mouth and the eye, and ending immediately between the latter and the angle of the mouth, which are both in a vertical line: all three are therefore in a vertical line. The tragus has its two sides nearly parallel, but it is a little widest at the end; it curves slightly inwards, and has the end rounded as in the genus *Miniopterus*, but is relatively broader. Thumb rather long, with the two visible phalanges equal in length (the small terminal one, bearing the claw, being excepted), the basal one wholly enclosed in the interbrachial membrane. Wing-membranes extending to the distal extremity of the tibiæ; hinder limbs rather long and slender; toes half the length of the entire foot. *Os calcis* long; interfemoral membrane very ample, with three diverging lines from the tip of the tail to its hinder margin; one on each side of these, from the root of the femur to the point of the *os calcis*; and two others, one from the distal extremity of each femur to near the middle of the *os calcis*. Transversely, this membrane has about twenty closely dotted lines.

The fur on the crown is long and thick, and approaches rather nearly the end of the nose; the sides of the face, from the auditory

openings through the eyes to the upper lip, naked, or nearly so; but the upper lip is fringed with scattered short bristly hairs. The extreme margin of the lips, both above and below, are naked and smooth.

That part of the wing-membranes which is contiguous to the under surface of the body is a little hairy; and the fur of the rump extends, to a very trifling degree, on to the interfemoral; but all other parts of the membranes are perfectly naked.

On all parts of the body the fur is rather soft, thick, and long, and perfectly devoid of lustre. It is also perfectly unicoloured everywhere, being above of a deep sooty brown with a slight tinge of rusty, and similar, though a little paler, beneath.

Upper incisors, 4, in pairs as in *Vespertilio*; they are very small, narrow near the alveolus, and blunt at the tips. Upper canines furnished with a kind of lobe or talon behind, at the base; the lower ones with a similar one in front. Lower incisors very small, symmetrically arranged, and with their cutting edges lobated.

Length of the head and body, about	2	0
— of the tail	0	7 or 8?
— of the head	0	9
— of the ears	0	5½
— of the tragus	0	2
— of the fore-arm	1	9
— of the longest finger	2	9
— of the fourth finger	1	10
— of the thumb	0	4
— of the tibia	0	8½
— of the foot and claws	0	3½
— of the <i>os calcis</i>	0	8½
— from the end of the nose to the hinder margin of the interfemoral mem- brane	3	6
Expanse of wings	12	0

Hab. "Island of Ovalée (Fiji Islands), August 1856, H.M.S. 'Herald,' F. M. Rayner." Such was the label attached to the specimen when it recently reached Dr. Gray, through whose kindness I am enabled to give the above description.

Obs. Several species of Cheiroptera have fur of much the same quality and appearance as this species. *Nyctophilus unicolor*, from Van Diemen's Land, *Molossus norfolcensis*, Norfolk Island, and *M. acetabulosus*, Mauritius and Natal, are amongst these; and the American species *M. nasutus* also has fur which approaches closely in texture that of all these species.

The present species, although it differs materially from *E. monoticola*, yet bears greater resemblance to it in the form of the head, ears, &c. than to any other species. To the African species, *E. afra*, Peters, it has some similarity in the form of the snout; and all these three are species which appertain to the genus *Emballonura* as

restricted by M. Paul Gervais, who separates, under the name of *Proboscidea*, those species which have a longer and more pointed snout, such as *E. savatilis* and *E. villosa*.

6. ON THE GENUS *ELAPS* OF WAGLER. BY DR. A. GÜNTHER.

(Reptilia, Pl. XVI.-XVIII.)

One of the most happy generic combinations in Wagler's '*System der Amphibien*' is the genus *Elaps*. He takes as the character of *Elaps* the grooved fangs in front, which are not followed by smaller and smooth teeth (pp. 193, 283), and thus he not only excludes those non-venomous snakes included by Schneider (*Hist. Amphib.* ii. p. 289), the first founder of the genus, but by this admirably-chosen character he removes also those species of the subsequently discovered genera of *Diemansia* and *Hoplocephalus* which Schlegel afterwards united with *Elaps*. The diagnosis given by Wagler, p. 193, and more fully detailed at pp. 282, 283, is most accurate and definite:—"Body elongate, equally cylindrical; head not distinct from body; tail short, conical; eyes small; scales smooth, equal, those of the vertebral line not larger; subcaudals two-rowed. Mandibular and facial bones only slightly expansible; grooved fangs in front, without smaller teeth behind." Thus we see the genus *Elaps*, as given by Duméril and Bibron in their '*Erpétologie Générale*,' already fully circumscribed by Wagler; and I am surprised that Duméril, when giving a historical sketch of the genus, does not mention that his predecessor was the actual definer of the genus *Elaps*. Besides, Wagler had already shown that the species coming from the same part of the globe exhibit common characters; and in enumerating the species he divides them into the following sections:—

α. *Corpore vittato* (ex Asia);

β. *Corpore annulato*:—

* Ex Africa;

** Ex America;

an arrangement which we see adopted in the "*Tableau Synoptique des Espèces*," '*Erpét. Génér.*' vii. p. 1207, but without reference to the geographical distribution. Australian *Elapes* were unknown to Wagler, it being impossible, without specimens, to trace the genus in the figure given by White, '*Journ. N. S. Wales*,' App. p. 259. Snake No. 2.

I need not enter on a detailed description of the mode of life of these Snakes, as it has been already given by distinguished travellers, who all agree in the fact that they belong to the slowest of the tribe, with the most uniform and sedentary life, always living on dry ground in shady places. No other Snakes exhibit such a similarity to *Elaps* in its mode of life, and such a powerless muscular organization, as the *Calamariidæ*; and this is why we so often find the former destroying the latter: the venomous snake is able to overpower the non-venomous, even if larger. Specimens dissected by me exhibited only a small number of eggs. Notwithstanding this sedentary life, and this diminished faculty of propagation, we find the genus *Elaps*

spread over all the tropical regions ; but each species of one region exhibits a certain number of characters common to species of the same region, and different from those of any second, so that we can at once refer them to their native country. From this circumstance the naturalist, in my opinion, is justified in attributing a generic value to such characters, although they may be subject to variation in another genus, or even in one and the same species. A variation in the number of the rows of scales in the genera *Zamenis*, *Tropidonotus*, &c., is of trifling value only, whilst in other genera the relative number of scales is a constant character (e.g. *Calamaria*, *Oxyrhopus*). The number of the ocular shields in species of *Zamenis*, *Pituophis*, *Tropidonotus*, varies much ; but in the species of *Simotes*, *Liophis*, *Dromicus*, &c. the number of these same shields is part of the generic character. Thus we see that in one group of animals a part of the organization is constant, and forms a positive character, whilst in another group the same part is liable to very considerable modification : and this peculiarity (liability to modification) itself constitutes a character of the group. In every instance where naturalists neglect to make this distinction, and try either to allow modification of a naturally fixed character, or to fix modifications of a naturally variable character as positive ones, artificial groups of animals are established. For instance, the East Indian *Simotes* is a most natural genus, distinguished by the form of the rostral shield, by the peculiar system of coloration, and by a single anterior ocular—three naturally fixed characters. Now, if we attempt to force the African Snake (*Heterodon diadema*) into this genus, we must actually modify two of those characters, and the result of this combination is the establishment of an artificial group*. The same is the case if we try to combine this type of a separate genus with *Heterodon*†. On the other hand, two East Indian genera, *Oligodon* and *Simotes*, form together a most natural group, having the same arrangement and shape of the shields of the head, the same form of the body, and even the same system of coloration—three naturally fixed characters ; but the dentition in these two genera of snakes is liable to variation. Now, if we consider the latter character a fixed one, so as to become that of families, the result is the artificial distant separation of those closely-allied genera from one another.

I have made these remarks to show, that to obtain a natural system of genera, we cannot rigidly adhere to certain preconceived constant characters, but we must apply them as they are made obvious by nature itself. Let us apply these views to the illustration of the genus *Elaps* of Wagler. Here we see that all the East Indian species are distinguished from those of the other parts of the world by a more slender, vermiform body, and by two longitudinal series of scales fewer in number than in the others. As Wagler rightly observed, the ornamental colours‡ on the upper parts of the body have a tendency to form longitudinal bands (*corpore vittato*) ; on the

* Catal. Colubrine Snakes, p. 26.

† Dum. et Bibr. vii. p. 26.

‡ In contradistinction to the ground-colour.

belly they are arranged in cross-bars, sometimes reaching on to the sides, and interfering with the bands on the back. But this latter character of the coloration not being constant, as *E. calligaster* shows a tendency to vary in coloration, I consider the difference in the number of the scales as more important; and the presence of thirteen rows of scales is, I believe, sufficient to determine any species as being East Indian.

All the species of *Elaps* from other tropical parts have fifteen rows; and the American and Australian species agree in another point, that the ornamental colours of the upper and lower parts are not separated into two systems of different direction, but are united, forming rings round the whole body with regular interspaces. But the nasal shield in the American species is constantly separated into two with the nostril between them, the same shield being single in the Australian species, and pierced by that opening. Lastly, the African species deviates in more than one respect. With the same number of scales, and with the same single nasal as in the Australian, it exhibits only one posterior ocular shield, the head being generally more depressed. The ornamental colours, being in all other species of *Elaps* arranged with a certain regularity, are here so irregularly and so variably disposed, that distinct cross-bands seldom appear on the belly and sides; the pure ground-colour often predominates along the medial line of the back.

Thus I divide the genus *Elaps* of Wagler into the following genera, which correspond with the natural divisions of the earth's surface.

A. With thirteen rows of scales.

1. *Callophis*. East Indies.

B. With fifteen rows of scales and—

a, with a double nasal shield :

2. *Elaps*. Tropical America.

b, with a single nasal shield and—

a, with two posterior oculars :

3. *Vermicella*. Australia.

β, with one posterior ocular :

4. *Pæcilophis*. Africa.

A. CALLOPHIS.

Elapidae with very slender and cylindrical body, with short tail, and with depressed head, not distinct from neck. No other tooth behind the fang. Thirteen rows of scales. Anal entire. Two nasals, nostrils placed between them; six (exceptionally seven) upper labials; one anterior, two posterior oculars. Colours of the upper parts arranged in longitudinal streaks.—East Indian region.

The following species are known :—

1. *CALLOPHIS BIVIRGATUS* (Schleg.).

Elaps bivirgatus, Schleg. Ess. p. 451, pl. 16. f. 10, 11; and Abb. taf. 47.

Elaps flaviceps, Cant. (Spicil.) Catal. p. 109.

Java, Borneo, Sumatra, Malayan peninsula, Pinang.

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In this species the external band only is subject to variation, sometimes occupying two series of scales, sometimes being very narrow, and nearly obsolete.

2. CALLOPHIS INTESTINALIS (Laur.).

Aspis intestinalis, Laur. Syn. Amph. p. 106.

Elaps furcatus, Schleg. Ess. p. 450, pl. 16. f. 12, 13; and Abb. taf. 46. f. 1-8.

This species is subject to great variation.

a. Javanese variety (Pl. XVI. fig. B), figured by Schlegel, brown, with three yellowish lines,—one occupying the vertebral series of scales, and forked on the head, and each of the two others running along the meeting line of the two outer rows. There is sometimes, moreover, another reddish-brown line between the third and fourth outer rows. The ground-colour of the belly is stated to be pale green during life. The lower side of the tail is generally uniform, without black cross-bands. The tail appears to be shorter, with a thicker conical tip.

Java.

There is in the British Museum a specimen, said to have been procured at Hong Kong. It is nearest to this variety, but has two black cross-bands on the tail.

b. The Malayan variety (Pl. XVI. fig. C) is well described by Cantor, Catal. p. 107; but this naturalist confounds the ground-colour with ornamental colour. In the 'Indian Zoology' of Gray and Hardwicke this variety is figured with the name of *Maticora lineata*. The vertebral line is rather broader, not continued on the head, and on the tail interrupted by two black rings, which entirely encircle that part; the two outer lines, as in the preceding variety. The reddish-brown line, which occurs in some Javanese individuals only, is here constantly to be found, and is very broad, occupying the whole of the fourth and fifth outer series. Cantor has mistaken it for the ground-colour: but this appears in narrow brownish-black lines only, viz. on the outer half of the first series of scales, on the second and third, and on the sixth. The ground-colour of the belly is stated to be pale citron. The tail is surrounded by two black rings, which, however, are interrupted by the lateral reddish-brown band; it is short, slender at the tip, and gradually tapering.

Malayan peninsula.

A specimen, caught in Labuan, and described in 'Contributions to the Nat. Hist. of Labuan, by Motley and Dillwyn,' Lond. 1855, 8vo, p. 45, appears to agree best with the above variety*.

c. The variety of the Philippine Islands (Pl. XVI. figs. A & a) (mentioned by myself, Catal. Col. Snakes, p. 230) perfectly agrees in the form of the tail with that of the Malayan peninsula; but the colo-

* In the work mentioned above, some species of Snakes are excellently represented, but not properly determined:—Plate (p. 46) with the name of *Dendrophis picta* represents *D. caudolineata*; Plate (p. 48) with the name of *Dipsas fusca* represents *D. trigonata*; Plate (p. 49) with the name of *Calamaria brachyorrhos* represents *Simotes purpurascens*.

ration is so modified, as, I think, to have caused Duméril to establish a new species, *Elaps trilineatus* (Erp. génér. vii. p. 1227). The black abdominal bands of the other varieties here become rings, encircling all the body, but interrupted by the two reddish-brown bands. The yellowish vertebral line occupies one series of scales and two half series, being broken up by those black rings; this line is interrupted on the head by the brown colour of the occiput and crown; but both the ends of the fork into which that line terminates in the first variety are visible, forming on each side a yellowish streak from above the eye to the side of the muzzle. The two lateral brownish-red streaks of the former variety are likewise present, and continue uninterrupted from the occiput to the tip of the tail. The narrow yellowish outer lines of the former varieties are scarcely visible. The tail is surrounded by two rings, and a third, incomplete, middle one. Duméril mentions the specimen of the Paris Museum as coming from the west coast of Sumatra; that of the British Museum was brought by Mr. Cuming from the Philippine Islands.

3. *CALLOPHIS GRACILIS*, Gray.

Calliophis gracilis, Gray, Ind. Zool. f. 1-3.

Elaps nigromaculatus, Cant. Catal. p. 108.

Penang; Singapore.

4. *CALLOPHIS UNIVIRGATUS*, Gthr. (Pl. XVII. figs. A & a.)

Elaps univirgatus, Gthr. Catal. p. 232.

This new species from Nepal, the most northern known at present, may be readily distinguished by the black head, with yellowish cross-band behind the eyes, and by the black dorsal streak. The descriptions of the two varieties given in my Catalogue I complete now with the figures. Coming from the same part of the East Indies, they are not climatic varieties; I rather think the difference in the colour depends upon the sexes, although I have not been able to make this out by dissection, on account of the condition of the internal parts.

5. *CALLOPHIS TRIMACULATUS* (Daud.). (Pl. XVI. fig. E.)

Russell, Ind. Serp. i. pl. 8.

Vipera trimaculata, Daud. Rept. vi. p. 25.

Elaps trimaculatus, Merr. Tent. p. 143; Schleg. Essai, p. 449.

Coluber melanurus, Shaw, Zool. iii. p. 552.

Tenasserim.

We are informed by Russell, who discovered this species, which he founded on a single specimen (and a second has not occurred), that he deposited it in the British Museum. I have been fortunate enough to find this original specimen, which, although the notice of its origin has been lost, so completely agrees in all the details with Russell's description and figure, that any doubt of its individuality appears to be removed. It proves to be different from the Snake described by Cantor as *Elaps melanurus* (Shaw), and named by myself *Elaps maculiceps*. Schlegel, to whom the species was known by Russell's work only, attributes to it a black vertebral line; but Russell

only mentions some dots on the vertebral line, and several narrow fillets on the sides. These markings, however, have now disappeared, whilst the black coloration of the head and the spots on the tail are still visible.

The diagnosis of this species will be—Belly uniform, without any spots; body above olive, uniform or with narrow lateral fillets; head above, occiput, and neck black, with some yellowish spots symmetrically arranged; tail beneath chequered with black; vertical shield six-sided, rather broad and short; six upper labial shields.

6. *CALLOPHIS MACULICEPS*, Gthr. (Pl. XVI. fig. D.)

Elaps melanurus, Cantor, Catal. p. 106, pl. 40. f. 6 (not Shaw).

Elaps maculiceps, Gthr. Catal. p. 232.

Penang.

This is the only East Indian species of *Elaps* with seven upper labial shields; but this anomaly is of no great importance, as it is effected by the posterior upper labial, which is generally elongated in these Snakes, being here divided into two. Cantor's description of the colours is correct in every respect; but the vertical shield of our specimen is elongate, and far from being equilateral.

The diagnosis of this species will be—Belly uniform, without any spots; body above light bay, on each side with a series of distant black dots; head with symmetrical black markings; a black collar; tail beneath chequered with black; vertical shield six-sided, elongate, much longer than broad; seven upper labial shields.

7. *CALLOPHIS CALLIGASTER*, Wiegman.

Elaps calligaster, Wiegman. Nov. Act. 1835, p. 253, tab. 25. f. 2.

Elaps collaris, Schleg. Ess. p. 448, and Abbild. taf. 46. f. 10, 11.
Philippine Islands.

B. ELAPS.

Elapidæ with slender and cylindrical body, with short tail and with depressed head, not distinct from neck. No other tooth behind the fang; fifteen rows of scales, anal entire (exceptionally bifid); two nasals, nostril placed between them; six or seven upper labials; one anterior, two posterior oculars (in one species one). Colours of the upper and lower parts arranged in cross-bands.

Tropical America.

The following species are known:—

1. *ELAPS CORALLINUS*, L.

Coluber corallinus, L. Mus. Ad. Frid. i. p. 33.

Elaps corallinus, Wied, Nov. Act. 1820, pl. 4; Schleg. Ess. p. 440.
pl. 16, f. 1-5.

Brazil, Surinam, New Granada, Guayaquil, Trinidad (West Indies?).

I consider as varieties of this species—

a. *Elaps circinalis*, Dum. & Bibr. p. 1210.

b. *Vipera psyche*, Daud. Rept. viii. p. 320.

Elaps psyche, Dum. & Bibr. p. 1212.

2. *ELAPS ALTERNANS*, Dum. & Bibr.*Elaps alternans*, Dum. & Bibr. p. 1211.3. *ELAPS MIPARTITUS*, Dum. & Bibr.*Elaps mipartitus*, Dum. & Bibr. p. 1220.—New Granada.*Elaps decussatus*, Dum. & Bibr. p. 1221, appears to belong to the same species.4. *ELAPS SURINAMENSIS*, Cuv.*Elaps surinamensis*, Cuv. Règne Anim. ; Schleg. Ess. p. 445, and Abbild. taf. 46. f. 9.

Surinam.

5. *ELAPS LEMNISCATUS* (L.).*Coluber lemniscatus*, L. Mus. Ad. Frid. i. p. 34 ; Schleg. Ess. p. 444, pl. 14. f. 6, 7.

Brazil, Surinam, Caraccas, Columbia, Trinidad.

Varieties of this species are—

a. *Elaps marcgravi*, Dum. & Bibr. p. 1209.b. *Elaps frontalis*, Dum. & Bibr. p. 1223, figured by Guichenot in Casteln. Anim. nouv. ou rares de l'Amér. du Sud, p. 71, pl. 14. This is the Snake first described by Marcgrave, Hist. Nat. Bras. vi. p. 240.6. *ELAPS FULVUS* (L.).*Coluber fulvus*, L. Syst. Nat. i. p. 381.*Elaps fulvus*, Holbr. N. Amer. Herpetol. iii. p. 49, pl. 10 ; Dum. Bibr. p. 1215.

Southern States of North America, through Central America, to Venezuela.

Variety of this species is

Elaps tristis, Baird and Girard, Catal. p. 23.7. *ELAPS EPISTEMA*, Dum. & Bibr.*Elaps epistema*, Dum. & Bibr. p. 1222.

Mexico.

8. *ELAPS BIPUNCTIGER*, Dum. & Bibr.*Elaps bipunctiger*, Dum. & Bibr. p. 1227.9. *ELAPS DECORATUS*, n. sp. (Pl. XVIII. fig. A.)*Body encircled by black rings, always three together, the middle one broadest. Muzzle and a cross-band between the eyes black. Vertical shield broad, five-sided, with a front side broader than the lateral ones, and behind with an obtuse or a right angle.*This species is allied to *Elaps lemniscatus*: it differs somewhat in the arrangement of the black rings ; but the reason why this species must be separated, is the form of the vertical shield, which in *E. lemniscatus* is much narrower, the front side being shorter than

the lateral ones, and the shield terminating in an acute angle. In general habit the species is scarcely more slender than *E. lemniscatus*. I count in one of the specimens 196, and in the other 202 ventral plates; in both 19 subcaudals. The shields of the head and the scales do not offer any other peculiarity, except that the sixth upper labial is in direct contact with the occipital, whilst in *E. lemniscatus* an elongate temporal shield separates that labial from the occipital. There are two nasals; one anterior, two posterior oculars; and seven upper labials; fifteen rows of scales; the anal plate in the older specimen entire, and in the younger one bifid. The muzzle in front, the vertical, superciliaries, and the third, fourth, and fifth upper labials are black; the remainder of the head is red. The neck is surrounded by a broad black collar, in front yellow-edged, and behind separated from a much narrower black ring by a yellow edge also. Then follow, in regular interspaces, fifteen zones (in the younger individual), or sixteen (in the older one). Each zone is composed of three black rings, with two yellow ones between. One of the zones surrounds the tail. The middle black ring is always broadest; but in the adult individual it occupies three rows of scales only, in the young one four; the outer black rings are as broad as the yellow ones, and occupy each two, sometimes only one row of scales. The red interspaces are nearly of the same extent as the zones; and each scale exhibits a black tip. The extremity of the tail is very blunt, rounded, and black. The total length of the large specimen is 19", the head taking $4\frac{1}{2}$ ", the tail 14".

The above description is founded upon two specimens, one of which has been for a long while in the collection of the British Museum; but being only a young individual, and not in a good state of preservation, it has not been introduced into the Catalogue. In the meanwhile Professor Jan has recognized it as belonging to a species for which he has intended the name given above; and finding the same name mentioned in his 'Index of Reptiles of the Milan Museum,' I have accepted it. I am not aware that the species has been described. The other specimen has been purchased for the British Museum, and is said to come from Brazil. The specimen in the Milan Museum is from Mexico.

10. ELAPS TENER, Baird & Gir.

Elaps tener, Baird and Girard, Catal. N. Amer. Rept. p. 22. Texas.

11. ELAPS FILIFORMIS, n. sp. (Pl. XVIII. fig. B.)

Exceedingly slender. Only one posterior ocular shield. Body surrounded by black rings, always three together; muzzle, and a cross-band between the eyes, black.

This species is as slender as any of the East Indian *Elapidæ*; in the number of the ventral plates it even surpasses them. I count 285 ventral, and 38 subcaudal plates. Compared with a specimen of *E. lemniscatus*, which has a head of the same size, it is twice as long. The tail is rather short, but tapering to a fine tip. From all the

other American species of *Elaps* it differs in having only one posterior ocular, the eye being very small. The vertical shield is five-sided, with the lateral and posterior sides equal, but with the anterior rather longer; the hinder angle is acute. The nasal appears to be divided into two below the nostril only; the nostril itself is round, open; seven upper labial shields, the sixth of which is separated from the occipital by an intermediate temporal shield. Scales in fifteen rows. Anal shield bifid. A strong fang in front of the upper jaw, and no smaller tooth behind.

It is easy to be seen which parts have been red-coloured during life, and which yellow, slight tinctures of both colours being preserved. The front part of the muzzle and the chin are black; a narrow yellow band crosses the posterior frontals; the following black band reaches to the front part of the occipitals; the remainder of the head is red. The body and tail are encircled by twenty-two zones, each of which is composed of three black rings and two yellow ones between. The anterior black ring of the first zone forms a collar; two of the zones encircle the tail, the tip of which is black. The black rings are nearly as broad on the belly as on the back; the middle one occupies five rows of scales, the outer ones four, the yellow rings mostly two. The red interspaces are as broad as the outer black ones; the scales in these interspaces are uniform, without any spot. The specimen is 17" long; of which the head takes $3\frac{1}{3}$ ", and the tail 15". It is in the collection of the British Museum, and has been procured in Para.

Doubtful American species of *Elaps* are—

12. *ELAPS GASTRODELUS*, Dum. & Bibr. p. 1212.
13. *ELAPS DIASTEMA*, Dum. & Bibr. p. 1222.
Mexico.
14. *ELAPS ZONATUS*, Hallow. Journ. Acad. Nat. Sc. Philad. 1855,
iii. p. 35.
Honduras.
15. *ELAPS DIVARICATUS*, Hallow. *l. c.* p. 36.
Honduras.

C. VERMICELLA, Gray.

Elapidae with slender and cylindrical body, with very short tail, and with depressed head, not distinct from neck. No other tooth behind the fang; fifteen rows of scales; anal bifid; one nasal, pierced by the nostril; six upper labials; one anterior, two posterior oculars. Ornamental colours in cross-bands.

Australia.

Only one species is known :—

1. *VERMICELLA OCCIPITALIS*. (Pl. XVII. fig. B.)

Elaps occipitalis, Dum. Bibr. vii. p. 1220.

Vermicella annulata (Gray), Gthr. Catal. Col. Sn. p. 236.

As I have already stated, this Snake was first figured by White in the Appendix to his 'Journ. N. S. Wales;' then we find it again in the 'Erpétologie générale,' p. 1220, as *Elaps occipitalis**. The description is short, and limited only to the coloration; nothing is said of the scales, shields, or plates, which are so remarkable; the native country is stated to be Rio de Janeiro; and one specimen is doubtfully mentioned as having been procured in New Holland. From this description I was led to consider *E. occipitalis*, D. & B., as a species closely allied to *Elaps corallinus* (Catal. p. 234), and to describe the true *E. occipitalis* as a new form, for which I accepted the denomination of *Vermicella annulata*, written by Dr. Gray on the bottle containing the snakes.

Whether the ground-colour of this snake is red, as in the South American species, or white, still remains a question. White, who probably saw the animal alive, figures it as white, and does not mention it as being red.

D. PÆCILOPHIS.

Elapidæ with slender and cylindrical body, with very short tail, and with depressed head, not distinct from neck. No other tooth behind the fang; fifteen rows of scales; anal entire; one nasal, pierced by the nostril; six upper labials; one anterior, and one posterior ocular. Ornamental colours distributed in irregular spots.

African region.

1. PÆCILOPHIS HYGÆ (Schleg.).

Coluber lacteus, L. Mus. Ad. Frid. t. 18. f. 1.

Elaps hygæ, Schleg. Ess. p. 446, pl. 16. f. 14, 15; Dum. & Bibr. p. 1213.

S. Africa.

2. PÆCILOPHIS DORSALIS (Smith).

Elaps dorsalis, Smith, Illustr. Zool. S. Afr. App. p. 21.

S. Africa.

Duméril, in the 'Erpétologie générale,' continues to place that unfortunate species of Merrem, *Elaps lubricus*, figured by Seba (ii. 34. 4; 43. 3; 62. 4), with the South American species *E. lemniscatus* in front, and with the Australian *Vermicella occipitalis* behind. It is placed in the genus *Naja*, first with the strange name of *N. sommersetta*, by Smith, and in more recent times as *N. fula-fula*, by Bianconi. Merrem's figure (Beitr. p. 9, pl. 2) is very easy to be recognized; but the description is incorrect in several points. Schlegel properly separates it from *Elaps*, and replaces it in *Naja*, according to his system. In the 'Illustrations of the Zoology of S. Africa,' by A. Smith, it is mentioned under two names,—first as *Aspidelaps lubricus*, and then as *Cyrtophis scutatus*. After having been thus strongly recommended as the type of a new genus, it is referred, after all, in

* I am indebted, for the identification of this species with *Vermicella annulata*, to Professor Jan, who has recently visited the British and Parisian collections.

the 'Erpétologie générale,' to *Elaps*, which is the least fit for it. Finally, I have tried in my Catalogue to give a proper diagnosis for the name *Cyrtophis*, given by Sundevall, and published by Smith; and if I add that the same Snake is the *Coluber latonia* of Daudin, and the *Natrix lubrica* of Laurenti, the synonymy will be complete.

7. LIST OF THE COLD-BLOODED VERTEBRATA COLLECTED BY
MR. FRASER IN THE ANDES OF WESTERN ECUADOR. BY
DR. A. GÜNTHER.

SAURIA.

1. *Anolis æneus*.
2. ? *Anolis cristatellus*, Dum. & Bibr.
3. *Enyalius laticeps*, Guichen. in Casteln. Anim. nouv. ou rares, Rept. p. 20, pl. 5 a, b.
4. *Liocephalus ornatus*.
5. *Cercosaurus gaudichaudi*.
6. *Microphractus humeralis*, n. g. & sp.
7. *Proctoporus pachyurus*, Tschudi, Faun. Per. p. 43, taf. 2. f. 2.
= *Riama unicolor*, Gray, P. Z. S. 1858, p. 446, pl. xv. fig. 2.
8. *Amphisbæna fuliginosa*.

OPHIDIA.

1. *Rhabdosoma elaps*, n. sp., Gthr. Catal. Col. Sn. p. 241.
2. *Liophis tæniurus*.
3. *Erythrolamprus venustissimus*, var. D, Gthr. l. c. p. 48.
4. *Xenodon severus*, var. C, Gthr. l. c. p. 54.
5. *Spilotes pœcilostoma*.
6. *Herpetodryas fuscus*.
7. *Leptognathus catesbyi*, var., Gthr. l. c. p. 251.
8. *Oxyrhopus petolaris*, var. *sebæ*.
9. *Leptodeira annulata*, Fitz. *Dipsas annulata*, Schleg.
10. *Craspedocephalus atrox*, var. *leucurus*, Dum. & Bibr. vii. p. 1508.

BATRACHIA.

1. *Cyclorhamphus marmoratus*.
2. *Bufo intermedius*, n. sp., Gthr. Catal. Batr. p. 140, pl. ix. f. A.
3. *Bufo aqua*. The male exhibits all the warts covered with spines. Some of the black markings are very conspicuous, as is generally the case in young specimens from Brazil.
4. *Otilophus margaritifer*.
5. *Hylodes conspicillatus*, n. sp., Gthr. l. c. p. 92.
6. *Hylodes lineatus*, Schneid., Gthr. l. c. p. 91.
7. *Hyla fasciata*, n. sp., Gthr. l. c. p. 100, pl. 7. f. D.
8. *Hyla rhodopepla*, n. sp., Gthr. l. c. p. 112, pl. 7. f. E.
9. *Nototrema marsupiatum*, Dum. & Bibr., Gthr. l. c. p. 115, pl. 10. f. B, B', B''.

PISCES.

1. *Arges brachycephalus*, n. sp.
2. *Pygidium* (*Trichomycterus*, Val.) *dispar*, Tschudi. In the figure, given in the 'Fauna Peruana,' the ventral and dorsal fins are too far advanced towards the head.
3. *Tetragonopterus peruanus*, Müller.
4. *Leporinus mülleri*, n. sp.

Nearly all the specimens on which the above list is founded, have been procured for the collection of the British Museum. Having already described the new species of Snakes and Batrachians, I here give an account of one Saurian and of the new Fishes.

MICROPHRACTUS, n. g. (*Hopluridæ*).

Fingers and toes slender, not dilated. Head above covered with small irregular shields, without any distinct larger one. Body above with very small granular scales, those along the middle of the back with a distinct keel; scales of the belly imbricate, smooth. Tail rounded, of moderate length, tapering, with rings of oblong scales, each with a strong keel in the diagonal line; a very low crest along the back of trunk and tail. No femoral nor præanal pores. Tympanum distinct; a fold on each side of the throat. No palatine teeth.

MICROPHRACTUS HUMERALIS, n. sp.

Diagnosis.—Above bluish green, marbled with dark brown; round the shoulder a black band, lighter-edged, interrupted on the vertebral line; beneath greenish-yellow; throat marbled with bluish.

Description.—The head is rather short and high, above spherical, with the interspace between the eyes of moderate width and flat; the muzzle is rather short, blunt and rounded in front. The nostril is directed upwards, round, situated near the outline of the upper surface, rather prominent, and formed by a tubular opening of a single small shield. The eyes are of moderate size, with round pupil, not very prominent above the level of the crown. The ear is on the same level with the cleft of the mouth, larger than the eye, irregularly elliptic, and in front bordered by a fringed fold of the skin. All the upper surface of the head is covered by many small shields, irregularly arranged and smooth; they are smallest on the posterior part of the occiput, and on the outer and front edges of the upper eyelid. Such shields occupy the loreal region also, the cheeks being covered with granular smooth scales, as the sides of the neck. The upper jaw is bordered in front by a broad, low labial, with a short upper prominence towards the forehead; the side of the upper jaw is covered by *only four narrow and elongate shields*; above this series is situated another one of still narrower and more irregular shields; between this series and the eye is a long sword-shaped shield, bordering the orbit from beneath. The lower front labial is anteriorly rounded, and has laterally two sides for the symphysis with two shields or with two series of shields, which, somewhat divergent, are

separated from one another by a stripe of irregular elongate shields. The outer of these series borders the side of the lower lip, and is formed by five shields similar to the correspondent upper labials; the inner series is formed by six or seven shields, shorter, quadrangular, and becoming smaller behind. The triangular space between, of the chin and of the front part of the throat, is covered by minute granular scales.

The trunk is depressed, with rounded sides, twice and one half as long as the head; it is covered by minute, rhombic scales. Those of the vertebral line are largest, not quite the size of those of the belly, each with a medial keel, which, being prominent, form together a low crest from the occiput to the middle of the tail; in several rows, nearest to the vertebral line, and especially nearest to the tail, the scales are apparently keeled; on the neck, between the shoulders and on the sides, the scales are smallest, and exhibit more the appearance of fine granulations; on the sides of the belly they assume again the appearance of scales, are rhombic on the belly, and arranged in transverse rows, each with about twenty-eight scales. These rows are more oblique on the breast, but they are all perfectly smooth. The tail is not quite one and a half as long as head and trunk together; it is stout, round, and tapering; it is surrounded by rings of oblong scales, about the size of those of the belly; each is provided with a strong keel, running in the diagonal line, and prominent behind. The scales of the dorsal line are rather smaller, more of a pentangular shape, and with a keel along the medial line.

The extremities are covered with rhombic scales, apparently imbricate; the upper ones keeled, the lower ones smooth. The length of the front extremity—from the humeral joint to the base of the fourth toe—is as long as the head; and the fourth toe is the longest, and half that length. The third is scarcely shorter; then comes the second, the fifth, and finally the first, being not quite one-half of the third. They are all slightly compressed, above smooth, beneath rough by the keels of scales, and provided with acute curved claws. The posterior extremity (without the foot) is not quite half as long as the trunk, and the hand one and one-third as long as the head; the fifth toe is separated from the four inner ones, and about as long as the third (from the point where they become free). The fourth toe is far the longest; then comes the third (and fifth), then the second, and finally the first, the latter being not quite half the length of the fifth.

The ground-colour of the upper parts is bluish-green, in one of the specimens greenish-brown, which colour predominates on the head and tail. All the upper parts, the head excepted, or at least the middle of the back and tail, are marked with dark brown. On each side of the shoulder, in front of the base of the fore extremity, is a black cross-band, lighter edged; it reaches from the fold on the side of the throat, across the shoulder to near the vertebral crest. The lower parts are greenish-yellow, the throat being marked with bluish-green.

	inch.	lines
Length of the head (to the front-edge of the tympanum)	0	$8\frac{1}{3}$
Breadth of the head	0	$6\frac{1}{4}$
Length of the trunk (to the anus)	2	4
—— of the tail	4	0
—— of the humerus	0	6
—— of the fore-arm	0	$4\frac{2}{3}$
—— of the fourth finger	0	$6\frac{1}{4}$
—— of the first finger	0	$2\frac{3}{8}$
—— of the entire fore extremity	1	4
—— of the femur	0	7
—— of the lower leg	0	$6\frac{1}{4}$
—— of the foot	0	$3\frac{1}{2}$
—— of the fourth toe	0	$7\frac{1}{4}$
—— of the fifth toe	0	6
—— of the first toe	0	3
—— of the entire hinder extremity	2	1
Entire length	7	0

ARGES BRACHYCEPHALUS, n. sp. (*Siluridæ*).

The length of the head is one-fifth of the total length; the eyes are situated nearly in the middle of the length of the head; the nostrils are much nearer the extremity of the snout than to the orbit; ventral fins inserted just below the extremity of the pectoral, on the same level with the dorsal. Brown, dotted with black. Length 7".

In other respects the specimens agree with the description given by Valenciennes of *Arges sabalo*; but those differences in the form, as stated above, are fully sufficient to distinguish the species. There were four specimens, besides several young ones, in Mr. Fraser's collection, the acquisition of which appears the more desirable, as one specimen only of the other species is known to exist in European collections.

LEPORINUS MÜLLERI, n. sp. (*Characini*, Müll.).

B. 4. D. 11. A. 14. L. lat. 39. L. transv. $5/3$.

The height of the body is contained $3\frac{3}{4}$ in the total length; the length of the head $4\frac{2}{3}$; the diameter of the eye is rather longer than one-fourth of the length of the head, and equal to the length of the snout. The pectoral fins are not quite as long as the head, and reach to the root of the ventrals; these are inserted just below the front end of the dorsal. Back brownish; sides lighter; a blackish band from a deep-black spot on the shoulder to the root of caudal-fin.

Teeth.—Those in the upper jaw are molar teeth, partly bluntly conical, with a brown top; others have lost their point, and appear rounded. They may be considered to be arranged in three series; in the front series are two teeth only, the strongest, one on the left side, and one on the right; the second series is interrupted in the middle, each half being composed of four teeth; one tooth (the second) stands a little more out of the row, towards the front; the third series is the most complete, is curved, extending on the maxillary,

and composed of sixteen teeth, the lateral ones being smallest. There is one series only in the lower jaw: six are situated in front; they are very powerful, slightly compressed; some exhibit a small point on each side; besides these there are two or three small ones on the side of the jaw.

Cæca pylorica 6; abdominal vertebræ 18, caudal 21; no pseudo-branchiæ. Total length 3 inch. 10 lin.; height of the body 1 inch; length of the head $9\frac{1}{2}$ lin.

February 8, 1859.

Dr. Gray, V.P., in the Chair.

The following papers were read:—

1. LIST OF BIRDS FROM THE FALKLAND ISLANDS, WITH DESCRIPTIONS OF THE EGGS OF SOME OF THE SPECIES, FROM SPECIMENS COLLECTED PRINCIPALLY BY CAPTAIN C. C. ABBOTT, OF THE FALKLAND ISLANDS DETACHMENT. BY JOHN GOULD, Esq., F.R.S., ETC.

CATHARTES AURA. Turkey Buzzard.

Captain Abbott mentions the Turkey Buzzard as inhabiting the Falkland Islands; and on reference to Mr. Darwin's 'Zoology of the Voyage of the Beagle,' I find that the bird which he states is the *Cathartes aura* had also been noticed there by him; but as much interest attaches to this group of birds, particularly as regards the range of the species, it is desirable that Mr. Darwin's opinion of its being the true *C. aura* should be confirmed or refuted by the receipt of more examples.

The egg of the Falkland Islands bird procured by Captain Abbott is of a light stone-colour, sparingly blotched and streaked with reddish-brown, some of the blotches being larger and more distinct than others. Length nearly 2 inches, by an inch and a half in breadth.

MILVAGO LEUCURUS.

Falco leucurus, Forster's Drawings.

Falco novæ-zelandiæ, Gmel.

Falco australis, Lath.

BUTEO ERYTHRONOTUS.

Haliaeetus erythronotus, King.

Buteo tricolor, D'Orb.

The ground-colour of the egg of this species is greyish-white, very

slightly stained or washed in parts with light buff, largely blotched with strongly contrasting umber-brown at the smaller end, and dotted or freckled with the same colour at the larger end. Length $2\frac{3}{16}$ inches; breadth $1\frac{3}{4}$.

BUTEO VARIUS, Gould.

This bird has been considered by some writers as identical with the preceding species; but in the opinion of J. H. Gurney, Esq., who has paid much attention to the subject, the two birds are distinct. In a letter from Captain Abbott, that gentleman inquires what are the names of the Hawks sent home by him, as he finds them so different,—thus implying that there are more than one.

The following description applies to the egg of this bird, whether it be or be not a distinct species. The general colour is a dull stony-white, blotched all over with light chestnut-red, the blotches increasing in size at the smaller end; the egg is also thickly sprinkled all over with dots and speckles of the same colour. Length $2\frac{5}{16}$ inches; breadth $1\frac{3}{4}$.

CIRCUS CINEREUS, Vieill.

OTUS PALUSTRIS, Gould.

TURDUS FALKLANDICUS.

The egg, which somewhat resembles that of the English Black-bird, is of a pale green, blotched all over, but particularly at the larger end, with reddish-brown. Length $1\frac{3}{8}$; breadth $\frac{1}{16}$.

Darwin states that the bird “chiefly inhabits the more rocky and drier hills. It haunts also the neighbourhood of the settlement, and very frequently may be seen within old sheds. In this respect, and generally in its habits, it resembles the English Song Thrush (*Turdus musicus*); its cry, however, is different. It is tame, silent, and inquisitive.”

STURNELLA MILITARIS.

The egg is somewhat lengthened in form, of a greenish stone-colour, suffused here and there with purplish-red, and blotched and obliquely streaked with dark crooked marks of chestnut-red, particularly at the larger end: blotches and spots of a darker hue also occur, appearing as if beneath the surface of the shell. Length $1\frac{3}{16}$; breadth $\frac{3}{4}$.

The nest, which appears to have been placed on the ground, is of large size, neat and cup-shaped in form, and entirely composed of extremely fine grasses; externally it is $7\frac{1}{4}$ inches over, while the internal cavity measures $3\frac{1}{2}$.

Mr. Darwin states that he “met with specimens of this bird on the east coast of the continent, from the Falkland Islands to 31° S., and on the western coast, from the Straits of Magellan to Lima, a space of forty degrees of latitude.”

OPETIORHYNCHUS VULGARIS.

Upucerthia vulgaris, D'Orb. & Lafr.

Brought from the Falkland Islands by Mr. Darwin.

OPETIORHYNCHUS ANTARCTICUS.

Mr. Darwin states that the *O. antarcticus* has been long noticed by voyagers to the Falkland Islands, from its extreme tameness. In the year 1763, Pernetty states, it was so tame, that it would almost perch on his finger, and that in half an hour he killed ten with a wand.

TROGLODYTES PLATENSIS.

MUSCISAXICOLA MACLOVIANA.

Darwin states that this species inhabits the east Falkland Islands.

ANTHUS CORRENDERA, Vieill.

The egg of this bird may be thus described :—General hue olive stone-colour, very thickly blotched and sprinkled, particularly at the larger end, with deep umber-brown. Length $\frac{3}{8}$; breadth $\frac{9}{16}$.

The nest, which is of a cup-shaped form and very neatly made, is entirely composed of the stalks and fibres of fine grasses, the lining, although of the same material, being much finer than the exterior; its diameter externally is 5 inches, and of the opening $2\frac{1}{2}$.

MELANODERA TYPICA, Bp.

Mr. Darwin states that this bird is extremely abundant, in large scattered flocks, in the Falkland Islands. I believe this is the bird which Capt. Abbott calls the Sparrow of those islands; if so, the following is a description of its eggs and nest :—

Ground-colour of the egg pale green, spotted and freckled all over with deep chestnut-brown; the spots so thickly deposited at the larger end, as to all but exclude the ground-colour. Length $\frac{5}{8}$; breadth $\frac{5}{8}$.

The nest is outwardly composed of strong grass-stalks, lined with finer grasses and a few feathers; it is $5\frac{1}{2}$ inches over, the interior cavity being $2\frac{1}{2}$.

MELANODERA XANTHOGRAMMA, Bp.

"This species," says Mr. Darwin, "is common on the Falkland Islands, and it often occurs mingled in the same flocks with the last one: I suspect, however, it more commonly frequents the higher parts of the hills."

CHIONIS ALBA.

SQUATAROLA? CINCTA.

As Mr. Darwin states that this bird is common in the upland

marshes of the Falklands, and as Captain Abbott has sent eggs of a bird which he calls the Dottrel, I have little doubt that the following description applies to the egg of this bird :—

Ground-colour pale greenish-olive, conspicuously and strongly blotched and streaked all over with blackish brown; $1\frac{7}{8}$ inch long by $1\frac{3}{16}$ broad.

LIMOSA HUDSONICA?

HÆMATOPUS UNICOLOR? Black Oyster-catcher.

A very large egg, the ground-colour of which is olive stone-colour, blotched, spotted, and streaked with umber-brown, some of the blotches being much larger than others, while some are of a more olive hue, are obscure, and appear as if beneath the surface of the shell,—the umber-brown hue prevailing at the larger end. Length $2\frac{1}{2}$ inches; breadth $1\frac{1}{2}$.

NYCTOCORAX AMERICANA.

Egg uniform light greenish blue. Length 2 inches; breadth $1\frac{1}{2}$.

CHLOËPHAGA MAGELLANICA (Gm.).

This bird lays a beautifully-formed egg, of a uniform light buffy cream-colour, $3\frac{1}{4}$ inches long by $2\frac{1}{8}$ in breadth.

CHLOËPHAGA POLIOCEPHALA, Gray.

Bernicla inornata, Gray & Mitch. Gen. B. pl. 165 (nec King).

BERNICLA ANTARCTICA.

The egg of this bird is of a lengthened elegant form, and of a light buffy cream-colour, $2\frac{7}{8}$ inches long by $1\frac{7}{8}$ broad.

QUERQUEDULA CRECCOIDES.

A lengthened oval egg, of a uniform buffy stone-colour. Length $2\frac{1}{4}$ inches; breadth $1\frac{9}{16}$.

QUERQUEDULA CÆRULEATA.

Anas rafflesi, King.

Fine specimens were sent by Capt. Abbott.

MARECA CHILOENSIS.

ANAS? CRISTATA.

A handsomely-shaped, somewhat pointed egg, of a uniform vinaceous buff-colour. Length $2\frac{3}{4}$ inches; breadth 2.

MICROPTERUS CINEREUS.

Anas brachyptera, Lath.

A rather long and elegantly-formed egg, of a uniform buffy stone-colour. Length $3\frac{1}{8}$ inches; breadth $2\frac{1}{4}$.

LARUS DOMINICANUS.

A young specimen sent by Captain Abbot.

GAVIA ROSEIVENTRIS, Gould, sp. nov.

I describe this Gull as new, with a degree of hesitation, since it is hardly to be supposed that a bird of this magnitude, and doubtless, like the other members of the group, of very wandering habits, should not have been noticed and described. Still I can find no description which answers to this somewhat anomalous bird; neither does it accord with any of the numerous species contained in our national Museum. I make use of the word anomalous, because, although I cannot separate it from the little group of Gulls, of which our well-known species *Gavia ridibunda* forms a part, it differs from them in several particulars. In the first place, the specimen, which is certainly fully adult, has a nearly white head, the hinder part only being clouded with dusky, inducing the belief that a black hood was its characteristic at another season; yet, strange to say, the bill, legs, and feet are of the most intense coral-red; moreover these organs are very thick and fleshy, much more so than is ever seen in *G. ridibunda* and its allies; the gape, also, is wider than in the other members of the group, while the bill and tarsi are shorter; the hind toes of this, the only specimen I have seen, are well developed, but are entirely *destitute of nails* (probably from accident or injury); and, lastly, the neck and breast are suffused with a beautiful pinkish rose-colour—a colour, which, in spite of every care, disappears after a time, and which has sensibly diminished during the two months it has been under my notice; the three first primaries have their terminal portions entirely white, and the tail also is white, in which respects it agrees with the Black-headed Gulls in the British Museum, said to be from the Falkland Islands and the Straits of Magellan.

The following is an accurate description of this Gull:—

Tail, head, neck, and all the under surface white, suffused on the breast and abdomen with rich pinkish rose-colour; back of the head clouded with dusky; back and wings silvery-grey; primaries white, the first narrowly edged on the base of the external web, and broadly marked on the base of the internal web, with black, the remainder broadly margined on the internal web with black nearly to the tip; tail white; bill, legs, and feet coral-red.

Total length 13 inches, bill $1\frac{3}{4}$, wing $11\frac{1}{4}$, tail $3\frac{1}{2}$, tarsi $1\frac{5}{8}$.

Ground-colour of the egg light olive, elegantly variegated with irregularly-shaped markings of umber-brown, disposed in a zone near the larger end, and continued more sparingly over the whole surface, some of them appearing as if beneath the surface of the shell: these markings assume various V-shaped, arrow-headed, tail-shaped, and other fantastic forms. A lengthened and very pretty egg. Length 2 inches; breadth $1\frac{2}{5}$.

MEGALESTRIS ANTARCTICA. (Skua Gull.)

A boldly-marked and handsome egg, of uniform greenish-buff, blotched and speckled all over with deep umber-brown, interspersed with large, obscure, clouded blotches appearing as if beneath the surface of the shell. Length 3 inches; breadth 2.

PODICEPS ROLLANDI.

PODICEPS CALIPAREUS.

PELECANOIDES BERARDI.

EUDYPTES PAPUA.

Egg uniform bluish-white, largely stained in parts with buff. Length $2\frac{1}{6}$ inches; breadth $2\frac{3}{8}$.

APTENODYTES PENNANTI.

CYGNUS NIGRICOLLIS.

"MOLLY MAUK."

Supposed to be either *Diomedea fuliginosa* or *Diomedea melanophrys*.

A very long, but rather elegant, oval-shaped egg, the ground-colour of which is a stony-white, slightly washed with pink, and with a zone of brownish-buff round the larger end. This buff zone differs in form in different eggs, some having the entire end of this hue, while in others it is merely a ring. Length $4\frac{1}{4}$; breadth $2\frac{5}{8}$.

THALASSIDROMA NEREIS.

2. ON A NEW SPECIES OF ODONTOPHORUS. BY JOHN GOULD, ESQ., F.R.S., ETC.

Two specimens of a fine species of *Odontophorus* having been placed in my hands by Mr. Selater, for the purpose of comparing it with the other known members of the group, I beg to state that, after having done so with great care, I can come to no other conclusion than that it differs from the whole of them. It is most nearly allied to the *O. speciosus* of Tschudi, and the *O. hyperythrus*, Gould, but differs from the former in the much darker colouring of its upper surface, and in the rich rusty-red colouring of its forehead; it is also distinguished by having a broad band of the same colour surmounting the eye and extending to the nape of the neck, where it is met by a similar band, which commences at the base of the upper mandible, extends under the eye, through the ear, which feature has suggested the name of *erythrops* as its specific appellation. From the *O. hyperythrus* it differs in having a shorter and more obtuse bill, and in the well-defined black marking of the throat. The bird was discovered at Pallatanga in Ecuador, by Mr. Fraser.

ODONTOPHORUS ERYTHROPS.

Forehead, stripe over and another below the eye, extending beyond the ear-coverts, deep rust-red; crown of the head dark-brown; all the upper surface dark chocolate-brown, blotched and freckled with black; a small spot of buffy-white at the tip of each of the wing-coverts; throat and upper part of the neck jet-black: in the centre of this black mark, near its lower margin, a few of the feathers are snowy-white at the base, forming an indistinct lunar-shaped mark. Under surface, rich deep chestnut; feathers of the short tail and the primaries brownish black, the outer margins of the latter freckled with buff; thighs and under tail-coverts rayed transversely with black and lighter chestnut; bill black; feet blackish horn-colour.

Total length $10\frac{1}{4}$ inches, bill $\frac{7}{8}$, wing $5\frac{3}{4}$, tail $2\frac{1}{2}$, tarsi $1\frac{3}{4}$.

3. ON THE MEMBERS OF THE GENUS *RUPICOLA*, AND WHETHER THERE BE TWO OR MORE SPECIES. BY JOHN GOULD, ESQ., F.R.S.

At present only two species of this splendid group of birds have been characterized, namely the *Rupicola crocea* and *R. peruviana*. It is true that several other specific names have been proposed by various writers, such as *aurantia*, *cayana*, and *elegans*; but I believe these terms all have reference to the first-mentioned species—the *Pipra rupicola* of Linnæus, the *Rupicola crocea* of Bonnaterre—a bird sent to Europe, and particularly to France, in the greatest abundance from Cayenne. There can be no doubt that the second species, the *R. peruviana* of Latham, is distinct from the *R. crocea*; but there is much doubt as to whether the specimens sent from Bogota be identical with the *R. peruviana*, since it is not to be found in the intervening country of Ecuador, whence we have long received a splendid bird, which I believe is not yet described, and to which I propose to give the name of *R. sanguinolenta*. At all events I have signally failed in my endeavours to see a male specimen of a Cock of the Rock from Peru, by which means alone the question can be determined; on the other hand, I have a female or young male from that country, which appears to differ from the females or young specimens from Bogota. In the present state of our knowledge of the subject, it will be advisable to leave the point undecided, and describe the bird from Ecuador, which is at once distinguished from its congeners by the deep blood-red colouring of its plumage, as compared with the bird from Bogota; it also differs in its smaller size, and in the relative lengths of its wings and tail. Before describing the *R. sanguinolenta*, I may mention, that specimens of *R. crocea* from Demerara, although very similar in colour to those sent from Cayenne, differ considerably in the form and size of the crest,—that of the Demerara specimens being much smaller and rounder, and having the terminal crescent of brown much darker than in the more dilated crest of the Cayenne birds.

RUPICOLA SANGUINOLENTA.

Crest (which is destitute of the terminal crescentic brown mark observable in the other species), the entire plumage of the body, the lesser wing-coverts, the under wing-coverts, and the thighs rich blood-red; the greater wing-coverts, wings, tail, and the extremities of the larger under wing-coverts velvety-black; tertiaries very broad, and of a fine silvery grey; bill and feet yellow.

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

4. ON A NEW SPECIES OF DENDROCHELIDON, OR TREE SWIFT. BY JOHN GOULD, ESQ., F.R.S., ETC.

The highly interesting group of Tree Swifts forming the genus *Dendrochelidon* has recently been augmented by the discovery of a new species in Celebes by Mr. Wallace—the fifth of the form with which we are now acquainted—the four previously known being the splendid *D. mystaceus* of New Guinea and the Aru Islands, the *D. comatus* of Manilla and Malasia, the old *D. klecho* of Java, and the *D. coronatus* of India. The new species (which is the second in size, being only exceeded in this respect by the *D. mystaceus*) is, as already stated, from Macassar, Celebes; it is most nearly allied to the *D. comatus* and *D. klecho*, but differs from both those birds in its much larger size, and in the deep-blue colouring of its shoulders and wings. This bird, which I have named *wallacii* in honour of its discoverer, may be thus described:—

DENDROCHELIDON WALLACII.

Crown of the head deep green, with steel-blue reflexions; lores black; over each eye an indistinct stripe of greyish-white; sides and back of the neck and the upper part of the back green, passing into grey on the lower part of the back and rump, which colour again passes into the bluish-green of the upper tail-coverts; shoulders blue, with reflexions of green; primaries bluish-black, with green reflexions; tertiaries greyish-white; tail bluish-black; throat and under surface grey, passing into greyish-white on the vent and under tail-coverts; bill and feet olive.

Total length 10 inches; bill, from gape to tip, $\frac{1}{2}$; wing $7\frac{3}{8}$, tail $5\frac{1}{8}$.

Remark.—The usual chestnut-coloured mark immediately below the ear, indicative of the male, occurs in this as in the other members of the genus.

Mr. Gould exhibited a specimen of *Crithragra brasiliensis*, a native of Brazil, forwarded to him by Mr. Stone of Brighthampton, which was shot in October last at Bampton in Oxfordshire, whilst in company with a flock of Sparrows. It had in all probability been brought to this country caged, but had evidently moulted since obtaining its freedom.

5. ON A NEW GENUS OF GOAT-SUCKER, AND ON A NEW SPECIES OF ENICURUS, BOTH FROM DARJEELING, FROM THE COLLECTION OF BRIAN H. HODGSON, ESQ. BY GEO. R. GRAY, F.L.S.

(Aves, Pl. CLII.)

OTOTHRIX, G. R. Gray, gen. nov.

This bird differs from the Indian *Batrachostomi* in the smallness of its bill, and in the general markings of its plumage, which agree in some measure with the species of true *Podargus*.

The feathers over the upper mandible in front of the head and above the ears are much prolonged into fine hair-like bristles; they are composed of a long slender stem, having very slender branches, springing from the sides at various distances, and thus agreeing with those of the Australian genus *Egotheles*. The bill is strong, with the nostrils situated like those of *Batrachostomus*, and of similar form.

These characters induce the proposal of a new division for this remarkably curious species, under the appellation of *Otothrix*.

OTOTHRIX HODGSONI. (Pl. CLII.)

Head black, each feather banded and slightly margined with rufous-white; the back and wing-coverts ferruginous, mottled with black, and varied with occasional blotches of white; the quills, secondaries, and tertials brownish-black, marked on the outer and inner margins with blotches of rufous-white; tail ferruginous, speckled with black, obliquely banded on each web with rufous-white, which is irregularly margined and marked with black, and tipped with black, slightly edged with white. Beneath the body white, tinged in some parts with rufous, and each feather irregularly marked at or near the tip with black.

Total length $10\frac{1}{2}$ ", wings $5\frac{1}{4}$ ".

Young bird.—Pale rufous, having each feather barred with black, a band over the eyes crossing the forehead, and some spots on the scapulars pure white. Under surface white, tinged with rufous, and barred with brown.

This remarkable bird is named after Brian H. Hodgson, Esq., as it forms part of the enormous collection of Birds made by that gentleman in Northern India, especially Nepaul, Behar, &c., many of which were new to science. Some of these have been described by Mr. Hodgson in the 'Asiatic Researches,' 'Journal of the Asiatic Society,' &c., while others have been recently described in Dr. Horsfield's 'Catalogue of the Birds in the Museum of the East India Company.' Not content with forming such large collections of skins, he, at the same time, had them represented in a series of instructive drawings, introducing the sterna and other anatomical illustrations of peculiarities in their organic structure; while many of them also show the formation of the nests, &c., most of which particulars were hitherto unknown. These collections together form a

series of materials for ornithologists that has been but rarely equalled by the collection of any other naturalist of late years. We are therefore well warranted in designating this singular bird in honour of Mr. Hodgson, as showing our appreciation of his labours in the cause of ornithological science.

ENICURUS NIGRIFRONS, Hodgs.

Black; upper tail-coverts, a band across the middle of each wing, the base of the middle feathers and the two outer feathers of tail, and under surface white; the throat and breast mottled with black and white; bill black; legs pale yellow.

Total length 6", wings 2" 11"', tarsi 1".

This species is easily distinguished from all the rest of the species of *Enicurus* by the black forehead and mottled breast.

6. ON THE SEA BEAR OF FOSTER, THE *URSUS MARINUS* OF STELLER, *ARCTOCEPHALUS URSINUS* OF AUTHORS. BY DR. GRAY, F.R.S., V.P.Z.S., P. ENT. SOC.

(Mammalia, Pl. LXVIII.)

Steller figures and describes a large Seal under the name of *Ursus marinus* (Nov. Comm. Petrop. ii. 331, t. 15), which is the authority for the Ursine Seal of Pennant (Quad. ii. 526) and *Phoca ursina* of Schreber, Gmelin, and most succeeding authors.

Forster, in Cook's 'Second Voyage' (ii. 203), appears to speak of the same animal under the name of "Sea Bear."

I had not been able to see a specimen of this species in any of the Museums which I had examined on the Continent or in England, or to find a skull of the genus from the Northern Pacific Ocean; yet I felt so assured, from Steller's description and the geographical position, that it must be distinct from the Eared Fur-Seals from the Antarctic Ocean and Australia, with which it has been usually confounded, that in my 'Catalogue of Seals in the Collection of the British Museum,' I regarded it as a distinct species under the name of *Arctocephalus ursinus*, giving an abridgment of Steller's description as its specific character.

The British Museum has just received, under the name *Otaria leonina*, from Amsterdam, a specimen of the Sea Bear from Behring's Straits, which was obtained from St. Petersburg. It is evidently not an *Otaria*, but a true *Arctocephalus*, and agrees in all its characters with the Sea Bear, *Ursus marinus* of Steller, and not with the 'Sea Lion or *Leo marinus* of that author, which is called *Otaria stelleri* in my catalogues, and was confounded with *Otaria leonina* of the Southern Pacific Ocean by Nilsson and most modern authors. The latter animal is still a desideratum in the British Museum and other European Collections.

The skin is 8 feet long, and agrees in all particulars with Steller's

description of the adult male of the species, and is most distinct in external character and colour from the Fur-Seal (*A. falklandicus*) of the Falkland Islands and of *A. lobatus* from Australia.

The skull is equally distinct from the various skulls of all the species of the genus *Arctocephalus* (both Fur- and Hair-Seals) which are in the collection of the British Museum, and is easily known from them by the shortness of the face and the height and convexity of the nose. See Plate LXVIII.

The skull of this specimen is quite distinct from the skull of the *Arctocephalus gilliespii* of California, recently described by Dr. Mac Bain in the 'Proceedings of the Physical Society of Edinburgh,' under the name of *Otaria gilliespii*, from a skull in the Edinburgh Natural History Museum, of which we have a cast in the British Museum: but we are not able to ascertain with certainty whether this is a Fur- or Hair-Seal, though, from the length of the palate, compared with the width of the skull at the hinder grinders, I am induced to believe that it may belong to an animal which has a soft under fur. This proves that the Seals from the different parts of the West Coast of America are distinct from each other, each specimen having a specific geographical range.

ARCTOCEPHALUS URSINUS. Northern Fur-Seal.

Adult male grey-black; hair of the back long, black, reddish, with a subterminal band and a short grey tip; under fur short, woolly, red; the hair of the neck and front of the body longer, forming a kind of mane; lips and nose reddish; whiskers very long, strong, white, smooth, tapering to a fine point. Skull short, forehead very convex and rounded.

Hab. Behring's Straits.

I may state that the name *Arctocephalus ursinus* is usually applied to the various species of Eared Fur-Seals found in the different English and Continental Museums.

7. DESCRIPTION OF A NEW SPECIES OF FISH, PERISTETHUS RIEFFELI. BY PROF. DR. KAUP.

(Pisces, Pl. VIII.)

This new species is an inhabitant of the seas of China and perhaps Japan, and shows, with a species of Japan and two of the Moluccas, that the Mediterranean species is not so isolated as we have hitherto believed.

The genus *Peristethus* (*Peristedion*) is to be placed in the middle of the subfamily *Triglinæ*, and connects the similar forms of *Dactyloptera* with those which are near to the genus *Trigla*.

The highest genera, *Cephalacanthus* and *Dactyloptera*, have no separated rays on the pectorals, a thorn-shaped prolongation of the preopercle, and a normal covering of scales without a trace of lateral line.

The lowest group shows also a high head, less obtuse, and three free articulated rays on the pectorals, small scales, and a distinct lateral line. To this section belong *Prionotus* and *Trigla*.

The genus *Peristethus*, which connects both groups, has only two articulated rays before the pectorals; and before the commencement of the small furcated caudal are three carinated scales, of which there are two only in *Dactyloptera*. The strongly-armed body is without a lateral line.

From these characters, this genus is more allied to the last than the first group. As in *Trigla lyra*, the snout is furcated, and along the dorsal line is a series of elevated thorns, by which the dorsals are placed in a more or less deep furrow.

If we see marks enough to connect *Peristethus* with one or the other group, there is also a series of characters by which this genus differs from all the others. *Peristethus* shows no trace of teeth in either jaw; and the symphysis of the lower jaw has fringed skin-flaps, more or less moveable, hanging downwards. The head is long and very compressed, with two fork-shaped prolongations on the end of the snout. Every part of this fork is rough on the margins, and on its lower part are four cavities covered with a thin transparent skin. The long head is only three times the length of the body; and the body has a pyramidal form with eight sides. All the scales are connected one with another, and have in the middle a thorn directed backwards. The pectorals are of middle length, not quite reaching the ventrals, and show only two free fingers. The over-breast and belly are of two shields, with a serrated suture in the middle, and elevated on the margins; the first shield is larger and longer than the second, which is rarely separated in two.

The dorsal commences on the second ring of the body and reaches not quite to the end of the body. The males are distinguished by the first rays of the dorsal being thin, filiform, and elongated. This is the case in the European species; and the others are no exception. The anal commences next the anal ring, and is as long as the second dorsal.

The colour is red; but this colour changes after death to a dirty ochreous-yellow.

The flesh of the smaller species is very dry and is not used. The Mediterranean species is not rare, but the fishermen take it only as a curiosity. The cavities in the two branches of the fork make it very weak and fragile; and most examples of these fishes have lost one or both parts of their fork.

In quite perfect specimens we never find the fork longer than an inch; therefore the horned fish of Pliny must be distinct from the Mediterranean fish. This horned fish of Pliny had horns of 18 inches in length, and is, according to the opinion of Cuvier and Valenciennes, the *Cephaloptera*, which Rondelet has never seen or described.

It is, in fact, curious, that the old authors never mention the *Cataphractus*,—the reason probably being its rare appearance, its smallness, and its bad flesh.

As I always place the smallest forms with the most rounded skull at the head, and give the bird-types with the largest pectorals, which enable these forms to fly, the second place, and as I see in the *Peristethus* the bone- or reptile-fish, and in *Prionotus* the real fish-type, my arrangement of the genera in this little subfamily is as follows:—

- I. CEPHALACANTHUS.
- II. DACTYLOPTERA.
- III. PERISTETHUS.
- IV. PRIONOTUS.
- V. TRIGLA.

After this preface, we proceed to distinguish the different species of

Genus III. PERISTETHUS (PERISTEDION*).

PERISTETHUS CATAPHRACTUS. (Pl. VIII. fig. 1.)

Peristedion cataphractum, Lac.

P. cataphractum (♂) et *chabrontera* (♀), Risso, iii. p. 402.

Octonus holosteon, Raf.

Trigla hispanorum chabrontera, Osb.

Trigla hamata, Bl. Schn.

Malarmat, Rond. p. 237 (♂), excellent fig.; Cuvier & Val. iv. p. 101 (♂), excellent fig.

Peristedion malamart, Yarr. p. 67 (♂), excellent fig.

This figure of Bloch, t. 49 (♂), is bad, shows too many scales and rays in the second dorsal.

Diagn.—Front with three thorns. Eye-covers with thorns. Preopercle leaf-shaped, without prolongation. The length of the head to the breadth under the middle of the eyes as $2\frac{7}{2}$:1. Breadth of the head nearly equal to its height, measured under the eyes. The forks more or less divergent.

Not exceeding the length of a foot. Common in the Mediterranean, more rare in the Channel.

PERISTETHUS ORIENTALIS. (Pl. VIII. fig. 2.)

Peristedion orientale, T. & Schleg. Fn. Jap. t. xiv. f. 5, 6; t. xv. f. 1, 2.

Similar in length to *P. cataphractus*, but without thorns on the front, and eye-covering. A female, besides the short rays of the first dorsal, shows the ventral shield separated into two, which is abnormal. On the symphysis are three small skin prolongations, and behind it a longer one.

I find the true specific character in the form of the head, and therefore doubt whether the number of the rays shows a great difference from the other species.

* The name *Peristedion* is wrongly formed.

PERISTETHUS RIEFFELI, Kaup. (Pl. VIII. fig. 3.)

Thorns on the front, not on the eye-margins; parts of the fork broader, and convergent towards the end. The breadth of the head is to the length as $1:1\frac{3}{5}$. The height of the head not quite half the breadth. The thorn-shaped prolongation of the preopercle not comparable with those of *P. cataphractus* and *P. orientalis*. The eyes are proportionately smaller, the front narrower and more concave, than in *P. cataphractus* and *P. orientalis*.

When we compare its head with those of the other species, we are led to believe that such a head belongs to a larger fish, which, however, is not the case. Our fish is scarcely larger than a large individual of *P. cataphractus*. In one cavity of the eye of a dry example I found a piece of China paper with the written characters of the country. From that, and the maceration and the varnish, I believe that this example came in an insect-box from China; it is, judging by the short rays of the first dorsal, a female.

I have named this very interesting species in honour of the memory of my true and excellent friend De Rieffel, who has done so much for our Museum and University.

Besides these smaller species of *Peristethus*, there appear to be two mentioned by older authors, which attain an immense size. The first I call

PERISTETHUS GIGAS.

Length 3 feet, of which the head is one-third.

In Valentyn, 'Oud en nieuw Ostindien,' tom. iii. p. 363, fig. 55, is a fish mentioned and figured under the name Tkan Scythân Merah (Red Devil Fish), which belongs, according to Cuvier, to this genus.

A bad plate of this is also given in Renard's 'Poissons et Ecrevisses,' fig. 67. What makes me doubt whether Renard copied the engraving of Valentyn, is that on the surface of the fork are cavities covered with membranes, which we do not see in the figure of Valentyn. Therefore I believe that both authors used one and the same painting belonging to another collection, made at Amboyna.

These cavities on the upper side of the bifurcated snout, which we find in the better known species on the underside, permit us to hazard two conjectures. Either this species has these cavities on both sides of the fork, or, by the mistake of the first drawer, the cavities of the under side are erroneously placed on the upper side.

According to Renard, this fish reaches the length of 8 feet 7 inches; but this does not agree with the assertion of Valentyn. According to the latter, the flesh of this fish is dry and without flavour; Renard says it is similar to that of the Sturgeon. The last opinion is certainly not founded on experience, but on the analogy of this fish with the Sturgeon. I have more confidence in old Valentyn than Renard, and consequently think that the size of 8 feet is an exaggeration, and that the length given by Valentyn is the more exact.

Another species, not yet rediscovered,

PERISTETHUS BREVIFURCATUS,

is figured, according to Cuvier and Valenciennes, in Cornelius v. Vlaming's Manuscript, nos. 165, 166. This fish is called Sturgeon of Banda, and has the fork of the snout not more largely developed than in *Trigla lyra*. Like *P. gigas*, it grows to a considerable size.

A third species is mentioned by Cuvier in few words: "Ainsi l'on doit croire qu'il y a dans la mer des Indes une espèce de ce genre différente de la nôtre." This species of Cuvier is perhaps *P. orientalis*, or my new *P. rieffeli*.

February 22nd, 1859.

Dr. Gray, F.R.S., V.P., in the Chair.

The following papers were read:—

1. ON THE EARED SEAL OF THE CAPE OF GOOD HOPE (*OTARIA DELALANDII*). BY DR. J. E. GRAY, F.R.S., V.P.Z.S.

(Mammalia, Pl. LXIX.—LXX.)

At the preceding meeting, I gave an account of the Eared Seal from Behring's Straits, showing that it was distinct from the species found in other localities. I have since received from Paris a fine specimen of an adult Eared Seal from the Cape of Good Hope, which has been described in the Catalogue as *Phoca*, or *Otaria delalandii*. Like the Seal from Behring's Straits, it proves to be a species of *Arctocephalus*, and, like it, is quite distinct from any of the species of that genus in the British Museum, being well characterized by the form and structure of the skull.

It is, like the Behring's Straits Seal, a *Fur-Seal*; that is to say, it has a close coat of red under-fur at the roots of the rigid flattened hair; but this under-fur is much shorter and less abundant in the adult specimen now under examination than in the adult specimen of the Eared Fur-Seal from Behring's Straits, or in the Eared Fur-Seal of the Falkland Islands. The adult is about the same size as the Seal from the Arctic Circle, but is much paler in its general colour.

ARCTOCEPHALUS DELALANDII. (Pl. LXIX.)

Hair rigid, under-fur small in quantity, reddish-brown; the hinder part of the palate with a deep narrow cavity, acutely angular in front.

Junior?

Le petit phoque, Buffon, Hist. Nat. xiii. 341, t. 53.

Little Seal, Penn. Quad. 243, from Buffon.

Phoca parva, Bodd. Elench. 78, from Buffon.

Phoca pusilla, Schreb. Säuegeth. 314, t. 85, from Buffon.

Otaria pusilla, Desm. N. Dict. xxv. 600.

Otaria peronii, Desm. Mamm. 250, 382; Encyc. Méthod. t. 111. f. 2, from Buffon.

Loup-marin, Pagès, Voy. aut. du Monde, ii. 32.

Adult.

Otaria delalandii, F. Cuvier, Dict. Sci. Nat. xxxix. 423; Cuvier, Oss. Foss. v. 220, t. 18. f. 15, skull.

Phoca pusilla, part, Fischer, Syn. Mamm. 232.

Hab. Cape of Good Hope.

Cuvier (Oss. Foss. v. 220) observes that Delalande brought from the Cape a young specimen 3 feet 6 inches long, of a reddish-grey colour, the ends of the hairs annulated with grey and blackish, rather paler beneath—the whiskers strong, simple, and black—the feet black—the under-fur soft, woolly,—and two skeletons of young, and the skull of an adult specimen. This skull is figured (Cuvier, Oss. Foss. v. t. 18. f. 5); but unfortunately, the palate, which is the most characteristic part of the skull, is not figured nor described. The palate of the skull of the younger specimen is described thus:—“Le palais est plus étroit, se porte plus en arrière et est échancré par un angle plus aigu.”

Buffon notices a young Seal, which he calls the *petit phoque* (vol. xiii. t. 53), on which the *Phoca pusilla* of Schreber and succeeding authors has been founded, which is probably the young of this species.

Daubenton states (Hist. Nat. xiii. 413) that the specimen figured by Buffon came from India; but it is probable that it was brought from the Cape of Good Hope in a ship coming from India. No Seal has as yet been described as inhabiting the coast of India.

Fischer confounded with *Phoca pusilla* of Buffon a Seal from Rottennest Island, on the eastern coast of Australia (Syn. Mamm. 232).

As the British Museum has a good series of skulls of this genus, I am induced to add the following synopsis of the species, characterized by the peculiarities of the skull alone.

- I. *Face of skull short. Forehead convex, regularly rounded from the end of the nasal bone to the middle of the vertex. Lower jaw short, thick.*

ARCTOCEPHALUS URSINUS.

Arctocephalus ursinus, Gray, Cat. Phocidæ B.M. 41, et P. Z. S. antea, p. 103.

Palate rather concave in front, narrowed and flattened behind, with a deep narrow hinder aperture, which has a regular ovate front edge; outer upper cutting-teeth moderate; orbit very large; zygoma very strong; grinders small.

Hab. Behring's Straits.

A skull of the adult male specimen here described, and from which the figure (Pl. LXVIII.) is taken.

- II. *Face of skull moderately elongated. Forehead rather convex, slightly rounded from nasal bone to vertex. Lower jaw elongated, slender.*

ARCTOCEPHALUS HOOKERI.

Arctocephalus hookeri, Gray, l. c. p. 45; Voy. Erebus and Terror, t. skull.

Palate deeply concave in front, narrow and rather concave behind, with a deep hinder aperture, which has a transverse truncated front edge with a slight central lobe directed backward; outer upper cutting-teeth very large, conical, acute; orbit moderate; zygoma slender; angle of jaw bent inwards.

Hab. Falkland Islands (and Cape Horn?).

The skull of four half-grown specimens. They are all very uniform in their characters.

We have also the skull of a very young Seal which appears to belong to the same species.

In three of the skulls the outer upper cutting-teeth are very large and acute, more than half the size of the canines, and like them in form. In one skull (perhaps of a female?) the upper outer canines are much smaller and more slender, not half the size of the same teeth in the other skulls of the same size, and the canines themselves are also much more slender; the front of the palate is also more concave.

- III. *Face of skull moderately elongated; forehead flattened from nasal bone to the vertex. Lower jaw rather short, strong.*

ARCTOCEPHALUS DELALANDII.

Otaria delalandii, F. Cuvier.

Face rather short; palate concave, hinder aperture narrow, with a rather acute ovate anterior edge; teeth large; lower jaw short, strong.

Hab. Cape of Good Hope.

Two skulls of adults from the Cape (Pl. LXIX.); and one half-grown, habitat unknown. These skulls agree in the form of the hinder palatine opening, but vary in other respects a little from each other: the two adult ones differ in the aperture of one being wider and shorter than that of the other; in the young skull the front edge of the aperture is more acute in the centre than in either of the others; the outer cutting-teeth of the upper jaw are large, but much smaller than the very large canines.

ARCTOCEPHALUS NIGRESCENS.

Arctocephalus nigrescens, Gray, Zool. Erebus and Terror, t. f. ; skull (inedit.).

Face rather elongate. Palate slightly concave, flat behind, hinder aperture narrow, with a nearly straight front edge.

Hab. Falkland Islands?

A single skull from a half-grown specimen.

This skull is very like that of *A. delalandii*, but differs considerably in the form of the front edge of the hinder palatine aperture: the outer cutting-teeth and the canines are moderately slender, and similar in form; but the latter are much the larger.

ARCTOCEPHALUS LOBATUS.

Arctocephalus lobatus, Gray, Cat. Phocidæ B.M. p. 44.

Face moderately elongate; palate deeply concave, narrowed behind, hinder aperture with a semicircular front edge; lower jaw rather short, strong.

Hab. Australia, Port Essington. Houtman's Abrolhos.

The canines are very large and strong; the outer upper cutting-teeth are large and compressed.

ARCTOCEPHALUS GILLIESPII.

Otaria gilliespii, Macbain, Rep. Phys. Soc. Edinb. 1858.

The face much elongated; palate slightly concave, front edge of the hinder aperture ovate; lower jaw elongate, strong.

Hab. California.

We have a cast of the original skull described by Dr. Macbain, now in the Museum of the College of Surgeons, Edinburgh, from which the figure (Pl. LXX.) is taken.

The species is at once known by the length of the face: that is, in all the skulls of the genus we have, a line drawn across the palate at the front edge of the zygomatic arch leaves one-third of the palate behind the line, and two-thirds in front of it; while in this species it leaves only one-fourth behind, and very nearly three-fourths in front of the line.

The skull has only four grinders on each side in the upper jaw, but one has evidently fallen out in front of the series and one behind; but the fifth grinder of the complete series, which is usually in a line with the front edge of the zygomatic opening, is in this species rather in front of it.

The Eared Seals (*Arctocephali*) have been divided into Fur- and Hair- (Eared) Seals by the sealers. *A. hookeri* and *A. lobatus* are called Hair Seals, because they are destitute of any under-fur: but this appears to be the case only with the older specimens; for the young of *A. lobatus* is said to be covered with soft fur, which falls off when the next coat of hair is developed. The under-fur is well developed in the adult specimens of *A. ursinus* and *A. delalandii* and the half-grown specimen of *A. nigrescens*, and entirely absent in the adult *A. hookeri* and half-grown *A. lobatus* in the Museum Collection.

2. DESCRIPTION OF A NEW SPECIES OF TÆNIA.

By W. BAIRD, M.D., F.L.S.

(Annulosa, Pl. LVI.)

TÆNIA SULCICEPS.

Caput tetragonum, magnum, acetabulis anticis lateralibus, orbicularibus, longe segregatis, sulco interposito. Proboscis nulla. Os terminale inerme. Collum longum, læve. Articuli supremi breviores; deinde longiores, infundibuliformes, angusti; lateribus undulatis, crenatis. Aperturæ genitales marginales, unilaterales.

Hab. In intestinis *Diomedæ exulantis*.

Longitudo exemplorum in possessione nostra, quæ sunt fragmenta solum, uncia tredecim.

In Museo Britannico.

The colour of this Tape-worm is a straw-yellow. The head is tetragonal in shape, large; and the neck is long, measuring nearly two or three lines, and quite smooth. Upon minute inspection, I could discover no trace of a proboscis; and the mouth was destitute of hooks of any kind. The joints of the body are small at first, becoming larger as they descend; but even when full-grown are narrow, somewhat undulated on the margin, and slightly but irregularly crenated. The suckers on the head are of considerable size, round in shape, and are separated from each other by a rather deep furrow. The genital orifices are situated on the lower margin of each joint, and are all on the same side. None of the specimens are quite perfect; but there are two or three fragments, each about 13 inches in length.

This Tapeworm was taken by Mr. Edward Gerrard of the British Museum from the intestines of the Albatros (*Diomedea exulans*), and is now in the collection of Entozoa in the British Museum.

The Secretary read the following notice of the habits of the Aye-aye of Madagascar (*Chiromys madagascariensis*) by Humphrey Sandwith, Esq., C.B., Colonial Secretary of the island of Mauritius, being a communication made on the 28th of January last, by Dr. Sandwith, to the Royal Society of Arts and Sciences of that island, of which he is President:—

“ Il y a déjà quelque temps que le grand naturaliste Owen m’a écrit pour me prier de lui procurer un spécimen de cet animal, si cela m’était possible, car le Musée Britannique n’en possède ni les os ni la peau. Tout petit et insignifiant que soit le Musée du Port-Louis par le nombre de ses spécimens, il est sous ce rapport plus riche que l’immense collection de curiosités du Musée Britannique, puisqu’il possède un AYE-AYE empaillé qui, par sa pose et le soin qu’on a pris pour le conserver, fait beaucoup d’honneur à l’empaillleur qui l’a préparé.

“Maintenant, Messieurs, lorsque l'on examine cette petite créature, on se demande naturellement dans quelle classe du règne animal on doit la placer. Tout homme qui ne connaît pas l'histoire naturelle dira de suite : C'est un *Maki*, ou en d'autres termes un *Lemur*, et certes, je ne pense pas qu'il soit bien éloigné de la vérité, quoique Cuvier l'ait rangé, comme il doit l'être, dans la famille des rongeurs, et l'ait classé avec l'écureuil et le rat. Il y a sans doute de bonnes raisons pour le ranger avec le Maki, autrement dit le Lemur, puisqu'en premier lieu, il nous vient du seul pays où se trouve le Lemur, ensuite aucun rongeur ne possède la rotation des os de l'avant-bras et ne peut comme l'homme mouvoir ses membres séparément et s'en servir comme d'instruments pour prendre les objets, particularité que l'on remarque chez les Quadrumanes ; et certes, aucun rongeur n'a les quatre pouces, ceux des pieds de derrière même, libres et opposables aux autres doigts ; ce fait donne encore à cet animal du rapport avec le singe et le Maki et prouve qu'il est destiné à grimper sur les arbres.

“D'après ce que je viens de vous dire, il doit être placé dans la classe des Lemurs, surtout puisqu'il nous arrive de Madagascar ; mais nous pourrions bien changer d'opinion après lui avoir examiné la bouche.

“Or, je vous ferai observer qu'il ressemble au Lemur autant par les mouvements et la forme du corps que par la queue et les pieds ; cependant, si vous l'examinez attentivement, vous verrez qu'il existe une bien grande différence entre ses pieds et ceux du Lemur : Les doigts que l'on pourrait appeler les index du Maki sont pourvus d'une griffe, tandis que les autres doigts ont les ongles plats comme ceux d'un être humain ou d'un singe. Vous voyez ici des griffes très bizarres qui ne peuvent être comparées à celles d'aucun autre animal : elles conviennent éminemment aux habitudes de l'AYE AYE comme les griffes du Lemur sont appropriées à ses habitudes ; mais elles sont bien différentes. C'est une preuve de plus que la nature se plaît à tout varier même lorsqu'elle a en vue les mêmes résultats. Le pelage de cet animal est aussi moins laineux que celui du Lemur ; mais c'est en approchant de la tête que vous apercevez une grande différence entre ces deux animaux.

“D'abord, permettez-moi d'appeler votre attention sur la forme de la tête. À première vue, elle vous semble être celle d'un animal nocturne. Ses oreilles grandes et nues ressemblant beaucoup à celles d'une chauve-souris sont faites de manière à pouvoir saisir le plus léger bruit dans le silence de la nuit. Je dois avouer que je fus un peu embarrassé sur ce point, cet animal n'étant point carnassier comme le chat, qui est obligé d'écouter le bruit des pas des petits animaux pour s'élancer sur eux ; il est au contraire apparemment frugivore, mais sans doute il ne l'est pas exclusivement, autrement ses dents ressembleraient à celles du singe, au moins il n'aurait pas besoin de grandes incisives. Remarquez que ses dents sont formées de manière à pouvoir ronger le bois le plus dur ; elles n'ont d'émail que sur le devant, de sorte que la partie postérieure du bout des dents s'use beaucoup plus vite que la partie antérieure et leur donne

la forme incliné d'un ciseau. Les pulpes qui les forment sont probablement persistantes comme celles des autres rongeurs, de sorte que les dents poussent aussi vite de la racine qu'elles s'usent à leurs extrémités. La mâchoire inférieure comme celle des autres rongeurs se meut évidemment au moyen d'un condyle longitudinal, de manière à empêcher tout mouvement horizontal, si ce n'est de l'arrière à l'avant et vice versa.

“Voici donc un rongeur très fort, ayant l'ouïe très fine (combinaison qui me porte à ajouter foi au récit des habitants de Madagascar qui prétendent que cet animal écoute le bruit que fait le ver en mangeant un arbre intérieurement, qu'ensuite il ronge le bois jusqu'à ce qu'il ait atteint le ver et qu'au moyen de cette phalange très effilée, il le retire du bois); mais on peut en dire autant des autres rongeurs. Ces animaux surtout : la souris, le lièvre, le lapin et un animal encore plus gros, le Chinchilla de l'Amérique méridionale, outre des dents très fortes destinées à ronger, sont doués d'une ouïe très fine, mais ces animaux vivent dans une crainte continuelle des plus gros carnivores. Il leur faut donc une ouïe très fine pour les avertir de l'approche du danger; tandis que le *Cheiomys* ou *Aye-Aye*, vivant sur les arbres, dans un pays où il n'y a pas de Carnivores d'une grandeur dangereuse, n'a rien à craindre des attaques de ses ennemis; l'ouïe de cet animal lui servirait donc à attaquer plutôt qu'à se défendre.

“Or, Messieurs, j'étais arrivé à ce point de mes observations, et jugeant d'après la nourriture supposée de l'*Aye-Aye* et sa conformation générale, plutôt que d'après ses habitudes et ses dents, je l'avais nourri de bananes et de dattes, pensant avec raison que puisqu'il est destiné à vivre sur les arbres et qu'il n'a pas de dents canines, loin d'être carnivore, il doit être frugivore et insectivore, lorsqu'un soir je le lâchai dans mon salon et j'observai tous ses mouvements. Il était très curieux à voir, grimpant sur les chaises et les tables et regardant avec attention le bois de chaque meuble. Pendant qu'il examinait la cloison, j'entendais constamment un bruit léger qui se renouvelait très rapidement et je fus quelque temps avant d'en découvrir la cause. Enfin, je remarquai que de temps en temps ce petit animal donnait rapidement de légers coups qui produisaient un son vibrant avec le second doigt, ce membre effilé et grêle qui ressemble à un fil de fer recourbé et au moyen duquel on prétend qu'il retire les vers des arbres. Pendant qu'il frappait ainsi le bois, il semblait écouter attentivement. Une fois comme il traversait ma chambre, après avoir ainsi frappé le parquet, il se mit tout-à-coup à déchirer la natte avec les dents. Comme je n'étais pas disposé à le laisser rien détruire, je fus obligé de le chasser, mais je demeurai convaincu qu'il mange réellement, comme on le raconte, les vers qu'il retire du bois. De sorte que vous avez maintenant chez les animaux ce qu'est le pic chez les oiseaux; car celui-ci, quoique insectivore, strictement parlant, vit aussi de fruits et même d'œufs.

“Une autre particularité très remarquable de cette petite créature, c'est sa manière de boire. Ayant placé une cuvette d'eau devant lui,

j'observai ses mouvements : Il s'approche du vase, étendit le bras et y ayant plongé son doigt effilé, il le passa ensuite obliquement dans sa bouche. Il renouvelait ce mouvement avec une telle rapidité que l'eau semblait couler du vase à sa bouche. Il me semble que cette singulière manière de boire est celle qui lui convient le mieux pour puiser l'eau dans le creux des arbres, réservoirs naturels où il va sans doute éteindre sa soif.

“ J'ai suivi le système de Cuvier et placé cet animal dans l'ordre des rongeurs, et cependant, Messieurs, cette classification-ci aussi bien que toute autre que vous seriez disposés à adopter, ne semble-t-elle pas inexacte ? La nourriture joue sans doute un rôle très important, quelques personnes mêmes disent le plus important dans la vie ; or, les dents étant des organes les plus nécessaires pour manger, si nous les prenons comme mode de classification, il faut avouer que nous rencontrerons d'étranges contrastes. En effet, est-il possible un seul instant de comparer cet animal au rat par ses habitudes, par sa forme ou son aspect ? Combien sa queue est différente du membre écailleux du Castor et quel contraste frappant entre les habitudes aquatiques de l'un et les dispositions grimpantes de l'autre ! Et cependant, parce que ces deux animaux rongent le bois et ont tous deux des dents en forme de lime, on les range improprement dans la même classe. Loin de moi, Messieurs, l'idée de critiquer Cuvier ou de trouver à redire à quelque chose qu'ait avancé ce géant de la science naturelle, je ne fais ici que vous indiquer combien il est impossible d'arriver à une classification complète.

“ Quant à moi, Messieurs, si je pouvais mettre de côté les entraves de la science et réussir à oublier tout ce que j'ai appris, je n'hésiterais pas un seul instant à appeler cet animal une nouvelle espèce de Lemur, pour cette raison bien simple : que bien qu'il ressemble au Rat ou au Castor sous un rapport, savoir, la forme des dents, il ressemble au Lemur sous presque tous les autres rapports : d'abord par son apparence en général, ensuite par son corps long et élancé, par l'habitude de grimper sur les arbres, par la forme de ses griffes et surtout par sa queue longue et touffue. Il a de plus des particularités que l'on ne rencontre pas chez le Lemur ; elles ressemblent sans doute à celles d'autres animaux, je vous les ai déjà signalées. Ses dents, par exemple, ressemblent à celles d'un rongeur, ses oreilles et ses yeux à ceux d'une chauve-souris, car étant un animal nocturne, il faut que tous les rayons de lumière se concentrent dans sa prunelle qui est aussi grande que celle du chat, et son ouïe l'aide sans doute.

“ Ayant entendu dire que les naturels de Madagascar affirment que cet animal mange les moutons et qu'il se sert de son doigt effilé pour les retirer du bois, je ne crus pas implicitement cette histoire, sachant du reste quels contes absurdes on débite sur les habitudes des oiseaux et des bêtes. Les paysans d'Angleterre, par exemple, croient fermement que le hérisson suce le lait des vaches, et l'engoule-vent, dit vulgairement ‘crapaud volant’ ou tette-chèvre ; celui des chèvres, mais quoique l'on doive accepter ces idées populaires *cum grano salis*, il y a tout lieu de rechercher si les habitudes que

l'on attribue à l'AYE-AYE sont en harmonie avec sa conformation. Or je ne voyais pas pourquoi il ne mangerait pas les vers des arbres, quoique je ne comprisse pas pourquoi il se servirait du second doigt pour les retirer de leurs trous, ne pensant pas qu'il pût ou percer ou retirer le ver. Cependant, j'eus bientôt occasion de vérifier la vérité de cette assertion. Ayant trouvé des branches d'arbres mangées par les vers, je les plaçai dans sa cage et j'observai ses mouvements. Je le vis bientôt grimper sur une des branches et l'examiner attentivement ; ensuite inclinant les oreilles en avant et appliquant le nez à l'écorce, il la frappa rapidement avec ce curieux deuxième doigt, comme le pic frappe l'arbre, quoiqu'il fût bien moins de bruit. De temps en temps il introduisait le bout du doigt effilé dans les trous des vers, comme ferait un chirurgien d'une sonde. Il arriva enfin à une partie de la branche qui rendit évidemment un son intéressant, car il se mit à la déchirer de ses fortes dents. Il eut bientôt enlevé l'écorce, coupé le bois et mis à nu le trou d'un ver qu'il retira délicatement avec son doigt effilé et le porta à sa bouche. J'observai ses mouvements avec beaucoup d'intérêt et je fus frappé de la manière merveilleuse dont cet animal est doué par rapport à ses habitudes. D'abord son ouïe si fine qui le met à même de bien distinguer les différents sons que font rendre au bois les légers coups qu'il lui donne, ensuite son odorat très subtil pour l'aider sans doute dans ses recherches, sa marche assurée sur les branches flexibles auxquelles il se cramponnait à l'aide de ses membres de quadrumane, ses fortes dents de rongeur qui lui permettent de déchirer le bois le plus dur, enfin ce curieux petit doigt qui ne ressemble à celui d'aucun autre animal et dont il se servit tour-à-tour comme d'un plessimètre, d'une sonde et d'une curette. La découverte des habitudes d'un animal aussi rare est réellement une bonne aubaine pour le naturaliste, bien que nos recherches, en apparence puériles, puissent faire sourire l'homme d'affaires.

March 8, 1859.

John Gould, Esq., F.R.S., V.P., in the Chair.

The following papers were read :—

1. DESCRIPTION OF AN ATTACUS FROM THE EAST INDIES, HITHERTO APPARENTLY UNRECORDED. BY ADAM WHITE, ASSIST. ZOOL. DEP. BRIT. MUS.

(Annulosa, Pl. LVII.)

ATTACUS EDWARDSII, n. s. (Pl. LVII.)

A. fusco-brunneus, colore saturatiore quam in ATTACO ATLANTE ;

fenestris ad basin rectis, squamulis ochraceis circumdati, sepimentis albis alarum latioribus: alis externe lineis duabus, rivulosis seu undatis, ochreis et nigro-fuscis.

Hab. In Indiæ mont. (*Dhargeeling*).

Bombyx hæc distinctissima, Professori Milne-Edwards clarissimo, a descriptore dedicatur, "in memoriam."

This fine insect comes next to the well-known *Attacus atlas*, but may at once be distinguished from it by its intensely dark colour, especially on that band, bounded by angled and curved, white, defined lines, in which the fenestræ occur. This band is of a dark blackish-brown, passing into a rich chestnut-brown above the fenestræ of the upper wings and on their posterior margin; the inner margin of the lower wings is of this red-brown also; the fenestræ are not bounded by a margin of black scales as in *Attacus atlas*, but by ochreous yellow squamation; the part of the fenestra towards the base of the wings, which in *Attacus atlas* is curved convexly, is in *Attacus edwardsii* straight; the fenestra is longer, the white lines on the wings, breaking up the brown so beautifully, are wider, and that on the lower wing is less scalloped than in *Attacus atlas*; the margin of the lower wing on the outside has two much-waved lines, the inner is yellow, with thirteen or fourteen undulations, continued on the upper wing till it leaves off where the wing is dilated into the lobe, which gives the wing its hooked-like character; the lower line is brownish-black, and is straight, except in six places, where the black runs up the nerves triangularly to a point, and meets two of the yellow lobes, which are conjugate. The figure will show this and the other markings better than any description.

This insect belongs to that largest group of *Bombycidae*, the cocoons of some of the species of which have been long used in India for the production of coarseish kinds of silk. One of these has been introduced into Algeria, Spain, Italy, and France, where the *Ricinus communis*, its food-plant, grows readily. The numerous valuable papers of M. Guérin-Méneville must be consulted, to show with what success the experiments have been made. It is not from want of energy, ability, and desire on the part of those who have tried to introduce it, that their endeavours have not been more successful. No silk is likely to supersede that of the old *Bombyx mori*, even although *Bombyx huttoni* and *Bombyx horsfieldii* be congeneric. The Silkworm seems, like the sheep, cow, and horse, to have been made for man. All our attempts are, or seem to be, in the main, unsuccessful to introduce new silk-producers—new domestic animals. They were created domesticated.

2. DESCRIPTIONS OF UNRECORDED SPECIES OF AUSTRALIAN
COLEOPTERA OF THE FAMILIES CARABIDÆ, BUPRESTIDÆ,
LAMELLICORNIA, LONGICORNIA, ETC. BY ADAM WHITE,
ASSIST. ZOOL. DEPART. BRIT. MUS.

(Annulosa, Pl. LVIII., LIX.)

CATADROMUS, MacL.

CATADROMUS ELSEYI. (Pl. LVIII. fig. 3.)

C. nitido-ater; thorace elytrisque viridi marginatis; thorace postice subquadrato; pectore ante propedes, lateraliter viso, recto; elytrorum basi, ad suturam, et pone scutellum, utrinque quadri-punctata.

Hab. In Australia boreali.

This fine Beetle was found on the Upper Victoria, Australia, in lat. 17° 30' S., in April 1856, by the lamented Mr. Elsey, the Surgeon of Mr. Gregory's famous Exploratory Expedition. It is as large as *Catadromus tenebrioides*, Macleay (Ann. Jav. p. 18, *Carabus t.*, Oliv.); the pectus, as in that species, is notched deeply in one sex, as Mr. Ford's admirable figure shows, less deeply in the other. It is an insect with the same long elytra as in that Javan species and in the Australian *C. australis*, differing from the *C. caraboides* from Australia, in which the elytra are much shorter.

PLATYSMA.

PLATYSMA STURTII. (Pl. LVIII. fig. 1.)

P. nigerrime lævigatum; thorace antice latiore quam longo; elytrorum lateribus basi et ante apicem dilatatis; dorso sulcato-striato, interstitiis depresso-convexis.

Hab. In Australia interiore.

Mr. Bakewell kindly gave to the Museum this species: it was found with the following, after a violent flood, and was washed from the plains of the interior into the province of Victoria. I have given to it the name of the great Australian explorer, Capt. Sturt.

PLATYSMA FLINDERSII. (Pl. LVIII. fig. 2.)

P. thorace elongatulo, lateribus rectiusculis; elytrorum basi carina abbreviata, lateraliter extensa.

Hab. In Australia interiore.

Found at the same time as the last. Both seem to be females, and nearly resemble each other: the thorax in this is much more elongate, the shortish outstanding keel at the base is not extended so far down the elytron at the side as in the last; but the general flattened character of the elytra and their dilated hind margin nearly agrees with it. They *may be* sexes of the same species. The first joint of the antennæ is longer than the rest, somewhat as in *Trigonotoma*. I have named it after Capt. Flinders, the great Australian navigator, whose naturalist was "Robertus Brown, Botanicorum facile prin-

ceps," and one of whose midshipmen was the distinguished Arctic explorer, Sir John Franklin.

These two insects should be placed in a new genus ; but shortness of time and other reasons force me to refer them to *Platysma*, or *Percus*. Mr. Ford's admirable figures will make them known.

AULACOPRIS, White.

AULACOPRIS REICHII. (Pl. LVIII. fig. 5.)

A. aterrimus ; thoracis dorso carinis decem elevatis longitudinalibus, quatuor antice et sex postice positis ; elytris muricatis, singulis seriebus tribus longitudinalibus tuberculorum.

Hab. In ripis fluvii Yarræ (Australia).

Mr. Bakewell kindly gave the Museum this fine new species, which I have named in compliment to my excellent friend Mr. Reiche of Paris, who has studied the Lamellicorns so much and described them so well. I remember seeing his fine collection in 1841. This is one of the *Minthophilides* of Lacordaire's third volume, in Section 2, where the pygidium is covered by the elytra. It has a broadly notched lobe on the front of the head, the surface of which is punctured. The femora of the fore legs have a strong, ridged hook on the under side. The deeply grooved thorax has its grooving produced by four elevated ridges on the fore part and six shorter ridges behind, the two portions separated by a transverse groove extending from side to side. The edges of the thorax are crenulated ; on each side of the *Hyboma*-shaped elytra are four rows of pointed tubercles. The tarsi of the hind legs (the specimen is deficient of the tarsi of the other legs) are nearly equal in width throughout. The inside of the hind tibiæ is crenulate or tubercled. All the femora are two-keeled below. The pectus of the metathorax is grooved on the hinder edge, and ends in a ridge.

We have only one specimen. It is a most remarkable Australian form of the family *Copridæ*.

ORYCTES.

ORYCTES MÜLLERANUS. (Pl. LVIII. fig. 4.)

O. lævigatus, brunneo-niger ; thorace valde dilatato, dorso valde cavato, margine antico ad medium cornu apice subfurcato armato, lateribus singulis cornu crasso angulato armatis.

Hab. In Australia sept. (Fitzmaurice River).

This remarkable Beetle, with its much dilated thorax hollowed deeply out on the back, and with a somewhat recurved, slightly forked, projecting horn in front, and a short, angled, strong upstanding horn, like a truncated snag-front, was found by the distinguished botanist Dr. Müller, on the Fitzmaurice River, N. Australia, during Mr. Gregory's exploration, on Oct. 18, 1855, as the late Mr. Elsey told me. Dr. Müller's able papers in the Linnean Society's 'Proceedings' must be valuable additions to Botanical science.

This species belongs to a new genus; but I prefer at present referring it to the old genus, as I have not *data* from which to describe it.

SCHIZORHINA.

SCHIZORHINA (HEMIPHARIS) BAKEWELLII. (Pl. LVIII. fig. 7.)

S. (H.) bakewellii, White, Ann. & Mag. Nat. Hist. 1859, iii. p. 290.

S. rufescenti-flava; capite, corpore subtus, pedibus thoracisque vitta lata mediana longitudinali nigris; thorace supra lævigato, postice ante scutellum dilatato; elytrorum scutello suturaque nigris; marginibus corporis supra maculis sericeo-albis notatis; pygidio transversim aciculato, apice emarginato.

Long. unc. 1, lin. $5\frac{1}{2}$.

Hab. Australia (ad ripas fl. Yarræ).

DIAPHONIA.

DIAPHONIA METALLESCENS, White. (Pl. LVIII. fig. 8.)

D. subrugosula, hirtula, viridi-ænea, obscure purpureo lavata; thorace linea mediana lævigata longitudinali.

Hab. — ?

A species, rather hairy, which may be known from all the others by its slightly metallic bronzy-green hue tinged with purple.

STIGMODERA, Solier.

Among the Australian *Buprestidæ*, and evidently belonging to the genus *Stigmodera*, we have in the Museum, through the great liberality of Mr. Bakewell, a species of interesting form, which at first sight resembles a *Sternocera* in form, or an *Iulodis*; unfortunately I cannot test the character of the diffuse antennal pores, or of these same pores being concentrated into one mass in a fossette of each joint,—characters, very slight, by which Lacordaire divides important groups. The species ought to belong to his third tribe, being somewhat like the *Stigmodera goryi*, but much longer and cylindrical.

STIGMODERA BAKEWELLII. (Pl. LIX. fig. 4.)

S. subcylindrica, Iulodiformis, seu Sternoceræ speciei, primo visu, subsimilis; elytris elongatis simplicibus, luteis, punctato-striatis; thorace purpureo-flavo, coloribus cyaneis et viridibus micante, rude et creberrime punctato; corpore subtus cæruleo viridi fasciato; pedibus cæruleo-viridibus.

Long. unc. 1, lin. 10.

Hab. Australia, in dumetis *Eucalypti dumosi* vulgo dictis “Maillee scrub.”

In honorem Dom. Roberti Bakewell, qui in Australia detexit, et specimen unicum Museo Britannico cum multis aliis insectis raris munificenter in dono dedit.

STIGMODERA PARALLELA. (Pl. LIX. fig. 3.)

S. elongata, parallela; capite thoraceque fusco-purpurascens

crebre et regulariter punctatis, thorace unicolore; elytris nigro-purpureis, sutura marginibusque lætioribus, dorso longitudinaliter sulcato-striato; singulis flavo sex-plagatis, plagis duabus lateralibus, prima basali elongata, secunda ad medium; plagis quatuor dorsalibus longitudinaliter directis, tertia obliqua, quarta subtriangulari; elytris ad apicem integris, interne oblique subtruncatis; pedibus corporeque subtus obscure purpureis.

Hab. In Australia ("Moreton Bay") (Mr. Diggles).

STIGMODERA GULIELMI. (Pl. LIX. fig. 2.)

S. elongata, longo-elliptica, thoracis lateribus antice convexis, postice foveis tribus profunde impressis.

Hab. Australia (Moreton Bay).

Dedicated to my kind friend William Jeakes, Esq., the possessor of a large and ever-increasing collection of insects of the families *Buprestidæ*, *Longicornia*, *Carabidæ*, &c.

TEMOGNATHA.

Among the Australian *Buprestidæ* we have a fine species from the Swan River, which I have named *imperatrix*, from its rich, royal, gold and green enamelled surface.

TEMOGNATHA IMPERATRIX, n. s. (Pl. LIX. fig. 5.)

T. flava; elytris ad apicem mucronatis, sutura etiam apiculata, dorso aureo-flavo, suturæ marginibus lateralibus (spatio pone basim excepto) purpureo-nigris; ad medium dorsi maculis 3-4 parvis transversis purpureo-nigris; pedibus viridibus; corpore subtus flavo, viridi decorato.

Long. unc. 1, lin. 6.

Hab. Australia (Swan River).

BUPRESTIS.

BUPRESTIS (CHRYSOEDEMA) LOUISA. (Pl. LIX. fig. 1.)

B. læte viridis; antennis, tarsorum articulis quatuor basalibus et apice extremo pedum rufulo-flavis; tarsorum articulo ultimo læte cupreo-viridi; elytris sulcato-lineatis, horum laterum dimidio majore apicali denticulato, dentibus purpureis, ad latera vitta elongata depressa; superficie metallica, cupreo-viridi, pilis curtis rufulis obsita.

Hab. In "Fiji Islands, Ovalau" (Mr. John Macgillivray).

Louisæ, conjugis carissimæ Caroli Hyde, Eq., (in exercit. Brit. capitani,) Lepidopterorum præsertim studiosissimæ, insectum hoc pedibus antennisque pallidis valde distinctum, nomen fert.

There is no figure in Gory and Laporte, nor in any of the recent French or other voyages, which resembles this. The elegant species has a depressed flattened thorax, with an impressed line down the centre; and the surface is rather thickly clothed with punctures, some of which have a tendency to accumulate into four depressed spots; the

somewhat grooved lines are deepest behind, and are punctured; the under side and legs are metallic green.

ZOPHEROSIS, White.

ZOPHEROSIS GEORGII. (Pl. LIX. fig. 6.)

Z. subparallelus elongatus, carbonaceo-niger, subnitidulus; elytris rugosissime tuberculatis, dorso generali elytrorum deplanato, lateribus tuberculatis, ad suturam tuberculis minoribus, apice elytrorum subdeclivi, tuberculis ante apicem maximis; thoracis lateribus rectiusculis, paulo curvatis, antice posticeque extensis, superficie dorsali valde irregulari, medio postice sulco profundo impresso, medio antice lævi, parte lævi postice sulcis angustis profundis sinuatis marginata.

Long. lin. 14; lat. max. elytror. pone medium lin. $4\frac{1}{2}$.

Hab. Australia ("New South Wales") (*Mr. John Macgillivray*).

In general appearance this remarkable insect closely resembles the species of the genus *Nosodendron*, particularly the *N. morbillosum* from Chili; but it evidently (as Mr. Waterhouse, who kindly examined it, and after whose Christian name its specific name is derived, remarks) is closely allied to *Zopherus*, G. R. Gray. Like that genus, it has the deep groove on the under side of the thorax, for the reception of the antennæ. This groove is widest at the end, and must effectually screen these organs from injury. The antennæ have the first eight joints with the inner edge straight, and forming a continuous line, while the outer edges of each of these joints are somewhat rounded, and give a moniliform appearance to the outer edge; the second joint is the smallest, it is very short, and widish compared with its length; the third joint is considerably longer than the joints from the fourth to the eighth; the three terminal joints form a short club, the sides of which have two notches, caused by the middle part of each joint across being the widest and the sides tapering to this point. The thorax and elytra are very like those of some species of *Nosodendron*; the tarsi, on the under side, have a widish groove, each of the sides of which have a keel; the prothorax below has a deep curved sulcus close to the margin, and two faint grooves behind it, and the sternal plate between the fore legs, which plate has on each side of the trochanter a curved groove, neatly impinged on the outer side.

The species of *Zopherus* are all from the New World; and as there are several species which agree together, others from Australia may be found agreeing with this: it may be called *Zopherosis*. The last segment of the abdomen has on each side a deep transverse bisinuated groove. This may possibly be sexual; but as the Museum only possesses a single specimen, I cannot tell.

DISTICHOCERA.

In the Proceedings of this Society, Mr. Newman, two or three years ago, described the species of this genus. I here add the description of a new species.

DISTICHOCERA THOMSONELLA, n. s. (Pl. LVIII. fig. 6.)

D. thomsonella, White, Ann. & Mag. Nat. Hist.

D. velutino-nigra; capite, thorace elytrisque maculis albo-sericeis notatis; pedibus nigris; femoribus, apice atro excepto, rubris (♂).

Long. lin. $6\frac{1}{2}$.

Hab. Australia.

Named in compliment to the well-known author and publisher of the 'Archives Entomologiques' and other finely illustrated entomological works.

RHYTIPHORA.

RHYTIPHORA AMICULA. (Pl. LIX. fig. 7.)

R. pilis cinereis delicatule obsita, plagulis rufulo-flavis variegata; elytrorum apice subtruncato, ad basin verrucis nigris paucis exstantibus, dorso carinulis duabus (saltem) haud prominentibus longitudinalibus.

Hab. In Australia septentrionali (Dom. Elsey).

The late Mr. Elsey found this species at the Victoria River dépôt, on Mr. Gregory's expedition; it is of a most delicate ash-colour, and slightly ornamented with dots of reddish-yellow hairs.

A species closely allied to *Rhytiphora polymita* of Mr. Pascoe. The antenna-joints, after the second, are fringed with hair; the head and thorax are thickly punctured under the hairs, and varied with rufous-yellow dots; the antennæ are cinereous, the fringe blackish, evanescent on the last joint.

SYMPHELETES.

SYMPHELETES (PLATYMOPSIS) ARMATULUS. (Pl. LIX. fig. 8.)

S. argenteo-cinereus, plagulis indistinctis rufescenti-flavulis, macula subobliqua subquadrata nigro-fusca in lateribus elytrorum ante medium, parte basali elytrorum colore subobfuscat, spinis curtis conicis paucis lineatim directis subarmata, spinis paucis in medio ad suturam, et paucis semiobsoletis in partibus alteris elytrorum; elytris ad apicem externum spinigerum ad suturam truncatis; thorace spinis (tuberculis potius) duabus transverse in medio dorsi positis, tuberculo in lateribus singulis thoracis ad angulum anticum.

Hab. In Australia septentrionali.

Collected by the late lamented J. R. Elsey, Esq., Surgeon to Mr. Gregory's Exploring Expedition. In this species the silvery grey pubescence, blackened somewhat on the base and on the hinder parts, and the squarish brownish-black spot on the sides before the middle, with a very short white oblique band before it, directed backwards, and another light and longer band considerably behind it, and directed forwards, and reaching almost to the suture, the conical spines on the back of elytra at the base and along the suture, and

other characters, mark it out as distinct from any other. The *Saperda obliqua* of Donovan is not unlike it. The hairs fringing the inside of the antennæ are whitish; while the eyes are nearly divided into two portions, the connecting part being very small. I must say I do not see any very trenchant characters to separate *Nyphona* and *Saperdopsis* or *Symphyletes*, Newm. In one *Lamia* (*L. pedicornis*), the great spine proceeding from the trochanters is a sexual character, possessed to a greater extent (and considerably curved) by a curious Longicorn from the Aru Islands, which will doubtless be described by my friend Mr. Pascoe, who studies the Longicorns so much, and who has described so many. In this the tibiæ of the fore legs are curved and have a spine at right angles to the tibia and near its tip. In the genus *Platymopsis*, established by Buquet in the 'Archives Entomologiques,' the head is flatter and broader than in *Symphyletes*. As we have not the 'Archives' in the British Museum, I can only quote it on Mr. Pascoe's authority. The head in *S. (Pl.) armatus* is widish and hardly notched.

3. DESCRIPTION OF TWO NEW SPECIES OF *BULIMUS* FROM THE COLLECTION OF MRS. DE BURGH. BY LOVELL REEVE, F.L.S., F.G.S.

BULIMUS DEBURGHIE. *Bul. testa elongato-ovata, crassiuscula, parum ventricosa, intense cærulescenti-viridi, infra suturas flavicanti-viridi abrupte interrupta, strigis flavidis longitudinalibus oblique undatis subdistantibus ornata, linea nigra spiraliter decurrente; anfractibus sex, declivi-convexis, lævibus, apertura parviuscula alba; labro reflexo; columella eburnea, valide implicata.*

Long. $2\frac{3}{4}$ in. Lat. $1\frac{1}{4}$ in.

Hab. Peruvian side of the Amazon.

A fine solid shell, encircled by a broad dark-green band, which suddenly stops short within a quarter of an inch of the suture, where the shell is yellowish-green, and it is crossed obliquely with yellow lightning-marks, which on reaching a thin black spiral band become narrower and more numerous. The columella, which is strongly plaited, and the aperture, are of a shining porcelain white.

BULIMUS PEELII. *Bul. testa elongato-ovata, subfusiformi, basi effusa, albida, maculis undatis ferrugineo-griseis albipunctatis fasciatim marmorata; anfractibus sex, lævibus aut longitudinaliter plicato-striatis; columella subappressa et oblique contorta vivide aurantiaca; apertura parviuscula, depressa; labro tenuiter reflexo, intus vivide aurantiaco.*

Long. $2\frac{1}{8}$ in. Lat. $\frac{3}{4}$ in.

Hab. Peruvian side of the Amazon.

This very elegant species belongs to the Bolivian and New Granada type of the genus represented by *B. fusoides*, *murinus*, *lino-*

stoma, and *spectatus*. It is painted with white-dotted rust-grey waved bands upon a white ground, the columella and border of the aperture being tinged with bright orange. I have the pleasure of naming it after Capt. John Peel.

4. SOME ADDITIONAL OBSERVATIONS ON *ZOANTHUS COUCHII*. By E. W. H. HOLDSWORTH, F.L.S., F.Z.S., ETC.

Some fine groups of *Zoanthus couchii* from Torbay having lately come under my notice, I have been enabled to obtain a better knowledge of the species than I possessed when I recently laid before the Society a description of its characters. I therefore venture to add a few remarks on certain points, which before were considered as relating to particular specimens, rather than to the species generally.

First, as to size. The dimensions given in my previous communication were those of the largest Polypes that I had seen alive, and which were described as being from 2 to $3\frac{1}{2}$ lines in height by about $1\frac{1}{2}$ in breadth; such also is the size of many that I have seen since; but among them have been several examples in which these measurements have been nearly doubled, and with the increase of size a power of varying the shape of the body has been exhibited, almost equalling that of *Corynactis*, so well known for the remarkable changes of form that it undergoes. This mutability of shape is dependent in a great measure on the degree of density of the external coating of sand, which does not increase in proportion to the growth of the animal; so that while the half-grown Polype is closely imprisoned in its hard covering, older and larger individuals are less thickly clothed; and when in a state of expansion, the grains of sand are sufficiently separated to allow the integument to be seen between them, and thus to permit that mobility of body which is so characteristic of the *Zoanthidæ*. The rigid form in the first specimens that I examined, was one of the difficulties that I met with in identifying them with Mr. Couch's description of the species.

There are some other points of disagreement which I have little hesitation in saying are due to a misconception on the part of Mr. Couch when preparing the original description. I refer especially to the statement that "the surface of the body is minutely glandular," and that "radiating from the mouth are numerous rows of whitish glandular-looking bodies, which are the tentacula in a contracted state;" in both these cases it is evident that the character of the sandy covering has been misunderstood. Secondly, as to the growth of the basal membrane. I have previously referred to it under the linear and expanded forms, which I then ventured to think were only modifications in the development of one species: the recently captured specimens throw some further light on the subject. Among various groups on one large shell, I have found lines of Polypes sometimes sending out lateral shoots from the basal membrane, and these again dividing; others expanding, so as to include two or three Polypes in parallel series, and in one instance a single specimen

was observed with the basal expansion extending equally on every side: again, the membrane leading from a group spreads at times over the surface of the shell in an irregular manner for a considerable distance, without any bud arising from it; so that no special form of growth can be considered as characteristic of the connecting membrane in this species. The rate of development in the members of a group is also of the same uncertain character—a large Polype being occasionally followed by a very small one, and that succeeded by two or three of intermediate but varying size; in fact, except in certain characters, the development of this *Zoanthus* is subject to great irregularity; and the cases above mentioned appear to me to confirm the opinion that I have before expressed of the specific identity of the linear form of growth with that which has been found in the Northern seas, overspreading the entire surface of small univalves.

5. NOTE ON THE ARTIFICIAL PROPAGATION OF SALMON.

BY A. D. BARTLETT.

The Committee of the Australian Association have been trying a series of experiments with a view of ascertaining the possibility of conveying Salmon to Australia, for the purpose of introducing this noble fish into the rivers of that country. The difficulty is to convey them across the tropics; and the object of these experiments, which have been carried on in the Crystal Palace under my supervision, has been—

1. To filter a sufficient quantity of water to supply a running stream for the spawn or young fish.
2. To ascertain the highest amount of temperature in which they would live.
3. To discover the best and most economical means of lowering the temperature, that they may be kept alive while passing the tropics.

In order to accomplish the first object, arrangements were made with the Charcoal Filter Company to fix filters to supply a running stream through long boxes, which were partly filled with gravel and small stones, upon which the Salmon ova were to be placed.

Mr. Ramsbottom being engaged to obtain the ova and to ensure their being perfectly impregnated, and to deposit them in the breeding place in the Crystal Palace, proceeded to Wales, and on the 5th of February obtained from two female fish at least 20,000 ova, which, by the usual process adopted in the artificial propagation of fish, he rendered fertile, and then starting immediately for the Crystal Palace, arrived there February 7th, and deposited the ova in the breeding-boxes, which had been duly prepared. Unfortunately, at this time the filters had ceased to act, and the water supplied by the Lambeth Water Company was obliged to be laid on in its usual state. In a few days the ova and the bottom of the breeding-boxes became co-

vered with a dark deposit, from the impure condition of the water, and large numbers of the ova died daily in consequence. Another batch of filters was then fixed, and a fresh supply of filtered water obtained; and no more sediment was deposited upon the ova. Notwithstanding this, they continued to die for some days; but about the 20th, the whole of the deposit, which had settled upon the bottom of the boxes and upon the ova, began to rise towards the surface in the form of *Confervæ*; the bottom of the boxes and the remaining ova appeared quite fresh and clean; the surviving ova rapidly assumed the perfect state of the young fish; and on March 7th the young fry began to move about (the outer covering being thrown off), endeavouring to hide themselves between the stones and gravel. The temperature of the water during this experiment was 57° . In order to ascertain if any advantage could be gained by placing some of these in filtered water at a lower temperature, a number of them were carefully removed to a glass tank, supplied with a fountain at the temperature of 54° . In this they appeared to be doing well, were evidently larger and more active, and exhibited great promise. Unfortunately, on the morning of the 13th, the workmen having been ordered to make some alteration in the water pipes in the building, turned off the water, leaving the young salmon, together with the ova which had not yet been hatched, five or six hours without fresh water, in the tropical end of the building: in consequence of this, they were all destroyed, and this interesting experiment delayed for a whole year, as it is impossible to obtain the ova until the next breeding-season.

There are, however, some important facts learned from this experiment, one of which is the early period of hatching. Previous experiments have shown that 60 days usually expire before the young come to life; sometimes 140 days have passed. This experiment has proved that the young fish can be hatched in 30 days: it yet remains to be tested whether this is an advantage. It is certain that in the case of more highly organized and warm-blooded animals, their production at an earlier period than the ordinary one is attended, if not with death, at least with great debility; while, on the other hand, it is not possible to retard the operations of nature beyond the ordinary period without destroying the mother or the offspring. There are many circumstances that induce the belief that the young fish would be stronger by the early development; but no positive conclusion can be arrived at without further experiments.

Mr. Gould took occasion to lay upon the table specimens of all the known species of the genus *Elanus*, and made some observations upon their habits and economy, and their distribution over the face of the globe. With the exception of *Elanus leucurus*, which is confined to America, all the other species of the genus are inhabitants of the Old World, the *Elanus melanopterus* being found sparingly in Southern Europe, Africa, the Indian Peninsula, and pro-

bably Java,—the *Elanus axillaris* inhabiting Australia, and perhaps extending its range to Java (he said perhaps, because a slight difference is observable between the only Javan specimen he had seen and those from Australia), and the fine *Elanus inscriptus* having been hitherto found only in Australia. To these he now added, to the Old World a fourth species, and to the entire group a fifth, by characterizing a fine bird from Celebes as *Elanus hypoleucus*. This new species is one of the largest members of the genus, and is rendered conspicuous by the entire under surface being white, even the basal half of all the primaries being of this hue,—in which respect, and in its larger size, it materially differs from the *E. melanopterus*, the only bird with which it could be confounded.

ELANUS HYPOLEUCUS, Gould.

Adult.—Face, space over the eye, ear-coverts, all the under surface of the body, under tail-coverts, under surface of the tail feathers, and the thighs, pure white; the under surface of the wing is also pure white; basal half of the under side of the first six primaries white, slightly speckled with grey, passing into blackish grey; on their apical halves this grey hue also pervades the under surface of the remaining primaries; crown of the head, back of the neck, back, and scapularies, deep grey; on the shoulders a large patch of black; secondaries and basal half of the primaries deep grey, passing into blackish grey at their tips; two centre tail feathers grey above, the next on each side grey on their outer margins, the rest white; cere and legs orange yellow; bill and nails black.

Total length, 14 inches; bill, $1\frac{1}{4}$; wing, $12\frac{1}{8}$; tail, $6\frac{3}{4}$; tarsi, $1\frac{5}{8}$.

Young.—At apparently about nine months old differs from the adult in having the crown lineated with reddish brown, and a crescent of white at the tip of the primaries, secondaries, scapularies, and wing-coverts.

Hab. Vicinity of Macassar, Celebes.

Remark.—The above description of the adult is taken from a fine example in the possession of J. H. Gurney, Esq., which, as well as the young bird in the possession of Mr. Gould, was collected by Mr. Wallace.

Dr. Crisp exhibited a hen, six years of age, that had taken on the plumage of the cock; the bird also had spurs an inch long. On dissection, the ovary was found converted into a hard cartilaginous mass of uniform consistence. He placed the specimen before the Society, not because this abnormal state of the ovary, and consequent change of external character, was of rare occurrence, but rather for the purpose of ascertaining whether such changes of plumage occurred in birds living in a state of nature. Dr. Crisp had seen them in the Hen, tame Duck, and common Pheasant; but the last-named bird in this country could scarcely be called a wild bird.

There was one curious physiological deduction which he might notice: viz. that when quadrupeds were castrated (young), they

assumed a feminine appearance ; but birds, on the contrary, when the function of the ovary was destroyed, put on the male character.

March 22nd, 1859.

Dr. Gray, F.R.S., V.P., in the Chair.

Mr. Gould exhibited and characterized two new species of birds, one belonging to the family *Cuculidæ*, the other to the *Coturniceæ*, and remarkable as forming probably the smallest species of the groups to which they respectively pertained.

For a small Shining Cuckoo, killed at Port Essington, on the north coast of Australia, and of the same form and very nearly allied to the *Chrysococcyx lucidus* of New South Wales and the *C. basalis* of Java, Mr. Gould proposed the name of *Chrysococcyx minutillus* ; and for the Quail, which belonged to the genus *Excalfactoria* of Bonaparte, that of *Excalfactoria minima*.

The following are the descriptions of these new species :—

CHRYSOCOCYX MINUTILLUS, Gould.

Head, all the upper surface, and wings shining bronzy-green ; all the under surface white, barred with bronzy-green, the bars being most distinct on the flanks ; primaries and secondaries white on the basal portion of their inner webs ; two centre tail feathers bronzy-green ; the next on each side bronzy-green on the outer web, rufous on the inner web, crossed by a broad band of black near the tip, and with an oval spot of white across the tip of the inner web ; the two next on each side bronzy-green on their outer webs, their inner webs rufous, with large spots of black near the shaft, most conspicuous in the outermost of the two feathers ; their inner webs are also crossed near the tip with a very broad band of black, and have an oval spot of white at the tip ; the outer feather on each side is barred alternately on the outer web with dull bronzy-green and dull white, and on the inner one with broad decided bars of black and white, and tipped with white ; bill black ; feet olive.

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

Remark.—This bird is perhaps more nearly allied to the Java species, *C. basalis* of Horsfield, than to the *C. lucidus* ; but it is as much smaller than the *C. basalis* as that bird is less than *C. lucidus*. The type of *C. basalis*, which is the only one I have seen, is not a fully adult bird ; and yet the measurement of its wing exceeds by half an inch that of the *C. minutillus*.

EXCALFACTORIA MINIMA, Gould.

Forehead and sides of the head grey ; crown of the head, all the upper surface, and wing-coverts reddish-brown, conspicuously spotted

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PHILIP LUTLEY SCLATER, M.A.,

Secretary.

THE
PROCEEDINGS
OF THE
ZOOLOGICAL SOCIETY
OF
LONDON.

1859.



PART II.
MARCH—JUNE.

PRINTED FOR THE SOCIETY ;
SOLD AT THEIR HOUSE IN HANOVER-SQUARE,
AND BY
MESSRS. LONGMAN, GREEN, LONGMANS, AND ROBERTS,
PATERNOSTER ROW.

[*Price 2s.*]

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and minutely freckled with brownish-black, a line of buff down the crown and nape, and a narrow line of brownish-white down the centre of the feathers, changing to broad and conspicuous stripes of buff on the lower part of the back and tail-coverts; wings pale brown; chin and throat black, on each side of which is an oblong patch of white encircled by a narrow line of black; below the black a broad crescent of white, fringed on the sides with black, and bounded below by a narrow semi-crescent of deep black; under surface grey, mottled on the flanks like the upper surface; line down the centre of the abdomen, thighs, and under tail-coverts chestnut-red; bill black; feet yellowish.

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

Hab. Vicinity of Macassar, Celebes.

Remark.—For this, the most diminutive species of the *Gallinaceæ* yet discovered, we are indebted to the researches of A. R. Wallace, Esq. It is of precisely the same form and very nearly allied to, but quite distinct from, the well-known Chinese Quail, *Excalfactoria chinensis* (*Coturnix chinensis* of authors).

The following extract from a Letter received by Mr. S. Stevens from Mr. Wallace, dated Batchian, Moluccas, Oct. 29, 1858, was read:—

“Here I have been as yet only five days; but from the nature of the country, and what I have already done, I am inclined to think it may prove one of the best localities I have yet visited. Birds are as yet very scarce; but I still hope to get a fine collection, though I believe I have already the *finest and most wonderful* bird in the island. I had a good mind to keep it a secret, but I cannot resist telling you. I have a new *Bird of Paradise*! of a new genus!! quite unlike anything yet known, very curious and very handsome!!! When I can get a couple of pairs, I will send them overland, to see what a new Bird of Paradise will really fetch. Had I seen the bird in Ternate, I should never have believed it came from *here*, so far out of the hitherto supposed region of the *Paradiseidæ*. I consider it the *greatest* discovery I have yet made; and it gives me hopes of getting other species in Gilolo and Ceram. There is also here a species of Monkey—much further eastwards than in any other island; so you see this is a most curious locality, combining forms of the East and West of the Archipelago, yet with species peculiar to itself. It also differs from all the other Moluccas in its geological formation, containing iron, coal, copper, and gold, with a glorious forest vegetation and fine large mountain streams: it is a continent in miniature. The Dutch are working the coals; and there is a good road to the mines, which gives one easy access to the interior forests.

“I can do nothing at drawing birds, but send you a horrible sketch of my discovery, that you may not die of curiosity. I am told the wet season here is terrible, and it begins in December; so I shall probably have to leave then.”

No. 392.—PROCEEDINGS OF THE ZOOLOGICAL SOCIETY.

The sketch alluded to in the above extract having been placed in Mr. G. R. Gray's hands for examination and comparison with the other known species, the following notes of that gentleman, relative to it, were read to the meeting :—

"This Paradise-Bird proves, as Mr. Wallace remarks in his lettre, to be a new form, differing from all its congeners, approaching most nearly to the King Bird of Paradise ; but in place of the lengthened caudal appendages, it has, springing from the lesser coverts of each wing, two long shafts, both of which are webbed on each side at the apex. It is the possession of these peculiar winged standards that induces me to propose for it the subgeneric appellation of *Semioptera*.

"I have endeavoured to transform the rough sketch into the probable appearance of the living bird ; and I further add the provisional specific name of *Paradisea wallacii*, which appellation I think is justly due to Mr. Wallace for the indefatigable energy he has hitherto shown in the advancement of ornithological and entomological knowledge, by visiting localities rarely if ever travelled by naturalists.

"I wait for the arrival of the specimens before venturing to give more detailed accounts of its subgeneric characters, or a full description of its coloration, &c., which I hope to have the pleasure of laying before the members at some future meeting of the Society."

Mr. G. R. Gray laid before the meeting a drawing of *Tringa pectoralis*, which was made by the late Mr. Adams, Surgeon of H.M.S. 'Enterprise.' It exhibited the bird in the act of having inflated its throat and breast in the manner of the Pouter Pigeon. From the correctness of the other drawings by the same gentleman, Mr. Gray had little doubt that Mr. Adams observed this singular phenomenon in the specimen from which the drawing was taken. The drawing was more especially placed before the members, in the hopes of learning whether such a singularity of habits had been noticed before in this species or in any other of the *Tringæ*.

The bird has peculiar feathers on its breast.

April 12, 1859.

Professor Busk, F.R.S., in the Chair.

The following papers were read :—

1. DESCRIPTION OF A NEW SPECIES OF OWL OF THE GENUS
CICCABA. BY PHILIP LUTLEY SCLATER.

Mr. Gurney has invited my attention to the example of an Owl of the genus *Ciccaba*, which I now exhibit. It has already passed through my hands once, having been submitted to my examination by M. Verreaux, along with other birds from Southern Mexico, of which I gave some account in these 'Proceedings' for last year. As will be seen by referring to my remarks given on that occasion*, I then somewhat unwillingly referred it to *Ciccaba huhula*. Mr. Gurney, however, having acquired the specimen for the Norwich Museum, agrees with M. Jules Verreaux (whose opinion to that effect I have already recorded) in insisting on its distinctness. And having lately had an opportunity of examining a second specimen of this bird in the collection of the Jardin des Plantes at Paris, I am now quite prepared to coincide with their views, and to characterize this Mexican *Ciccaba* as an independent species, differing from, though closely allied to, the S. American *Ciccaba huhula*. It may be recognized at once by the more uniform colour above, there being hardly a trace of white transverse markings, except on the elongated feathers of the neck-collar; and by the ground-colour below being pure white, crossed by frequent narrow bands of black, each feather showing three or four of such cross-bands. I propose to call this bird

CICCABA NIGROLINEATA.

Schistacescenti-nigra, colli postici plumis elongatis et albo ter quaterve transfasciatis : maculis in regione superciliari et auriculari quibusdam albis : subtus alba, lineis nigris crebro transfasciata : mento nigro : subalaribus albis, nigro variegatis : cauda nigra, albo quinquies transfasciata : rostro et pedibus flavissimis : tibiis nigris, albo sparsis.

Long. tota 15·0, alæ 10·5, caudæ 6·78, rostri a rectu 1·35, tarsi 2·1.

Hab. In Mexico Meridionali.

Mus. Norfolkense et Parisiense.

2. NOTE ON THE SPUR-WINGED GEESE (PLECTROPTERUS) NOW
LIVING IN THE SOCIETY'S GARDENS. BY PHILIP LUTLEY
SCLATER.

(Aves, Pl. CLIII.)

The Society have frequently possessed living examples of the Spur-winged Goose of Western Africa (*Plectropterus gambensis*); and we

* See P.Z.S. 1858, p. 96.

have at present two male examples of this bird in the Gardens. Last summer, along with the Secretary-birds (*Serpentarius reptili-vorus*), came two Spur-winged Geese from Eastern Africa. They were placed in the Gardens along with the W. African pair, and immediately attracted the notice of those who take an interest in such matters, as being apparently of a different species. Comparing the males of the eastern and western birds together, we observe that the former is larger, stands considerably higher, and has longer tarsi and larger feet. There is a large oblong naked space of bare pink skin on the throat, which is wholly wanting in the West African bird; the beak is longer, and the bony protuberance on the front is much larger and more elevated. We have not, unfortunately, the female of the eastern species; but Rüppell tells us that in her too there is a stripe of naked skin between the eye and the base of the bill. Now in the western bird the whole sides of the head in both sexes are closely feathered: the male has a frontal protuberance (much smaller, however, than in the eastern species); the female has none. It appears therefore that two species have been confounded together under the name *gambensis*. The West African bird, originally brought from the Gambia (whence the name), and which has been described and figured as such by Latham, Yarrell, and other writers, is obviously the proper owner of the title *Plectropterus gambensis*; while the East African bird, first accurately figured and described by Dr. E. Rüppell in the third volume of the 'Museum Senckenbergianum,' may very appropriately take the name of *Plectropterus rüppellii*.

On examining the stuffed specimens in the gallery of the British Museum, as I have been enabled to do through Mr. G. R. Gray's kindness, I find examples of both species. Of the larger *Plectropterus rüppellii* there is a male bird procured during Clapperton's expedition in Central Africa, and a female which died in the Zoological Gardens. Of the smaller *Plectropterus gambensis* there is one from Western Africa, and one of which the locality is not marked. An immature bird from the Cape is certainly referable to the smaller species.

The separation of these two birds may not perhaps be entirely satisfactory until we have had an opportunity of examining their internal structure, several parts of which, particularly the trachea, are well known to afford good characters for discriminating nearly allied species among the *Anatidæ*, as has been so successfully shown in Mr. Eyton's Monograph.

In the accompanying plate (Pl. CLIII.) are represented the male birds of *Plectropterus gambensis* and *Plectropterus rüppellii*.

3. NOTES ON THE SCALY ANT-EATER (*MANIS JAVANICA*), TAKEN DURING LIFE AND AFTER DEATH. BY ARTHUR ADAMS, F.L.S., SURGEON H.M.S. 'ACTEON.'

A. During Life.

Two living specimens of this singular mammal having come under my observation, I am induced to offer some account of their habits as far as I was enabled to make them out.

Our first Ant-eater is a female, and rejoices in the *sobriquet* of "Scales." She is crepuscular, and remains coiled up in a ball during the day, secure in her scaly panoply; but at the decline of day she grows lively. Now a creature whose habits require to be studied by the aid of a dark lantern must needs be interesting even to the most incurious; and a Lizard-like Mammal whose every movement and attitude is probably a living illustration of those great extinct quadrupeds which once peopled the earth before man was created, must certainly have the power of arresting the attention, if not of stimulating the imagination. I doubt not Professor Owen would have lain prone on his stomach all the livelong night to watch the evolutions of this gnome-like mountaineer. And indeed there is something old-world and weird in her aspect as she prowls about at night. The Scotch would say she has an "uncanny" look; and truly, if but ten times bigger, she would unmistakeably remind one of the times before the Deluge. When she walks she treads gingerly on the bent-under claws of her fore feet, and more firmly on the palms of her hind feet. A very favourite attitude with her is that assumed by her gigantic extinct analogue the *Mylodon*, as seen in the wondrous model of Waterhouse Hawkins in the Gardens of the Crystal Palace. The fore feet in my "Madam Scales" are raised; and the animal is supported by the strong hind limbs, and firm, flattened, powerful muscular tail, the head and body being at the same time moved from side to side, and the little round prominent eyes peering curiously about in every direction. In walking, the fourth toe of the hind foot is also extended. The Chinese, in their sly manner, say that she pretends to be very quiet; but "s'pose no man lookee," she runs very fast. She is certainly of a very timid and retiring disposition, tucking in her head between her fore legs on the least alarm. So apathetic a quadruped appeared our "Pangolin" (for such is she called by the Malays), that, coiled up in a strong net, I considered her properly secured, and carefully deposited her in my cabin. But no sooner did the last gleam of light vanish from my little "scuttle" than she knew the period of her lethargy had expired, and, bursting the trammels of her hempen toil, she roamed abroad; and the first intimation I had of her escape was the ominous bark of Master "Wouff," a clever little terrier we had on board. Dog, puzzled by the queer scaly rat he had suddenly encountered, regarded with impotent rage the lizard-like intruder; while "Scales," secure in her coat of mail, bid defiance to the attacks of her canine assailant.

The Scaly Ant-eater is called by the Chinese of Quang-tung

"Chun-shau-cāp," which literally means "Scaly Hill-borer." They also name it "Ling-li" or "Hill-Carp;" and it seems to be regarded by them as truly "a fish out of water." They say it lives in the sides of the great mountains, and that it lays a trap for insects by erecting its scales, when, suddenly closing them, flies, ants, and other intruders are secured, and, when dead, fall out and are eaten. They also assert that it feeds upon fish; but both these stories appear to be myths something similar to those told of our own familiar "Hedge-pig" sucking the teats of cows, and impaling apples on her quills in the orchards. The *Manis javanica* is sold in the markets at Canton, and is often carried about the streets as a curiosity. The scales are employed by the Chinese for medicinal purposes; but the flesh does not appear to be eaten, though it is very excellent food when roasted, as I can testify from personal experience, having had a portion of the defunct "Scales" nicely cooked. The *Manis* climbs very well, and can suspend itself head downwards by means of its strong flat tail. We fed our "Scaly Hill-borers" on raw eggs and chopped raw beef, on which they seemed to thrive. The unfortunate "Scales" fell a victim to female curiosity. Exploring the hold of the ship in one of her midnight rambles, she was lost for a time, and at length found her way back to her box, where she died of starvation.

B. After Death.

Our specimen was an adult female, weighing 4 lbs. The length from the end of the nose to the root of the tail was $14\frac{1}{2}$ inches, of the head 3 inches, and of tail $10\frac{3}{4}$; extreme length 2 feet $1\frac{1}{4}$ inch.

Head.—The eye is protuberant, and the cornea remarkably convex; the vision is lateral; the eye-lids are pyriform, the pointed end forward, the upper lid well-rounded; the iris is brown, with a tinge of green. The nostrils and lips are fleshy, naked, and, when the animal is alive, constantly moistened by a mucous secretion. The ears are naked and open. The tongue (used as a feeler during life) is 9 inches in length, and is enclosed in a membranous sheath; it is highly retractile and muscular, subcylindrical at the base, flattened at the anterior half, grooved on the upper surface, and beset with prominent papillæ. At the hinder end of the groove, arranged in the form of an equilateral triangle, are three pores which secrete a viscid fluid. The epiglottis is broad and hood-like; the thyroid glands are $2\frac{1}{2}$ inches in length and $1\frac{1}{4}$ in width: they are very large, ovate, and pointed at each end.

Thorax.—The mammary glands are large, pectoral, two in number, and well developed. The lungs are composed of three lobes on the right, and two on the left side; the middle lobe very small; the lower lobe furnished with a process which embraces the base of the heart. The heart is central, large, and oval; the auricles very distinct; the ventricles thick and fleshy; the columnæ carneæ and chorda tendinea very strong; the vena cava very large. The liver is large and five-lobed; the upper lobe is large, the middle is notched in front, irregular and trilobate; the left lateral is rounded, with a

thin edge; the right lateral is subcylindrical and truncate below. The gall-bladder is large, and placed between the upper central and right lateral lobes of the liver. The pancreas is of loose texture, transversely elongated, flattened and pointed, obliquely truncate at one end, angular and pointed at the other; coiled up imbedded in a sac on the outer surface of the truncate extremity, was a small slender worm.

The omentum is thin and membranous, with no fat; the mesentery is membranous and transparent, the vessels conspicuous, and the glands large, brown, and flattened.

The stomach is simple, 4 inches in length, the greatest breadth 3 inches; coats muscular, especially at the pyloric extremity, where the muscle is thickened so as almost to form a fleshy gizzard. The mucous membrane is loosely corrugated at the cardiac end, and densely covered with papillæ at the pyloric extremity. There is a central pyriform tubercle suspended from the lesser curvature, projecting into the cavity of the stomach.

Between the thickened parts of the stomach, imbedded in the coats on the greater curvature, and midway between the cardia and pylorus, is a small sac surrounded by a mass of glands, the use and structure of which is to me unknown.

The small intestines are 10 feet 10 inches long, and half an inch in circumference; they are dark-coloured and vascular.

The cæcum is $2\frac{1}{2}$ inches in length and 1 inch in circumference. The large intestines are 10 inches long and $1\frac{1}{2}$ inch in circumference.

The kidneys are ovoid, large, and smooth; the pelvis ending in a single follicle or sac; the ureters end near the neck of the small pear-shaped bladder.

The ovaries are $\frac{1}{4}$ inch long, small, yellow, ovoid, and spotted, and situated at the inner side of the horns of the uterus.

The uterus is divided above into two horns, which are curved inwards and downwards; each cornu is 1 inch in length; body of uterus $1\frac{1}{2}$ inch long and subcylindrical. Fallopian tubes 2 inches in length. Vagina long and muscular. Anus immediately behind vulva at root of tail; there is a transverse linear opening leading to a *cul de sac* $\frac{1}{2}$ inch deep, studded with conical papillæ, and which is the seat of the peculiar odour of the *Manis*, which is alliaceous.

A second Entozoon was found in the muscles of the lumbar region.

4. LIST OF THE FIRST COLLECTION OF BIRDS MADE BY MR. LOUIS FRASER AT PALLATANGA, ECUADOR, WITH NOTES AND DESCRIPTIONS OF NEW SPECIES. BY PHILIP LUTLEY SCLATER.

(Aves, Pl. CLIV.)

Mr. Fraser passed part of the month of August, the whole of September and October, and part of November last year at Pallatanga, a *puebla* lying to the S.E. of Riobamba on the Pacific slope of the

Western Cordillera of Ecuador in the *tierra caliente*. The branch of the Rio Chimbo, which flows through the ravine on which this place is situated, joins the main stream below, and enters the gulf of Guayaquil. The place is marked in Dr. Villavicencio's Map of Ecuador, and described in his 'Geografia,' p. 326. The following list gives the species contained in Mr. Fraser's first collection from this locality, a second and larger collection not having been received by reason of the blockade of Guayaquil by the forces of the neighbouring republic of Peru. This is by far the best locality for birds that Mr. Fraser has yet visited. The collection contains 290 skins, representing 102 species, among which are several interesting novelties. In the first rank of these must be placed the new Umbrella-bird, *Cephalopterus penduliger*, which I have already exhibited to the Society. Other apparently new species are *Vireo josephæ*, *Nemosia ornata*, *Anabates subalaris* and *A. temporalis*, *Dysithamnus unicolor*, *Formicivora caloptera*, and *Pachyrhamphus homochrous*, all of which I have described below; and *Odontophorus erythrops*, which Mr. Gould has already described in these 'Proceedings.' Besides these, we have some scarce Humming-birds—*Panoplitus mathewsii*, *Heliotrypha viola*, and *Bourcieria fulgidigula*,—and some rare and beautiful Toucans—*Andigena laminirostris* and *Aulacorhamphus erythropygius*. I forbear making remarks upon the general character of the ornithology of this locality until the arrival of Mr. Fraser's second collection, formed on the same spot, shall give us a further insight into its peculiarities.

I. PASSERES.

1. *TURDUS GIGAS*, Fraser.

Irides hazel; bill, legs, and feet orange. 1 ex. ♀, Sept.

2. *TURDUS ATROSERICEUS* (Lafr.).—*Merula atrosericea*, Lafr. R. Z. 1848, p. 3.

"Bill, rim round the eyes, legs, and feet orange." 1 ex. ♂.

3. *TURDUS ALBIVENTRIS*, Spix.

"♂, irides light brown; bill greenish-yellow."

4. *CATHARUS FUSCATER* (Lafr.).—*Myioturdus fuscater*, Lafr. R. Z. 1845, p. 341; Sclater, P. Z. S. 1858, p. 64.

Several specimens, ♂ and ♀. Sexes alike. *Merlo*. "Bill and rim round the eyes red; legs and feet orange. Frequents swampy places. Contents of stomach—fruit, seeds, and insects."

Comparing these specimens with examples of *Catharus melpomene* I can see no ground for generic separation, and therefore propose to unite the genus *Malacocichla* to *Catharus*, of which the six species will then stand as follows:—

1. *C. melpomene*, ex Mexico (Cf. P. Z. S. 1858, p. 971).

2. *C. aurantirostris*, ex Venezuela.

3. *C. mexicanus*, Bp., ex Mexico.

4. *C. fuscater*, ex Nov. Granad. et rep. Equat.
5. *C. dryas*, ex Guatemala.
6. *C. maculatus*, ex ripis fl. Napo.

5. TROGLODYTES FURVUS (Gm.).

Two ex. agreeing with specimens from S. Martha, Trinidad, and the Lower Amazon.

6. PARULA BRASILIANA (Licht.).

Already noticed from New Granadian collections. See P. Z. S. 1855, p. 143.

7. SETOPHAGA VERTICALIS (Lafr. et D'Orb.).

"Irides hazel; bill, legs, and feet black." Seemingly a common species. Mr. Fraser has sent many examples.

8. BASILEUTERUS CHRYSOGASTER, Tsch.—*Setophaga chrysogastra*, Tsch. F. P. p. 276.

One ex. Irides hazel; bill black; legs and feet orange.

9. BASILEUTERUS CORONATUS (Tsch.).—*Setophaga coronata*, Tsch. F. P. p. 16.

Two ex. "Irides hazel; bill brown, darker above; feet nearly orange."

10. BASILEUTERUS BIVITTATUS (Lafr. et D'Orb.).—*Muscicapa bivittata*, Lafr. et D'Orb.—*Myiodytes tristriatus*, Tsch. Av. Consp. p. 283.

Two ex. "Irides white; bill nearly black; legs and feet flesh-colour. A pretty songster."

11. VIREO JOSEPHÆ, sp. nov. (Pl. CLIV.)

Fuscescenti-olivaceus, pileo nigricanti-fusco: alis caudaque intus nigricantibus, extus olivaceo limbatis; superciliis distinctis albis; lateribus capitis cinereis: subtus albus, abdomine toto et tectricibus subalaribus flavo perfusus: rostro superiore plumbeo, inferiore albicante, pedibus plumbeis.

Long. tota 4·75, alæ 2·6, caudæ 1·8.

Seven ex. ♂ and ♀. The ♂s brighter below. "Irides dark hazel; contents of stomach insects."

This is the only *Vireo* with a first spurious primary (in this bird measuring 0·7 inch from its insertion) which I have yet seen from Southern America. In form it is somewhat similar to *V. noveboracensis*. I have named it at Mr. Fraser's request after Señora Josefa Borja y Davilos, who, with other members of the same family, rendered every facility to Mr. Fraser in forming his collections on their estates at Pallatanga. The only other species of this group of which I have seen S. American examples are *Vireosylvia olivacea* of the U.S., which extends into New Granada, and *V. agilis* (*Lanius agilis*, Licht.) from Brazil, and extending northwards to

New Granada. I do not know *Vireosylvia frenata* of DuBus (Bull. Ac. Brux. xxii. p. 150), said to be from Ocaña in New Granada; but the description given agrees with *Vireo altiloquus* of the Antilles.

12. PETROCHELIDON CYANOLEUCA, Vieill.

One ex. juv.

13. CHLOROPHANES ATRICAPILLA, Vieill.

One ex.

14. CONIROSTRUM ALBIFRONS, Lafr.

Two ex.

15. DIGLOSSA PERSONATA, Fraser.

Four ex.

16. DIGLOSSA ALBILATERALIS, Lafr.

♂ et ♀. "Irides dark hazel; bill black; legs and feet pale brown."

The female of this species is of a brownish-olive; below pale fulvous.

17. SALTATOR MAGNUS (Gm.).

One ex. Irides hazel; bill black, with the base of the lower mandible bluish; legs and feet brownish flesh-colour; contents of stomach pink fruit and black seeds.

18. SALTATOR ATRIPENNIS, Sclater, Pr. Ac. Sc. Phil. viii. 261.

Two ex. ♂ and ♀ alike. "Irides hazel; bill black, with a bluish margin to lower mandible; legs and feet black, in female blue. The stomach contained fruit." I am much pleased at meeting with additional examples of this *Saltator*, which I originally described from specimens in the Museum of the Academy of Natural Sciences of Philadelphia, collected at Popayan.

19. BUARREMON BRUNNEINUCHUS (Lafr.).

Two ex. "Gizzard contained insects and seeds."

20. BUARREMON LEUCOPTERUS, Jardine.

Four ex. "Irides hazel; bill black, legs and feet nearly so. Found in the bushes."

21. CHLOROSPINGUS CANIGULARIS, Lafr.

One ex. ♂. Irides hazel; upper mandible black; lower blue. Gizzard contained insects.

22. NEMOSIA ORNATA, sp. nov.

Fuscescenti-cinerea olivaceo tincta; capite toto undique et corpore subtilus saturate cinnamomeo-rufis; gula flavicantiore;

ventre medio albo : rostro superiore nigro, inferiore cum pedibus plumbeis.

Long. tota 4·7, alæ 2·4, caudæ 2·0.

Three ex. "Bill black above, blue below ; feet and legs blue : stomach contained insects." This pretty new species of *Nemosia* is a close ally of *N. sordida* and *N. ruficeps* of my Synopsis, but is conspicuously different in colouring.

23. *TACHYPHONUS DELATRII*, Lafr.

One ex. ♀. "Irides hazel ; bill bluish-black ; legs and feet dark flesh-colour."

This bird is of the uniform brown colour characteristic of the females of *Tachyphonus*; and from its general appearance and locality, I have little hesitation in referring it to Lafresnaye's species.

24. *PYRANGA ARDENS* (Tsch.).

♂ et ♀, 4 ex. "*Gallito*. Irides hazel ; bill black above, blue beneath ; legs and feet blue : gizzard contained insects."

25. *RAMPHOCELUS ICTERONOTUS*, Bp.

Five ex. "Irides red ; bill blue ; legs and feet dark blue : stomachs contained vegetable matter : *Onza*. Commonly seen in the orange trees."

26. *TANAGRA CANA*, Sw. ?

Sexes alike, 4 ex. "Irides dark hazel ; bill black above, blue below ; legs and feet light blue."

27. *TANAGRA CYANOCEPHALA* (Lafr. et D'Orb.).

"Sexes alike, 6 ex. Irides hazel ; bill black ; base of lower mandible bluish ; legs and feet bluish." Stomachs contained "fruits and seeds."

28. *COMPSOCOMA SUMPTUOSA*, Less.

Six ex., sexes alike. "Irides red-hazel ; bill black above, bluish below ; legs and feet bluish." The contents of the stomach are recorded as "green vegetable matter, seeds, and small spiders." Native name '*Curillo*.'

29. *CALLISTE RUFICERVIX* (Prev.) : Sclater, Mon. Call. pl. 32.

Three ex. "Irides hazel ; bill black ; legs and feet blue." Gizzard contained "vegetable matter and insects" in one specimen, in another "insects and seeds."

30. *CALLISTE GYROLOIDES* (Lafr.) : Sclater, Mon. Call. pl. 26.

Two ex. "Irides hazel ; bill blackish ; legs and feet bluish." The contents of stomach noted as "vegetable matter" and "fruit with small seeds."

31. *CALLISTE AURULENTA* (Lafr.): Sclater, Mon. Call. pl. 14. fig. 2.

Many examples, sexes alike. "Irides hazel; bill black; legs and feet blue." Contents of stomach, "vegetable matter," "seeds," and "grubs."

32. *EUPHONIA XANTHOASTRA*, Sund.

Four ex. "Irides hazel; bill black above, bluish below; legs and feet bluish."

33. *PHEUCTICUS CHRYSOGASTER*, Less.

Chugo. Stomach contained "small seeds."

34. *ZONOTRICHIA PILEATA* (Bodd.).

35. *VOLATINIA SPLENDENS* (Vieill.).

One ex., marked male, but in the usual dress of the females of this group, and therefore probably young. "In the bushes, in small flocks."

36. *COTURNICULUS* — ?

A single example of a curious little short-legged Fringillide, marked 'male,' but of rather *feminine* appearance.

37. *OSTINOPS ATROVIRENS* (Lafr. et D'Orb.), D'Orb. Voy. pl. 51. fig. 2.

One ex., agreeing with Tschudi's Peruvian specimens. "Irides hazel; bill orange; legs and feet brown, with a slight greenish tinge: contents of gizzard, insects and vegetable matter. This specimen had a very strong, disagreeable smell, from the fatty gland above the root of the tail."

38. *CASSIDIX ORYZIVORA*, Cab. Mus. Hein. p. 194.

"*Garrapatero*. Irides yellow: stomach contained Indian corn."

39. *XIPHOCOLAPTES PROMEROPHIRHYNCHUS* (Less.).

One ex. "Irides grey; bill black above, blue below; legs and feet greenish." This example agrees with New Granadian (Bogota) specimens.

40. *DENDRORNIS TRIANGULARIS* (Lafr.).

One ex. "Irides grey; bill blue, darker above; legs and feet blue: gizzard contained insects."

41. *PICOLAPTES LACRYMIGER* (Lafr.).

Two ex. "Irides hazel; bill light brown above, blue below; legs and feet blue: gizzard contained insects."

42. GLYPHORHYNCHUS CASTELNAUDI, Des Murs, Voy. Cast. et Dev. Ois. pl. 15. fig. 2.

Irides hazel. Three ex. Seems hardly different from Brazilian examples of *G. cuneatus*, as far as I have hitherto been able to compare it. Mr. Fraser has sent the nest and eggs of this species, taken near San Jorge (Pallatanga), October 1858. It was placed in a hole in a large tree only about 3 feet from the ground. The nest is scanty, as is usually the case with birds which breed in such situations, consisting of a small quantity of moss and fine roots mixed with dead wood. The eggs, two in number, are of a pure white, and rather broad in comparison to their length. They measure 0·8 by 0·7 inch.

43. ANABATES SUBALARIS, sp. nov.

Fusco-brunneus : uropygio et cauda tota saturate ferrugineis : striis capitis et colli superioris, plumarum scapas occupantibus, cum gula tota et striis pectoris latioribus pallide cervinis : tectricibus subalaribus clare cinnamomeis : rostro superiore nigro, inferiore plumbeo : pedibus virescentibus.

Long. tota 6·75, alæ 3·5, caudæ 3·0.

Five ex. "Irides dark hazel."

44. ANABATES TEMPORALIS, sp. nov.

Rufescenti-brunneus, cauda ferruginea ; capite olivascente, oculorum ambitu et superciliis ante oculum angustis cum gula tota stramineis, striga superciliari post oculum, pectore toto et tectricibus subalaribus clare cinnamomeis : ventre crissoque fusciscentibus : rostro fusciscenti-viridi, apice pallidiore : pedibus fuscis.

Long. tota 6·0, alæ 3·6, caudæ 2·5.

Two ex. "Irides hazel."

45. SYNALLAXIS ELEGANS, Sclater.

Five ex. "Irides hazel ; bill blackish above, horn-colour beneath ; legs and feet green."

46. DYSITHAMNUS UNICOLOR, sp. nov.

Obscure schistaceus unicolor : alis caudaque nigricantioribus : subalaribus albo variegatis : rostro nigro, pedibus plumbeis.

♀. *Obscure ferruginea, subtus dilutior : lateribus capitis cinerascientioribus.*

Long. tota 5·6, alæ 2·8, caudæ 2·3.

A pair of these birds, "from the lower trees and underwood : irides grey." The species must be placed next to *D. schistaceus* of my Synopsis. It differs in its shorter stouter bill, the white markings beneath the wings, and want of white terminations to the rectrices. The brown bird is marked by Mr. Fraser as 'male ;' but I have little doubt this is wrong.

47. *FORMICIVORA CAUDATA*, Sclater, P. Z. S. 1858, p. 240.

Two ex. "Irides hazel; bill black above, bluish beneath; legs and feet blue."

48. *FORMICIVORA CALOPTERA*, sp. nov.

Cinerascenti-olivacea, fronte et superciliis albis: loris et regione oculari nigris: alis nigris, harum tectricibus minoribus et majoribus albo late terminatis; remigibus secunda, tertia, quarta et quinta albo, ceteris castaneo-rufo extus anguste limbatis: subtus alba; subalaribus, lateribus corporis et crisso flavicante perfusis: cauda cinerea, rectricibus duabus utrinque extimis omnino et duabus sequentibus partim albis: rostro nigro, mandibulæ inferioris basi albicante, pedibus plumbeis.

Long. tota 4·4, alæ 2·1, caudæ 1·8.

Three ex. "Irides hazel." Sexes, as marked, alike; but I should be inclined to consider them all males. The general appearance of this species is much the same as that of *Herpsilochmus rufimarginatus*; but the bill is much smaller and more feeble.

49. *PACHYRHAMPHUS HOMOCHROUS*, sp. nov.

♂. *Nigricanti-cinereus, subtus dilutior: plaga in basi inter-scapularium celata et macula ad basin primariorum interna albis: rostro superiore nigro, inferiore cum pedibus plumbeis.*

♀. *Castanea, subtus dilute cinnamomea, remigum parte interna nigricante.*

Long. tota 6·7, alæ 3·6, caudæ 2·7.

Three examples, one male and two females of this apparently undescribed species of *Pachyrhamphus*. It is closely allied to the rosy-breasted *Pachyrhamphus pectoralis* and its allies, but has no trace of colouring on the breast. The male has the usual second abnormal short primary. Mr. Fraser says in his notes, of the male (No. 1310), "Irides hazel; scaling of feet exactly like specimen No. 1307, of which I believe it to be the male. It was not found in the same tree, but close by. To me this is the most interesting bird I have collected in America, particularly as I believe it will confirm Mr. Sclater's views." "Contents of stomach insects."

50. *CEPHALOPTERUS PENDULIGER**, sp. nov.

Niger, nitore nonnullo æneo: subalaribus albis nigro variegatis: appendiculo gutturali angusto, longissimo, ad mediam caudam attingente, omnino plumis obtecto: rostro superiore nigro, inferiore plumbeo; pedibus nigris.

Long. tota 14·5, alæ 9·5, caudæ 4·5, rostri a fronte 1·7, tarsi 1·8.

Two ex., both males. "Irides reddish." This extraordinary bird forms a third species of the peculiar genus *Cephalopterus* of Geoffroy St.-Hilaire, of which the type *C. ornatus* is now well known in col-

* A figure of this *Cephalopterus*, from Mr. Wolf's pencil, is given in the first number of 'The Ibis,' 1859 (pl. iii.).

lections, and commonly called the "Umbrella-bird." It is considerably smaller than *C. ornatus*, as may be seen by comparing the measurements given above with the following taken from a fine example of the latter species in Mr. Gould's collection. Whole length 17·5, wing 11·0, tail 6·5, bill from the front 1·9, tarsus 2·1. The peculiar characteristic of the present bird is, however, the length of the throat-lappet, which measures in one specimen 10 inches in length, in the other 8½ inches. In *Cephalopterus ornatus* the throat-lappet in the male measures about 4 inches. Here also it is much broader, and conceals a bare space on the neck, of which there is no appearance in the present bird. In *Cephalopterus glabricollis**, the only other known species of this curious form, which was discovered by Warscewicz in Veragua, described by Mr. Gould, and figured in these 'Proceedings' (See P. Z. S. 1850, p. 92, pl. xx.), the fore-chest and neck, as well as the base of the throat-lappet, are entirely denuded.

Mr. Fraser's notes on this bird are, "*Bocinero*—found solitary in the high trees in the deep forest. His name is taken from his note, which resembles the noise made by the Indians when sounding their large shells, or (as others compare it to) the bellowing of a bull. At this time they are said to inflate the neck-appendage to nearly 3 inches in diameter, and to spread the crest as much over the face as possible. But a lady who once had one alive told me that when it slept its crest was thrown forward, and that when it uttered its note the feathers were thrown backward, showing the white stems. The appendage to the throat had not any opening to view; nor could one be found by blowing into the mouth or nostrils. It is rather contracted in drying than otherwise. The gizzard of one specimen contained fruit and seeds."

I have lately received from MM. Verreaux of Paris a skin of a *Cephalopterus* out of a collection received from Bogota. The specimen is not in good order, having been much contracted in drying, and deprived of its feet; but from its small size, white under wing-coverts, and narrow throat-lappet (which, however, is only 2·5 inches in length), it is apparently of this same species, being probably a female, or possibly a young male bird. It seems, therefore, probable that *Cephalopterus penduliger* occupies the valleys on the western side of the Andean range, as *C. ornatus*† those on the eastern side, and that *C. glabricollis* takes their place in Central America.

51. MYIODYNASTES CHRYSOCEPHALUS (Tsch.): Sclater, P. Z. S. *antea*, p. 43.

"*Solitario*." Bill black; legs and feet blue."

52. TYRANNUS MELANCHOLICUS, Vieill.

* The suggestion of a recent writer in the Zoology of Castelnau's Expedition (Oiseaux, p. 65), that this species is the adult stage of *Cephalopterus ornatus*, we regard as simply ridiculous.

† An interesting account of the habits of *C. ornatus* by Mr. A. R. Wallace will be found in these 'Proceedings' for 1850, p. 206.

53. *CONTOPUS ARDESIACUS* (Lafr.). — *Tyrannula ardesiaca*, Lafr. Rev. Zool. 1844, p. 80.

"Irides hazel; bill black above, horn-coloured beneath; legs and feet nearly black."

54. *ELAINIA*, sp.?

55. *ELAINIA*, sp.?

56. *TYRANNULUS CHRYSOPS*, Selater, P. Z. S. 1858, p. 458.

Several examples.

57. *TYRANNULUS* —?

Several examples.

58. *TYRANNULUS* —?

As I hope shortly to finish a monographic account of the *Tyrannidæ*, I forbear to publish isolated descriptions of these obscure species.

59. *MIONECTES STRIATICOLLIS* (Lafr. et D'Orb.).

Four ex. "Irides hazel; in the gizzard of one specimen a berry."

60. *TODIROSTRUM RUFICEPS*, Kaup.

Irides hazel; bill black; legs and feet bluish. Gizzard contained insects.

61. *TODIROSTRUM SQUAMICRISTATUM*, Lafr.

Irides orange; legs and feet flesh-colour; bill blackish.

62. *SERPOPHAGA CINEREA*, Strickl. P. Z. S. 1858, p. 458.

63. *SERPOPHAGA* —?

64. *PYROCEPHALUS NANUS*, Gould, Zool. Voy. Beagle, Birds, pl. 7.

One ex. ♂. "*Brujo*. Irides hazel; bill, legs, and feet black."

65. *MYIOBIUS ORNATUS* (Lafr.). — *Tyrannula ornata*, Lafr. R. Z. 1853, p. 56; Selater, P. Z. S. 1854, pl. 66. fig. 1.

Two ex. "Irides hazel; bill, legs, and feet black."

66. *MYIOBIUS* —?

67. *PHAROMACRUS AURICEPS* (Gould).

Four ex. A female is marked "Irides red." Native name, *Pilco real*.

68. *TROGON* —?

Pilco.

69. *TROGON PERSONATUS*, Gould, ♀.

70. *PHAETHORNIS GUY* (Less.): Gould, Mon. Troch. pt. iv.
 71. *PHAETHORNIS SYRMATOPHORUS*, Gould, Mon. Troch. pt. iv.
 “*Quindi amarillo*: irides hazel; upper mandible black; lower red, tipped with black; legs and feet dark flesh-colour. Stomach contained yellow insects: all insects previously examined amongst the Humming-birds have been black.”
 72. *PHEOLEMA RUBINOIDES* (Bourc. et Muls.): Gould, Mon. Troch. pt. xvi.
 Irides dark hazel; bill black; legs and feet dark flesh-colour.
 73. *BOURCIERIA FULGIDIGULA*, Gould, Mon. pt. vii.
 Three ex. “Irides dark hazel; bill black above, blue beneath; legs and feet light blue.”
 74. *ADELOMYIA MELANOGENYS* (Fraser): Gould, Mon. pt. ix.
 Bill black; base of lower mandible red; legs and feet dark flesh-colour.
 75. *METALLURA TYRIANTHINA* (Lodd.): Jard. Contr. Orn. 1850, pl. 55.
 76. *PETASOPHORA CYANOTIS* (Bourc.): Gould, Mon. pt. iv.
 Three ex. “Irides dark hazel.”
 77. *PETASOPHORA IOLATA*, Gould, Mon. pt. iv.
 “*Quindi real*: a very common species.”
 78. *CÆLIGENA WILSONI* (Delattre et Bourc.): Gould, Mon. pt. xi.
 “Irides dark hazel.”
 79. *PANOPLITES MATHEWSII* (Bourc.), Gould, Mon. pt. viii.
 “Inside of mouth and bill black; legs and feet reddish flesh-colour.”
 80. *SPATHURA MELANANTHERA*, Jardine, Contr. Orn. 1851, p. 111, pl. 80.
 One example, a male. “Feet white.”
 81. *HELIOTRYPHA VIOLA*, Gould.
 Two examples of this beautiful species.
 82. *AMAZILIUS RIEFFERI*, Boiss.
 Many examples. “Irides dark hazel.”
 83. *CHLOROSTILBON ATALA* (Less.).
 Many examples.

84. *CALOTHORAX MULSANTI* (Bourc.): Gould, Mon. pt. ii.
Many examples. "Irides hazel."

II. SCANSORES.

85. *PIAYA MEHLERI*, Bp.

Several specimens. "Irides red; bare space round the eyes, and base of mandible green; bill yellow, with a greenish tinge; legs and feet blue."

86. *RHAMPHASTOS AMBIGUUS*, Sw.; Gould, Mon. Ramph. ed. 2. pl. v.

Two ex. "Irides green; space round the eyes green, with a yellowish tinge; legs green; feet blue: gizzard containing fruit and large orange-coloured seeds."

87. *ANDIGENA LAMINIROSTRIS*, Gould, P. Z. S. 1850, p. 93; Mon. Ramph. ed. 2. pl. xxxvii.

Three examples of this curious species, two males and a female. Sexes alike; but the female smaller, and the bill shorter. "Irides red; naked space before, behind, and over the eye bright blue, beneath it yellow; bill black; bases of both mandibles maroon; a horn-coloured spot on each side of the upper mandible; legs and feet green: gizzard contained a fruit called *Guelicon*. Native name, *Marra*."

88. *AULACORHAMPHUS HÆMATOPYGIUS*, Gould, Mon. Ramph. ed. 2. pl. 45.

Three ex. "Irides and cere red; white margin to both mandibles; bill black, with an indistinct reddish patch at the base of the upper mandible; legs and feet olive-green. Found on the high trees in the mountains; very noisy. Food, fruit and small seeds."

89. *EUBUCCO BOURCIERI* (Lafr.).

"Irides red; bill greenish-yellow; legs and feet green: gizzard contained fruit and remnants of insects. Found solitary in the high trees. Somewhat stupid."

90. *DRYOCOPUS GRAYII*, Malh.

91. *DRYOCOPUS ALBIROSTRIS*, Spix.

92. *CHLORONERPERES FUMIGATUS* (Lafr. et D'Orb.).

Several examples, ♂ and ♀. "Irides dark hazel; lower mandible, and base of upper, bluish; tips of upper mandible black; legs and feet greenish."

93. *CONURUS ERYTHROGENYS* (Less.). — *Psittacara erythrogenys*, Less. — *Conurus rubrilarvatus*, Mass. et de Souance.

A young bird, apparently of this species.

94. *PIONUS CHALCOPTERUS*, Fraser.

Irides hazel; bill reddish-yellow; legs and feet reddish flesh-colour: gizzard contained small seeds.

95. *PIONUS CORALLINUS*, Bp. Rev. Zool. 1854, p. 148.

One ex. "Irides hazel; bill red." This is the northern representative of *Pionus maximiliani* (Sis, Azara, no. 286) of Paraguay and Bolivia, and a very close ally. The *Pionus corallinus*, spoken of by Mr. Cassin in Page's 'Narrative of the U.S. La Plata Expedition' (New York, 1859), p. 601, is doubtless Azara's species.

III. ACCIPITRES.

96. *TINNUNCULUS SPARVERIUS* (L.).

One example.

97. *ASTURINA MAGNIROSTRIS*.

"*Gabilan*." Two ex. Specimen No. 874, "♂, by dissection: irides hazel, cere orange, bare space round the eye yellow; legs and feet orange: gizzard contained insects and a lizard. This bird feeds principally, if not entirely, on the ground." Specimen No. 1122, "♀, by dissection: irides, cere, bare space round the eyes, legs, and feet orange."

98. *URUBITINGA UNICINCTA*, Temm.

One ex. "*Huarro*. ♀, by diss. Irides hazel; legs and feet yellow; cere and gape yellow; bill blue at the base, black at the tip: gizzard empty. The toughest bird I ever had to skin."

IV. COLUMBÆ.

99. *COLUMBA RUFINA*, Temm.

"Irides pink; rim round the eye, legs, and feet red."

100. *LEPTOPTILA VERREAUXII*, Bp. Consp. ii. p. 73?

Two ex. "Irides orange; naked space round the eyes, legs, and feet red."

V. GALLINÆ.

101. *ORTALIDA RUFIVENTRIS*, Tsch.

Two ex. "Irides, legs, and feet red; bill black."

102. *ODONTOPHORUS ERYTHROS*, Gould, *antea*, p. 99.

Two ex. "*Cubalan*. Irides red; legs and feet blue: stomach contained seeds and grit. Found on the ground. Flight like that of *Perdiz* (*Tinamus*); but they build their nests high up in the trees. ♀ irides hazel."

5. DESCRIPTION OF A RARE ENTOZOOON FROM THE STOMACH OF THE DUGONG. BY W. BAIRD, M.D., F.L.S., &c.

(Annulosa, Pl. LVI.)

In the Museum of the College of Surgeons there is a preparation of an *Ascaris* from the stomach of the Dugong. In dissecting this animal, Professor Owen discovered several specimens of an intestinal worm, which he named *Ascaris halichoris*. The preparation was made in 1831, and the 'Catalogue of the Physiological Series of Comparative Anatomy' was published by the College in 1833. About the same period, but in a different part of the world, Rüppell found the same species of worm in the stomach of the same species of animal. He very briefly notices them in describing a Dugong which he found in the Red Sea, but merely mentions that these Entozoa "were found in a clustered glandular apparatus in the stomach, and were 5 inches long." His description of this Dugong was sent in a letter to Dr. Sömmering, and is dated from the Island of Dahalac on the Abyssinian coast of the Red Sea, in the month of January, 1832. This paper was published in the first volume of the 'Museum Senckenbergianum,' in 1834. In the 'Proceedings of the Zoological Society' in 1838, there is an elaborate paper by Professor Owen, descriptive of the principal viscera of the Dugong; and in this paper he again notices these worms, and there mentions that they were originally found in a remarkable glandular apparatus situated near the cardiac extremity of the stomach. In the article *Entozoa* in Tod's 'Cyclopædia of Anatomy and Physiology,' the Professor again alludes to them in reference to its peculiar digestive apparatus, showing the presence of a cæcum, which arises from the upper portion of the intestine. This organ he considers a kind of accessory to the digestive apparatus, and of rather a peculiar nature. "The second example," he says, "of an accessory digestive gland occurs in a species of *Ascaris* infesting the stomach of a Dugong: here a single elongated cæcum is developed from the intestine at the distance of half an inch from the mouth; and is continued upwards, lying by the side of the beginning of the intestine, with its blind extremity close to the mouth; from the position where the secretion of this cæcum enters the intestine, it may be regarded as representing a rudimental liver." The next mention we find of this worm is in the 'Mémoires de l'Académie Impériale de St. Pétersbourg.' In the 7th volume of the Mémoires (the 5th volume of the 'Sciences Naturelles'), Brandt has published a paper entitled 'Symbolæ Sirenologicæ,' illustrating the natural history of the *Rhytina borealis* or *stelleri*, a specimen of a Cetacean allied to the Dugong, in which he mentions the fact that Steller had found a number of white worms in a gland attached to the stomach of that animal; and in a note to his paper he says, "they are similar to those found by Owen and Rüppell in the Dugong." Lastly, Diesing, in his valuable work, 'Systema Helminthium,' 1851, apparently not aware of Professor Owen having named this *Ascaris*, enumerates it, along with a number of others, amongst his

list of doubtful species, or "Species inquirendæ," under the name of *Ascaris dugonis*—a name which of course cannot stand, as that of Professor Owen has the precedence of nearly twenty years. The species found in the *Rhytina* by Steller appears to have been six inches long, the same length as those observed by Rüppell in the Dugong; but as this latter animal was found in the Red Sea, whilst the former was taken in Behring's Straits, they can scarcely be identical. Be that as it may, however, the *Ascaris halichoris*, though named long ago, has never been fully described or figured, and I now propose to fill up this blank.

ASCARIS HALICHORIS, Owen. (Pl. LVI.)

Caput nudum, epidermide stricte adnata; os labiis rotundatis, porrectis; corpus, in utroque sexu, extremitatibus magis attenuatis; extremitate caudali brevi, subulata, nuda.

Long. feminae, $3\frac{1}{4}$ unc.; maris, $2\frac{1}{4}$ unc.

The body is of a whitish colour, thickest in the centre, gradually tapering to each extremity. The body is strongly striated across; in the female, apparently all its length; in the male, till nearly about half an inch from its posterior extremity. This latter portion is smooth or slightly striated lengthways. In the female, the vagina is situated at about two-thirds of its length from the anterior extremity. The spicula of the male appear very short. The intestine, as described by Professor Owen, has a cæcum developed from it at the distance of about half an inch from the mouth, and is continued upwards, lying by its side, and terminating in a blind extremity near the mouth. The specimens, now in the British Museum, are shorter than those noticed by Rüppell.

(The figures will explain this structure.)

In the Collection of the British Museum.

May 10, 1859.

John Gould, Esq., V.P., in the Chair.

The following papers were read:—

1. LIST OF BIRDS COLLECTED AT TAVOY, IN THE TENASSERIM PROVINCES, BY CAPTAIN BRIGGS, DEPUTY COMMISSIONER OF TAVOY. BY JOHN GOULD, V.P., F.R.S., ETC.

To none is the naturalist more largely indebted for a knowledge of the productions of distant countries than to the officers of our military and civil services, since no inconsiderable number of them devote the little leisure at their command to the acquisition of the many interesting objects with which they are surrounded; and I

have much pleasure in adding the name of Captain Briggs, the Deputy Commissioner of Tavoy, to the number of those who have so creditably distinguished themselves,—that gentleman having lately transmitted to me a most interesting series of birds procured by him at Tavoy in the Tenasserim Provinces. These I have carefully identified, and, aware that the publication of a list of the birds from this little-known locality will be regarded with interest, I have the pleasure of sending it for insertion in the Society's 'Proceedings.'

Pandion haliaetus.
Accipiter badius.
Ketupa ceylonensis.
Ephialtes lempiji.
Athene cuculoides.
Crypsirhina varians.
Sturnopastor contra.
Acridotheres fuscus.
Ploceus manyar.
Copsychus saularis.
Jora typhia.
Orthotomus edela.
Garrulax albogularis.
Gampsorhinus — ?
Pycnonotus nigripileus.
 — *jocosus.*
 — *finlaysoni.*
Brachypodius melanocephalus.
Reguloides proregulus.
Motacilla luzoniensis.
Budytes viridis.
Petrocincla affinis.
Euspiza aureola.
Anthus malayensis.
 — *richardi.*
Nectarinia flammarillaris.
Dicæum trigonostigma.
 — *cruentatum.*
Lanius hypoleucus.
Oriolus melanocephalus.
Edolius paradiseus.
Dicrurus macrocercus.
Irena puella.
Hirundo rustica.
Centropus philippinus.
Zanclostomus sirkee.
Eudynamys orientalis.
Cuculus sonnerati.
Palæornis cyanocephalus.
Tiga tridactyla.
Gecinus dimidiatus.
Megalaima virens.

Xantholæma indica.
Rhyticeros subruficollis.
Hydrocissa albirostris.
Cymbirhynchus affinis.
Coracias affinis.
Merops viridis.
 — *philippinus.*
Halcyon atricapillus.
 — *leucocephalus.*
Ceryle varia.
Alcedo bengalensis.
Caprimulgus maharattensis.
 — *nipalensis?*
Treron bicincta.
Carpophaga ænea.
Chalcophaps indicus.
Turtur suratensis.
 — *humilis.*
Gallus bankiva.
Gennæus lineatus.
Turnix pugnax.
Mycteria australis.
Tantalus leucocephalus.
Herodias garzetta.
Ardetta flavicollis.
 — *cinnamomea.*
 — *scapularis.*
Lobivanellus goensis.
Hoplopterus ventralis.
Charadrius virginicus.
Gallinago stenura.
Actitis hypoleuca.
Rallus gularis.
Gallinula? phœnicura.
Hydrophasianus sinensis.
Micropterus rufonotus.
Dendrocygna arcuata.
Casarca leucoptera.
Nettapus coromandelicus.
Pelecanus philippinus.
Carbo cormoranus.

2. LIST OF BIRDS COLLECTED IN SIAM BY SIR ROBERT H. SCHOMBURGK (H.B.M. CONSUL AT BANGKOK). BY JOHN GOULD, V.P., F.R.S., ETC.

I have lately received from Sir Robert Schomburgk, Her Majesty's Consul at Bangkok, a collection of Birds collected by him in Siam, and which has been transmitted to me in furtherance of ornithological science, and particularly of my work on the 'Birds of Asia;' and being aware that a knowledge of the species inhabiting that little-visited country will be of interest to all naturalists, I have carefully identified and ascertained the names of the species with the view to their publication in the 'Proceedings' of the Society. The collection now received, which is to be followed by others, comprises sixty-four species.

Haliastur indus.
Accipiter badius.
Strix flammea.
Urocissa magnirostris.
Garrulax albogularis.
Reguloides proregulus.
Acridotheres nigricollis.
 — *javanicus.*
Sturnia elegans.
Ploceus hypoxanthus.
Munia punctularia.
Estrela amandava.
Copsychus saularis.
Petrocincla affinis.
Orthotomus edela.
Anthus pratensis.
 — *richardi.*
 — *rufulus.*
Anthreptes malaccensis.
Nectarinia flammazillaris.
Dicaeum cruentatum.
Edolius paradiseus.
Lanius longicaudatus.
Artamus fuscus.
Leucocerca javanica.
Oriolus chinensis.
Hemichelidon latirostris.
Hirundo rustica.
Pycnonotus goiavier.
Eudynamys orientalis.
Centropus philippensis.
Zanclostomus sirkee.

Chalcites xanthorhynchus?
Palæornis cyanocephalus.
 — *alexandri.*
 — *barbatus.*
Tiga tridactyla.
Xantholæma indica.
Coracias affinis.
Merops viridis.
 — *sumatranus.*
 — *philippinus.*
Upupa nigripennis.
Halcyon leucocephalus.
 — *collaris.*
 — *atricapillus.*
Alcedo bengalensis.
Columba intermedia.
Treron bicincta.
 — *viridis.*
Turtur suratensis.
 — *humilis.*
Turnix pugnax.
Francolinus sinensis?
Ardetta scapularis.
 — *flavicollis.*
 — — ?
Nycticorax europæus.
Lobivanellus goensis.
Esacus recurvirostris.
Gallinula phœnicura.
Glottis canescens.
Rhynchophilus glareola.
Actitis hypoleuca.

3. ON THE NIDIFICATION OF THE KINGFISHER (*ALCEDO ISPIDA*). BY JOHN GOULD, V.P., F.R.S., ETC.

Ornithologists are divided in opinion as to whether the fish-bones found in the cavity in which the Kingfisher deposits its eggs are to be considered in the light of a nest, or as merely the castings from the bird during the period of incubation. Some are disposed to consider these bones as entirely the castings and fæces of the young brood of the year before they quit the nest, and that, the same hole being frequented for a succession of years, a great mass is at length formed; while others believe that they are deposited by the parents as a platform for the eggs, constituting in fact a nest,—in which latter view I fully concur; and the following are my reasons for so doing.

On the 18th of the past month of April, during one of my fishing excursions on the Thames, I saw a hole in a precipitous bank, which I felt assured was a nesting-place of the Kingfisher; and on passing a spare top of my fly-rod to the extremity of the hole, a distance of nearly three feet, I brought out some freshly-cast bones of fish, convincing me that I was right in my surmise. The day following, the 9th of May, I again visited the spot with a spade, and, after removing nearly 2 feet square of the turf, dug down to the nest without disturbing the entrance-hole or the passage which led to it. Here I found four eggs placed on the usual layer of fish-bones; all of these I removed with care, and then filled up the hole, beating the earth down as hard as the bank itself, and replacing the sod on the top in order that barge-horses passing to and fro might not put a foot in the hole. A fortnight afterwards the bird was seen to leave the hole again, and my suspicion was awakened that she had taken to her old breeding-quarters a second time. The first opportunity I had of again visiting this place, which was exactly twenty-one days from the date of my former exploration and taking the eggs, I again passed the top of my fly-rod up the hole, and found not only that the hole was of the former length, but that the female was within. I then took a large mass of cotton wool from my collecting-box, and stuffed it to the extremity of the hole, in order to preserve the eggs and nest from damage during my again laying it open from above. On removing the sod and digging down as before, I came upon the cotton wool, and beneath it a well-formed nest of fish-bones, the size of a small saucer, the walls of which were fully half an inch thick, together with eight beautiful eggs and the old female herself. This nest and eggs I removed with the greatest care; and I now have the pleasure of exhibiting it to the Society, before its transmission to the British Museum, the proper resting-place of so interesting a bird's nest. This mass of bones then, weighing 700 grains, had been cast up and deposited by the bird or the bird and its mate, besides the unusual number of eight eggs, in the short space of twenty-one days. To gain anything like an approximate idea of the number of fish that had been taken to form this mass, the skeleton of a minnow, their usual food, must be carefully made and weighed; and this I may

probably do upon some future occasion. I think we may now conclude, from what I have adduced, that the bird purposely deposits these bones as a nest; and nothing can be better adapted, as a platform, to defend the eggs from the damp earth.

4. LIST OF THE BIRDS LATELY SENT BY MR. A. R. WALLACE FROM DOREY OR DORERY, NEW GUINEA. BY GEORGE ROBERT GRAY, F.L.S., ETC.

[The * indicates those that are for the first time recorded from Dorery, New Guinea.]

Amongst the series of New Guinea birds received from that indefatigable naturalist and collector Mr. A. R. Wallace, are several which prove of so great an interest, that I am induced to draw up the following list of them, as an Appendix to my paper on Aru and Ké Island-Birds, which I laid before the Society the 23rd of March, 1858. (Proc. Zool. Soc. 1858, p. 169.)*

FALCONIDÆ.

1. HALIASTUR LEUCOSTERNUS (Gm.).

2. *BAZA STENOZONA, G. R. Gr. P. Z. S. 1858, p. 169.

3. ASTUR LONGICAUDA, Less.

The collection contains a female specimen of this rare bird, which has hitherto been supposed to belong to the subfamily *Accipitrinæ*; but the examination of this example proves that it would be more correctly placed in that of *Milvinae*, as it possesses all the characters which are essential to that group. It forms part of the genus *Pernis*; but as it exhibits some slight differences in the wings, &c., from the type of the genus, I have ventured to propose the subgeneric appellation of *Henicopernis*, instead of adopting *Dædalion* (*Dædalia*), as suggested by Prince C. L. Bonaparte, because the latter word was long since given by Savigny as a more classical term for that of *Astur*. It should therefore stand thus—

PERNIS (HENICOPERNIS) LONGICAUDA, G. R. Gr.

♀ 26" 6'''.

Beneath the body white, slightly tinged with rufous, and longitudinally streaked with blackish-brown.

4. *ACCIPITER POLIOCEPHALUS, G. R. Gr. P. Z. S. 1858, p. 170.

♂ juv. Greyish brown, more or less margined with rufous; tail greyish-brown, with narrow bands of black; under surface white, marked down the middle of each feather with rufous, enlarged in some at the tip; thighs and under wing-coverts rufous; bill black; feet yellow.

* See also Catalogue of Mammalia and Birds of New Guinea, in the British Museum, 1859.

CAPRIMULGIDÆ.

5. **PODARGUS MARMORATUS* (juv. ?).

Podargus marmoratus, Gould, B. of Austr. Suppl. pt. ii.

6. **EGOTHELES WALLACII*, G. R. Gr.

Black, reticulated and blotched with white, especially on the wing-coverts; the front and crown of head blotched with rufous-white; tail black, with narrow and irregular reticulated bands of white; beneath the body rufous white, darker on the front of throat and breast, reticulated and blotched with black; mentum rufous white; upper mandible black, and lower mandible white.

Length 8", wings 4" 9".

7. **CAPRIMULGUS MACRURUS*, Gould.

HIRUNDINIDÆ.

8. *HIRUNDO FRONTALIS*. Q. & G.

CORACIADÆ.

9. **EURYSTOMUS PACIFICUS* (Lath.).

ALCEDINIDÆ.

10. **DACELO GAUDICHAUDI* (Q. & G.).11. *DACELO MACRORHINUS*, Less.12. **HALCYON ALBICILLA*, Less.13. **HALCYON SANCTUS*, Vig. & Horsf.14. *TANYSIPTERA GALATEA*, G. R. Gr.

Alcedo dea, Less. Voy. Coq. i. 697 (juv.).

Tanysiptera dea, Vigors, Linn. Trans. xiv. 433; G. R. Gr. Cat. Mamm. & Birds of N. G. p. 20.

♂. Black, tinged with deep blue: front, crown of head, inner border of shoulder, and lesser wing-coverts, verditer blue; beneath the body and rump white, slightly tinged with rufous; lateral feathers of tail white, margined outwards with cobalt blue; middle tail-feathers slightly narrowing towards the tips (which are of a broad spatulate shape), and of a silvery blue, with the inner margin slightly bordered with white; bill red.

Length 15", wings 4" 3".

This bird is at once distinguished from the type of Linnæus's *Alcedo dea* by the formation of the two middle tail-feathers. In the type these feathers are broad at their bases for a short distance, and then suddenly narrowed for a space towards the broad spatula-shaped terminations, as is distinctly shown in all the old figures (Seba, i. t. 46. f. 3; Briss. Orn. iv. t. 40. f. 2; Pl. Enl. 116).

15. *CEYX SOLITARIA*, Temm.

16. *ALCYONE AZUREA*, var. *LESSONII* (Cass.).

MEROPIDÆ.

17. **MEROPS ORNATUS*.

Merops ornatus, Lath.

PROMEROPIDÆ.

18. *EPIMACHUS MAGNIFICUS*, Cuv.

19. *NECTARINIA ASPASIA* (Less.).

20. *NECTARINIA ZENOBIA* (Less.).

21. **NECTARINIA EQUES* (Less.).

MELIPHAGIDÆ.

22. **MYZOMELA NIGRITA*, G. R. Gr. P. Z. S. 1858, p. 173.

23. *PTILOTIS CHRYSOTIS*.

This bird is the same as *Tropidorhynchus chrysotis* (Less.), and *Ptilotis filigera*, Gould. See Cat. Mamm. and Birds of N. Guin. pp. 23, 25.

24. **PTILOTIS SIMILIS*, Homb. & Jacq.

25. **PTILOTIS MEGARHYNCHUS*, G. R. Gr. P. Z. S. 1858, p. 174.

26. *TROPIDORHYNCHUS NOVÆ GUINÆÆ*, Müll. & Schl.

27. **ENTOMOPHILA*? *SPILODERA*, G. R. Gr.

Olivaceous-grey ; feathers of the crown margined with dull brown ; quills and tail brown ; throat white, spotted with dull brown ; breast and abdomen yellowish-white ; bill and feet pale.

Length 5", wings 2" 5".

LUSCINIIDÆ.

28. **PETROICA HYPOLEUCA*, G. R. Gr.

Slaty-black ; cheeks, line from nostrils extending above the eyes, bases of the tertiaries, secondaries, and primaries, and beneath the body, pure white. The white on the cheeks extends up to the margin of the eyes, in a short and narrow band. The black colour continues from the hind-head, and forms a narrow pointed band on each side of the breast.

Length 5" 9", wings 3" 3".

TURDIDÆ.

29. **PITTA MACKLOTI*, Temm.

30. *PITTA NOVÆ GUINÆÆ*, Müll.

31. *ORIOLOUS STRIATUS*, Q. & G.

32. *POMATORHINUS ISIDORI*, Less.

MUSCICAPIDÆ.

33. **PIEZORHYNCHUS LUCIDUS*.

♂. *Myiagra lucida*, G. R. Gr. P. Z. S. 1858, p. 176.

♀ ? . *Piezorhynchus rufolateralis*, ibid.

34. **PIEZORHYNCHUS CHALYBEOCEPHALUS*.

Muscicapa chalybeocephala, Garn. Voy. Coq. t. 15. f. 2.

35. *TODOPSIS CYANOCEPHALA*, &c. (Proc. Z. S. 1858, p. 177), is to be altered in the following manner :—

*♂. Crown of head silvery blue, extending towards the nape; front and sides of the head deep silky black; upper part of back and scapulars greenish-blue; quills dull black; secondaries margined with green; tail verditer blue, darker at the tip, which is slightly margined with white; beneath the body deep blue.

Length 5" 8"', wings 2" 5"'.

♀. *Todus cyanocephalus*, Quoy & Gaim. Voy. Astrol. t. 5. f. 4.

Philentoma cyanocephala, Pucher. Voy. Pôle Sud, t. 20. f. 2.

Todopsis cæruleocephala, Pr. B. Compt. Rend. 1854.

Todopsis cyanocephala, G. R. Gr. P. Z. S. 1854, p. 177.

TODOPSIS BONAPARTII, G. R. Gr.

♂. *Todopsis cyanocephala*, G. R. Gr. Proc. Z. S. 1858, p. 177, pl. 134. ♂.

♀. Deep rufous; crown and hind head blue; over the nostrils and sides of the head black tinged with blue; quills fuscous-black, margined with rufous; tail dull blue, broadly tipped and the margins of the outer feathers white; throat and sides of breast deep blue; breast and abdomen white; sides, thighs, and under tail-coverts pale rufous.

Length 6", wings 2½".

Hab. Aru Islands.

36. *RHIPIDURA GULARIS*, Müll. & Schl.

37. **MONARCHA DICHROA*, G. R. Gr.

Shining glossy black; breast, abdomen, and under wing-coverts pure white.

Length 6" 3"', wings 3" 3"'.

38. *MONARCHA TELESCOPHTHALMA* (Garn.).

39. **MICRÆCA CONSPICILLATA*, G. R. Gr.

Olivaceous greyish-brown; head, quills and tail greyish-brown,

margined with olive ; spot over the nostrils, ring round the eyes, and the under surface white, tinged on the breast with pale rufous.

Length 4", wings 2" 1".

AMPELIDÆ.

40. **DICRURUS ASSIMILIS*?, G. R. Gr. P. Z. S. 1858, p. 179.

♂. Length 12", wings 6".

LANIIDÆ.

41. *RECTES KIRROCEPHALUS* (Less.).

42. **RECTES STREPITANS*, Pr. B.

43. *MYIOLESTES MEGARHYNCHUS* (Q. & G.).

44. **CRATICUS PERSONATUS*, Temm.

CORVIDÆ.

45. *CORVUS ORRU*.

Corvus corone, pt., Wagl.

Corvus coronoides?, G. R. Gr. Cat. Mamm. & Birds of N. Guin. p. 35.

Corvus orru, Müll.; Bp. Consp. Av. p. 385.

46. **CORVUS FUSCICAPILLUS*, G. R. Gr.

Corvus orru, pt., Cat. Mamm. & Birds of N. Guin. p. 35.

Corvus macrorhynchus, pt., Wagl.

Head and neck obscure brownish-black ; rest of the body black, slightly tinged with purple. Bill very large, measuring 3" 2" from the gape, culmen elevated and much arched ; that of the ♂ entirely black, of the ♀ white tipped with blue and black. "Iris sky-blue." —*Wallace*.

Length 23", wings 13" 3".

47. *GYMNOCORVUS SENEX* (Less.).

PARADISEIDÆ.

48. *PARADISEA PAPUANA* (Less.).

Mr. Wallace has offered some remarks in reference to the supposed variety of *Paradisea apoda*, which will be best explained by quoting his own words :—"I cannot consider the *Paradisea apoda* of Aru a new variety, because I believe *all* the specimens known have come from there. You will find, I think, the same difference of colour between my *Paradisea papuana* and the native skins, which arises from my care in covering up the plumes during the period of drying, which preserves their colour, while the natives bleach them by weeks of exposure to sunshine. The pale colour of the head also is from my specimens not being shrunk and smoked, as all the na-

tive ones are.” Under these circumstances, I now propose that the name of Var. *Wallaciana* (given Proc. Z. S. 1858, p. 181) should be erased from the list.

STURNIDÆ.

49. *MANUCODIA ATRA* (Less.).

50. *MANUCODIA KERAUDRENI* * (Less.).

Juv. entirely purplish glossy black, without any trace of green reflexions.

51. **CALORNIS VIRESCENS*, G. R. Gr. P. Z. S. 1858, p. 182.

Calornis metallica, Sclater, Proc. L. S. 1858, p. 164.

52. *GRACULA DUMONTII* (Less.).

BUCEROTIDÆ.

53. *BUCEROS RUFICOLLIS*, Vieill.

PSITTACIDÆ.

54. *PLATYCERCUS AMBOINENSIS* (Bodd.).

Psittacus dorsalis, Q. & G.

55. **CHARMOSYNA PULCHELLA*, G. R. Gr. List of Psitt. p. 102.

56. *LORIUS TRICOLOR* (Linn.).

57. *LORIUS CYANAUCHEN*.

Psittacus (Lorius) cyanauchen, Müll. & Schl. Verh. Nat. Gesch. Nederl. Ind. p. 107.

Lorius superbus, Fr. Zool. Typ. pl. 55.

Hab. Mafor Islands.

58. *EOS CYANOGENIA*.

Eos cyanogenia, Pr. B. P. Z. S. 1850, p. 27, pl. 14.

Hab. Mafor Islands.

59. **EOS FUSCATA*.

Eos fuscata, Bl. Journ. A. S. B. 1858, xxvii. p. 279.

Eos (Chalcopsitta) torrida, G. R. Gr. List of Psitt. p. 102.

60. *ELECTUS LINNÆI*, Wagl.

The Aru specimen differs from those of Dorey in the abdomen being pure blue; in those from the latter place it is purplish blue.

* The specimen figured by Mr. Gould, in his ‘Birds of Australia,’ as from Cape York, is of a uniform glossy golden green, with the feathers of the neck of a less pointed form than those of the Dorey examples. It is certainly distinct from the *M. keraudreni* of Dorey, and therefore will warrant a new specific name being given to it; and I now propose that of *Manucodia gouldii*.

61. *TRICHOGLOSSUS NIGROGULARIS*, var., G. R. Gr. P.Z.S. 1858, p. 183.

62. **PSITTACUS PUCHERANI* (Pr. B.).

Pionus fuscicapillus, Homb. & Jacq.

63. *PSITTACULA DESMARESTII* (Garn.).

64. *CACATUA TRITON*, Temm.

65. *MICROGLOSSUM ATERRIMUM* (Gm.).

The Aru examples should more properly be placed under *Microglossum alecto*, as they are of a smaller size than those found at Dorey.

CUCULIDÆ.

66. *CENTROPUS MENEBIKI*, Garn.

67. *EUDYNAMYS PUNCTATUS*.

COLUMBIDÆ.

68. *PTILONOPUS SUPERBUS* (Temm.).

69. *CARPOPHAGA PUELLA* (Less.).

70. *CARPOPHAGA PINON* (Q. & G.).

71. *CARPOPHAGA ZOÆ* (Less.).

72. *CARPOPHAGA RUFIGASTRA* (Q. & G.).

73. *MACROPYGIA DOREYA*, Pr. B.

74. **CHALCOPHAPS STEPHANI* (Homb. & Jacq.).

75. **GOURA CORONATA* (Linn.).

MEGAPODIDÆ.

76. *TALEGALLUS CUVIERI*, Less.

77. *MEGAPODIUS REINWARDTII*, Wagl.

ARDEIDÆ.

78. *BOTAURUS HELIOSYLUS* (Less.).

RALLIDÆ.

79. **RALLINA TRICOLOR*, G. R. Gr. P. Z. S. 1358, p. 188.

5. LIST OF NEW CALEDONIAN BIRDS. BY GEORGE ROBERT GRAY, ESQ., F.L.S., ETC.

(Aves, Pl. CLV.)

This list contains an enumeration of the Birds recorded by Forster as obtained by the naturalists who accompanied the great circumnavigator Cook, while the expedition lay off New Caledonia, with the addition of those which have been lately received from the same locality. It has been thought that these would together form the nucleus of an Ornithological Fauna of that little-known island and of the smaller islets dependent upon it.

1. PANDION HALIAËTUS?

Falco haliaëtus, Forst. Descr. Anim. p. 257.

Hab. Isle of Pines (Isle of Spruce-trees of Forster).

2. HALCYON SANCTUS.

Halcyon sanctus, Vig. & Horsf. Linn. Trans. xv. 266.

Hab. Loyalty Islands (B.M.); Island of Nu, Port de France, New Caledonia (B.M.).

3. GLYCIPHILA MODESTA.

Upper surface obscure cinereous, darker on the head; back varied with olive; quills and tail fuscous-black, margined outwards with olive; throat, breast, and sides greyish-brown, varied with cinereous white; abdomen pale greyish-brown, tinged with yellow; ear-coverts shining grey.

Length 5" 6", wings 3", bill $10\frac{1}{2}$ ".

Hab. Island of Nu (B.M.).

4. GLYCIPHILA POLIOTIS.

Fuscous, tinged with olive; beneath pale fuscous, tinged with olive; ear-coverts grey; quills and tail fuscous-black, margined with bright yellow.

Length 6", wings 2" 11", bill 1".

Hab. Loyalty Islands (B.M.).

These two species are nearly allied to *G. ocularis*, but they are without the yellow spot behind each eye.

5. — ? CHLOROPHAEA.

Certhia chlorophaea, Forst. Descr. Anim. p. 264.

Hab. New Caledonia.

6. — ? FASCIATA.

Certhia fasciata, Forst. Descr. Anim. p. 263.

Hab. New Caledonia.

7. — ? INCANA.

Certhia incana, Lath. Ind. Orn. p. 296.

Hab. New Caledonia.

8. *TROPIDORHYNCHUS LESSONI*.

Tropidorhynchus diemenensis, Less. Tr. d'Orn. p. 401 ; Pucher. Arch. du Mus. 1855, t. 21.

Hab. Port St. Vincent, New Caledonia (B.M.) ; Isle of Pines (B.M.) ; Loyalty Islands (B.M.).

9. *ACANTHIZA FLAVOLATERALIS*.

Head and upper part of neck cinereous ; back olivaceous ; quills blackish-fuscous, margined with olive ; throat, breast, middle of the abdomen, and a line from nostril to above the eye cinereous white ; sides of abdomen bright yellow ; tail fuscous, lateral feathers black, marked near the tip of each with white ; bill and feet black.

Length 3" 8"', wings 2" 1"'.

Hab. Island of Nu. (B.M.)

10. *ZOSTEROPS XANTHOCHROA*.

Yellowish-olive ; lore and beneath the eyes black, the latter surmounted with white ; throat and under tail-coverts yellow ; sides of abdomen rufous-grey ; middle of abdomen white, tinged with yellow ; bill and feet plumbeous ; the former long and acutely pointed.

Length 4" 3"', wings 2" 4"'.

Hab. Island of Nu. (B.M.)

11. *ZOSTEROPS GRISEONOTA*.

Head, lower part of back, margins of the wings, and tail olive-yellow ; upper part of back cinereous ; throat and under tail-coverts yellow ; breast pale cinereous, tinged with rufous ; sides of abdomen rufous-grey ; middle of abdomen white, tinged with yellow ; bill short and conical.

Length 4" 6"', wings 2" 7"'.

Hab. Island of Nu. (B.M.)

12. *TURDUS XANTHOPUS*.

Turdus xanthopus, Forst. Descr. Anim. p. 266 ; G. Forst. Icon. ined. 151.

Hab. New Caledonia. "Degbe" of the natives. Island of Nu. (B.M.)

The *Merula vinitincta* of Mr. Gould (P. Z. S. 1855, p. 165) is closely allied to this species.

13. *PETROICA* ———?

Turdus minutus, Forst. Descr. Anim. pp. 88 and 257.

Hab. Isle of Pines.

14. *MYIAGRA PERSPICILLATA*.

Greyish slate-colour ; ring round eyes white ; throat and breast rusty red ; abdomen and middle of breast rufous-white ; under tail-coverts white ; quills fuscous-black, very slightly margined with

rufous-white; tail fuscous, with the lateral feathers more or less tipped and the outer web of the first feather white.

Length 5" 9"', wings 2" 9"', bill from gape 9"'.
Hab. Island of Nu. (B.M.)

Allied to *M. oceanica*, H. & J., but smaller, especially in the size of the bill.

15. MYIAGRA VIRIDINITENS.

Black, with glossy green reflexions; breast, abdomen, under tail-coverts, and margins of lateral tail-feathers white; quills black, slightly margined with grey.

Length 6" 6"', wings 3"'.
Hab. Loyalty Island. (B.M.)

Allied to t. 12*. f. 4, Voy. au Pôle Sud.

16. EOPSALTRIA VARIEGATA.

♂. Upper surface olivaceous-brown; head cinereous; throat white, with the feathers slightly margined with black; breast and sides of abdomen pale brownish-grey; middle of abdomen yellowish-white; under tail-coverts yellow; quills fuscous, margined with rufous-olive.

♀. Upper surface obscure olivaceous-brown, rather darker on the head; quills fuscous, margined with olive; margins of greater wing-coverts and tertials rufous; throat pale yellow, with the feathers slightly margined with black; breast and sides of abdomen rufous-grey; middle of abdomen rufous-white; under tail-coverts yellow.

Length 6", wings 3" 6"'.
Hab. Island of Nu. (B.M.)

17. EOPSALTRIA ? CALEDONICA.

Muscicapa olivacea, G. Forst. Descr. Anim. p. 271.

Muscicapa caledonica, Gmel. S. N. i. 944.

Hab. New Caledonia.

18. PACHYCEPHALA XANTHETRAEA.

Muscicapa xanthetreaea, Forst. Descr. Anim. p. 268.

Hab. New Caledonia. "Magga" of the natives. Island of Nu. (B.M.)

19. CAMPEPHAGA CALEDONICA.

Corvus cinereus, Forst. Descr. Anim. p. 260; G. Forst. Icon. ined. 53.

Corvus caledonicus, Gmel. S. N. i. 367.

*Corvus caesi*us, Cuv., Pucher. Arch. du Mus. 1855, p. 323.

Pica cinerea, Wagl. Syst. Av.

Gazzola caledonica, Pr. B. Consp. Av. p. 383.

Campephaga caledonica, G. R. Gr. Gen. of B. p. 283.

Hab. New Caledonia. "Ghewa" of the natives. Isle of Pines. (B.M.)

20. CAMPEPHAGA (LALAGE) NÆVIA.

Musicapa nævia, Forst. Descr. Anim. p. 269; G. Forst. Icon. ined. 159; Gmel. S. N. i. 944.

Hab. New Caledonia; Island of Nu (B.M.).

21. ARTAMUS MELALEUCUS.

Loxia melaleuca, Forst. Descr. Anim. p. 272; G. Forst. Icon. ined. 40.

Hab. New Caledonia. "Keeuh" of the natives. Island of Nu. (B.M.)

This species is quite distinct from *A. leucorhynchus*, being of a darker colour on the upper surface.

22. CORVUS CORONE?

Corvus, n. sp., Licht. Descr. Anim. p. 275.

Corvus corone, Wagl. Syst. Av.

Hab. New Caledonia. "Maga" of the natives.

23. CORVUS MONEDULOÏDES.

Corvus moneduloides, Less. Tr. d'Orn. p. 329.

Corvus inflatus, Temm. MSS.

Physocorax moneduloides, Pr. B. Compt. Rend. 1853.

Hab. New Caledonia.

24. APLONIS* STRIATA.

Coracias pacifica, Forst. Descr. Anim. p. 261; G. Forst. Icon. ined. 54, upp. fig.

* The other species of this genus are

A. TABUENSIS.

Friendly Islands.

Lanius tabuensis, Gmel.

Aplonis marginata, Gould.

Aplonis tabuensis, Hartl.

A. CASSINI.

Fiji and Tongatabou.

Lamprotornis fusca, Peale.

Aplonis marginalis, Hartl.

Aplonis marginata, Cassin.

A. BREVIROSTRIS.

Navigators' Islands.

Lamprotornis brevirostris, Peale.

Aplonis brevirostris, Hartl.

A. FUSCA.

Australia.

Aplonis fusca, Gould.

A. ZEALANDICA.

New Zealand.

Lamprotornis zealandicus, Quoy & Gaim.

Aplonis zealandica, G. R. Gr.

A. OBSCURA.

New Zealand.

Lamprotornis obscurus, Dubus.

Aplonis obscura, G. R. Gr.

? A. NIGROVIRIDIS.

—?

Lamprotornis nigroviridis, Less.

Coracias striata, Gmel. S. N. i. 381.

Lanius striatus, Wagl. Syst. Av.

Hab. New Caledonia; Island of Nu (B.M.)?

25. APLONIS VIRIDIGRISEA.

Slaty-grey, with glossy green reflexions; top of head and cheeks glossy purplish-black; quills and tail black; tertials and secondaries bordered with slaty-grey; beneath the body greyish slate-colour, tinged with olivaceous-yellow; under tail-coverts greyish-white.

Coracias striata ♀, Gmel. S. N. i. 381?; G. Forst. Icon. ined. 54, low. fig.

Length 7", wings 4", bill from gape 11"

Hab. Island of Nu. (B.M.)

26. APLONIS ATRONITENS.

Sooty black; feathers on the back margined with green reflexions, and those beneath the body are broadly margined with grey; quills and tail deep fuscous-black; bill and feet black.

Length 8" 3"', wings 4" 3"', bill from gape 1".

Hab. Loyalty Islands. (B.M.)

27. ESTRELLA PSITTACEA.

Fringilla pulchella, Forst. Descr. Anim. p. 273; G. Forst. Icon. ined. 153.

Fringilla psittacea, Gmel. S. N. i. 903; Lath. Syn. pl. 48; Vieill. Ois. Chant. t. 32.

Estrella psittacea, G. R. Gr. Gen. of B. ii. 369.

Erythrura psittacea, Pr. B. Consp. Av. p. 457.

Poephila pandoni, M'Gill. Ann. & Mag. Nat. Hist. 1858.

Hab. New Caledonia. "Durubee," "Gherubee" of the natives. Island of Nu. (B.M.)

28. PLATYCERCUS (NYMPHICUS) CORNUTUS.

Psittacus bisetis, Forst. Descr. Anim. p. 258; G. Forst. Icon. ined. 43; Lath. Syn. pl. 8.

Psittacus cornutus, Gmel. S. N. i. 327.

Platycercus cornutus, Vigors, Zool. Journ. i. 528.

Nymphicus bisetis, Wagl. Monogr. Psitt. p. 522.

Nymphicus cornutus, G. R. Gr. List of Gen. of B. 1855, p. 86.

Hab. New Caledonia (B.M.). "Kere," "Keghe" of the natives. South Harbour, south end of N. C. (B.M.).

29. PLATYCERCUS CALEDONICUS.

Psittacus caledonicus, Gmel. S. N. i. 328.

Psittacus bisetis ♀, Shaw.

Platycercus caledonicus, Wagl. Monogr. Psitt. p. 532.

Hab. New Caledonia.

30. CUCULUS (CACOMANTIS) BRONZINUS.

Allied to *C. cineraceus*, Vig. & Horsf.; but the bill is larger, and

the bird is altogether of a deeper colour, especially beneath the body, which is of a rusty colour; the white spots on the sides of the tail-feathers are very small, and unconnected with one another.

Length 10" 9^{'''}, wings 5" 6^{'''}.

Hab. Island of Nu. (B.M.)

31. PTILONOPUS GREYI.

Ptilonopus greyi, G. R. Gr. List. of Col. p. 4.

Ptilopus purpuratus, Pr. B. Consp. Av. ii. 19?

Hab. Loyalty Island (B.M.); Isle of Pines (B.M.).

32. PTILONOPUS HOLOSERICEUS.

Columba holosericea, Temm. Fig. t. 32.

Ptilonopus sericeus, G. R. Gr. Gen. of B. ii. 467.

Lamprotreron holosericea, Pr. B. Consp. Av. ii. 18.

Hab. Isle of Pines. (B.M.)

33. CARPOPHAGA (PHÆNORHINA) GOLIATH. (Pl. CLV.)

♂. Greyish slate-colour on the head, neck, breast and back; wings slaty-black, with slight green reflexions, and the middle feathers of the wing-coverts of an obscure purplish-red; outer webs at the base of the primaries greyish-white, hardly appearing on that of the first quill; tail slaty-black, with green reflexions; inner web of the first, and both webs of the second to the fifth feathers, more or less of a deep brownish-red, two middle feathers with only a space in the middle of each web of an obscure brownish-red; abdomen deep brownish-red; thighs and under tail-coverts rufous-white; bill red, with the tip black; feet red.

Length 19" 9^{'''}, wings 13" 3^{'''}.

Hab. Isle of Pines. (B.M.)

The specimen exhibits the nostrils only partly covered at the base, and the openings entirely exposed; which has not been observed in any other species of the family *Columbidæ*, therefore might be supposed to form a subgeneric division, with the name of *Phænorhina*.

34. CARPOPHAGA (IANTHÆNAS) HYPÆNOCHROA.

Ianthænas hypænochroa, Gould, P.Z.S. 1856, p. 136.

Carpophaga (Janthænas) hypoinochroa, G. R. Gr., List of Columb. B.M. p. 24.

Hab. Isle of Pines. (B.M.)

35. CHALCOPHAPS CHRYSOCHLORA, var.

Chalcophaps chrysochlora, Gould?

Hab. Island of Nu. (B.M.)

36. CHARADRIUS — ?

Charadrius glaucopus, var., Forst. Descr. Anim. p. 258; G. Forst. Icon. ined. 124.

Hab. New Caledonia. "Poemanghee" of the natives.

37. STREPSILAS INTERPRES.

Tringa interpres, Linn.*Strepsilas interpres*, G. R. Gr.*Hab.* New Caledonia.

38. ARDEA (HERODIAS) ALBOLINEATA.

Closely allied to *A. sacra*, Gm. (*A. jugularis*, Forst.); but the white is wider and extends less down the throat, and the tarsi are rather longer, being 3" 6''' in length.

Hab. Isle of Pines. (B.M.)

39. NYCTICORAX CALEDONICUS.

Ardea ferruginea, Forst. Descr. Anim. p. 274; G. Forst. Icon. ined. 111.

Ardea caledonica, Gmel. S. N. i. 626.*Ardea sparrmannii*, Wagl. Syst. Av.*Nycticorax caledonicus*, Steph.*Hab.* New Caledonia.

40. ANAS SUPERCILIOSA.

Anas leucophrys, Forst. Descr. Anim. p. 93; G. Forst. Icon. ined. 77.

Anas superciliosa, Gmel. S. N. i. 537.*Hab.* New Caledonia.

41. ANAS PUNCTATA, var.

Anas punctata, Gould.*Hab.* New Caledonia.

42. STERNA GRACILIS.

Sterna gracilis, Gould, B. of Austr.*Hab.* New Caledonia.

43. STERNA MELANAUCHEN.

Sterna melanauchen, Temm. Pl. Col.*Hab.* Loyalty Islands (B.M.); New Caledonia.

44. STERNA (HALIPLANA) FULIGINOSA.

Sterna serrata, Forst. Descr. Anim. p. 476; G. Forst. Icon. ined. 110.

Onychoprion serrata, Wagl.*Sterna fuliginosa*, Gmel. S. N. i. 605.*Haliplana fuliginosa*, Wagl.*Hab.* New Caledonia.

45. LARUS NOVÆ HOLLANDIÆ.

Larus scopulinus, Forst. Descr. Anim. pp. 106 & 257; G. Forst. Icon. ined. 109.

Larus novæ hollandiæ, Steph.*Larus jamesoni*, Wils. Ill. of Zool. pl. 23.*Hab.* Isle of Pines.

46. *SULA FUSCA*.

Pelecanus plotus, Forst. Descr. Anim. p. 278.

"*Pelecanus fiber*, Linn.," G. Forst. Icon. ined. 108.

Sula fusca, Briss. ?

Hab. New Caledonia.

6. DESCRIPTION OF A NEW SPECIES OF DIVER (*COLYMBUS*).

BY GEORGE ROBERT GRAY, ESQ., F.L.S., ETC.

COLYMBUS ADAMSI, G. R. GR.

Closely allied to *C. glacialis*; but the head and collar round the neck shining bluish-black, except on the top of the head and neck, which have a slight green reflexion; the rows of spots of the tertials and secondaries very much larger and more like those of *C. arcticus*, while the spots on the sides of the abdomen and upper tail-coverts are smaller than those of *C. glacialis*. This bird is easily distinguished from either of those species by its larger bill, by having the gonys more strongly developed, and by its bill being of a yellowish-white colour.

Length 31"; bill from gape 5", from the base of culmen 3" 9"; wings 15".

Hab. Russian America.

This fine species is named after the late Mr. Adams, Surgeon of H.M.S. Enterprise, commanded by Capt. Collinson, in the voyage made by him through Behring's Straits. Mr. Adams employed his pencil in producing beautiful drawings of the remarkable birds obtained during the voyage; but after his return to this country, he undertook the appointment of surgeon to one of H. M. S. on the West African Station, where he soon fell a victim to the unhealthy climate.

7. ON SOME NEW FRESHWATER SHELLS FROM ECUADOR AND NEW GRANADA, IN THE COLLECTION OF HUGH CUMING, ESQ. BY DR. VON DEM BUSCH.

1. *MELANIA FUSCO-PUNCTATA*, V. d. Busch.

Testa ovato-turrita, tenuis, laevis, nitida, lutea cum numerosis punctis fuscis in seriebus transversis circumdata; anfractibus 4 parum convexis; margine columellari albo; apertura ovata, alba, intus maculis fuscis nonnullis ornata.

Long. 8"', diam. 5"'; apertura 4"' alta, 3"' lata.

Hab. Ecuador.

This fine *Melania*, found, according to the statement of Mr. Cuning, by Mr. Fraser in Ecuador, is particularly distinguished by numerous red-brown points, which are arranged in transverse lines

or bands from the apex of the shell to the base, but are only distinctly visible by means of a lens, and are more distinct on the two inferior than on the two upper whorls.

2. MELANIA FRASERI, V. d. Busch.

Testa turrito-subulata, tenuis, nitida, apice decollato; anfractibus 7½ subconvexis; sutura mediocris; anfractus inferiores olivacei et cum flammulis fuliginosis ornati, superiores autem solummodo fuliginosi, basis striata; apertura ovata, effusa.

Long. 14''' , diam. 3''' ; apertura longa 3''' , lata 2''' .

Hab. Ecuador.

This *Melania*, which was also found by Mr. Fraser in Ecuador, and which I dedicate to him, is distinguished by the coloration of the shell; the inferior whorls are of olive-yellow colour, upon which appear dark-brown flames; the upper whorls are, however, of a uniform dark-brown colour.

3. AMPULLARIA SOLIDA, V. d. Busch.

Testa oblongo-conoidea, solida, lævis, haud nitens, imperforata, anfractibus 4 convexis, olivacea, fasciis fuscis obsoletis circumdata; apertura ovato-oblonga, alba, intus cærulea; labrum crassum; columella subcallosa, alba.

Altit. 18–19''' , latit. 13''' ; apertura 9''' longa, 6''' lata.

Hab. Ecuador.

This *Ampullaria*, found also by Mr. Fraser in Ecuador, seems to be in every respect like the *A. spencei*, Reeve, figured under 124 of his 'Monograph of the Genus *Ampullaria*,' and is perhaps only a variety of it.

4. AMPULLARIA MODESTA, V. d. Busch.

Testa globosa, solida, imperforata, haud nitida, apice eroso; fusca sine fasciis, sed costulis lævibus sparsim circumdata; anfractibus 4; spira brevis; apertura ovata, intus cæsia; labrum solidum, luteum.

Altit. 16''' , latit. 10''' ; apertura 9''' longa, 6''' lata.

Hab. Ecuador.

A mean-looking species, somewhat solid, distinguished by some dispersed fore ribs upon the last whorl, visible with the naked eye.

5. AMPULLARIA QUITENSIS, V. d. Busch.

Testa globoso-ventricosa, solida, profunde et anguste umbilicata, spira exserta, anfractibus 5 convexis ad suturam impressis; virescens, obscure fasciata; apertura ovata, intus cinereo striata; labrum vivide aurantio-rufum.

Altit. 17''' , latit. 14''' ; apertura 9''' longa, 7''' lata.

Hab. Ecuador.

Distinguished by the fire-red lip. On the interior of the aperture are visible the indistinct bands of the exterior of the shell, as more or less distinct grey bands.

6. AMPULLARIA NOVÆ-GRANADÆ, V. d. Busch.

Testa globosa, tenuis, nitida, perforata; spira exserta, ovata; anfractibus 5-6 convexis ad suturam planis; ultimus anfractus valde globosus, $\frac{4}{5}$ totius altitudinis æquans; virescenti-olivacea fasciis obscuris circumdata; apertura ampla, semicircularis, nitida, intus plus minusve cærulea; labrum tenue, subreflexum, acutum; margo columellaris luteus.

Altit. 24''', latit. 19''' ; apertura longa 18''' , lata 13''' .

Hab. New Granada.

The obscure bands of this fine olive-green *Ampullaria*, which comes, according to the statement of Mr. Cuming, from New Granada, are distinctly visible in the interior of the aperture.

8. THE BIRDS OF CASHMERE AND LADAKH. BY A. LEITH ADAMS, A.M., M.B., 22ND REGIMENT.

(Aves, Pl. CLVI.)

The indefatigable naturalist, Mr. Hodgson, has made us well acquainted with the ornithology of Nepal and the Eastern Himalayan ranges; but towards the west, including Cashmere and the neighbouring districts, there is yet much to be discovered. The following list, I fear, falls short of its object, inasmuch as it is very deficient in water-birds. This is owing to the circumstance that my visits were made during the summer months, when the migratory species had left the lakes and fens of Cashmere for the cooler regions of Chinese Tartary. Rapid movements through an extensive tract of mountainous country are not calculated to secure comprehensive or even very correct information of its natural history. I was fortunate, however, in being enabled to make a large collection, including several new species; among the latter may be mentioned the *Pyrrhula aurantia* (Gould's Birds of Asia, Part X.), *Chelidon cashmeriensis* (P. Z. S. 1858, p. 356), and *Montifringilla adamsi* (Moore, P. Z. S. 1858, p. 482).

For the information of those desirous of pursuing this delightful study in the countries visited by me, I may state that among the vast mountain chains of the Hindoo Coosh and Kaffiristan a great field lies unexplored, and, as far as I am aware, as yet untrodden by a single naturalist. Great is the variety as regards the climate, appearance, and vegetation of the Himalayas; and in the same manner does its fauna vary: indeed nothing can be more illustrative of this fact than a comparison of the birds of Nipal and those of the districts through which I travelled. This dissimilarity is even apparent in the birds of adjoining districts; so that I have found it requisite to include in this list only the species I observed during my travels in Cashmere and Ladakh. Notices of other species frequenting the ranges towards the east will be found in my papers on the 'Birds of India,' published in these 'Proceedings' for last year.

1. *GYPÆTUS BARBATUS* (Linn.).

Common on the lesser ranges near the Punjab, Vale of Cashmere, and northwards in Ladakh and Chinese Tartary. The measurements of several adult males were, from tip of bill to extremity of tail 3 feet 10 inches; between tips of wings 9 feet. Weight 12 lbs. Iris of adult, red; in young, hazel.

2. *GYPΣ INDICUS* (Scop.).

Common on the Cashmere mountains.

3. *GYPΣ BENGALENSIS* (Gmel.).

Same distribution as the last; not so common.

4. *NEOPHRON PERCNOPTERUS* (Linn.).

Not common in the Vale of Cashmere, but often seen on the ranges near the plains of the Punjab. It does not proceed any distance towards the interior of the Himalayan Mountains.

5. *AQUILA* — ?

On one occasion, on the mountains near Leh, Ladakh, and at an elevation of about 17,000 feet, I saw a fine Eagle: "Head and neck were white; rest of plumage black; tail long and wedge-shaped." I was struck subsequently with its similarity to the *Aquila malayensis* (Gray).

6. *HALIAËTUS MACEI* (Temm.).

Abundant on the lakes and Jhelum river in the Valley of Cashmere. This noble-looking bird is an interesting object in the Cashmere landscape.

7. *FALCO TINNUNCULUS*, Linn.

Common on all wooded mountains around the valley and cultivated districts in Ladakh.

8. *FALCO CENCHRIS*, Naum.

Not so common as the last; has the same distribution.

9. *ACCIPITER BADIUS* (Gmel.).

Valley of Cashmere and surrounding ranges; pretty common.

The inner wing-coverts of certain specimens were *ochrey-white*, while others were *barred* and *spotted*. Some were more rufous on the back than others; and the spots and bars on the lower parts were more distinct in the specimens, with barred under wing-coverts. These may be only sexual differences.

10. *MILVUS GOVINDA*, Sykes.

Cashmere, common. Builds in the walnut and chunar trees in the valley. Not seen in Ladakh or northwards of the Valley of Cashmere.

11. *CORVUS CORAX*, Linn.

Pretty common in the Valley of Cashmere; abundant all over Ladakh, found at very high elevations in the latter mountains; extends northwards to Chinese Tartary. (*Vide* Thomson's 'Travels in Tibet and Nobra,' p. 430.)

The species is common in the Northern Punjab, Upper Scinde, and Afghanistan. I have compared specimens with *Corvus tibetanus* (Hodgson), and consider them identical.

12. *CORVUS CULMINATUS*, Sykes.

Common on the ranges southward of the Valley of Cashmere.

13. *CORVUS CORONE*, Linn.

Valley and mountains of Cashmere; common. I have not been able to find this species in any list of birds from the Western Himalayas, and unfortunately the specimens I killed in Cashmere were lost; but I have no doubt as to their identity. It is a native of Afghanistan.

Note.—*Corvus frugilegus* is a winter visitor to the districts forming the north-western boundary of the Punjab. Certainly not a summer resident in the Valley of Cashmere, but may be found there in winter.

14. *CORVUS* — ?

Intermediate between the European Jackdaw and the last species, there is a crow which I consider distinct from any yet described, and which at first sight might easily be confounded with the last*. Generally seen in flocks on the lesser Himalayan ranges; is abundant on the mountains around the Valley of Cashmere, and eastward on the ranges near the European stations at Dugshai and Simla. The collection containing specimens of this bird was lost. I have, however, preserved the following notes:—"Nostrils covered with incumbent bristles; uniform colour, metallic black. Tail wedge-shaped. The tertials are mucronate at the tips. Its flight is rapid and strong, habits familiar; and is generally seen feeding in villages or around the hill stations. I consider this species distinct from *C. corone* on account of its smaller size. I propose the name *Corvus intermedius* for this species."

15. *CORVUS MONEDULA*, Linn.

Very common in the Valley of Cashmere; but does not proceed northwards. Builds in all the old and ruined palaces, and migrates to the Northern Punjab during the winter months.

16. *CORVUS SPLENDENS*, Vieill.

Not common in Cashmere. Seldom seen any distance from the towns or villages.

* See J. A. S. No. LXIX. 601. Indian Oology, by W. Theobald, Esq.—"A small black Hill-crow which builds in chunar trees." Evidently this species.

17. *FREGILUS GRACULUS* (Linn.).

On the mountains of Cashmere. Seen generally in flocks, feeding around the margin of melting snow at high elevations. Its call is rough and harsh. Migrates to the Punjab in winter.

18. *PYRRHOCORAX ALPINUS*, Vieill.

Ladakh and Tibet; pretty common; not seen on the Cashmere ranges; strictly alpine, and confined to the interior chains. Feeds on the mulberry and other fruits; gregarious. Easily distinguished from the last by the yellow colour of the bill and dark legs.

19. *PICA TIBETANA*, Hodgs.

Extends all over Ladakh and Tibet, but is not found on the Cashmere ranges or southwards. This peculiarity in the habits of the Asiatic bird is striking; it prefers the bleak and woodless wastes of Ladakh to the highly-cultivated lands and forests of Cashmere. I believe it is identical with *P. bactriana*, Bonap.; and the distinctions between it and the British bird are by no means well-marked. I am inclined to consider the eastern bird only a local variety.

20. *DENDROCITTA VAGABUNDA* (Vieill.).

Pretty common in the woods and jungles of the lesser Himalayan Ranges.

21. *UROCISSA OCCIPITALIS* (Blyth).

Is not uncommon in the jungles and woods of the lesser ranges around Simla; replaced on the mountains of Cashmere by the *Urociassa flavirostris* (Blyth), which was often met with on the banks of the Jhelum in its mountain course from the Valley of Cashmere. It was not seen but in this situation; and, until I saw Mr. Blyth's description in J. A. S. xv. p. 28, I considered it an immature bird of the *U. occipitalis*. It appears Mr. Blyth's specimens are from Cashmere. Its habits are similar to those of the other species.

22. *NUCIFRAGA HEMISPILA*, Vig.

Pine forests of Cashmere and surrounding mountains. Call loud and discordant.

23. *CORACIAS INDICA*, Linn.

Very common in the Valley of Cashmere, and frequently seen in cultivated districts in Ladakh and Tibet.

Note.—Mr. Blyth, in the 'Cat. As. Soc. Mus.' p. 51, mentions the *C. garrula* as found in N.W. India and Cashmere. I have not seen it anywhere in the Punjab or Western Ranges, including Cashmere, and doubt if it frequents any part of N.W. India eastward of the Khyber Pass.

24. *GARRULUS GULARIS*, Gray.

Not common on the Cashmere Mountains; often seen on the lesser Himalayan Ranges, near Simla, to the eastward of Cashmere.

25. *STURNUS UNICOLOR*, Marmora.

Very common in the Valley of Cashmere. Its nest is built of dried grass, and placed in holes of decayed trees. Gregarious.

26. *STURNUS VULGARIS*, Linn.

Valley of Cashmere; common.

27. *STURNIA PAGODARUM* (Gmel.).

Pretty common on the lesser ranges southwards of the valley.

28. *ACRIDOTHERES GINGINIANUS* (Lath.).

Sometimes in the valley, but oftener seen on the ranges southward. Gregarious.

29. *ACRIDOTHERES TRISTIS* (Linn.).

Very common in the valley and in the villages on the lesser ranges.

30. *PALÆORNIS ALEXANDRI* (Linn.).

On the wooded slopes of the lesser ranges southward of Cashmere; not common.

31. *PALÆORNIS TORQUATUS* (Briss.).

Common in all wooded districts on the lesser ranges and in the Valley of Cashmere.

32. *PALÆORNIS SCHISTICEPS* (Hodgs.).

Never seen out of the mountains; least common of all the species named.

33. *PALÆORNIS CYANOCEPHALUS* (Linn.).

Pretty common in and out of the valley southwards.

34. *BUCCO GRANDIS* (Gmel.).

Seen frequently in the dense jungles on the lesser ranges and in the Valley of Cashmere. Flight very rapid; cry loud and harsh.

35. *PICUS SQUAMATUS*, Gould.

Woods and forests of Cashmere, and the lesser ranges; pretty common; solitary in its habits.

36. *PICUS HIMALAYANUS*, Jardine and Selby.

Forests of Cashmere, and likewise occasionally in the jungles southward; common.

37. *PICUS* — ?

Seen on one occasion in a pine forest of the Northern Cashmere Ranges. About the size of the lesser Woodpecker: head white; neck and breast bluish-black; belly and vent red.

38. *BRACHYPTERNUS AURANTIUS* (Linn.).

Woods and forests of Cashmere, not seen in the valley ; by no means common.

39. *CERTHIA HIMALAYANA*, Vig.

Woods and forests of the lesser ranges and Cashmere ; pretty common.

40. *SITTA HIMALAYANA*, Gould.

Generally distributed in wooded districts in the valley and surrounding mountains.

41. *UPUPA EPOPS*, Linn.

Plentiful in the Valley of Cashmere and in Ladakh, but only during the summer months. Migrates southwards to the Punjab and India in winter.

42. *TICHODROMA MURARIA* (Linn.).

Its favourite haunts are rocky and precipitous, sides of rivers and streams in and out of the valley ; generally seen single ; has no call note.

43. *CERYLE RUDIS* (Linn.).

Pretty common on the rivers and streams in the valley and ranges southwards.

44. *ALCEDO BENGALENSIS*, Gmel.

A common tenant on all the streams and lakes in the Valley of Cashmere.

45. *MEROPS VIRIDIS*, Linn.

Not seen in the Valley of Cashmere or in Ladakh, but pretty common on the lesser Himalayan Ranges.

46. *MEROPS APIASTER*, Linn.

Common in the valley and surrounding mountains ; generally seen in flocks.

47. *OXYLOPHUS MELANOLEUCUS*, (Blyth).

Very common in the dense brushwood in the Valley of Cashmere. A noisome bird, and more frequently heard than seen.

48. *CUCULUS CANORUS*, Linn.

Common in the valley and Ladakh. Continues its well-known call until the end of June. I have seen the Cuckoo among the stunted birch-trees on the high ranges at an elevation of 13,000 feet above the level of the sea. It wanders all over the Western Himalayas wherever vegetation exists, and may be heard calling even in July close to the confines of perpetual snow.

49. *CENTROPUS* — ?

This bird is common in bushy places on the lesser ranges; gregarious; call loud and harsh; flight feeble. In habits resembles the bush Thrushes. The specimens were lost, but I have preserved the following notes descriptive of the species:—Size, a little larger than the Fieldfare; bill much curved, hooked at the tip, and scarlet, becoming fainter towards the tip; upper parts brown; lower surface of the body an ochrey-brown; wings rounded; tail long, broad, and fan-like; tarsus large and strong; feet small; versatile toe nearly equal to the lateral: general caste of plumage lax; points of feathers spinous, particularly about the head and neck; gizzard contained an entire lizard of about 3 inches in length, and parts of locusts, beetles, and large insects.

50. *CYPSELUS AFFINIS*, Gray.

Common on the banks of the Dras River in Ladakh, and on the lakes and streams of that country. Often seen in the city of Sirinuggur, Cashmere, during summer evenings, sporting around the ruined walls of the palace.

51. *CYPSELUS MELBA* (Linn.).

Frequently observed in the Valley of Cashmere and on the ranges southwards.

52. *CYPSELUS APUS* (Linn.).

In the valley and surrounding mountains; common during the summer months.

53. *HIRUNDO FILIFERA*, Steph.

Valley of Cashmere during the summer months; migrates with others of the family to the Punjab and India in winter.

54. *HIRUNDO RUSTICA*, Linn.

Common on the ranges between the plains of the Punjab and Cashmere. Very common in the valley. "The Swallow twittering from the straw-built shed," is to me a pleasing remembrance of the happy valley. Moore in his 'Lalla Rookh' might have introduced the Swallow in place of the Nightingale. "The Nightingale's hymn from the Isle of Chunars" is a creation of the poet's imagination. The *Luscinia philomela* is not found in the Western Himalayas.

55. *HIRUNDO DAURICA*, Linn.

Mountains around Cashmere: common; not seen in the valley.

56. *CHELIDON CASHMERIENSIS*, Gould, P.Z. S. 1858, p. 356.

This new species is plentiful in the Valley of Cashmere, and on the banks of the Ladakh rivers. The distinctions between it and *Ch. urbica* are well-marked: it is not so large as *C. urbica*; and the axillary feathers are brown instead of greyish-white. The difference

between it and *Delichon nipalensis*, Hodgs., are likewise distinct. The even tail and more robust bill will always distinguish the Nipal from the Cashmere Martin, independent of the other distinctions with respect to plumage. It migrates to the Punjab during the winter months.

57. *COTYLE RIPARIA* (Linn.).

Rivers and lakes of Cashmere and the lower ranges. Ladakh, common: frequently seen on the banks of the Chimouraree lake.

58. *COTYLE SUBSOCCATA*, Hodgs.?

I found this bird abundant in July on the Chimouraree lake, Ladakh, and during the cold months on lakes and pools among the Salt ranges of the Punjab. It is distinct from the *C. riparia*; neither is *Hirundo minuta*, Hodgs., no. 333, Cat. Brit. Mus., which is equivalent to *C. sinensis* and *Hirundo brevicaudata* of M'Clelland, the same bird. *C. subsoccata*, Hodgs., no. 332, is the only species which I have not been able to compare with my specimen, and which is at all likely to prove identical.

Description:—Total length 4 inches. Upper parts greyish-umber. Wings darker, length $3\frac{2}{10}$ inches, as long as the tail. Tail moderate, and nearly even. Throat dirty white; an irregular band of greyish umber across the breast. Belly, vent, and under tail-coverts white. Tarsus almost naked, except a minute tuft above the insertion of the hind toe.

58*. *COTYLE* — ?

The specimen was lost from which the following description was taken:—A small striated Swallow: is common on the lakes and streams in the Vale of Cashmere during the summer months, and likewise in the Punjab at certain seasons. Total length $4\frac{1}{2}$ inches. Bill small, robust; crown of head rufous, speckled with narrow black lines; back glossy-black; wings bluish-black; rump inclining to white; tail black, slightly forked; breadth between tips of wings 10 inches; throat and breast white, with numerous black lines; belly and vent white, with the black lines more sparingly dispersed; tarsus naked; inner surface of wings brownish-black.

59. *PARUS CINEREUS*, Vieill.

Cashmere and the surrounding ranges, common.

60. *PARUS MELANOPHUS*, Vig.

Generally seen in flocks in the forests and plantations in the valley and lesser ranges towards the south. Sometimes associates with *Paroides flammiceps* (Burton).

61. *PARUS* — ?

I killed a specimen of this species, in company with the last, on the oak-covered slopes of one of the lesser ranges near the Valley of Cashmere. The following is a description:—Crested; total length

5 inches. Iris brick-red ; bill bluish-black ; forehead and between ear-coverts a dirty white ; all upper parts, wings and tail leaden ash ; breast, belly, and vent ochrey white ; tail moderate, slightly forked ; legs and claws leaden blue. Specimen a male.—In vain I have searched authors and journals for a description of this species, which is probably new.

Note.—It agrees almost with the *Parus rufonuchalis* (Blyth).

62. *PAROIDES FLAMMICEPS* (Burton).

By no means common. I saw it only on one occasion, when the specimen was procured. Frequents the same localities with the Tits—wooded mountain sides or dense jungles on the lesser Himalayan ranges.

63. *PSALTRIA ERYTHROCEPHALA*, Gould.

Not common : seen occasionally in the oak woods of the lesser ranges along with the *Parus cinereus* (Vieill.).

64. *PYRRHULA AURANTIA*, Gould, B. A. pt. x. ; Proc. Zool. Soc. pt. xxv. p. 222.

“The orange-coloured Bullfinch.”

The male has the crown of the head, neck, breast, back and belly a rich orange. The female has the head and neck an ash colour, like the female of *P. vulgaris* ; back the same, rather fainter, and tinged with orange ; lower parts like the male, but not so brilliant, and approaching to olive.

This new and beautiful species I met with for the first time on the wooded slopes of the lesser ranges in March 1852, and subsequently in the woods and forests of Cashmere, where it is not uncommon. The *P. erythrocephala*, Vig. was not seen during my visits to Cashmere, although frequently observed on the ranges near Simla.

65. *PASSER DOMESTICUS* (Linn.).

Most abundant in the valley on the lesser ranges, and northwards in Ladakh.

66. *PASSER CINNAMOMEUS*, Blyth.

Pretty common in the valley and surrounding mountains ; generally seen in small flocks.

67. *CARPODACUS ROSEUS* (Vieill.).

Pretty common in cultivated districts in Ladakh and Tibet. Its favourite food is the seeds of a vetch cultivated by the natives of these countries.

68. *CARPODACUS* — ?

Similar in plumage to No. 67, but larger, with the red on the throat and breast more brilliant. In flocks on the sides of the mountains forming the northern barrier to the Valley of Cashmere, high

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up and close to the margin of melting snow,—strictly alpine in its habits. A specimen was not procured. It is possible this may be the *Carp. rhodochrous* (Gould).

69. *HESPERIPHONA ICTERIOIDES* (Vig.).

In small flocks in the dense pine forests of the Cashmere mountains. Its call-note is loud and plaintive, and can be heard at a long distance.

70. *MONTIFRINGILLA HÆMATOPYGIA*, Gould.

Common on the mountains surrounding the Chimourarce Lake in Ladakh. Generally seen in small flocks along with *Linota brevirostris* (Gould), feeding on the seeds of a wormwood.

71. *MONTIFRINGILLA ADAMSI*, Moore, P. Z. S. 1858, p. 482. (Pl. CLVI.)

This new and, until lately, undescribed species, at first sight seems closely allied to *M. gebleri*, but differs from that bird in several well-marked appearances. It is a native of the barren wastes and mountains of Ladakh, particularly near the Lamestry at Lamayeroo. Generally observed in small flocks, it is strictly terrestrial in its habits; and in its call-note, and mode of progression when on the ground, is very similar to the true Larks. The nest is composed of dried grass, and usually placed in dykes and stony places by the wayside. Larger than *M. gebleri*; but with the bill of the same shape and appearance. Iris hazel. Head and back greyish ash; upper tail-coverts white; primaries black; tips and inner webs of the secondaries white, the two last having both webs white. Wing-coverts white, with black tips. Tertiaries greyish ash; bastard wing white, tipped with black; two centre tail feathers black; the other remiges white, with a black band at the tip, which narrows on the external remiges. Auriculars grey. Chin and throat pale grey. Below white. Axillary feathers pure white. My specimens were shot in July 1852. I am indebted to Sir William Jardine, Bart., for having directed my attention to the specific differences between the above and *M. gebleri*; and I take this opportunity of expressing the obligations which I owe that distinguished naturalist for his valuable assistance on many points connected with the natural history of India.

72. *METOPONIA PUSILLA* (Pallas).

Very common in all the wastes and uncultivated districts in Ladakh. Seen generally in flocks. Habits and call-note closely resemble the European Redpole.

73. *MOTACILLA BOARULA* (Linn.).

A common tenant of all the Cashmere rivers and mountain streams; not so plentiful in Ladakh: seen at Leh and Iskardoh.

74. *MOTACILLA LUZONIENSIS* (Scop.).

Generally distributed over Cashmere and Ladakh.

75. *BUDYTES VIRIDIS* (Gmel.).

Cashmere and lesser ranges. Generally seen in flocks by the sides of pools and damp situations.

76. *BUDYTES CITREOLA* (Pallas).

In marshes and wet situations all over the valley, and in like places in Ladakh : common.

77. *ENICURUS MACULATUS*, Vig.

Common on the mountain-streams southwards of the valley. Among the tangled jungles by the sides of the mountain torrent this beautiful creature sports from rock to rock : it flutters like a huge butterfly, intently searching after its winged prey : now and then uttering a harsh scream, as it runs along the water's edge with its tail expanded like a fan.—*MS. Notes*.

78. *ENICURUS SCOULERI*, Vig.

Frequently seen with the last species, but is not so common, and prefers the mountain-streams of the higher ranges. Often seen on the Chenab river near Kishtewar. Both this and the last species were often observed with the *Ruticilla fuliginosa* (Blyth), and *Ruticilla* — ? , No. 82.

79. *RUTICILLA ERYTHROGASTRA* (Güld.).

I first met with this bird at Ghia, a few marches north of the Chimouraree Lake, Ladakh : it is common on the streams and sides of the lakes, but was not observed in the Valley of Cashmere or its mountains, where, probably, its place is taken by the next species. The female has no white on the forehead, and the head and back are a brownish ash. This is the state likewise of the young.

80. *RUTICILLA LEUCOCEPHALA* (Vig.).

Common on all the streams from the lesser ranges northwards to Ladakh. It is partial to the lower Himalayan ranges and wooded and cultivated mountain tracts.

81. *RUTICILLA FULIGINOSA* (Vig.).

With the last species, but not nearly so common. Secluded mountain torrents on the high mountains are its favourite haunts.

82. *RUTICILLA* — ?

In like situations with the last, a species was often seen. It is smaller : colour a leaden ash, with several *white* feathers in the tail. Specimen not procured.

83. *RUTICILLA INDICA*, Blyth.

Common in the valley and on the lesser ranges, very plentiful on the wastes and mountains of Ladakh, Nobra, and northwards.

84. *CALLIOPE PECTORALIS*, Gould.

Frequents the high and rocky mountains around the Valley of Cashmere; not common.

85. *PRATICOLA INDICA*, Blyth.

Common on the lesser ranges; but not seen in the valley or ranges northwards.

86. *PRATICOLA CAPRATA* (Linn.).

Plentiful between the plains of the Punjab and Cashmere; not seen in Ladakh.

87. *SAXICOLA ATROGULARIS*, Blyth.

Common on waste lands in the valley, and generally all over Ladakh and Tibet.

88. ? *SAXICOLA*.

At the Salt Lake in Ladakh, on one occasion a bird evidently of this genus was observed, about the size of the Whinchat; upper parts a bluish-black; breast black; belly and lower parts white. This I consider a rare, if not an undescribed species. A specimen was not procured.

89. *COLLURIO LAHTORA* (Sykes).

Valley of Cashmere; common.

90. *LANIUS CANICEPS*, Blyth.

Pretty common in the valley and on the surrounding ranges.

91. *TEPHRODORNIS PONDICERIANA* (Hardw.).

A solitary bird, and seen in the villages and fields of the lesser ranges; not plentiful.

92. *DICRURUS LONGICAUDATUS*, Hay.

On the lesser ranges and Valley of Cashmere: common. The nest is built of lichens and bark, carefully interwoven and lined with hair; it is placed on the fork of a branch. The female lays from three to five eggs, white, with dull or red spots; scarcely two eggs are exactly alike.

93. *HYDROBATA ASIATICUS* (Swains.).

Generally distributed on all rivers and streams from the lesser ranges northwards even to Chinese Tartary.

94. *HYDROBATA CINCLUS* (Vieill.).

Not uncommon on the mountain-streams of the higher ranges around the Valley of Cashmere; often seen in Ladakh. Mr. Gould

states that my specimen "more nearly resembles *melanogaster* than *cinclus*;" but as many consider the former only a variety of *cinclus*, I prefer the latter name. I am informed by Sir William Jardine that a specimen from Russia in his collection, nearly quite black below, has twelve feathers in the tail; *H. melanogaster* of Temminck is said to have ten.

95. *TURDUS UNICOLOR*, Tickell.

This is the regular Song-thrush of the Valley of Cashmere, and is heard in every garden and grove during the breeding-season; its song resembles the Blackbird's. Builds its nest in vineyards, and in poplar trees around the villages. Seen on the ranges around the valley, but not on the lesser ranges near the plains of the Punjab.

96. *TURDUS VISCIVORUS*, Linn.

In the forests and in sequestered valleys of the Cashmere ranges, particularly pine or oak forests; pretty common.

97. *ORIOULUS KUNDOO*, Sykes.

Seen in flocks in the valley, and met with occasionally in the woods and jungles of the lesser ranges.

98. *MYIOPHONUS TEMMINCKII*, Vig.

Generally distributed over the lesser ranges and Valley of Cashmere; frequents mountain-streams; and builds a nest like that of the Blackbird, to which in habits and general appearance it bears a resemblance. Its note is soft, short, and little varied.

99. *PETROCINCLA LONGIROSTRIS*, Blyth.

Seen always single; pretty common on the barren wastes and mountains of Ladakh in rocky and sequestered situations; seldom seen on the lesser ranges southward of Cashmere.

100. *MONTICOLA CINCLORHYNCHA* (Gould).

Forests and woods on the Cashmere ranges; not common.

101. *PYCNONOTUS LEUCOGENYS* (Gray & Hardw.).

All wooded situations in the valley and lesser ranges; common.

102. *PYCNONOTUS BENGALENSIS*, Blyth.

Never seen in the valley, although common on the ranges near the plains of the Punjab.

103. *HYPsipETES PSAROIDES* (Vig.).

Frequents the dense jungles of the lesser ranges; gregarious; flight strong and rapid; a noisy bird, and oftener heard than seen; secretes itself among the foliage; imitates the songs of other birds.

104. *TROCHALOPTERON RUFIGULARE* (Gould).

Common in the dense jungles of the lesser ranges; generally seen in flocks. Call loud and harsh.

105. *MALACOCERCUS LINEATUS* (Vig.).

Bushy places on the lesser ranges near the plains of the Punjab; generally seen in small flocks; flight feeble, flutters from bush to bush, uttering a low chattering note.

106. *MUSCIPETA PARADISI* (Gould).

Groves and wooded situations in the valley and lesser ranges; flies with great rapidity; shy and wary: common.

107. *HYPOTHYMIS MELANOPS* (Vig.).

Inhabits dense jungles and bushes on the lesser ranges; generally single: its chirp resembles the Redbreast's; and its habits are very much like.

108. *PERICROCOTUS FLAMMEUS* (Swains.).

Seen generally in flocks from fifty to a hundred; not unfrequently the sexes separate, and flocks composed of males or females only are observed.

"What more pleasing sight can there be than, in a delightful evening in July, to observe flocks of these beautiful creatures pursuing their gambols around the tall walnut trees of a Cashmere hamlet! Their soft twittering notes and graceful motions have often excited in me feelings of admiration and pleasure, until the Govind Kite or some unwelcome intruder has driven the gorgeous little fairies away."—*MS. Notes.*

109. *HEMICHELIDON FULIGINOSA*, Hodg.

Pretty common in woods and groves in the valley and on the lesser ranges. Its habits closely resemble those of the true Flycatchers. The young bird is spotted until the first moult.

110. *SYLVIA AFFINIS* (Blyth).

In bushy places in the valley; common.

111. *PHYLLOSCOPUS TRISTIS*, Blyth.

Pretty common on the lesser ranges in jungles and wooded situations.

112. *PHYLLOSCOPUS LUGUBRIS*, Blyth.

Same situations as the last; pretty common.

113. *ABRORNIS* —?

Common in the woods and thickets of the lesser ranges. Approximates pretty closely to the *Abrornis xanthoschistes*, Hodgs., but

differs in some respects. Size of *Motacilla trochilus*, Linn.; bill long, slender, and slightly notched, with a few weak bristles at the gape; head, neck, and back leaden-ash, a white line over the eye; rump and sides tinged with yellow; wings brownish black, with edges of quills tinged with yellow; tail pretty long, olive; wings rounded, first quill very short, second not so long as third, fourth, fifth, and sixth, which are about equal; throat, neck, breast, and lower parts lively yellow; tarsus long, slender, and light brown; lateral toes unequal. Call-note loud; often seen with the *Parus melanolophus*, Vig.

114. *ZOSTEROPS PALPEBROSUS* (Temm.).

In all wooded districts on the lesser ranges.

115. *ACROCEPHALUS BRUNNESCENS* (Jerdon)?

At certain times all the fens in the Valley of Cashmere swarm with these birds; their harsh notes are heard all over the lakes. I have not been able to confirm its identity with the above, but am inclined to think it is the same. Total length 8 inches; bill long, slender, and notched, light brown; all the upper parts olive-brown, wings and tail inclusive—first quill minute, second not so long as the third, and fourth the longest; lower parts dirty white; vent and sides of the body have an ochrey tinge; legs long, tarsus lengthened, inner toe shorter than outer, claws slender and slightly curved, legs a leaden ash; tail soft, and rounded at the tip.

116. *LARVIVORA CYANEA* (Hodg.).

In bushy places among the mountains around the valley. Habits resemble the Robin's. Call-note a feeble chirp.

117. *LARVIVORA* — ?

Generally seen solitary in the thick jungles of the lower ranges. Habits of the true Flycatchers. Total length $4\frac{1}{4}$ inches. Bill black, triangular, with a prominent culmen, notched, bristles of gape directed forwards; a white line over the eye; all upper parts titmouse-blue; throat, neck, breast, and belly pure white; first quill spinous, second much shorter than third, and fourth the longest; tail moderate, slightly forked; legs black, tarsus long.

118. *NILTAVA SUNDARA* (Hodg.).

Solitary in its habits; frequents like situations with the last, and resembles that species in its habits.

119. *PRINIA CRINIGERA*, Hodg.

Pretty common in the jungles and bushy hill-sides of the lesser ranges. Call-note loud, harsh, and ringing.

120. *PRINIA GRACILIS*, Franklin.

Pretty common on the lesser ranges around the valley in bushy situations; Punjab.

121. *STACHYRIS CHRYSÆA*, Hodg.

Pretty common in bushy situations on the ranges southward of the valley. Iris *red*.

122. *FRINGALAUDA NEMORICOLA*, Hodg.

Gregarious ; common on the lesser ranges during the winter months, but moves towards the high ranges as spring advances ; found in summer on the high mountains of Cashmere and Ladakh, where large flocks may be observed feeding close to the snow. Its call-note is like the Linnet's.

123. *EMBERIZA CANICEPS*, Gould.

Common on the grassy mountain-sides of the lesser ranges and in various parts of Ladakh. There is a close resemblance between this species and the next ; and they are frequently seen together.

124. *EMBERIZA CIOIDES*, Temm. ?

Pretty common on the lesser ranges southward of the Valley of Cashmere. Its call-note resembles that of the Yellow Bunting.

125. *EMBERIZA ALBIDA*, Blyth, J. A. S. xviii. 811.

On the ranges near Simla, and once northwards, on the mountains of Cashmere ; not common in the latter situation.

126. *CARDUELIS CANICEPS*, Vig.

Common on the ranges near the Punjab during the winter months, at all seasons in the Valley of Cashmere. The song of this species does not differ in any respect from that of the *C. elegans* (Linn.). Occasionally observed in cultivated districts in Ladakh.

127. *CHRYSOMITRIS SPINOIDES* (Vig.).

Wooded districts in and out of the valley. Song closely resembles that of the European bird.

128. *MELANOCORYPHA TORQUATA*, Blyth.

Although not seen in a wild state, it is a common cage-bird in Cashmere, and, I was informed, is a native of that country. Its song sweet and melodious.

129. *LINOTA BREVIROSTRIS*, Gould.

Plentiful in the plains and barren wastes of Ladakh. It may be doubtful if this is other than a variety of *L. montium*. The young birds have the edges of the quills with more white, and in adult specimens the pink of the rump is paler than in *L. montium*.

130. *ALAUDA ARVENSIS*, Linn.

Valley of Cashmere and cultivated districts in Ladakh ; common.

131. *ALAUDA RAYTAL*, Blyth.

Wastes of Ladakh; common.

132. *HETERURA SYLVANA* (Hodg.).

Common on the grassy hill-sides of the lesser ranges southwards of the valley. Habits like the true Pipits.

133. *ACCENTOR STROPHIATUS*, Hodg.

Pretty common among the furze and brushwood in Ladakh, near the Great Chimouraree Lake. Its call-note is very like that of the Siskin, *Chrysomitris spinus*, and its nest and eggs are almost exactly similar to those of the *Emberiza citrinella* (Linn.).

134. *REGULUS CRISTATUS* (Ray).

Pretty common in the forests of Cashmere.

135. *TROGLODYTES NIPALENSIS*, Hodg.

Its favourite haunts are rocky mountain-sides on the high ranges around the valley; it is often seen at great elevations around the sides of melting glaciers, in the secluded valleys of the Northern Pinjal.

136. *GALLUS FERRUGINEUS* (Gmel.).

Now and then met with in dense jungles on the lesser ranges southward of Cashmere.

137. *CERIORNIS MELANOCEPHALA* (Gray).

A few are found on the tops of the Southern Pinjal range, among the dense forests and jungles on their southern slopes; not common. Its call-note is usually heard at dusk or early morn, and is loud and plaintive.

138. *LOPHOPHORUS IMPEYANUS* (Lath.).

At high elevations on the Cashmere Mountains; nowhere abundant, but pretty generally distributed over the northern ranges. On the Chor Mountain near Simla it is very common.

139. *PERDIX HODGSONIÆ* (Gould), B. A. pt. ix.: *Sacfa hodgsoniæ*, Hodg. Journ. As. Soc. Beng. xxv. p. 165.

Science is indebted to Mr. Hodgson for the discovery of this species; but my friend Capt. Smith, 75th Regiment, in the summer of 1853 shot a male specimen in Nobra, north of Ladakh, from which the beautiful delineation in Mr. Gould's 'Birds of Asia' was taken. Probably Nobra is the southern limit of this species on that part of the Himalayas.

140. *CACCABIS CHUKAR* (Gray).

Pretty common on the bare mountain-sides of the lesser ranges and mountains of Cashmere. It was seen now and then in Ladakh, but is not common there.

141. *COTURNIX PENTAH* (Sykes).

Often observed on the lesser ranges southwards, in small flocks in bushy places.

142. *TETRAOGALLUS HIMALAYENSIS* (Gray).

Frequents the high ranges around the valley and mountains of Ladakh, close to the confines of perpetual snow. Its peculiar, wailing cry is very striking; but from its tardy motions when on the ground, and colour of the plumage, it is not easily discovered until approached within a few yards.

143. *LERVA NIVICOLA*, Hodg.

Frequents like situations with the last species. Seldom seen under 10,000 feet, on the high ranges of Cashmere and Ladakh; generally seen in flocks from sixteen to twenty. Call-note, a harsh whistle.

144. *FRANCOLINUS VULGARIS*, Stephens.

Common in cultivated localities on the lesser ranges; never in the Valley of Cashmere or Ladakh. The bird of the hills differs in size from that found in the plains of India; and its plumage is more brilliant. I have not compared the two. Many sportsmen consider them distinct; I think the differences are merely local.

145. *FRANCOLINUS PONTICERIANUS* (Gm.).

Is abundant on the low hills of the lesser ranges bordering the Punjab, but not near the Valley or northwards.

146. *PUCRASIA MACROLOPHA* (Lesson).

Common on the ranges near Simla eastward. There is a species very common in the jungles and woods of Cashmere, which I have not examined and am inclined to consider different from the above. Its crow is like that of the domestic cock, but not so prolonged. The Valley of the Duchinpara and surrounding ranges of the Northern Pinjal are its favourite and particular localities.

147. *GALLOPHASIS ALBOCRISTATUS* (Gould).

Rare on the Cashmere ranges; more plentiful on those near the Punjab. This and *P. macrolopha* are not seen in the same localities. Both are common on certain ranges around Simla,—the *G. albocristatus* low down, while the *P. macrolopha* inhabits the oak and pine forests at higher elevations on the same ranges.

148. *SYRRHAPTES TIBETANUS* (Gould).

Flocks of this species may be seen around the freshwater lakes of Ladakh. In habits they resemble the other species of Sand-grouse, and emit a similar cry when on the wing. Not found southward of Ladakh.

149. *PTEROCLES FASCIATUS* (Scop.).

Confined to the jungles of the lesser ranges near the Punjab. Pretty common.

150. *COLUMBA PALUMBUS*, Linn.

Pretty generally distributed over the lesser ranges. The clay-colour of the nuchal patch seems peculiar to the Eastern species.

151. *COLUMBA LIVIA*, Linn.

In the usual localities all over the Cashmere ranges; frequently seen associating with the next species. There is a variety of *C. livia* which might easily be confounded with *C. leuconota*, if indeed it is a variety, and not a distinct species. The back and wings are a light blue, inner surfaces of wings white; rump white; tail-coverts leaden black; a broad white band across the middle of the tail, its tip black; belly and lower parts bluish-white.

This variety I found abundant on the rocky banks of the Dras river, Ladakh; and my reasons for supposing it only a variety of *C. livia* were the constant companionship of the two, and some variety as regards the colouring of both; however, it is possible they may be distinct species. I saw this bird nowhere else.

152. *COLUMBA LEUCONOTA*, Vig.

Gregarious; common in certain sequestered mountain-valleys on the northern Cashmere ranges. Seen often with *C. livia*, feeding in fields in the Wurdwun Valley; it was met with in Ladakh on one occasion. I have seen no variety of *C. leuconota*. The drawing in Gould's 'Century of Birds from the Himalayan Mountains' is identical with my specimens; the legs, however, are lobster-red, and not yellow.

153. *TURTUR ORIENTALIS* (Lath.).

In fields and cultivated districts in Cashmere and Ladakh.

154. *TURTUR HUMILIS* (Temm.).

Valley and lesser ranges: common.

155. *TURTUR* — ?

This species is common in certain localities on the Cashmere ranges and Ladakh; plentiful likewise to the east towards Simla. Frequents grassy mountain-sides or valleys in the lesser ranges. Description from a young male—Total length 12 inches. Bill slender, soft at its base, and of a beet-root colour, tip bluish; nostrils slit-like. Iris red; eyelids bare, and of the same colour as the bill. Head bluish-ash, black semicircle on the back part of the neck; back and rump leaden-brown; wings blackish, their coverts broadly margined with rust-colour, giving the bird a spotted or mottled appearance. Tail pretty long, rather narrow, bluish-black, with a broad white tip; lower parts brown, turning to white towards the vent; inner surface of wings leaden colour; tarsus and toes beet-root colour; vent-feathers white. A specimen marked *T. meena* (Sykes), in the Derby Museum, comes close to this bird.

156. There is a beautiful species with *bronze* wings on the lesser

ranges, not common, and most difficult of approach. A *Columba* probably.

157. *TRETERON PHENICOPTERA* (Lath.).

Confined to the woods and dense jungly parts of the lesser ranges. Not often seen. Wary and difficult to approach.

158. *BOTAURUS STELLARIS* (Linn.).

A resident in the lakes and fens of Cashmere.

159. *ARDEA NIGRA*, Linn.

I killed a young bird of this species on one of the branches of the Jhelum, in the Valley of Cashmere. I have not observed it elsewhere.

160. *ARDEA CINEREA*, Linn.

Common on all rivers and lakes of Cashmere and in the surrounding mountains. There is a large heronry on the Chunar trees in the famous gardens of the Shalimar. The herons are preserved with care by the present and former ruler. Their plumes adorn the heads of the princes and nobility of Cashmere.

161. *LOBIVANELLUS GOENSIS* (Gmel.).

In all wet and damp situations, in and out of the Valley southwards, not Ladakh.

162. *CHARADRIUS LESCHENAULTII* (Blyth).

Common on the banks of the Chimouraree Lake, Ladakh, where it breeds.

163. *HIATICULA PHILIPPINA* (Sonn.).

Pretty common in the valley.

164. *PARRA SINENSIS* (Gmel.).

On the Dul Lake, near Sirinugger; sometimes strays into the valleys among the northern mountains. Flight irregular and like the Magpie's. Builds its nest on the broad leaves of the lotus and floating plants; runs along the surface of the weedy parts with great celerity. Call-note loud and harsh. Named "Water Pheasant" by Europeans.

165. *GALLINULA CHLOROPUS* (Linn.).

Common on all the Cashmere lakes, not seen in Ladakh.

166. *FULICA ATRA*, Linn.

Lakes of Cashmere.

167. *NUMENIUS ARQUATA* (Linn.).

At all seasons in the lakes and fens of Cashmere.

168. *IBIDORHYNCHUS STRUTHERSII*, Vig.

Seen on one occasion only on a mountain-stream near a glacier in Ladakh.

169. *SCOLOPAX RUSTICOLA*, Linn.

Generally distributed over the Cashmere mountains, in woods and forests, where it breeds.

170. *GALLINAGO SCOLOPACINA*, Bonap.171. *GALLINAGO GALLINULA* (Linn.).

Winter visitor to the lakes and marshes; not observed during the summer months.

172. *GALLINAGO SOLITARIA* (Hodg.).

I killed two specimens of this bird on the mountain-streams of the lesser ranges. It is rare.

173. *GLOTTIS CANESCENS* (Gmel.).

Lakes and fens of Cashmere: common.

174. *TOTANUS OCHROPUS* (Linn.).

Lakes and rivers of Cashmere, and in the lesser ranges southwards: seldom more than a couple are seen together. A solitary bird, and is often met with by the sides of pools in secluded mountain-valleys. In Ladakh I frequently observed a Sandpiper, which appeared to me only a variety of the above. Its peculiarities were, the upper parts being jet black, rump, tail, and lower parts white.

175. *TRINGOIDES HYPOLEUCA* (Linn.).

On all the rivers and streams of Cashmere, and along the Indus and its tributaries in Ladakh and Tibet.

176. *GRACULUS CARBO* (Linn.).

Often seen on the lakes and Jhelumi river in Cashmere.

177. *GRACULUS SINENSIS* (Shaw).

Frequents the same localities as the last.

178. *PODICEPS MINOR* (Gmel.).

Lakes of Cashmere: common.

Another species was seen in the same situations, lighter in plumage. A specimen was not procured.

179. *ANSER FERUS*, Stephens?

Abundant on the large lakes in Ladakh, where it breeds; migrates southwards to Cashmere and India in winter.

180. *CASARCA RUTILA* (Linn.).

In great numbers on the Ladakh lakes in summer, on the bare hills around the pools, where it breeds. Migrates southwards in winter.

181. *ANAS BOSCHAS* (Linn.).

A few remain in the valley all the summer; but the majority migrate northwards to the lakes of Chinese Tartary.

182. *SPATULA CLYPEATA* (Linn.).

Common in Cashmere all the year.

183. *DAFILA ACUTA* (Linn.).

Cashmere lakes in winter.

184. *QUERQUEDULA CRECCA* (Linn.).

Cashmere lakes all the year: pretty common.

185. *NYROCA LEUCOPHTHALMA*, Bechst.

Common all the year in Cashmere; abundant on the Dul Lake, near the city of Sirinugger.

186. *MARECA PENELOPE* (Linn.).

I did not see this species during my travels in the Himalayas, but on good authority was informed it arrives in autumn with the other migratory species, and is common on the lakes of Cashmere during the winter months.

187. *STERNA HIRUNDO*, Linn.

Rivers of Ladakh and the great Chimouraree Lake. Pretty common.

188. *LARUS BRUNNEICEPHALUS*, Jerdon, Madr. Journ. xiii. 225.

This species I found common on the lakes of Ladakh during the summer months. Not having seen the above bird, I merely apply the name in consequence of the similarity in the colour of the head. Total length 1 foot 5 inches; between tips of wings 3 feet 5 inches. Bill and inside of mouth lobster-red, likewise the margins of the eyelids; white circle around the eyes. Iris *white*; whole of the head, throat, part of neck greyish-brown, turning to black on the neck; rest of neck, breast, belly, vent, and tail pure white; back wing-coverts and secondary quills leaden ash; first six primaries with the proximal half white and the distal half black: near the points of the two first quills there is a white spot; this and the other markings on the quills are very distinct when the bird is on the wing. Legs lobster-red. Tail short, even.

189. *STERNA MELANOASTRA*, Temm.

Abundant all over the Valley of Cashmere. Seen often in flocks hunting for insects in the fields. There is a variety worthy of notice: some specimens wanted the black on the belly, and had scarcely any markings on the head—I fancy, young birds; they were killed in July.

9. ON SOME NEW SPECIES OF SYNALLAXIS, AND ON THE GEOGRAPHICAL DISTRIBUTION OF THE GENUS. BY PHILIP LUTLEY SCLATER, M.A., F.L.S., SECRETARY TO THE SOCIETY.

1. SYNALLAXIS PUDICA, sp. nov.

Murino-brunnea, alarum remigibus et cauda obscurioribus : pileo cum fronte et alarum tectricibus omnibus rufis : subtus cinerascens, ventre imo albicante, lateribus brunnescentibus : rostro superiore nigricante, inferiore plumbeo ; pedibus validis, nigris : cauda elongata, reatricibus decem.

Long. tota 7·0, alæ 2·6, caudæ 4·0, tarsi 0·95.

Hab. In Nov. Granada int.

This species is allied to *Synallaxis fuliginosa*, and of the same form, but easily distinguishable by its red head. From *S. elegans* (also from New Granada) it differs in its earthy-brown tail and cinereous colour below. The single specimen in the British Museum is a "Bogota" skin. I have likewise an example in my own collection, received from MM. Verreaux of Paris.

2. SYNALLAXIS STICTOTHORAX, sp. nov.

Murino-brunnea, uropygio rufescente ; alis caudaque intus nigricanti-brunneis, extus rufo late limbatis : superciliis a fronte et lateribus cervicis albidis, nigro obsolete punctatis : subtus alba, lateribus et ventre imo rufescentibus ; pectore toto maculis triangularibus nigricantibus asperso : rostro nigro, basi alba, pedibus fuscis.

Long. tota 4·75, alæ 2·0, caudæ 2·25, tarsi 0·75.

Hab. In rep. Equator.

I first noticed a specimen of this *Synallaxis* in Sir William Jardine's collection. The British Museum contains an example transmitted from Guayaquil by Mr. Barclay. The species is not very like any other *Synallaxis* that I am acquainted with, and may be distinguished easily by the arrow-headed or triangular spots on the breast, which are partly continued up the sides of the neck, and of which there are also some faint indications on the superciliaries.

3. SYNALLAXIS SCUTATA, sp. nov.

Supra murino-brunnea ; dorso toto, alis extus et cauda rufis : superciliis ante oculum albis, post oculum magis cinnamomeis ; remigum parte interna nigricante : subtus alba, pectore cinnamomeo lavato, plaga distincta quadrilaterali in cervice antica nigra : rostro plumbeo, basi pallidore ; pedibus pallide brunneis.

Long. tota 5·75, alæ 2·25, caudæ 2·75, tarsi 0·8.

Hab. In Brasilia.

I have as yet only seen one specimen of this distinct species, which is in the British Museum.

I subjoin a list of the numerous species of this genus, as far as I am acquainted with them ; and a table showing their geographical distribution :—

1. *S. RUFICAPILLA* (Vieill.), Sclater, P. Z. S. 1856, p. 97 ; Burm. Syst. Ueb. ii. 38 ; Pelzeln, Sitz. Akad. Wiss. Wien. 1859, p. 116.

Brazil, prov. S. Paolo, Minas Geraes.

2. *S. SPIXI*, Sclater, P. Z. S. 1856, p. 98 ; Pelzeln, *l. c.* p. 117.
—*Synallaxis albescens*, Burm. Syst. Ueb. iii. 39.

Brazil, prov. S. Paolo.

3. *S. ELEGANS*, Sclater, P. Z. S. 1856, p. 25 ; Pelzeln, *l. c.* p. 21.
New Granada and Western Ecuador.

4. *S. ALBIGULARIS*, Sclater, P. Z. S. 1858, p. 53.
Eastern Ecuador, Rio Napo.

5. *S. ANTISIENSIS*, Sclater, P. Z. S. 1858, p. 457.
Ecuador, Cuenca.

6. *S. PALLIDA*, Max. Beitr. iii. p. 691.
S.E. Brazil.

7. *S. ALBESCENS*, Temm. Pl. Col. 227. fig. 2.
Trinidad, Venezuela, Guiana and N. Brazil.

8. *S. PUDICA*, Sclater, *supra*.
New Granada.

9. *S. FULIGINOSA*, Lafr. Rev. Zool. 1843, p. 290.
New Granada.

10. *S. BRUNNEICAUDIS*, Sclater, P. Z. S. 1858, p. 62.
Eastern Ecuador.

11. *S. ERYTHROTHORAX*, Sclater, P. Z. S. 1855, p. 75, pl. 86.
Southern Mexico and Guatemala.

12. *S. GULARIS*, Lafr. R. Z. 1843, p. 290.
New Granada and Ecuador.

13. *S. LÆMOSTICTA*, mihi. — *S. cinnamomea*, Lafr. R. Z. 1843,
p. 290 (nec Sw.).
New Granada.

14. *S. TERRESTRIS*, Jardine, Ann. Nat. Hist. xix. p. 80.
Island of Tobago.

15. *S. MÆSTA*, Selater, P. Z. S. 1856, p. 26.
New Granada.
16. *S. RUTILANS*, Temm. Pl. Col. 227. fig. 1 ; Pelzeln, *l. c.*
p. 119.
Northern Brazil.
17. *S. CASTANEA*, Selater, Ann. Nat. Hist. 1856, xvii. p. 466.
Venezuela.
18. *S. TORQUATA*, Max. Beitr. iii. p. 697.
Eastern Brazil and Bolivia.
19. *S. SORDIDA*, Less. — *S. flavigularis*, Gould ; *S. modesta*,
Eyton.
Chili and Patagonia.
20. *S. ANTHOÏDES*, King, P. Z. S. 1831, p. 30. — *S. rufigularis*,
Gould.
Chili.
21. *S. HUMICOLA*, Kittlitz, Mém. Acad. Sc. Petersb. 1830, t. 6.
Chili.
22. *S. DORSO-MACULATA*, Lafr. et d'Orb. : d'Orb. Voy. pl. 14.
fig. 1.
Paraguay.
23. *S. MALUROIDES*, Lafr. et d'Orb. : d'Orb. Voy. pl. 14. fig. 2.
Paraguay.
24. *S. STRIATICEPS*, Lafr. et d'Orb. : d'Orb. Voy. pl. 16. fig. 1.
Paraguay.
25. *S. ÆGITHALOIDES*, Kittlitz, Mém. Acad. Sc. Petersb. 1830,
t. 7.
Chili.
26. *S. PHRYGANOPHILA*, Vieill. ; Temm. Pl. Col. 311. fig. 1.
Bolivia and Paraguay.
27. *S. RUFICAUDA*, Vieill. Nouv. Diet. xxxii. p. 310.
Brazil.
28. *S. ALBILORA*, Pelzeln, Sitz. Akad. Wiss. Wien, xx. p. 16, et
xxiv. p. 120.
Interior of Brazil and Bolivia.

29. *S. INORNATA*, Pelzeln, *l. c.* xx. p. 161, et xxiv. p. 120.

Northern Brazil.

30. *S. VULPINA*, Pelzeln, *l. c.* xx. p. 162, et xxiv. p. 122.

Interior of Brazil.

I possess examples of all these thirty species in my own collection. For specimens of the last three I am indebted to the courtesy of Herr August von Pelzeln of Vienna, who kindly sent them to me in exchange for examples of other species which were deficient in the Imperial Cabinet.

Of the next following eleven species, I have examined specimens, namely:—

31. *S. CANICEPS*, Sclater, *P. Z. S.* 1856, p. 98.

In Mr. Eyton's collection. A specimen of this bird in the Leyden Museum is from Brazil.

32. *S. FLAMMULATA*, Jardine, *Contr. Orn.* 1850, p. 82, pl. 56.

Ecuador. In Sir William Jardine's collection.

33. *S. UNIRUFA*, Lafr. *Rev. Zool.* 1843, p. 290.

New Granada.

34. *S. MULTOSTRIATA*, Sclater, *P. Z. S.* 1857, p. 273.

New Granada. *Mus. Paris.*

35. *S. CANDÆI*, Lafr. et d'Orb. *Rev. Zool.* 1838, p. 165.

Littoral of New Granada, Cartagena (*Mus. Berol.*), Rio Hacha (*Delattre, Mus. Derb.*).

36. *S. SETARIA*, Temm. *Pl. Col.* 311. fig. 3.

Brazil. *Mus. Lugd.*

37. *S. CINERASCENS*, Temm. *Pl. Col.* 227. fig. 3.

Brazil. *Mus. Lugd.*

38. *S. ALBICEPS* (Laf. et d'Orb.): d'Orb. *Voy. Ois.* p. 241.

Corrientes in rep. Arg. *Mus. Brit. supra.*

39. *S. CINNAMOMEA*, Sw. (*S. ruficauda*, Spix).

Brazil. *Mus. Brit.*

40. *S. STICTOTHORAX*, Sclater, *supra.*

Ecuador. *Mus. Brit.*

41. *S. SCUTATA*, Sclater, *supra.*

Brazil. *Mus. Brit.*

1. South Mexico and Central America.	2. New Granada.	3. Transandean Ecuador.	4. Cisandean Ecuador.	5. Tobago.	6. Trinidad.	7. Venezuela.	8. Guiana.
erythrothorax.	candei. <i>striaticollis</i> . elegans. unirufa. fuliginosa. <i>brachyura</i> . gularis. laenosticta. moesta. multo-striata. pudica.	antiensis. flammulata. elegans. stictothorax. gularis.	brunneicaudis. albigularis.	terrestris.		castanea. albescens.	ruficapilla (?). ruficauda (?). albescens.
1	11	5	2	1	1	2	3

TABLE (continued).

9. Northern Brazil.	10. South-eastern Brazil.	11. Eastern Peru.	12. Bolivia.	13. Paraguay and Argent. republic.	14. Chili.	15. Patagonia.
ruficapilla? rutilans. albilora. <i>kollari</i> . inornata. <i>propinqua</i> . albescens. cinnanamea. <i>alopexias</i> . <i>hyposticta</i> .	ruficapilla. cinerascens. setaria. pallida. spixi. <i>frontalis</i> . caniceps. vulpina. <i>striolata</i> . <i>semicinerea</i> . torquata. ruficauda. <i>flis</i> (?). <i>obsoleta</i> . <i>striolata</i> . scutata.	ruficapilla (?). rutilans.	azarae (?). striaticeps. albiceps. <i>fuliginiceps</i> . aegithaloides. <i>d'orbignii</i> . maximiliani. phryganophila. albilora. torquata.	ruficapilla (?). striaticeps. malhiroides. dorso-maculata. <i>platensis</i> (?). <i>d'orbignii</i> ? maximiliani. phryganophila. ruficauda?	sordida. anthoides. dorso-maculata. aegithaloides. humicola.	<i>trogodytoides</i> . sordida. anthoides. <i>leucocephala</i> . aegithaloides. <i>patagonica</i> . <i>brunnea</i> .
10	16	2	10	9	5	7

I only know by name eighteen species which have been described as members of this genus, namely, *S. striaticollis*, Lafr. Rev. Zool. 1843, p. 290; *S. brachyura*, Lafr. ibid.; *S. kollari*, Pelz. Sitz. Akad. Wiss. Wien, xx. p. 158, pl. 1. fig. 3; *S. striolata*, Pelz. ibid. p. 159; *S. propinqua*, Pelz. ibid. xxxiv. p. 101; *S. alopecias*, Pelz. ibid.; *S. hyposticta*, Pelz. ibid. p. 102; *S. frontalis*, Pelz. ibid. p. 117; *S. fitis*, Pelz. ibid. p. 123; *Leptoxyura semicinerea* et *L. obsoleta*, Reichb. Nat. Syst. pp. 170, 171; *Bathmidura d'orbignyi*, Reichb. ibid. p. 163; *Leptasthenura platensis*, Reichb. ibid. p. 160; *S. fuliginiceps*, Lafr. et d'Orb.; *S. troglodytoides*, Lafr. et d'Orb.; *S. leucocephala*, Lafr. et d'Orb.; *S. patagonica*, Lafr. et d'Orb.; and *S. brunnea*, Gould, Voy. Beagle, p. 78.

The table indicates the geographical distribution of the genus, as far as it is at present known, the species of which I have not seen specimens being printed in *italics*.

10. DESCRIPTIONS OF SOME ASIATIC LEPIDOPTEROUS INSECTS
BELONGING TO THE TRIBE BOMBYCES. BY FREDERIC
MOORE, ASSIST. NAT. HIST. DEPT. MUSEUM, INDIA HOUSE.

(Annulosa, Pl. LX.)

Genus TRYPANOPHORA, Kollar.

Trypanophora, Kollar, in Hügel's Kaschmir, iv. pt. ii. p. 457 (1844); Walker, List Lep. Het. Brit. Mus. pt. 1. p. 3.

TRYPANOPHORA SEMIHYALINA. (Pl. LX. figs. 1, 2. ♂ ♀.)

♀ *Trypanophora semihyalina*, Kollar, in Hügel's Kaschmir, iv. pt. ii. p. 457, pl. 19. f. 1 (1844); Walker, List Lep. Het. Brit. Mus. pt. ii. p. 434.

♀ *Syntomis humeralis*, Walker, List Lep. Het. B.M. pt. vii. f. 1593 (1856).

Hab. Kaschmir (*Kollar*); N. India (*Col. Buckley*).

The male of this very curious insect differs from the female in having the antennæ thickly bipectinated (these in the female being minutely bipectinated and slightly clavate at the tip); the wings are narrower, the hyaline spots on the fore-wing are less in size, and the two spots near the posterior angle are covered with ochreous scales; the entire disc of the hind-wing is hyaline.

The larva is represented among the original drawings of General Hardwicke, now in the British Museum (*vide* vol. 10999. fig. 181, and vol. 11001. figs. 23, 26 & 90), and is also figured among the drawings made in N. India by A. Grote, Esq. of Calcutta, who states that it "feeds on *Raphiolepis*."

Genus SYNTOMIS, Ochs.

SYNTOMIS MARSDENI, n. sp. (Pl. LX. fig. 3.)

Blackish-brown: fore-wing with five whitish transparent spots,

one within the discoidal cell, two on the posterior margin, and two near the apex; hind-wing with yellowish base, and small, whitish, transparent discal spot; front of head, collar, shoulders, and abdominal bands ochreous-yellow; antennæ tipt with white.

Expanse $\frac{9}{10}$ ths of an inch.

Hab. Java (*Dr. Horsfield*).

SYNTOMIS VIGORSI, n. sp. (Pl. LX. fig. 4.)

Male, black, glossed with metallic green: fore-wing with five quite transparent spots; hind-wing with a rather large transparent discal spot; body dark metallic green; antennæ filiform, tipt with yellow. Female duller-coloured, and having larger spots.

Expanse of male 1 inch, female $1\frac{1}{4}$ inch.

Hab. Java (*Dr. Horsfield*).

SYNTOMIS PFEIFFERÆ, n. sp. (Pl. LX. fig. 5.)

Male dark brown: fore-wing with five pale yellow spots, one disposed at the base of posterior margin, inwardly oblique across the disc, and two from near the apex; hind-wing with a discal spot and along abdominal margin yellow; face, collar, spots on thorax, and abdominal bands yellow. Female, ferruginous-brown, the spots larger and ochreous-yellow. Antennæ filiform in both sexes.

Expanse of male $1\frac{1}{8}$, of female $1\frac{2}{8}$ inch.

Hab. Java (*Dr. Horsfield*).

Remark.—This species is somewhat allied to *Syntomis tenuis*, Walker, from Celebes.

SYNTOMIS WALLACII, n. sp. (Pl. LX. fig. 6.)

Purple-brown: fore-wing with five, and hind-wing with two, small, rounded, semitransparent yellowish spots; face, collar, and abdominal bands bright yellow; tip of antennæ and first joint of tarsi white.

Expanse $1\frac{1}{4}$ inch.

Hab. Java (*Dr. Horsfield*).

SYNTOMIS PENANGÆ, n. sp. (Pl. LX. fig. 7.)

Fuliginous-black: fore-wing with two narrow longitudinal yellowish streaks from the base to one-third of its length, also with two upper and one lower silvery transparent spots; hind wing with a transparent discal space, suffused anteriorly with yellowish; collar, lower part of thorax, and narrow abdominal bands yellowish; antennæ bipectinated, margined with whitish to near the tip.

Expanse 1 inch.

Hab. Penang (*Dr. Cantor*).

SYNTOMIS RAFFLESII, n. sp. (Pl. LX. fig. 8.)

Male, fuliginous-black: fore-wing with two very narrow ochreous-yellow streaks at the base; and three transparent spots on the apical half, two being disposed transversely to posterior angle, the other near the apex; hind-wing with a transparent spot on the abdominal margin, also a small yellow discal spot; front of head, collar, base

of thorax, and narrow abdominal bands ochreous-yellow. Female paler, with the ochreous-yellow brighter, the transparent spots being tinged with the same. Antennæ bipectinated in both sexes.

Expanse of male $\frac{4}{5}$, of female $1\frac{1}{8}$ inch.

Hab. Java (*Dr. Horsfield*).

SYNTOMIS WALKERI, n. sp. (Pl. LX. fig. 9.)

Male, dark brown: fore-wing with seven yellow spots, two being disposed along the costal margin and narrow, two along posterior margin, the outer one of which has a minute spot above it, and two obliquely near the apex; hind-wing with the costal margin whitish, and two spots from the base yellow; collar, shoulders, and abdominal bands yellow. Female paler throughout, and the spots larger. Antennæ bipectinated in the male, filiform in the female.

Expanse of male $1\frac{9}{10}$, of female 1 inch.

Hab. Java (*Dr. Horsfield*).

SYNTOMIS PRAVATA, n. sp. (Pl. LX. fig. 10.)

Fuliginous-black: fore-wing with two transverse pairs of small white spots; hind-wing with small white spots; cilia at the apex of each wing, and tip of antennæ, white. Antennæ bipectinated, filiform at the tip.

Hab. Java (*Dr. Horsfield*).

SYNTOMIS CRAWFURDI, n. sp. (Pl. LX. fig. 11.)

Black: fore-wing with a narrow costal streak near the base, two longitudinal spots in the middle of the wing, and five small spots disposed in a semicircle near the apex, transparent; hind-wing with the anterior margin and two spots transparent; base of both wings coppery-red; body black; collar, shoulders, and abdominal bands coppery-red. Antennæ bipectinated, metallic-green.

Expanse nearly 1 inch.

Hab. Java (*Dr. Horsfield*).

SYNTOMIS CANTORI, n. sp. (Pl. LX. fig. 12.)

Fore-wing from the base to near one-third of its length, a small disco-cellular spot, apex, and narrow space along exterior margin black, which also extends slightly up the first median veinlet; middle portion of the wing transparent, where the veins and costal margin are yellow; hind-wing black, with a minute transparent discal spot; cilia black; body wholly black, glossed with green; antennæ broken off.

Expanse $1\frac{5}{12}$ inch.

Hab. Penang (*Dr. Cantor*).

Genus PHALANNA.

Euchromia (*Phalanna*), Walker, List Lep. Het. Brit. Mus. pt. 1. p. 218 (1854).

Euchromia, pt., Hübner.

PHALANNA HORSFIELDI, n. sp. (Pl. LX. fig. 13.)

Dark brown: fore-wing with a lengthened spot below the cell, indented in the middle of its posterior margin, a shorter spot within the cell, and a transverse oblique row of spots near the apex, deep yellow; a small spot at the base and another near the middle of the wing indigo-blue; hind-wing with large yellow spot in its middle, and a semi-transparent spot near the base, the upper half of the latter being yellow; body black; face, spot on each shoulder, and underside white; abdomen with two deep-yellow bands, one being situated at the base, the other on the fourth segment; top of head, thorax, and margin of the other abdominal segments indigo-blue. Antennæ bipectinated.

Expanse $1\frac{7}{12}$ inch.

Hab. Java (*Dr. Horsfield*).

Remark.—This species may be distinguished from *P. polymena* by the two bands on the abdomen being yellow, whereas in *P. polymena* there are three bands, and these of a crimson colour. *P. horsfieldi* is also without the crimson spot in front of the thorax.

Genus PHAUDA.

Euchromia (*Phauda*), Walker, List Lep. Het. Brit. Mus. pt. 1. p. 256 (1854).

Xenares, Herr.—Schæffer, Lep. Exot. Spec. Nov. pp. 58, 81 (1858).

PHAUDA? MAHISA, n. sp. (Pl. LX. fig. 14.)

Wings pale fuliginous-black; a band along entire length of costal margin of fore-wing, and another along costal and abdominal margins of hind-wing, and body, pale red. Antennæ slightly serrated.

Expanse $1\frac{1}{10}$ inch.

Hab. Java (*Dr. Horsfield*).

Professor Raddi exhibited numerous preparations illustrative of one of the processes of his new method of preserving animal substances, which were explained to the Meeting by Signor V. de Tivoli.

Mr. Gould exhibited some specimens of birds of the genus *Urocissa* (*Corvidæ*), and remarked upon the distinctive characters and geographical distribution of the four known species, namely, *U. sinensis* of China, *U. occipitalis* of the Himalayas, *U. magnirostris* of Aracan and Pegu, and *U. flavirostris* of Bhotan and Thibet.

Dr. Crisp related an instance which had occurred, to his knowledge, in Scotland, of a Bantam hen sitting upon the eggs of a Water-Ouzel (*Cinclus aquaticus*), and hatching and rearing one of the young birds, which was fed principally upon porridge.

Mr. Selater exhibited specimens of two rare species of Arctic birds from the collection of John Barrow, Esq., of Hanover Terrace, Regent's Park. One of these was the new species of Diver with a white bill, described by Mr. G. R. Gray as *Colymbus adamsi**, which had been also obtained in Capt. Collinson's expedition, on the N.W. Coast of America. The other was an example of the exceedingly scarce Wader with a spatulated bill, *Eurynorhynchus pygmaeus* (Linn.) (Gray & Mitch. Gen. of B. pl. 152), in what was apparently its summer dress, the head, neck, and breast being rufous. This was believed to be the only specimen known in this state of plumage, the bird having hitherto occurred as a straggler in Asia and Europe in its winter dress. The locality of this specimen was supposed to be the North-eastern Coast of Asia.

May 24, 1859.

G. R. Waterhouse, Esq., V.P., in the Chair.

The following papers were read :—

1. ON THE DEVELOPMENT OF *AURELIA AURITA* IN THE SOCIETY'S AQUARIA. BY E. W. H. HOLDSWORTH, F.L.S.

Few persons can have paid any attention to marine aquaria without noticing in them the frequent occurrence of the little white polype, commonly known as *Hydra tuba*. The ova producing them are doubtless introduced with the sea-water; and if the conditions are suitable for their development, the rock-work and sides of the tank are often studded with hundreds of their delicate transparent bells. The changes they undergo before assuming the adult form have been investigated by Sars, Siebold, and many other naturalists; and it is now well known that these little polypoid forms are only early states of *Aurelia aurita*—the medusa seen thronging our coasts in such countless thousands during the summer months. The perfect animal, however, is so rarely produced within the limits of an aquarium, that a recent case of its occurrence in one of the Society's tanks appears to me worthy of record. Since the establishment of the Fish-house in the Zoological Gardens, not a year has passed without the abundant production of the polypes in several of the tanks, and their transverse splitting and change to medusoids have been frequently observed; but no further development has taken place, and after a short period the young animals have gradually disappeared. In the present year, however, greater success has been attained; and this is perhaps partly due to the water in the tank having been kept at a nearly uniform temperature, from the absence of any severe cold during the early part of the season. The polypes

* See p. 167.

made their usual appearance about the end of January; and after two or three weeks a considerable number of medusoids were detached, of which a few only have survived; but some of these now exhibit all the specific characters of the perfect Medusa, the largest specimen at the present time being 3 inches in breadth when dilated, and the others of various intermediate sizes. It is unnecessary to detail here the gradual changes undergone in the course of development to the perfect animal, as they have been fully and accurately described by several authors: I will only mention that an instance was observed of two medusoids having been thrown off together from the parent stock, and remaining united for more than a week; each gave evidence of independent existence; and their course through the water was marked by great irregularity, from the uncertain and sometimes opposite action of the two disks.

The water containing these Medusæ has remained for several months unchanged, but its purity has not been endangered by the presence of fish, or other animals requiring a large supply of oxygen.

2. ON A NEW SPECIES OF MOLLUSK OF THE GENUS *SCISSURELLA*,
d'ORB. BY S. P. WOODWARD, F.G.S. COMMUNICATED BY
PROF. OWEN.

(Mollusca, Pl. XLVI.)

The little shell for which I propose the name of *Scissurella mantelli* was found in a sample of "Menaccanite" sand, collected in New Zealand by Mr. Walter Mantell. This sand also afforded a minute species of *Ringicula*, and numerous examples of *Calcarina*, *Siderolites*, and other Rhizopods. *Scissurella mantelli* resembles the type of the genus, *S. elegans*, d'Orb., but is rather larger, more depressed, more strongly ornamented, and has a longer *scissural band*. The specimen has been in my possession several years, but I did not think it worth publishing until I observed that it exhibited a character hitherto omitted in all descriptions of the genus, viz. that the shell when young *has no slit*. M. d'Orbigny's figures of *Scissurella elegans*, elaborate and highly magnified, represent the scissural band winding round all the whorls and extending to the extreme apex*; but on referring to the specimens collected by Mr. Jeffreys at Spezzia, I found that the band really terminated within half a whorl of the aperture—a smaller proportional distance than in *S. mantelli*, and that during the first part of its life the *Scissurella elegans* also had a simple, entire lip, like the ordinary *Trochidæ*.

M. d'Orbigny's figures and description are faulty in a still more important respect; for Mr. G. Sowerby has observed that in the adult shell the fissure became closed at the aperture, leaving only a small foramen†: so that *Scissurella* presents three phases of growth—having a simple aperture when young, a slit when half-grown, and a

* Mémoires de la Société d'Hist. Nat. de Paris, 1823, pl. 23, p. 340.

† Zool. Journ. 1824, p. 255, and 'Genera of Recent and Fossil Shells,' fasc. 35.

foramen when adult. It is evident from the mode in which the slit is finally closed by the lateral expansion and union of its edges, that this change is final, and coincident with the termination of the shell's growth; whereas in the extinct *Trochotoma* the foramen must have been established at an early period, and continued to travel onward with the growth of the shell, as in the genus *Rimula*.

Eleven species of *Scissurella* are enumerated by Messrs. H. and A. Adams, under the generic name "*Anatomus*"*:—

<i>angulatus</i> , Sow.	<i>d'orbignyi</i> , Audouin.
<i>asper</i> , Phil.	<i>indicus</i> , Montf.
<i>bertheloti</i> , Webb.	<i>lævigatus</i> , d'Orb.
<i>conicus</i> , d'Orb.	<i>striatulus</i> , Phil.
<i>costatus</i> , d'Orb.	<i>reticulatus</i> , Phil.
<i>crispatus</i> , Flem.	

Of these, *A. costatus* and *A. lævigatus* are only varieties of *A. elegans*; "*reticulatus*" appears to be a misprint for *S. plicata*, Phil., of which *S. d'orbignyi*, Scac. (not Audouin), is a synonym; and both this and *S. striatula* are only varieties of *S. elegans*, d'Orb. *S. angulata*, Lovén (not Sow.), appears to be the adult Norwegian form of the British *S. crispata*; and *S. aspera*, Phil. (described as *fossil* only), is the Mediterranean equivalent of the same species.

Instead of *eight or nine* European species of *Scissurella*, I can find only *two*; and of these the typical species must be called *S. elegans* (d'Orb.), that being the only appropriate name of the three first given.

S. bertheloti, Webb, from the Canaries, is closely allied to *S. elegans*; *S. conica*, d'Orb., from the Falkland Islands, is more like *S. crispata*. The British species, *S. crispata*, differs considerably from the typical *Scissurella* in form; and the slit is permanently open, as in *Pleurotomaria*,—a character which may be considered of subgeneric importance. Prof. King, in his otherwise excellent remarks on this genus (*Pleurotomaria*), assumes its identity with *Scissurella* (*crispata*), and supposes it to be "essentially non-perlaceous†;" but since the Cretaceous, Tertiary, and recent species of *Pleurotomaria* are all *nacreous*, it is reasonable to conclude that those of the older rocks were likewise so, although now metamorphic and destitute of any remains of pearly lustre. *Scissurella* of d'Orbigny, typified by *S. elegans*, is distinct from every other genus, recent or fossil, hitherto described.

The Messrs. Adams have substituted for *Scissurella* the name "*Anatomus*, Montf.," which certainly was never intended for any shell of the kind. Montfort's figure was most likely taken from a specimen of *Serpula spirorbis*, which agrees with the description of "*Anatomus indicus*" in being *gregarious upon sea-weed*, and in having, when detached, a slit in the *lower margin* of the lip.

If it should still be considered desirable to have a subgeneric

* 'Genera of Shells,' p. 439 (June 1854).

† Monograph of Permian Fossils, Trans. Pal. Soc. 1850, p. 215.

name for *Scissurella crispata*, I have no objection to the adoption of ANATOMA, provided it be spelled properly, and not attributed to Montfort.

3. NOTE ON CYCLOSTOMA ARTICULATUM. BY S. P. WOODWARD, F.G.S. COMMUNICATED BY PROF. OWEN.

(Mollusca, Pl. XLVI.)

This land-snail is peculiar to the Island of Rodriguez, and belongs to the subgenus *Tropidophora* (Troschel), characteristic of the Mascarene Islands. Numerous examples were collected in February 1858 by the late Madame Ida Pfeiffer, who conveyed them to the Mauritius, where they continued active, but took no food during a stay of two months. Three individuals remained alive after the voyage to England, which occupied ten weeks, and several others were sufficiently preserved for examination. They were brought over packed in paper and rags, in a tin pot with a lid, and were not taken out until a fortnight after their arrival. One of these snails lived for some months under a bell-glass with moss and ferns, and afforded frequent opportunities for examination. The animal was of a pale buff colour, with darker tentacles and muzzle; the tentacles were acute, rugose, and slightly annulated; the muzzle annulated, grooved beneath, and bilobed at the end, which was constantly used in walking. The foot was ample, with a deep central groove dividing it into two lateral elements moved alternately in walking. When it retired and closed its shell, it still adhered, and sometimes became suspended, by a tenacious thread of mucus.

Madame Pfeiffer also brought home specimens of *Cyclostoma carinatum* and *C. (Otopoma) listeri*, from Mauritius; which were in a tolerably fresh state. The lingual dentition of these species differs slightly from that of *C. articulatum*.

EXPLANATION OF PLATE XLVI.

Figs. 1-7. *Scissurella elegans*: several varieties at different periods of growth, magnified 24 diameters.

1, 2. Young shells, exhibiting the commencement and successive filling up of the slit.

3-6. Old examples, showing the extent to which the shell grows after the establishment of the foramen.

7. Front view of a shell with the multispiral operculum.

Fig. 8. *Scissurella mantelli*, magnified 40 diameters.

Fig. 9. *Scissurella (Anatoma) crispata*, magnified six times. From the coast of Norway. In the collection of Mr. MacAndrew.

Figs. 10, 11. *Cyclostoma articulatum*, of the size of life.—June 9, 1858.

Fig. 12. Its lingual ribbon, natural size.

Fig. 13. A portion of the same, magnified.

4. INDICATIONS OF THE EXISTENCE OF A SECOND SPECIES OF
EMEU (*DROMÆUS*). BY A. D. BARTLETT.

The specimen of *Dromæus* now exhibited was obtained with others far in the interior of South Australia, several hundred miles from Port Philip.

It differs from *Dromæus novæ-hollandiæ* in having the whole of the feathers of the body distinctly marked with narrow transverse bars of light grey and dark brownish black. The feathers of the back and sides of the bird are broader and longer and less silky in texture than those of the common species: that this is so, is quite evident to the touch. The upper part of the neck and head is nearly black; and the feathers appear thicker than those on these parts in the common bird.

The specimen from which these remarks are taken was one of three examined by me, two of which were adult, and one a young bird about one-third grown. This young bird exhibited the transverse bars on its plumage as distinctly as the adult bird; at the same time the broad longitudinal stripes were clearly to be seen. Judging from the skins, I am inclined to consider this bird to be smaller than the common species. As I hope before long to obtain more information respecting these birds, together with other and more perfect specimens, I beg to propose provisionally the name of *Dromæus irroratus* for this supposed new species.

5. A RECORD OF THE NUMBER OF DAYS OF INCUBATION OF
BIRDS WHICH BREED IN THE SOCIETY'S GARDENS. BY
PHILIP LUTLEY SCLATER, M.A., F.L.S., SECRETARY TO THE
SOCIETY.

The subjoined table, furnished to me from the observations of our intelligent Assistant Head-Keeper, Benjamin Misselbrook, gives the period of incubation of eighteen species of birds which ordinarily breed in our Gardens. The time of incubation appears to be as constant in each species of bird as the period of gestation in each species of mammal; and I think that every addition to our imperfect knowledge of this subject must be of interest to the naturalist, and is worthy of record in our 'Proceedings.'

	Days.
1. Emeu* (<i>Dromæus novæ-hollandiæ</i>)	56
2. American Rhea (<i>Rhea americana</i>)	35
3. Impeyan Pheasant (<i>Lophophorus impeyanus</i>)	28
4. Cheer Pheasant (<i>Catreus wallichii</i>)	28
5. Purple Pheasant (<i>Gallopheas horsfieldii</i>)	24
6. White-crested Kaleege (<i>Gallopheas albocristatus</i>) . .	26
7. Black-backed Kaleege (<i>Gallopheas melanonotus</i>) . .	24

* The eggs of the Emeu and Rhea were hatched in the Society's incubator.

	Days.
8. Californian Quail (<i>Callipepla californica</i>)	21
9. Crowned Pigeon (<i>Goura coronata</i>)	28
10. Crested Pigeon (<i>Ocyphaps lophotes</i>)	14
11. Black-necked Swan (<i>Cygnus nigricollis</i>)	35
12. Black Swan (<i>Cygnus atratus</i>)	35
13. Cereopsis Goose (<i>Cereopsis novæ-hollandiæ</i>)	35
14. Sandwich-Island Goose (<i>Bernicla sandvicensis</i>)	31
15. Ashy-headed Goose (<i>Chloëphaga poliocephala</i>)	30
16. Ruddy Shieldrake (<i>Casarca rutila</i>)	30
17. Summer Duck (<i>Aix sponsa</i>)	30
18. Mandarin Duck (<i>Aix galericulata</i>)	30

6. REMARKS ON EXHIBITING SPECIMENS OF TWO SPECIES OF DIVERS (COLYMBUS), FROM MR. GURNEY'S COLLECTION. BY PHILIP LUTLEY SCLATER, M.A., F.L.S., SECRETARY TO THE SOCIETY.

On showing to Mr. J. H. Gurney the specimen of the supposed new Diver (*Colymbus adamsi*, G. R. Gray), belonging to Mr. Barrow, and exhibited at the last meeting of the Society, that gentleman informed me that he had a somewhat similar bird in his own collection, killed off the coast of Norfolk. Mr. Gurney has kindly ordered this specimen to be sent up for the inspection of the Society. As it is in winter plumage, no comparison can be made relative to the white markings of the neck and scapularies; but in respect of the thickened and whitened bill, it entirely agrees with *Colymbus adamsi*. In the British Gallery of the British Museum I have also noticed an example of the Great Northern Diver in which the bill has become partially white. Upon the whole, therefore, I am inclined to agree with Mr. Gurney's views that this is the effect of age, the bill becoming thickened and whitened in the very adult birds, and that we cannot use this character as a ground of difference to separate *C. adamsi* from *C. glacialis*. It remains, however, yet to be proved that the other characters assigned by Mr. G. R. Gray to his *C. adamsi* are not of sufficient importance to maintain that species as distinct.

As there might be some doubt raised as to whether Mr. Gurney's specimen was really shot on the English coast, I subjoin the following letter, which seems to set that question at rest:—

“ 24 Kensington Park Gardens,
30th May, 1859.

“ MY DEAR SIR,—I have been endeavouring to verify the facts respecting the White-billed Diver.

“ It was shot *on the beach*, or *from the beach*, at Pakefield, on the coast of Suffolk, and was brought *in the flesh* to Mr. Scales, a gentleman living in Pakefield, who sent it to Mr. Thirtle, a bird-stuffer at Lowestoft, to preserve for him. I saw it at Thirtle's, and wrote to Mr. Scales to say that I should like to possess it, when he very kindly gave it to me as a present.

"I am sorry to find that I have no exact memorandum of the date when it was procured, but believe it to have been in the early spring, about seven years since.

"I am, yours faithfully,

"J. H. GURNEY."

"P. L. Slater, Esq."

Mr. Gurney has at the same time forwarded for examination a specimen of the Black-throated Diver (*Colymbus arcticus*) from the coast of California, in fully adult summer plumage. Mr. Lawrence, in his portion of the 'Report upon North American Ornithology,' published in the ninth volume of the 'Pacific R. R. Report,' has separated this bird from the ordinary *Colymbus arcticus* as a distinct species, observing that, though he had not met with it in summer plumage, its smaller dimensions, and, in particular, more slender and weaker bill, seem to warrant his so doing.

Comparing the Pacific example with a fine specimen of the ordinary Black-throated Diver from these seas, kindly lent to me by Mr. Leadbeater, we observe just these very differences. In plumage there is none, or none worth mentioning. I am therefore hardly inclined to think that the specific independence of *Colymbus pacificus* will ultimately be maintainable, knowing, as I do, that there is considerable variation in size prevalent among European specimens of the Black-throated Diver.

7. ON A NEW LEPIDOPTEROUS INSECT FROM AUSTRALIA. BY A. W. SCOTT, M.A., MEMBER OF THE LEGISLATIVE ASSEMBLY OF NEW SOUTH WALES. COMMUNICATED BY DR. GEORGE BENNETT, CORR. MEMB.

(Annulosa, Pl. LXI.)

HYPHANTIDIUM SERICARIUM.

The silken web, portions of which are herewith transmitted, formed by these small gregarious larvæ, is so remarkable for its vast superficial extent, the extreme evenness of manufacture, and the fineness and beauty of the texture, that I have been induced to submit these homely Lepidoptera, with their transformations, for publication in the Proceedings of the Zoological Society, deeming the subject worthy of notice and interest to the European entomologist;—the more so, as, after a careful and patient investigation of the families closely related (the European examples of which have been so beautifully illustrated and correctly defined by Hübner), I am led to believe that the insects now before me are, in all respects, non-descript.

Acting in accordance with this impression, I have formed a new genus under the name of *Hyphantidium*: it will however rest with the scientific naturalist at home, with his numerous books of reference and cabinet specimens, to determine this question and to correct the error which I may thus possibly have fallen into.

The larvæ, together with fine specimens of the web, were originally sent to me by Helenus Scott, Esq., Police Magistrate of the Wolombi district, who had himself obtained them early in July of last year from his neighbour Mrs. Thomas Wiseman of Laguna House, the original discoverer. This gift was accompanied by the following remarks:—

“Mrs. Thomas Wiseman of this district had placed a quantity of shelled maize in a verandah room, 8 feet 6 inches long, 6 feet wide, and 9 feet 3 inches high, the stone walls being plastered. At a subsequent period, this room being required for a bed-room, the walls were found to be entirely and uniformly covered by a beautiful white-coloured web, fastened at the ceiling, floor, and corners, by a stouter and coarser fabric, and occasionally to portions of the wall itself. So that in this instance an unbroken sheet of cloth containing some 72 square feet might with care have been obtained; while the whole of the web inside of the room would contain some 252 square feet.”

The specimens of this cloth sent to me were of the size of a large handkerchief, having been rudely torn from the walls. In anticipation of obtaining other specimens, I gave mine to the Australian Museum in Sydney; but now, unhappily, the whole of the remaining portions of the original construction have been ruthlessly destroyed by the servants.

The samples now sent will, however, be sufficient to enable the admirers of the curious and beautiful to form an opinion by ocular demonstration of the extreme delicacy and uniformity of the fabric.

The *Larva* (fig. 1, natural size, fig. 2, magnified) is, when full-grown, about $\frac{5}{12}$ inch in length, fleshy, with the head and first annulation depressed, somewhat horny, and of a blackish brown. It possesses sixteen feet. In colour pale yellowish white, with whorls of six small black spots on each annulation, each emitting a tiny hair. The caudal segment is spotted with brown.

In confinement these Caterpillars were found to be active, with a dislike to the light, so that when exposed they immediately commenced spinning their web over, and connecting several grains of the maize together, upon the mealy portions of which they subsisted. They had likewise lined the top and sides of the box with their silken tissue.

In their natural state I am of opinion that during the day they conceal themselves between the wall and the web, and descend at night to carry on their depredations;—but this is mere supposition.

At the latter end of August they changed to the chrysalis, each larva forming a separate cocoon for itself amongst the maize, consisting of a flimsy web somewhat tightly enveloping the chrysalis. The chrysalis (fig. 3) is of a light yellowish-brown, with the wing-cases largely developed, and of $\frac{1}{3}$ inch in length.

The perfect insect (fig. 4) took wing in October, and is in expanse $\frac{3}{4}$ inch, and active in its movements. The superior wings elongated, the costal margin arched, and apices rounded. General colour greyish-brown, of a silvery hue, with stigmata and strigæ of a darker

colour. Inferior wings of a light semitransparent silvery hue, with a deep marginal fringe. Thorax similar in colour to anterior wings and not crested. Abdomen yellowish; the entire of the under side light silvery grey. The wings are slightly convoluted in repose.

Antennæ (fig. 5, magnified portion) rather short, setaceous, and scaly above.

Labial palpi (figs. 6 & 7, denuded), 3-jointed, covered with feathery scales. Basal and terminal joints nearly equal, and each about one half the length of the middle one. The whole cylindrical and terminating in a point, and bending upwards and forwards to about level with the top of the eye.

The legs.—Anterior pair (fig. 8) small and spurless. Tibiæ half the length of the femora. Second pair (fig. 9), two spurs at ends of tibiæ. Posterior pair (fig. 10), four spurs. The second and posterior legs are long, and nearly equal to each other. The whole of the legs are closely covered with feathery scales, thicker however, and intermixed with some hairs on the tibiæ of posterior pair. Tarsi in all 5-jointed (first joint about equal to remaining four) terminating in small claws.

8. DESCRIPTION OF A SPECIES OF PERGA, OR SAW-FLY, FOUND FEEDING UPON THE EUCALYPTUS CITRIODORA OF HOOKER, OR WIDE BAY LEMON-SCENTED GUM-TREE. BY DR. GEORGE BENNETT, OF SYDNEY, F.Z.S., AND A. W. SCOTT, ESQ., MEMBER OF THE LEGISLATIVE ASSEMBLY OF NEW SOUTH WALES.

(Annulosa, Pl. LXII.)

Among numerous *Eucalypti* or Gum-trees growing in great profusion in New South Wales, a species, named *Eucalyptus citriodora* by Sir William Hooker, is peculiar to the Wide Bay district at the northern part of the Colony. It is a tree of graceful and elegant growth, and assumes a picturesque character and appearance devoid of stiffness; and as the younger branches become elongated towards the top, they gradually yield and become partially pendent. It bears delicate white flowers in clusters, which attract by the honey secreted within them numerous insects and honey-eating birds. The foliage affords food to the larvæ of many insects, which sometimes appear in such myriads as to denude the tree; and the flowers are the resort of a great variety of Coleopterous and other insects. This tree has a great claim to picturesque beauty, and proves an ornament to any landscape when seen growing in its native soil. It does not produce timber of any great size, nor am I aware of its being used for any particular purpose. At Wide Bay it has been known to attain the height of from 80 to 95 feet, with a circumference of from 8 to 10 feet. It has recently been introduced into the Botanic Garden at Sydney, from the Wide Bay district, and has been found to be of quick growth. My friend Mr. C. Moore, the Director of the

Botanic Garden at Sydney, informs me that a tree now in that garden was planted about six years since; and I found it had in that time attained the height of 35 feet; but the top of the tree having been cut off at an early period of its growth, it had divided into several branches. This had retarded its growth as far as regards elevation, although (as was the intention) it had promoted the extension of its branches: and, but for this circumstance, it might have been expected that by this time the tree would have attained the elevation of about 60 or 65 feet. The leaves of this species of *Eucalyptus*, on being bruised, yield a delightful citron-like odour, compared by some to the smell of balm, and by others to the scent called Citronella; and when the leaves are dried and placed among clothes or papers, they impart an agreeable scent to them. Considering that it might prove useful in an economical point of view, I procured a quantity of the leaves, which were distilled by Mr. Norie, a practical chemist in Sydney; and it was found that three pounds twelve ounces weight of the leaves yielded by distillation six drachms and a half of a pure colourless oil. A very small number of drops of the oil (about eight), to an ounce of spirit, produce a very powerful and agreeable perfume, approximating to that known as Citronella, which may be called "Essence of Lemon-scented Gum-tree." I sent some of this oil in its pure state to Sir William Hooker, through my friend Dr. F. Müller of Melbourne, to be placed in the Museum of Economic Botany. When the outer bark of the tree was hanging in strips upon the trunk and branches, as is usual with the *Eucalypti*, the new bark underneath was of a delicate greenish white colour. A red gum exudes from this tree. As this tree may eventually prove of great utility in affording perfume, every exertion will be made to propagate it in the neighbourhood of Sydney, and being of rapid growth it will, no doubt, quickly succeed. About September I observed a gregarious Caterpillar feeding upon the foliage of this tree and rapidly destroying it. On a closer inspection I found the larvæ of a species of *Perga* or Saw-fly, huddled together both on the upper and under sides of the leaves, arranged for the most part in regular rows. When disturbed, they simultaneously bent their bodies in the form of an arch, and emitted a greenish fluid from their mouths, as if to intimidate the intruder, forming, on a small scale, a representation of an angry cat when a dog approaches her lair. When put into a box, the larvæ emitted so powerful an odour of the leaves on which they had been feeding, as to scent the room in which they were placed. The larva of the *Perga* is evidently an omnivorous feeder, as it has been observed upon several species of the *Eucalyptus* as well as on the *Callistemon*. On showing the larva to my friend A. W. Scott, Esq., of Ash Island, he informed me that he had made drawings and magnified dissections of this and other species. In a few days I received the accompanying description of this species, together with the beautiful and accurate drawing (copied in Pl. LXII.) by his daughter, Miss H. Scott.

Family SECURIFERA.

Tribe 1. TENTHREDINETÆ (Saw-flies).

Genus PERGA (Leach).

PERGA EUCALYPTI, sp. nov. ? (Pl. LXII.)

These larvæ are gregarious, and live exposed on the leaves of the *Eucalyptus*, on which they feed, and when full-grown attain a considerable size, from 2 inches to $2\frac{1}{4}$. Of a uniform velvety black, with numerous short stiff white hairs, they bear a general resemblance to Lepidopterous Caterpillars, easily discernible however by the possession of only six squamous feet, and these large, powerful and reddish.

Living, as they do, in considerable numbers, huddled together and even one upon another, on the upper as well as the under side of the leaf, they present so striking an object, that the most unobservant must easily recognize the group of larvæ depicted in our plate.

We may also add, that during their repast these pseudo-caterpillars keep slowly moving their abdominal portions, rapping their extremities against the leaves, and, if disturbed, arching their bodies in a menacing manner, and emitting from their mouths a viscid matter.

Our larvæ buried themselves underground in October, forming cocoons of a very strong, brownish texture. The perfect insect appeared in the following March, and measured in expanse of wings $1\frac{7}{8}$ inch, the length of the body being $\frac{1}{2}$, of which the head and thorax constituted $\frac{4}{5}$.

Fig. 1. The head magnified.

Fig. 2. Antennæ. These are short, 6 jointed, the last joint longest and clubbed; the whole of a yellow colour.

The legs: anterior pair two spurs on tibiæ; second and posterior (fig. 3) have similar spurs, with an additional moveable spine on the middle of their inferior side; the tarsi are 5-jointed, the first four furnished with pairs of blunted appendages, with large pulvilli between, the ultimate one terminated by strong claws.

Fig. 4. Anterior wing. This has four cubital cells, the second and third of which receive a recurrent nervure, the transverse nervures of the disc; but the radial cell is not appendiculated.

Fig. 5. Posterior wing.

The wings of the live insect are brownish inclining to bronze, but in the cabinet these soon assume a shabby and ragged appearance. Head and thorax have a metallic dark green-red lustre. Abdomen bright shining green; three large orange-yellow patches on the upper side, one at each base of wings, and one over junction of thorax and abdomen; underneath similar patches immediately below and between the legs.

We have other species of this genus in our possession, exhibiting considerable variations in their larvæ, as to size, colouring, and markings; but they are all uniformly supplied with only six powerful squamous feet.

The *Eucalyptus*, *Melaleuca* and *Callistemon* appear to afford the principal food for the *Pergæ*.

The habits of the Saw-flies are so well described by Latreille, Leach, and others, that it is quite unnecessary for us to make further comments; and it has been to the larvæ of a species which may be considered the type of the genus, that we have principally devoted our attention in this short sketch.

The *Tenthredinetæ* are represented by numerous examples in this colony, and are well deserving of a memoir devoted exclusively to their family, as many others, in addition to the *Pergæ*, may be found worthy of being formed into separate and distinct genera.

The following list of additions to the Society's Menagerie by presentation and purchase during the month of May was read:—

1 Axis Deer	<i>Axis maculata</i>	Presented by Richard Ansdell, Esq.
1 Gannet	<i>Sula bassana</i>	Presented by T. W. Foster, Esq.
1 Australian Thick-knee	<i>Edicnemus australis</i>	Purchased.
2 Mooruks	<i>Casuarius bennettii</i>	Presented by Dr. Bennett, F.Z.S.
4 Hippocampi	<i>Hippocampus brevirostris</i>	Presented by T. F. Pinto, Esq.
15 Green Lizards	<i>Lacerta viridis</i>	Presented.
1 African Civet	<i>Viverra civetta</i>	Presented by Captain R. Hughes.
1 Kangaroo	<i>Petrogale penicillata</i>	Purchased.
2 Tachard Buzzards	<i>Buteo tachardus</i>	Purchased.
1 Red-capped Parrakeet	<i>Platycercus pileatus</i>	Purchased.
1 Love Parrakeet	<i>Agapornis pullaria</i>	Purchased.
5 Wax-wings	<i>Ampelis garrula</i>	Purchased.
1 Grivet Monkey	<i>Cercopithecus engythitia</i>	Presented by B. J. Angell, Esq.
1 Barred Ichneumon	<i>Herpestes fasciatus</i>	Presented by R. F. Burton, Esq., F.R.G.S.
1 Boa	<i>Boa constrictor</i>	Presented by G. Furness, Esq.
2 Chinese Pheasants	<i>Phasianus torquatus</i>	Presented by Geo. Moss, Esq.
2 Pr. Albert's Curassow	<i>Crax alberti</i>	Purchased.
8 Water Tortoises	<i>Emys</i> — ?	} Presented by Rev. R. T. Lowe, Corr. Memb.
4 Land Tortoises	<i>Testudo</i> — ?	
1 Paradoxure	<i>Paradoxurus typus</i>	Presented by Sir D. Baird.
1 Flying Phalanger	<i>Belideus flaviventris</i>	Presented by Dr. Bennett, Corr. Memb.
1 Capuchin Monkey	<i>Cebus</i> — ?	Presented.

Of these, the *Hippocampus brevirostris*, *Buteo tachardus*, and *Belideus flaviventris* were stated to be exhibited for the first time.

June 28, 1859.

Dr. Gray, F.R.S., V.P., in the Chair.

The following papers were read :—

1. NOTES ON THE DUCK-BILL (*ORNITHORHYNCHUS ANATINUS*).
BY DR. GEORGE BENNETT, F.Z.S.

(Mammalia, Pl. LXXI.)

On the morning of the 14th of September, 1848, I received through the kindness of Henry Brooks, Esq., of Penrith, six specimens of the *Ornithorhynchus*—an unusually large number to be captured and sent at one time—consisting of four full-grown males and two full-grown females. As usual, the latter were much smaller in size than the former. Some of these animals had been shot, and others captured in nets at night, at a place named Robe's Creek, near the South Creek, Penrith, about thirty miles from Sydney. They were all in good and fresh condition, excepting one of the females, in which some degree of decomposition had taken place, but not sufficient to prevent examination. On dissection, I found the uteri of the females (although it was the commencement of the breeding season) unimpregnated; but in the four males the testes were all enlarged, resembling pigeons' eggs in size, and of a pure white colour. At other seasons of the year I have observed them in these animals not larger than a small pea, and this being the commencement of the breeding season could alone account for their size; so that they show in this respect a great resemblance to what is observed in most birds during the breeding season of the year. I am not aware of this peculiarity existing in any other Mammalia. The testes in all the specimens were of equal size, and measured $1\frac{3}{8}$ inch in length and 1 inch in the diameter. I preserved one animal with the testes *in situ*, and detached the testes from the others, placing them in spirits for a further examination if required.

On examining the cartilaginous lips of these animals as they were lying heaped upon the table, dripping wet as if just emerged from the water, they were dark grey above, and mottled of a darker or lighter colour underneath, as is shown in the drawing made from life by G. F. Angas, Esq. (Pl. LXXI.), and which I have not yet seen correctly represented in any coloured drawing or engraving of the animal, in consequence of their not being taken from a living or recently dead animal. Over the eye is a tawny brownish-yellow spot, which marks distinctly the situation of that minute but brilliant organ of vision. These animals have horny teeth on the tongue. On the back part of this organ there is a bulb which serves to prevent the passage of the food collected in the mouth together with

the water into the gullet, and to direct the former into the temporary receptacles—the cheek pouches, which have an opening on each side at the back part of the mouth. In these I have found the food well comminuted, mingled with fine gravel of a muddy consistence, the food consisting of *débris* of insects and small shell-fish mingled with mud and gravel to aid digestion, and I have also found the whole length of the alimentary canal filled with mud or sand mingled with *débris* of food. I have observed the same in the *Echidna* or ‘Porcupine Ant-eater’ of the colonists. In the stomach of that animal I have found the sand which filled it exhibit under the microscope the remains of ants alone. The sand appears to me to be necessary for the proper digestion of the food in both animals.

On the morning of the 28th of December, 1858, I received a male and female specimen of the *Ornithorhynchus* alive; the male very large, and the female much smaller; they had been captured four days before the opportunity occurred of sending them. They were packed in a box with straw, carefully and securely fastened down; they had burrowed into the straw, and seemed warm and comfortable. When taken out and placed into a tub of water, they were very lively, diving down and remaining out of sight; and were so timid, that, when reappearing, it was only to place the end of the mandibles out of the water to inhale some fresh air, when they would speedily disappear again, seeming to be perfectly aware they were watched. The longest time this animal could remain under water, without rising to the surface to breathe, was full 7 minutes 15 seconds, by the watch. I placed them in the evening in a tub of water with turf and grass; they remained quite tranquil, bubbles of air rising occasionally to the surface of the water alone indicating their position, with a movement as if they were shifting their place in the tub, but without showing the body. After some minutes had elapsed, the tip of the black snout would appear on the side of the tub, to the length of about an inch, or just sufficient for the nostrils to be above the surface of the water, they being at the same time dilated as if to imbibe a supply of atmospheric air. They would only remain a few seconds, when they again speedily disappeared. When watched at a distance, one was seen to crawl out from the tub and escape upon the ground, but it was speedily captured and replaced. After leaving them in the water for about an hour, I placed my hand in the tub and took them out, and, on replacing them in the box, they soon burrowed down in the straw.

They are, as may be expected, fond of darkness and concealment, and dive under water or burrow under ground, coming to the surface to feed and enjoy themselves, principally at the dusk of the evening or at night.

I do not believe that the Duck-bill has ever been found in South Australia, no specimen having yet been brought from that locality.

These animals are rather crepuscular in their habits, sleeping for the most part of the day; and, in captivity, I have always found them very annoying at night, disturbing the rest of every one within hearing by the scratching and restless noises which they make in

their vigorous efforts to escape ; whereas in the morning they will be found rolled up and fast asleep. Still I am now of opinion that all the Australian crepuscular and night animals—judging from those I have been able to observe in captivity—although very active, and feeding principally at night, will leave their places of concealment during the day for a short time for the purpose of feeding.

The male animal, as if to keep up its bird-like character, has a spur, moveable, like that of the barn-door cocks. This is found also in the *Echidna* or Porcupine Ant-eater, another of the Monotrematous family ; but, judging from experiments on both animals, cannot be considered a weapon of offence or defence, and is for some purpose in the economy of the animal at present unknown to us. From my recent observations I consider the question of the spur in the male being a poisonous weapon as now decided ; for the living male specimen, though very shy and wild, can be handled with impunity. Although making violent efforts to escape, and even giving me some severe scratches with the hind claws in its attempts, still either in or out of the water he has never attempted to use the spur as a weapon of offence. Indeed the scratching I have before alluded to has not been done by the animal intentionally, as it is to all intents and purposes perfectly harmless ; but accidentally by the hind claws, which alone are sharp, in the efforts made to extricate itself from my grasp. The female will float feeding upon the water, and is much tamer than the male. The latter keeps swimming about below, and it is a long time before he ventures to put more than the snout above the water, and then rarely more than the head and a little of the upper part of the body.

From the 29th to the 31st of December they were lively and well. I placed them for one or two hours in the water morning and evening, to feed and wash themselves, which they appeared to enjoy exceedingly. I placed some meat minced very fine in the water, to try to feed them, so as to send them alive to Europe, as I considered the manner of feeding them an important preliminary step to ascertain. In their natural state they evidently feed in water. Just before I took them out in the evening they had burrowed to the bottom of the box, among the straw, very warm and comfortable, and they were cuddled close together.

On the third morning I found them much tamer, and, instead of diving down immediately they were placed in the water, they floated upon the surface. The female would permit me to look close to her little twinkling eyes ; her ears were always much dilated, and she would remain tranquil even when I touched or scratched her head or back ; but the instant I touched the sensitive mandibles, she would either dip down partially or disappear altogether under water for a short time. The male is evidently much more timid. I have only once seen his body on the surface of the water ; and when taking him out of the water and replacing him in his box, I found great difficulty in capturing him. The female, being generally upon the surface, is secured and placed in the box very easily, but the struggles of the male are very great ; and this makes it more difficult to take

him every time. The female paddles about upon the surface, and occasionally performs somersaults in the water; the male sometimes comes up, but dives rapidly down again. The female floats upon the water without any apparent paddling, and remains in a sort of half-immersed position for a great length of time, with the beak lying flat upon the water. If any dust comes near the sensitive nostrils, a bubbling of water is seen to issue from them, as if to drive away the irritating substance; and, if this does not succeed, the beak is washed in the water to remove it.

January 1st, 1859.—Both the animals this morning had a sleek, healthy, and lively appearance; they did not require to be taken out of the box to be placed in the tub of water, but ran in themselves as soon as the lid of the box was opened. On entering the water they turned and gamboled about, and then reclined on one side, scratching themselves with the hind claws. They would permit me to touch them without being disturbed; indeed they had become so tame as to allow me to tickle and scratch them gently, and appeared to enjoy it very much. They generally remained half-submerged in the water; it is only when touching the sensitive mandibles that they would dive down; but even then they would not remain long under water. Their favourite position was half-submerged, with the mandibles resting down upon the surface of the water.

The female is languid and weak, but the male continues vigorous, diving and swimming about. When in the water they play together, occasionally tumbling one over the other, and then remain on the surface of the water, gently combing their fur. No attempt was ever made (even when he growled at being disturbed) by the male to injure or even scratch with the spur. When I took the male out or disturbed him at night, he growled, and afterwards made a peculiar shrill whistling noise, as if a signal call to his companion. It is principally in the evening and at night that these animals are in the habit of coming out of their burrows to sport and feed both in the water and upon the banks. On retiring to their burrows to repose, they roll themselves up like furred balls.

January 2nd.—The female appeared quite exhausted this evening. On being placed in the water, it paddled feebly about, and then, dropping its head, sank. On removing it, I found it was dead. It appeared, on examination, to be in poor condition.

January 3rd.—The male does not appear to be thriving, but I have now a large tub prepared for his reception, in which I have made the following arrangements:—The tub is 3 feet 6 inches in length by 1 foot 9 inches broad, and 2 feet deep. At one end I have had a wooden enclosure made, which was partially filled with earth and a sprinkling of straw; this attempt to imitate the burrow was 12 inches deep and 15 inches in length. I then placed sand from a pond a few inches deep in the tub, in which I planted some fresh plants of *Damasonium ovatum* and other river plants from a pond in the Botanic Gardens. The tub was filled with water up to an inclined plane, which was turfed like a bank; a level space was also left, on which turf was placed, so that the animal might repose

and clean himself on emerging from the water. On placing the male into it, he dived down and seemed to enjoy himself very much. He was still lively, lying upon the surface of the water and scratching himself, and again diving and swimming among the weeds; he then went upon the level bank and again plunged into the water; after remaining there for nearly an hour, sometimes upon the surface and often for a long time under water, he found his way into the burrow, where he remained. I covered the whole of the cage with zinc wire, by which means he had light and air, and we could observe all his actions. This was to prevent his escape, as he could readily have climbed up the surface of the tub. There are openings at each end of the cask, by which means we could draw off all the dirty stagnant water, and replace it with clean, as often as was required. I fed the animal on meat minced very small, and then thrown into the water.

Both of these animals were captured in a net. The man who took them stated he had kept two alive for fourteen days, feeding them upon river mussels, which he broke and gave them in the water: that they seemed to thrive very well; and that he supposed that they fed upon these mussels, as they had been in good health, their death having been occasioned by accident.

It surprises many why these animals, when captured in a net and left all night, are found drowned in the morning. It is my opinion that when one of these animals is captured in a net (as was the case with a male specimen taken in that way a short time since in the Mulgoa Creek, and found dead in the morning), it is entangled in the meshes, and, being unable to rise to the surface to breathe, is drowned.

January 5th.—Last night I observed the animal emerge from the water and enter the burrow: this was about 11 P.M. This morning I did not see him in the water; he appeared yesterday evidently drooping and sickly, and I fear we have not yet got into the method of feeding them. Their food being minute and delicate, it requires some experience to give it to these peculiar animals successfully. On opening the burrow the animal was not there, and on drawing off the water we found him dead and stiff at the bottom. Having, no doubt, been too weak to regain the burrow, he perished when in the water. Thus ends the first experiment of keeping Duck-bills alive.

On dissection I found that they had been starved; there was no food or sand either in the intestines or pouches,—nothing but dirty water. Should I procure other specimens, it is my intention to introduce into my tank river-shrimps and insects of different kinds, previous to placing them in it, so that they may obtain a sufficient supply of their natural food. Still all this will increase the difficulty of taking them to Europe, as the supply cannot be kept up at sea. They evidently are very delicate animals, and life is soon destroyed if nutriment is not rapidly kept up. These specimens were not emaciated in body before they died.

The testes in this male were very small, being not larger than

peas. The animal was full-grown, and of the size of the largest specimens usually seen.

Sometimes I have seen the male with the spur so far thrown back and concealed from view, as at a glance to be taken for the female, and when opened for anatomical examination to be mistaken for one; so that it is not improbable that the large testes resembling pigeons' eggs may have given rise to the notion of the animal laying eggs.

I have no doubt that the Duck-bills make their burrows high in the banks, so as to be out of the reach of the floods which occasionally prevail. Although amphibious in their habits, they require to repose on the dry land, and also to breathe atmospheric air at short intervals of time. Did they not adopt some plan of the kind, they would be destroyed or drowned in their burrows by the floods.

Another very young specimen was kept for three weeks, and fed upon worms; it had a rudimentary spur; it was very tame and easily fed by hand; it died on the 7th of February, and was preserved in spirits.

The plan I propose, besides introducing shell-fish, &c., is to feed them in captivity upon worms, and, if we succeed in keeping them alive in Sydney by that method for three months, to send them in the place of confinement, arranged as before described, to England, keeping them upon the same diet. At all events it is worthy of a trial; and, on quitting Sydney, I left the artificial burrow and other preparations with a person interested in the subject, in order that he might try the experiment.

I have remarked that, when healthy, these animals on emerging from the water are in the habit of cleaning and drying their fur, and seem to pay great attention to their being in a clean and dry condition, and appear also to be fond of warmth. Not long previous to the death of both these animals, I remarked that they did not dry or clean their fur, and I have no doubt that the chilliness produced by that circumstance accelerated their death, as the body—more especially in the male—was not so emaciated as would have been the case had death ensued from starvation.

2. ON THE LONG-TAILED FLYING-OPOSSUM (*BELIDEUS FLAVIVENTRIS*)*, IN A STATE OF NATURE AND IN CAPTIVITY. BY DR. GEORGE BENNETT, F.Z.S.

In November 1858 I received from the district near Broulee, south of Sydney, from a station on the Mooruya River, a young female of this comparatively rare species, and, although so young, found it of a very savage and vicious disposition, spitting, screeching, and growling when handled, accompanying the noise by scratching and biting. The claws were sharp, producing scratches as severe as those of a cat; but the teeth, being as yet only partially developed, were not sufficient to produce much effect. It was evident that any animal displaying such

* See Gould, Mamm. of Austr., pt. 1. pl. 3.

vicious propensities when in so young a state would be formidable and savage when adult, which has been found to be the case. The aborigines, who capture them for food, pull them by the tail from the cavity of the tree, and kill them by dashing their brains out against it before they are able to inflict any injury upon their capturers. The animal, from the conformation of its feet, is evidently intended to live in trees, and therefore when seen on the ground has a very awkward, waddling gait. This is shown but seldom, and then only when it is obliged to walk upon the level surface of the ground. When climbing upon a tree it becomes more independent in character, and it regards the spectator from the top of its perch in a very different manner. It retires either between the forked branches or in the hollow cavities during the day to sleep, and at night passing from one tree to another by flying leaps, aided by its parachute-like membrane, descends to the ground only from unavoidable necessity, such as the trees being so far apart as to render it impossible to traverse the space by leaping. When pursued it takes to the highest branches, and springs from tree to tree with great rapidity, reminding me of monkeys seen in the forests of Singapore, which, when frightened, exhibit a similar degree of activity. It contrives to elude its pursuers by leaps, which, giving an impetus to the body, are very materially aided by the expanded membrane between the fore and hind feet. This enables the animal to pass over a very considerable distance in its leaps. It is surprising to see it passing from branch to branch and tree to tree in the clear and delightful atmosphere of a fine Australian moonlight night, with so extraordinary a degree of skill and rapidity. But I remarked that the flying leaps were invariably downwards in an oblique direction; and that, when desirous of ascending, the creature would climb rapidly, and if overtaken would cling so tenaciously to the bark of the tree, as, while living, to be very difficult of removal.

Having become tamer from confinement, the animal would suffer itself to be handled without scratching and biting as at first, and would lick the hand for sweets, of which it was very fond, and permit its little nose to be touched and fur examined in any gentle manner. But if any one attempted to take it up by the body, it became most violent in temper, biting and scratching with savage rage, at the same time uttering its snarling, wheezing, spitting kind of guttural growl. If caught by the tail it would be more quiet (excepting if held too long in one position), and would spread the membranes as if to save itself from falling. Its beautiful fur above and beneath could be well seen in that position, much better than in the ordinary position of the animal when in action. Although tamer in confinement, it appears devoid of any attachment to those who feed it, for it evinces all the symptoms of dislike at being taken up by the body, whether by a stranger or by the person by whom it has been accustomed to be fed. It is a crepuscular and night animal, sleeping most of the day, coiled up in a circle, with its bushy tail thrown over it like a blanket; but it occasionally wakes up and feeds a little.

It was fed upon milk, raisins, and almonds ; and indeed sweets of all kinds in the form of preserved fruits, as well as loaf-sugar, met with its approbation. It appears to be a very small eater. In its wild state it feeds upon the honey of the blossoms of the *Eucalyptus* or gum-trees, as well as on the tender shoots and seeds. No doubt insects would form a portion of its diet. The length of the animal in its present young state, evidently not full-grown, is from the head to the extremity of the tail 1 foot 10 inches, and the length of the tail alone is 1 foot 2 inches. The upper part of the body is of a greyish-black, with handsome deep black broad lines on the upper part of the head, back, and the edges of the parachute-like membrane. The tail is cylindrical, black, and bushy. The under surface of the body is white, with yellowish-white under the throat and about the centre of the abdomen ; feet deep black, nails white. The muzzle is naked and of a delicate pinkish flesh-colour ; the naked palms of the feet of a similar colour. The ears are naked, semitransparent, and mottled with black. The under side of the membrane between the feet is also of a dirty white colour ; the fur is rather long, loose, and of a soft silky texture, very delicate and fine to the touch. The head is short and broad ; the ears are also broad ; the eyes black, and dull during the day, more brilliant and animated at night, which conveys the idea that it has very imperfect vision during the daylight.

I have before observed that during the day it is sluggish, but at night full of activity. The only time I saw it active during daylight was on the day on which it was taken to the Zoological Gardens. This may have been occasioned by the cage having been much shaken on the road, or perhaps the gloomy atmosphere of London on that day might have led the animal, so accustomed to the clear sky of its native climate, to regard it, although barely noonday, as the approach of night.

In Australia the blacks capture them for food, and having prepared them by singeing the fur, cook them with the skins on, which gives the meat a more delicate and juicy flavour ; but by the colonists they are valued only for their fur, which, in many, for delicacy and beauty, almost equals that of the Chinchilla. This animal traverses the tops of the trees, and passes to the extremity of the outermost branches with the greatest facility. When leaping, it is observed always to ascend a little at the termination of the leap, by which the shock received in coming from a great height is broken.

My captured specimen escaped one night from its place of confinement, and was seen in one of the uppermost branches of a lofty weeping-willow tree, quietly reposing between one of the forks of the larger branches. A boy was sent to climb up the tree to come upon the animal when asleep. By creeping cautiously up he approached the creature without being seen or heard, and, succeeding in seizing it by the tail, threw it down a height of about 60 feet, when by the assistance of its parachute-like membrane it alighted safely upon the ground, and was then readily secured again. It holds a raisin or almond in its fore-paws, licking and nibbling it. It is often seen lying upon its back at the bottom of the cage when feeding, and when

drinking milk holds the small vessel containing it between its fore-paws, lapping the milk as a kitten is observed to do. It is evident, from the fondness of this animal for sweets, that, when the *Eucalypti* are in flower, it subsists upon the honey which the blossoms yield in very large quantities (this honey is in such abundance as to afford subsistence to honey-eating parrots and other birds, as well as to these animals, and also to myriads of insects of various species). When these have disappeared, it lives upon the nuts and young foliage, and also upon insects. It drinks frequently, and will take water, but evinces a decided preference for and thrives best upon milk. I found that it would sometimes eat the young flower buds of the *Eucalyptus*, and was also fond of succulent fruit, such as apricots. Although the formation of its teeth would indicate a mixed diet, yet it never, in a state of captivity, has as yet attempted to eat animal food when given to it.

It left Sydney, N. S. Wales, on the 14th of March 1859 by the overland route, arrived at Southampton on the 27th of May, and was safely deposited in the Gardens of the Society in Regent's Park on the 28th of May, in excellent health and condition, and much grown since it left N. S. Wales.

3. NOTES ON AUSTRALIAN CUCKOOS. BY DR. GEORGE BENNETT, F.Z.S.

The Bronze-winged Cuckoo (*Chrysococcyx lucidus*) very frequently, but it appears not invariably, deposits its egg in the nest of the Fan-tailed Flycatcher (*Rhipidura albiscapa*). I bring before the Society a sketch of a Fan-tailed Flycatcher feeding the young of that species of Cuckoo, from specimens captured at Ryde, near Sydney, and now preserved in the Australian Museum, from which the drawing was made. This Fan-tailed Flycatcher was shot in the act of feeding a young bird in its nest, which, when examined, was found to be the young of the Shining Cuckoo (*C. lucidus*),—the Golden or Bronze Cuckoo of the colonists. The nestling was full-fledged, brown with black markings. It was ludicrous to observe this large bird filling up the entire nest with its corpulent, well-fed body, and receiving the sustenance intended for several young *Rhipiduræ*. We could imagine underneath the nest the skeletons of the former tenants sacrificed to the rearing of this parasitical Cuckoo.

On the morning of the 25th of February, 1859, Mr. Alfred Denison pointed out to me on the lawn in the garden of Government House among the flower-beds a male Purple Warbler (*Malurus cyaneus*) of glowing colours, perched upon a rose bush, and the female in its pale-brown plumage. They were both actively engaged, hopping about and wagging their tails (which they carry generally in an elevated position), in attending to the wants of a young bird much larger than themselves. This was found to be the

young of the *Cuculus inornatus*, having the speckled breast and greyish-coloured back of the immature age of that species. It had been brought up in fine condition by the old birds, which appeared, judging by their actions, very proud, and apparently took the greatest care, of their parasitical charge, doubtless regarding its size with great satisfaction as an improved breed of Little Warblers.

4. ON THE FISH CALLED GLYPHISODON BIOCELLATUS.

BY DR. GEORGE BENNETT, F.Z.S.

(Pisces, Pl. IX.)

The following notes on the *Glyphisodon biocellatus*, together with an accurate drawing from life, were given to me by Mr. G. F. Angas for the purpose of being brought before the Zoological Society. This interesting and elegant little fish we at first supposed to be a new species; but on my arrival in England I found it was the *G. biocellatus* of Cuvier. As, however, the description of that eminent naturalist has evidently been made from specimens preserved in spirits, his account, as far as regards colour, cannot be entirely depended upon; and, as the drawing gives the accuracy of colour and the brilliant hues of the fish when seen alive and swimming about the aquarium, it will form an interesting addition to our more accurate knowledge of Australian fishes. Although the fish itself is not at present readily captured even at Sydney, yet I hope that before long it may be brought to Europe, to adorn the aquaria of this country.

GLYPHISODON BIOCELLATUS, Cuv. (Pl. IX. fig. 1.)

"This brilliant and elegant little fish is found in the pools amongst rocks at low spring tides, both on the outer coast and in several localities inside the harbour of Port Jackson. The first time I met with it was amongst the rocks in a pool at Coodgee Bay, about four miles from Sydney. The extreme brilliancy of the colours, gold and azure, as the little creatures dart in and out amongst the cavities of the rocks, reminds one of jewels flashing in the sunlight. They are remarkably shy, and on the slightest noise or the shadow of a person approaching the pool, they dart in and conceal themselves under the ledges and in the holes of the rocks; hence they are very difficult to catch. They generally make their appearance on the coast about November, and remain till May; during the winter months I have looked for them in vain. The usual size varies from 1 to 2 inches in length. The one figured is of the largest dimensions that has come under my notice; so that it is probable that 4 inches is the largest size they acquire.

"In the aquarium they are most exquisite objects. Last summer I only succeeded with every care in keeping them alive in a well-established tank for a week or ten days. At the present moment

I have a specimen in perfect health, which was captured at North Harbour three weeks ago. They eat small worms and crumbs of bread greedily when in confinement.

"I have sent a small specimen in spirits to accompany the drawing.

"GEORGE FRENCH ANGAS."

5. NOTES ON SHARKS, MORE PARTICULARLY ON TWO ENORMOUS SPECIMENS OF *CARCHARIAS LEUCAS*, CAPTURED IN PORT JACKSON, SYDNEY, NEW SOUTH WALES. BY DR. GEORGE BENNETT, F.Z.S.

Sharks are formidable for their strength and the numerous rows of teeth with which their powerful jaws are armed; these teeth, inclining backwards, prevent the prey, once swallowed, from readily escaping without severe laceration, even if at all; the teeth are slightly moveable, which mobility, being merely to an erect position, renders the escape of prey still more difficult. The stomachs of these fish are found to contain a very mixed diet, some holding small fishes, or flying squids; others, paper, canvas, even tin pots, and offal of every description cast overboard from ships,—the stomachs being of enormous capacity, and, to judge from the contents and quantity found in them, these fishes having enormous powers of digestion.

As an article of food, a Shark is not considered good eating; but the flesh of a young one is preferable to that of many of the deep-water fishes, and by some considered superior to that of Bonitos or Albicores. The large Sharks are very coarse food: the liver in every species yields a large quantity of oil.

I have observed that if several Sharks are together, it is very seldom that a Pilot-fish (*Naucrastes*) is seen to accompany them; but a solitary Shark is rarely or never seen without being accompanied by one or more of the latter. On capturing a Shark which was accompanied by Pilot-fish, by keeping the Shark in the water until it was exhausted, or, as the sailors termed it, "drowned," the Pilot-fish kept constantly about it; and, by aid of the towing net at the end of a long stick, I succeeded in capturing it as it swam on the surface of the water.

We find, as well in the Sharks as in all those kinds of fish which have a prolonged snout, the mouth situated far underneath, and the upper portion of the tail considerably lengthened, so that it may aid them in turning readily round; for this purpose also the eye-ball revolves on a cartilaginous pedicle with a ball and socket joint, so that they are capable of turning that organ in every direction to capture their prey.

An enormous Shark (*Carcharias leucas*, Valenciennes) was lately captured in Port Jackson by two boatmen, T. Mulhall and J. Rica, who finding him ranging about the harbour, procured a harpoon and went in chase of him. They succeeded in harpooning the monster, who when struck ran away with a great length of line. Being tired,

and finding himself fast, he rushed back again and attacked the boat, leaving five teeth broken in the wood. The boat fortunately was strong enough to bear the shock. He then ran off again to some distance, and, finding escape hopeless, rushed a second time at the boat. On this the men attacked and finally succeeded in disabling him by violent and repeated blows upon the head with a large piece of wood; they then towed him the whole length of the line, so as "to drown him," as it is termed, and brought him to Sydney alive, but helpless. He died some hours after being landed on the wharf, being very tenacious of life. The huge monster was soon a great object of curiosity, and, being enclosed, was duly advertised for exhibition to the public; whereby the capturers realized the very handsome sum of about £80. The animal was afterwards presented to the Museum, in which institution it remains in an excellent state of preservation. Its size, by actual measurement, is as follows:—

	feet.	inches.
The circumference of the body, about the centre	6	7
Height from the abdomen to the base of the dorsal fin	2	10
Height from the base of the pectoral fin	2	0
Length from the end of the tail to the point of the nose	12	4
Length of dorsal fin	1	1
Breadth of ditto at base	1	4
Length of pectoral fin	2	3
Length of second pectoral fin	0	8
Caudal fin, upper part	2	4
Caudal fin, lower part	1	9
Anal fin	0	3½
Second dorsal fin	0	4
Expansion of jaw, breadth.	0	10
Perpendicular length of jaw	1	0

This is the expansion of the jaw in the dried state; when alive no doubt it could have been expanded to a greater extent. The head appears to be small in comparison to the enormous bulk and length of the body. There is a singular pectinated line running down on each side near the back from the base of the head to the commencement of the tail, as if situated just beneath the cuticle. The fish in its recent state was of a uniform bluish-grey colour, excepting the dorsal, caudal, and other fins, which were of a darker tint. Branchiæ 5. No spiracles. I would not venture to send one alive to the Zoological Gardens, as its keep would be ruinous; for the contents of the stomach were as follows:—

Eight legs of mutton, half a ham, hind quarters of a pig, head and fore legs of a bull dog with a rope round the neck, about 300 lbs. of horse-flesh, a ship's scraper, and a piece of bagging.

From the liver of the fish 12 gallons of oil were obtained.

On the 29th of September, 1858, I examined a Shark harpooned in the harbour of Port Jackson. It was similar in character to the

species of *Carcharias* previously described, and preserved in the Australian Museum. It measured as follows:—

	feet.	inches.
Length from the extremity of the nose to the tail	13	0
Circumference round the neck	5	6
Length from one end of the pectoral fin to that of the other	6	2
Length of pectoral fins	2	4
Circumference of the body below the pectoral fins	7	0
Length of dorsal fin	1	10
— of tail	2	10
— of ventral fins	1	1
— of anal fins	0	5
— of second dorsal fin	0	5

The contents of the stomach were large quantities of horse-flesh, as it was feeding upon a dead horse when captured. In the upper jaw there was apparently one row of large teeth, and at the angle there were two teeth of a second row, the largest tooth measuring $1\frac{1}{4}$ inch in length. In the lower jaw there were two rows of teeth. The teeth were inclined backwards and moveable. On a further and more minute examination it was discovered that five rows or more of teeth, fully formed, and well-serrated at their edges, were lying down under the loose thick skin or gum, inside the mouth, either to be elevated if required, or to supply the place of the front rows, when damaged or broken by accident.

I have observed the teeth in many Sharks disposed in five or more rows, the first and second rows erect, the others recumbent and concealed by a kind of gum.

In the early days of the settlement of New South Wales the oil of the Shark was found to be of great use. Collins states that "nothing was lost;" even the Shark was found to contain a certain supply; the oil which was procured from its liver was sold at 1s. a quart; and but very few houses in the colony were fortunate enough to enjoy the pleasant light of a candle. Even now at the Custom House station at Botany Bay Heads, Mr. Brett told me he captured the Spotted Tiger Shark, which species is very numerous about that locality, Watt's Shark, and other kinds, for the sake only of the oil to be produced from the livers, which he found very serviceable for lamps.

In the stomach of a Shark, near the pyloric orifice, I found a large quantity of Entozoa, varying in length, of a white colour and flattened form. These, being placed with a portion of the stomach in sea-water, displayed great vitality, rapidly elongating and contracting themselves; but they soon died on being immersed in fresh water, which was done previous to placing them in spirits.

A question may arise if any annoyance is produced to the Shark by the multitudes of these parasites; they could hardly have sufficient power to irritate the stomach of a fish that swallows, and, as it

is asserted, digests, tin pots, cloth, canvas, &c. I remarked that the inner surface of the stomach to which these parasites were attached appeared inflamed.

On the afternoon of the same day, three small Sharks were taken, the whole of which were also infested by similar parasites about the pyloric orifice of the stomach.

It is not a little singular that four Sharks caught about the same locality should have parasites. In one of the Sharks the worms were not only about the pyloric orifice of the stomach, but extended through the whole extent of the intestines, even penetrating the coats of the intestines themselves; and on examination, irritation of the coats of the bowels, and in some parts inflammation and ulcerated portions, were observed in several situations.

Preparations of these structures are deposited in the Museum of the College of Surgeons of England.

6. NOTES ON THE RANGE OF SOME SPECIES OF NAUTILUS, ON THE MODE OF CAPTURE, AND ON THE USE MADE OF THEM AS AN ARTICLE OF FOOD. BY DR. GEORGE BENNETT, F.Z.S.

The three best known species of the genus *Nautilus* are *N. pompilius*, *N. macromphalus*, and *N. umbilicatus*. The first species is the most common and has the widest range; the second species is more limited in its range, and rarer; the third, although found in collections, is scarcer than the two preceding, and has a range peculiar to itself. The range of *N. pompilius* embraces the islands of the Eastern Archipelago, Erromanga, Aneitum, and other islands of the New Hebrides, and also the Feejee group. *N. macromphalus* is found about the Isle of Pines and New Caledonia; and the rare *N. umbilicatus* in the Solomon Archipelago, New Georgia, New Britain, New Ireland, and probably to the eastward of these groups of islands. Two very fine and perfect shells of *N. umbilicatus* were given to me in Sydney, which had been procured from the natives of Denys Island, New Ireland, eastward of New Guinea. Dr. Macdonald, of H. M. S. "Herald," informs me that on examination and comparison, there is a marked difference between the *tentacula* or feelers, in the first two species. The sculpturing on *N. umbilicatus* is very distinctly marked on the external surface of the shell, differently from what is observed either in *N. pompilius* or *N. macromphalus*, and forming one of its very distinctive characters. The outer edge of the lip of the perfect shell in *N. umbilicatus* has a narrow, black rim, continuous from the anterior portion of the whorl; this obtains in perfect shells. I remark that in *N. pompilius* and *N. macromphalus* the black rim is on the inner side of the edge of the lip. The colour of the shells in the different species varies from brick-red and orange (of brighter or paler tints) to nearly a dark crimson colour, being as various as the colour observed among the common Cowrie shells.

The natives of the New Hebrides, New Caledonia, and the Feegee group of islands capture this Nautilus, and use it as an article of food.

When at Erromanga (one of the New Hebrides group), I observed about the fires of the natives shells of a small species of *Harpa*, and remains of *Nautili* shells and their horny mandibles, as if they had been used at a recent meal. A lady residing at the Isle of Pines, at my request, sent me a fine specimen of *N. macromphalus*, with the animal, which she informed me was readily procured for her by the natives, who dive for them; she soon after sent a second specimen of the same species, but it was not in so perfect a state as the first. They were both deposited in the Australian Museum.

In 1857 the same lady, then residing at the Island of Aneitum, one of the New Hebrides group, having removed there from the Isle of Pines, when I wrote to her for a specimen of the Nautilus in the shell, and asked whether she had observed them used by the natives as food, and also if they had any method of capturing them, sent me the following reply, accompanied by a specimen of *N. pompilius* in the shell:—

“I send you, as requested, a Nautilus containing the animal. I was fortunate in procuring one so soon after I received your letter; it was cast on shore during a heavy gale, and found by one of our native servants. He was just in the act of putting it upon the fire for a meal, when one of the native girls from the Isle of Pines, knowing the value we set on them, stopped him. This will be an answer to your inquiry. The natives sometimes take them in their fish-falls in from three to five fathoms water; the bait they use is the Sea-egg (*Echinus*). They are very fond of them. In some of the islands they make a kind of soup of them. These animals are very plentiful at Ware, an island about thirty miles from New Caledonia; and I have noticed at that place some difference in the shell” (*N. macromphalus* being found about that coast) “from the one we have at this place. I am acquainted with a person who was wrecked at that island, and used to have them curried frequently: he says they taste like whelks when roasted... I once saw one floating past our residence near the beach at the Isle of Pines.”

The mode of capturing this animal by the natives of the Feegee Islands was kindly communicated to me by my friend Dr. J. W. Macdonald of H. M. S. “Herald,” to the natives of which group of islands, as at the Isle of Pines and New Hebrides group, it furnishes an article of food.

“The Feegeans esteem the Pearly Nautilus highly as an agreeable viand, and their mode of capturing it, for the embers or for the pot, is not a little interesting. When the water is smooth, so that the bottom at several fathoms of depth, near the border of the reef, may be distinctly seen, the fisherman in his little frail canoe scrutinizes the sands and the coral masses below to discover the animal in its favourite haunts. The experienced eye of the native may probably encounter it in its usual position clinging to some prominent ledge, with the shell turned downwards, and preparations are accordingly

made for its capture. The tackle consists, first, of a large round wicker-work basket, shaped very much like a cage rat-trap, having an opening above, with a circlet of points directed inwards, so as to permit of entry, but preclude escape; secondly, a rough piece of native rope of sufficient length to reach the bottom; and, thirdly, a small piece of branched wood, with the branches sharpened to form a sort of grapnel, to which a perforated stone is attached, answering the purpose of a sinker. The basket is now weighted with stones, well baited with boiled cray fish (*Palinurus*), suggested no doubt by the large quantity of the fragments of Crustacea usually to be found in the crop of the Nautilus, and then dropped gently down near the victim. The trap is now either closely watched, or a mark is placed upon the spot, and the fisherman pursues his avocations on other parts of the reef, until a certain period has elapsed, when he returns and in all probability finds the Nautilus in his cage feeding upon the bait. The grapnel is now carefully let down, and having entered the basket through the opening on top, a dexterous movement of the hand fixes one or more of the points or hooks, and the prize is safely hoisted into the canoe. Thus we observe that, although it has been a matter of doubt if the animal could be so silly as to run into the nets of the fishermen, as related by Rumphius, whose account was supposed to be exaggerated, yet it is now found that the *Nautili* are in reality stupid enough to run into the well-baited baskets of the Feegean and Aneitum fishermen."

The Pearly Nautilus is not found at the Navigator group of islands in the South Seas, and the shells form at that group of islands an important article of exchange. They are brought by European vessels from New Caledonia and the Feegee Islands as articles of trade, and are bartered with the natives at the rate of four for a dollar, or 1s. each. I am told it is indifferent to the natives if the shells are old or rather damaged, as they use the chambered portion for ornament, rubbing them down to suit the various purposes to which they apply them. They also make armlets and other ornaments from the shell. A vessel arrived at Sydney from New Caledonia with several tons of these shells, which were disposed of as an article of trade to the Navigator and Friendly Islands; they were sold at Sydney at the rate of about $1\frac{1}{2}$ £. each.

I have seen a very elegant fillet formed of these shells (of very small size, and brought from the Samoan Islands). The fillet, or band, was composed of seventeen small shells, evidently principally of *N. macromphalus*, or Pearly Nautilus, each shell having the upper part removed, and the chambered portion only of the shell remaining. Part of the outer coloured coat was left on some of them near and in and about the umbilicated part of the shell; the whole of the shells were similar in size, being about one inch in diameter; the external coat was removed, so as to exhibit the beautiful pearly hue; and the brilliancy of the whole ornament was that of the most highly burnished silver. They are used by the natives in war, and are highly valued. This fillet was valued at 20 dollars, at which price it was purchased in barter. The shells are fixed to a small midrib of

cocoa-nut leaf, which supports them on a worked band of sinnet ; upon this, under the row of seventeen shells, small oval pieces of the same pearly shell were placed, to add to the ornamental effect. The length of the band was 12 inches (not including the tying strings) and the depth 3 inches.

7. DESCRIPTIONS OF NEW SPECIES OF SALAMANDERS FROM CHINA AND SIAM. BY DR. J. E. GRAY, F.R.S., V.P.Z.S., ETC.

(Reptilia, Pl. XIX.)

Mr. Fortune, on his late return from China, brought with him for the British Museum a bottle containing a Salamander, some Fishes, and a Leech, collected from a river on the north-east coast of China, inland from Ningpo.

The Fishes are two varieties, olive and golden, of a very peculiar monstrosity of the common gold fish of China, *Cyprinus auratus*, which has long been known, and is figured in several of the Chinese works.

It is peculiar for having a very short and thick body, entirely destitute of any dorsal fin, with a regularly trifid or three-finned tail, and more especially for having very large and swollen eyes, which give a distorted appearance to the animal ; the pupil of the eyes being on the upper part of the swollen orbs, and on a level with the upper surface of the back.

The Salamander or Newt was obtained from the same stream. It is curious as being the first example of the family which has been found in Continental Asia, though there are several species common in Japan.

It is nearly allied and appears to belong to the same genus as one of the Japanese specimens ; but at the same time it is quite distinct, as a species, from any yet received from that country.

It may be indicated as—

CYNOPS CHINENSIS. (Pl. XIX., fig. 1.)

Above uniform dark olive (in spirits) ; beneath bluish-black, with small, unequal, irregular, yellow spots on the chin, neck, belly, and underside of the legs ; the spots on the belly are the largest ; the under edge of the tail reddish-yellow ; skin acutely granular.

Var. 1. Tail pale grey, brown on each side, with a blackish marginal band above and below, and with a yellow inferior edge.

Hab. River N.E. Coast of China, inland from Ningpo.

This species resembles in the form of the head, the parotoid glands, and in the granular state of the skin, *Cynops pyrogaster* of Japan ; but it differs from it in its much larger size and in the style of its colouring, especially on its under side. *C. pyrogaster* is dark red, with large black blotches or spots ; while this is dark lead-coloured, with small yellow spots.

The Leech is one of the Land Leeches, with a lunate head, similar to those received from Ceylon.

The British Museum has also received in a collection of reptiles and fishes, obtained in Siam by Mr. Mouhot, two specimens of a species of Newt, which is so exceedingly like the *Plethodon glutinosum* of North America in external appearance, that is to say in form, size, and colour, and also in the distribution of the palatine teeth, that I was at first inclined to regard them as specimens of the American animal which had been sent to Siam. But I cannot believe this to be the case, as they were inclosed in a bottle containing several kinds of reptiles, which are evidently all natives of Siam. I may observe that this is the first time that any species of Newt has been received from Continental India.

I propose to designate the Siamese species

PLETHODON PERSIMILIS. (Pl. XIX., fig. 2.)

Black, white-speckled, the specks closer and more abundant on the sides; the hind toes elongate, unequal. Tail compressed.

Hab. Siam.

The only character that I can find between the two specimens received from Siam, and some twenty or more of *P. glutinosum* from different parts of the United States in the Museum collection, is that the toes of the hind feet appeared rather longer, more slender, and unequal in length, and the tail much more compressed.

8. DESCRIPTION OF SCAPHA MARIA-EMMA, A NEW SPECIES OF VOLUTE. BY DR. J. E. GRAY, F.R.S., ETC.

(Mollusca, Pl. XLVIII.)

Mr. Cuming kindly sent to me a specimen of *Volute*, which had been sent to him by Mr. Jamrach, who received it from Singapore. It is most probably from some of the Malayan Islands, Singapore being merely the entrepôt. The specimen is unfortunately not in a very good condition, being rather sponge-eaten on the hinder part of the body whorl, and having a small hole on the spire; but it is otherwise in a perfect state, with its proper outer lip, so as to be in a good state for description.

It combines the characters of several species. It has the large, regular, smooth-whorled, spired nucleus, of *Scapha aulica*, *S. deshayesii*, *S. luteostoma*, &c., the fusiform shape of *Scapha rutila*, and especially of the smooth variety of *S. aulica*; but it is entirely differently coloured from both of them and all the other large species of the genus, the colouring resembling that of *Amoria undulata*. Indeed some conchologists, to whom I have shown the specimen, have regarded it as a very large specimen of the latter species, which has lost its external polished coat, and with a larger nucleus than usual.

A careful examination of the shell at once shows the fallacy of such

an idea. The form and structure of the nucleus are entirely unlike that of the genus *Amoria*. The shell is entirely destitute of any polished coat, which is the character of that genus, as is proved by the examination of the body whorl near the inner lip; for, though the very thin inner lip is almost entirely destroyed, yet the groove which indicates its extent is well marked by a rather broad impressed line, defining its limits and showing that it was not even extended over the lower part of the body whorl of the shell, much less over the extreme surface of it.

SCAPHA MARIA-EMMA. (Pl. XLVIII.)

Shell ovate, fusiform, pale brown, with narrow, deeply-waved, longitudinal, dark brown lines, forming four more or less distinct, interrupted, spiral bands, consisting of the broader and straighter portions of the longitudinal lines; nucleus large, subcylindrical, with a regular spiral, smooth and rounded apex, without any crenulation near the suture; spire conical; whorls rather ventricose; outer lip rather arched.

Hab. —?

I have named this fine species after my wife, Maria-Emma Gray, whose work, entitled 'Figures of Molluscous Animals for the use of Students,' having brought the figure of the animals of a large number of shells within the reach of students, has entirely changed the previous condition of the science of conchology (as is proved by the works of Adams, Philippi, Weigmann, and other Malacologists); and who was an industrious collector of shells and mollusca before our marriage, now many years ago.

We have also received a *Volute* from Mr. Cuming which has been lately described at Paris under the name of *Voluta rossiniana*. It has a large nucleus, with a large rounded apex of regular smooth-edged whorls. It will be called in the Museum *Scapha rossiniana*.

I have also seen a young *Volute* from New Zealand, which is very like *Volutella papillosa*; but the shell shows no sign of the expanded mantle, which may only be expanded in the adult state of the animal. It differs from the specimen of *V. papillosa* in the British Museum in the nucleus being shorter and of fewer, only one and a half, whorls, though it agrees with those shells in the apex being rather excentric, and the outer edge of the upper or apical whorl being blackish.

The shell is much more ventricose, and the spire shorter, than in the usual form of *V. papillosa*. It may be only a variety of that species, but other specimens are wanting to determine this point.

9. DESCRIPTION OF SOME NEW RECENT ENTOMOSTRACA FROM NAGPUR, COLLECTED BY THE REV. S. HISLOP. BY W. BAIRD, M.D., F.L.S., ETC.

(Annulosa, Pl. LXIII.)

The *Entomostraca* now about to be described were taken from some freshwater pools at Nagpur, and placed in my hands by the

Rev. Mr. Hislop. It is interesting to find two species of *Cypris* in a recent state, that had been already described as fossil. The three species here figured are all true *Cypris*, the animal in all of them having the pediform antennæ provided with the bundle of long setæ which characterize the genus.

ESTHERIA HISLOPI, Baird. (Pl. LXIII. fig. 1.)

Animal.—Head large, prolonged anteriorly into a beak of considerable size, which is rounded at the extremity, and toothed on its upper edge. The first three or four teeth are very distinct, they then become smaller and less distinct; they are very numerous. Eye large, compound. Superior antennæ or rami thick, rather short, composed of two branches, each of which consists of seven articulations only; each articulation, close to the joint, is armed with short spines, and the last two or three possess longer setæ. Antennules long, nearly half the length of superior antennæ, rather slender, composed of four joints, the last joint rather club-shaped; all destitute of setæ. Tail large, armed with seven or eight pairs of strong, slightly curved hooks; the first pair are long, serrated on the edges; the second pair, near the root, armed with about ten rather stout spines. Mandibles strong, fleshy.

Shell.—Carapace nearly orbicular; umbo prominent; margins quite round. Altogether the shell very closely resembles that of the genus *Artemis* or *Dosinia* amongst the Mollusca. Shell surrounded with six or seven concentric ridges; the surface between them, when magnified, is seen to be pitted or marked with very numerous, small, close-set dots or punctures. When dry, it is of a clear, polished, shining appearance.

Hab. Freshwater pools at Nagpur (*Rev. S. Hislop*).

Mus. Brit.

CYPRIS SUBGLOBOSA, Sow. (Pl. LXIII. fig. 2.)

The shell is of a green colour, and the surface is strongly punctured, the pattern resembling the depressed punctures of a thimble. The anterior extremity is somewhat broader than the posterior, and when seen from the inside appears as it were double, the external edge of the carapace being produced beyond the true margin of the shell. The lateral portion of the carapace is very prominently swollen or gibbous. The dorsal margin is convex; the ventral is concave and sinuated.

Hab. Freshwater pools at Nagpur (*Rev. S. Hislop*).

Mus. Brit.

This species appears to be identical with *C. subglobosa* of Sowerby, which was found by my old friend the late John Grant Malcolmson, Esq., in the district of the Sichel Hills, the geology of which he has described at length in the fifth volume of the Transactions of the Geological Society, 2nd series. It was described shortly by Mr. J. de C. Sowerby at the end of Malcolmson's paper, in these words:—"Subglobose, triangular, inflated; front concave; outer surface is punctured." It was found in grey chert, with a species of *Unio* (*U.*

deccanensis), &c., and in indurated clay with *Gyrgonites*, *Paludinæ*, *Physæ*, and *Lymnæi*.

CYPRIS CYLINDRICA, Sow. (Pl. LXIII. fig. 3.)

The shell is of a green colour, somewhat mottled. It is cylindrical in shape; the anterior margin rounded; dorsal margin slightly convex till it approaches the posterior extremity, when it suddenly slopes down, and is there bluntly pointed. The ventral margin is slightly sinuated in the centre. The valves are somewhat gibbous on their lateral portion. Internally, we see near the anterior margin a kind of shelf, which extends across that portion of the shell, and is hollow underneath it—exactly resembling the shelf we see in the shells of the genus *Crepidula*. The surface of the carapace is very minutely and slightly punctate. The edge of the ventral margin of the carapace, both inside and outside, appears thickened, which thickening, as seen on the inside of the shell, extends to the commencement of the dorsal margin at either extremity, and there the shell both internally and externally is strongly and regularly ridged.

Hab. Along with *C. subglobosa* in pools at Nagpur (*Rev. S. Hislop*).

Mus. Brit.

This species appears to me to be identical with *C. cylindrica*, described by Mr. Sowerby at the end of Mr. Malcolmson's paper on the "Geology of the Sichel Hills," mentioned above. It was found along with *C. subglobosa* in chert and indurated clay, along with *Unio deccanensis*, *Gyrgonites*, *Paludinæ*, *Physæ*, and *Lymnæi*. The chief difference consists in the recent shells being so slightly punctured on the surface as to appear nearly quite smooth. Mr. Sowerby thus describes it:—"Twice as wide as long, almost cylindrical; front very slightly concave; the outer surface, which is very rarely obtained, is punctured."

CYPRIS CYLINDRICA, Sow., var. MAJOR, Baird. (Pl. LXIII. fig. 4.)

The chief difference in this variety consists in its larger size, being about double in all its dimensions. The typical or smaller variety described above might at first sight appear to be merely the young; but an examination of a large series of that species shows them to be completely adult shells. The internal shelf, the thickening of the edges of the ventral margin, and the ridges on that margin, are all indicative of a full-grown and adult shell.

The colour of the shell of this variety is almost exactly the same as the typical variety; the form is the same, but the shelf is rather larger, and there is some slight indication of a shelf at the posterior extremity also.

Hab. Along with the preceding (*Rev. S. Hislop*).

Mus. Brit.

CYPRIS DENTATO-MARGINATA, Baird. (Pl. LXIII. fig. 5.)

Shell rounded-oval, swollen, smooth, of a light greenish colour,

with a polished shining surface. Anterior extremity slightly narrower than posterior; dorsal margin somewhat convex; ventral margin nearly straight or slightly sinuated. Seen from the inside, the shell near each extremity is toothed, or marked with a series of small projections, like the teeth of a saw.

Hab. Pools at Nagpur (*Rev. S. Hislop*).

Mus. Brit.

[P.S. Since the above was written, I have had my attention called by Mr. Hislop, through my friend Mr. T. Rupert Jones, to a paper by Mr. H. I. Carter, in the 'Geological Papers on Western India, 1857,' in which the author mentions some of the recent *Entomostraca* found in the freshwater deposits of Bombay, and of which he gives an outline sketch in the Atlas accompanying the volume. These Mr. Carter considers as "the corresponding forms" of the fossil species mentioned by Mr. Malcolmson and described by Mr. Sowerby; but he does not attach any name to them.

In plate ix. of that Atlas, the species figured No. 19 is, without doubt, the same as what I consider to be the *Cypris cylindrica*, var. *major*, of this paper; and the species figured No. 18 is evidently identical with the *Cypris subglobosa* described and figured in this paper also. The third species, figured No. 20, differs from any of those collected by Mr. Hislop.—W. B.]

10. NOTES ON THE HABITS OF TWO MAMMALS OBSERVED IN THE SOMÁLI COUNTRY, EASTERN AFRICA. BY CAPTAIN J. H. SPEKE, 46TH B.N.I.

The curious Rat discovered by me during my expedition into the Somáli country, and named by Mr. Blyth *Pectinator spekii* (Journ. As. Soc. Beng. xxiv. p. 294), inhabits the large cellular blocks of lava on the sea-face side of the northern Somáli sea-coast range (lat. 9° N. and long. 47° E.). Several frequent one block, from which they emerge on all sides at the same time, sit up like Squirrels, and feed from their fore paws. From their general appearance and size, with grey coating, bushy tails, and jerking hurried action, one is much struck with their close resemblance to the Giléri, or common Squirrel of India.

They run in and out of these cells much in the way that the Marmot and other stony-mountain Rats quit and re-enter their abodes on the approach of any suspicious looking object, more especially if that be man.

Their habits are quite different from that of the *Hyrax* (*Hyrax habessinicus*), which is also found in great quantities about those hills. This animal climbs into and lies about in the branches of bushes or small trees, but usually inhabits the rocky ledges and chinks as described in the Journal As. Soc. Beng. xxiv. p. 296. I have seen it as far south as 5° south lat.

11. ON A COLLECTION OF BIRDS FROM VANCOUVER'S ISLAND.
BY PHILIP LUTLEY SCLATER, M.A., F.L.S., SECRETARY TO
THE SOCIETY.

Dr. Acland of Oxford has kindly placed in my hands for examination a small collection of birds made by Capt. Prevost, R.N., of H. B. M. Ship 'Commissioner,' in Vancouver's Island. Though the species are not numerous and are all known, as this is, I believe, the first series of Birds that has been brought to England from a colony which is now attracting so much attention, I have thought that their names would be worthy of record. I accordingly subjoin a list of them, adding a few notes on their previous history and geographical distribution.

1. *TURDUS MIGRATORIUS*, Linn.

Several specimens, including the young bird just from the nest.

2. *SIALIA MEXICANA*, Sw.

Several specimens.

3. *REGULUS SATRAPA*, Licht.

One example.

4. *CERTHIA AMERICANA*, Bp.

Seems to be rather shorter in the wings than eastern specimens.

5. *VIREO* —?

An imperfect specimen of the section with the first spurious primary, which I am unable to refer to any described species.

6. *HIRUNDO THALASSINA*, Sw.

One specimen, not quite in full plumage.

7. *HELMINTHOPHAGA CELATA* (Say); Baird, Rep. p. 257.

Two examples.

8. *ZONOTRICHIA GAMBELLI* (Nutt.); Baird, Rep. p. 460.

Two specimens seem to present the character of the continuous superciliaries, which Professor Baird has noted as the only difference between this species and *Z. leucophrys*.

9. *SPIZELLA SOCIALIS* (Wils.).

10. *MELOSPIZA FALLAX*, Baird, Rep. p. 481?

11. *PIPILO OREGONUS*, Bell.

12. *XANTHOCEPHALUS ICTEROCEPHALUS* (Bp.).

13. *STURNELLA NEGLECTA*, Aud., Baird, Rep. p. 537.

14. *CYANURUS STELLERI* (Gm.).

I have not yet met with specimens, which I can certainly refer to Prof. Baird's *C. macrolophus*, but I possess examples of two other allies of the present species—*C. diadematus* from the Table-land of Mexico, and *C. coronatus* from Southern Mexico and Guatemala.

15. *CERYLE ALCYON* (Linn.).

Several specimens.

16. *NEPHECETES BOREALIS* (Kennerly).—*N. niger*, Baird, Rep. p. 142.—*Cypselus borealis*, Kennerly.

I am much pleased at being able to handle a specimen of this fine Swift from Vancouver's Island, and to compare it with examples of Gosse's *Cypselus niger* from Jamaica in my own collection. Prof. Baird is right in saying that the difference between specimens of these birds is small, yet I am not quite convinced of their specific identity. The bird of the Antilles is smaller in every part, there seems to be a considerable difference in the breadth of the skull, and the northern bird has much more of the fine white edging to the feathers of the face than is found in the southern species, and is generally browner and not so dark in colouring. I am inclined on the whole to think that the birds may yet prove to be distinct.

17. *HYLOTOMUS PILEATUS* (Linn.); Baird, Rep. p. 107.18. *PICUS GAIRDNERI*, Aud.19. *SPHYROPICUS RUBER* (Gm.); Baird, Rep. p. 104.20. *COLAPTES MEXICANUS* (Sw.).21. *TINNUNCULUS SPARVERIUS* (Linn.).22. *COLUMBA FASCIATA*, Say.23. *TETRAO OBSCURUS*, Say.

This bird appears to be the *Tetrao obscurus* of Say, and the species generally known and described under that name. The tail has a broad terminal band of pale slate-colour, and I can hardly believe that the bird figured in 'Northern Zoology' (pl. 59), in which, besides other differences, the tail is described and figured as uniform black, can belong to this same species*.

24. *BONASA SABINII*, Douglas; Baird, Rep. p. 631.25. *OREOORTYX PICTUS* (Douglas); Baird, Rep. p. 642.26. *APHRIZA VIRGATA* (Gm.).

I believe there can be no doubt about the occurrence of this bird

* Sir William Jardine has already expressed this opinion in letters to myself and in a note in the 'Edinburgh Philosophical Magazine' for April 1859.

on the shores of the Northern Pacific. Besides the present example, specimens are in the British Museum from the same country. Prof. Baird, in his 'General Report' (p. 698), seems hardly satisfied on this point.

27. *MACRORHAMPHUS GRISEUS* (Gm.).

28. *GAMBETTA MELANOLEUCA* (Gm.).

29. *TRINGA WILSONI*, Nutt.; Baird, Rep. p. 721.

30. *TRINGA* — ?

31. *QUERQUEDULA CYANOPTERA* (Vieill.).

32. *QUERQUEDULA CAROLINENSIS* (Gm.) ♀.

33. *MERGUS CUCULLATUS* (Linn.).

34. *LARUS BELCHERI*, Vigors, Zool. Journ. iv. 358.—*Larus heer-
manni*, Cassin?

35. *BRACHYRHAMPHUS MARMORATUS* (Gm.); Baird, Rep. p. 915.
An adult and two younger specimens.

SYNOPSIS OF THE KNOWN ASIATIC SPECIES OF SILK-PRODUCING
MOTHS, WITH DESCRIPTIONS OF SOME NEW SPECIES FROM
INDIA. BY FREDERIC MOORE, ASSIST. MUSEUM, INDIA
HOUSE.

(Annulosa, Pls. LXIV., LXV.)

In the following list we have endeavoured to give descriptions of those species of silk-producing Moths that are known to inhabit India, its adjacent countries and islands, and to bring together such information (so far as our present materials will allow) relating to each individual species, as may prove interesting, and, we trust, useful, not only to the Oriental entomologist, but also to those gentlemen, in India and elsewhere, who devote their attention to the advancement of the productive resources of the silk trade.

Genus *BOMBYX*, Schrank.

Bombyx, Schrank, Fauna Boica, ii. pt. 2. p. 150 (1802).

Phalæna-Bombyx, pt., Linnæus.

Bombyx, pt., Fabricius.

Sericaria, pt., Latreille.

1. *BOMBYX MORI* (Linnæus).

Phalæna-Bombyx mori, Linnæus, S. N. i. 2. p. 817 (1767); Amœn.
Acad. iv. p. 563; Faun. Succ. p. 832; (Aldrovand, Ins. p. 280;
Albin, Ins. pl. 12. f. 16; Réaum. Ins. ii. pl. 5. f. 2; Roësel, Ins. iii.
pl. 7, 8).

Bombyx mori, Fabricius, Spec. Ins. ii. p. 180; Mant. Ins. ii. p. 114; Ent. Syst. iii. i. p. 431; Godart, Lép. de France, iv. p. 153. pl. 14. f. 3, 4; Helfer, Journ. Asiatic Soc. Beng. vi. p. 40; Walker, List Lep. Het. Brit. Mus. pt. 6. p. 1505; Royle, Report on the Paris Universal Exhib. pt. 3. p. 216; Moore, Catal. Lep. Mus. India House, ii. p. 374.

Sericaria mori, Blanchard, Gay, Hist. de Chile, Zool. vii. p. 55.

The Common Domestic, or Chinese Silkworm Moth.

Pat of Bengal, Royle.

Hab. China (domesticated in China, Siam, India, Persia, France, Italy, &c.).

In a 'Dissertation on the Silk Manufacture and the Cultivation of the Mulberry,' translated from the Chinese works of Tseu-kwang-k'he, called also Paul Siu, a Colao, or Minister of State in China, and recently published at Shanghæ, and reprinted in 1858 at Madras, it is stated, that "the earliest allusion to the mulberry and silk met with in the ancient writings of the Chinese is in the Historical Classic, a work which existed before the days of Confucius, because it is quoted by him, and which embraces the history of China from B.C. 2356 to B.C. 722, a period of 1634 years. In the former part of that period, we have the allusions referred to, recorded in the section called the tribute of Yû, who flourished 2200 years before Christ. In his days the mulberry is spoken of as a well-known production, and silk as obtained therefrom; so that it must have been discovered before his days. The usual tradition is, that it was discovered during the reign of Hwângté (B.C. 2640) by his queen." The passages in the Historical Classic in which references to the mulberry and silk are made are as follows:—In giving an account of Yen-chow, the south-western part of the modern Shan-tung, the writer says, "The mulberry region having been supplied with silkworms, the people descended from the hills, and dwelt in the plains." On this the commentator remarks:—"The nature of the silkworm is to abhor dampness; hence it was not till the waters were abated that the silkworms could be reared. The nine regions of China equally depended upon this source of wealth; but the Yen province alone is mentioned, because it was best adapted for the mulberry." The Classic goes on to say that the tribute of Yen-chow consisted in varnish and silk, while their tribute-baskets were filled with wove stuffs of various colours (see translation of the Shoo-king, pp. 91, 92). In speaking of the production of Tsing-chow, the north-eastern part of Shan-tung, the Classic says that "from the valley of the Taé mountain they brought silk and hemp; while their tribute-baskets were stored with the wild mulberry and silk." The silk produced from the mountain mulberry is said by the commentator to be so tenacious, that it was peculiarly adapted for harps and guitars (see translation of the Shoo-king, p. 93).

Black silk and chequered sarcenets are spoken of as the production of Tseu-chow, the southern part of Shan-tung and the northern part of Këang-soo (see translation of the Shoo-king, p. 96).

The productions of King-chow, the modern Hoôk-wang, where silk

has since been cultivated to a great extent, are spoken of as consisting of black and red silks, with silk fringes (see translation of the Shooking, p. 101).

The next Classic in which we find any reference to the silkworm is the Chow-le, or Account of the Ceremonies of the Chow dynasty, where it is said that "the officer who adjusted the price of horses forbade the people to rear a second breed of silkworms in one season," because, in accordance with the views of astrologers, the horse belonged to the same constellation with the silkworms, and they were therefore considered of the same origin. Conceiving that two things of like nature could not prosper at the same time, the Chinese forbade the rearing of the second breed of silkworms, lest it should be of some disadvantage to the horses. However absurd this notion, it shows, at the least, that the rearing of silkworms was a common practice at that period.

After this we meet with frequent references to this subject in the Le-ke Book of Ceremonies. This book was written partly in the Tsin dynasty (B.C. 204) and partly in the Han dynasty (B.C. 135), and gives an account of the ceremonies observed by the Chinese in very early antiquity. In the 6th section of this work, entitled Yue-ling, we meet with the following directions:—

"In the first month of spring, orders were issued to the forester not to cut down the mulberry-trees; and when the cooing doves were observed fluttering with their wings, and the crested jays alighting upon the mulberry-trees, people were to prepare the trays and frames, &c., for the purpose of rearing the silkworms.

"In the spring season, when the empress and her ladies had fasted, they proceeded to the east, and personally engaged in picking the mulberry leaves; on this occasion the married and single ladies were forbidden to wear their ornaments, and the usual employments of females were lessened, in order to encourage attention to the silkworms. When the rearing of the silkworms was completed, the cocoons were divided (for reeling), and the silk weighed (for weaving), each person being rewarded according to her labour, in order to provide dresses for the celestial and ancestral sacrifices: in all this none dared indulge in indolence."

From another passage of the same section we learn that in "the last month of summer the order was given to the female officers to dye the silk of various colours, in order to weave chequered sarcenets, comprising black and white, black and green, green and red, with red and white checks! All which was to be done according to the ancient rule, without the least variation; the black, yellow, azure, and red tints were all to be correct and good, without the least fault; in order to provide dresses for the celestial and ancestral sacrifices, and standards for distinguishing the high and low degrees."

In the 24th section of the same book, on sacrificial rites, we read, that "in ancient times the emperor and his princes had a public mulberry-garden, and a silkworm establishment, erected near some river. On the morning of the first day of the third month of spring, the sovereign, wearing a leather cap and a plain garment, ascertained

by lot the chief of his three queens, with the most honourable amongst his concubines, and caused them to attend to the rearing of the silkworms in the above-named establishment. They then brought the eggs of the worms and washed them in the river above alluded to, after which they picked the mulberry leaves in the public garden, and aired and dried them, in order to feed the worms.

"When the season was over, the royal concubines, having completed the business of rearing the silkworms, brought the cocoons to show them to the prince, when he presented the cocoons again to his consort; whereupon his consort said, 'This is the material of which your highness's robes are to be formed.' Having said which, she covered herself with her robe, and received the cocoons. On this occasion the ladies of the court were honoured with the present of a sheep. This was the mode in which the presentation of the cocoons was anciently conducted."

Hawae-nan-tsze in the *Silkworm Classic*, says, that "Se-ling-she, the principal queen of Hwang-te (B.C. 2640), was the first to rear silkworms; and the Hwang-te was induced to invent robes and garments from this circumstance. Afterwards, when Yu regulated the waters (B.C. 2200), mention is made in his work on the tribute, of the land adapted for the mulberry-tree having been supplied with 'silkworms,' from which time the advantage thereof gradually increased. In the Yue-ling section of the *Le-ke*, it is said that in the last month of spring, the trays and frames, with the square and round baskets, were to be got in readiness for the rearing of the worms, &c. It appears, on examination, that the queens and wives of the nobles, through successive generations, personally attended to the rearing of the silkworms; how much more, then, ought the wives of the common people to busy themselves in the same! All this alludes to what was done in the Chow dynasty, B.C. 1000. It is recorded of Wán-te, of the former Hàn dynasty (B.C. 150), that he commanded his empress personally to attend to the picking of the mulberry leaves in order to prepare the sacrificial garments. King-té (B.C. 130) enjoined the same thing on his queen, that she might be an example to the empire. In the time of Yuên-té (B.C. 20) the empress-dowager Wang visited the silkworm establishment, leading on the empress and the different ladies of the court, to gather mulberry-leaves. In the time of Ming-té (A.D. 70) the empress with the ladies of the princes attended to the rearing of the silkworms. During the Wei dynasty, in the reign of Wán-té (A.D. 250), the empress attended to the silkworms at the northern border, according to the regulations of the Chow dynasty. During the Tsin dynasty, in the reign of Woó-té (A.D. 280), the silkworm palace was built, and the empress personally attended to the business of rearing the silkworms, as had been the practice during the two preceding dynasties. During the Súng dynasty, in the reign of Heaóu-woó (A.D. 460), the silkworm monastery was built, and the empress personally gathered the mulberry-leaves, as had been the practice in the preceding dynasty.

"In the northern Tsè dynasty (A.D. 490) a silkworm palace was

erected, and the empress went in person to gather the mulberry-leaves. According to the regulations of the Sui dynasty (A.D. 620), the empress went to the appointed place to gather the mulberry-leaves. During the Tang dynasty, in the reign of Chin-kwan (A.D. 650), the empress did the same; in the first year of the following monarch Hsien-k'hing (A.D. 655), and in the reign of K'ien-yuen (A.D. 747), the empresses all attended to the silkworm ceremony. At the same time a decree was issued, requiring that the silkworms should be fed in the palace, when the empress went in person to inspect them. During the Sung dynasty, in the reign of K'hae-paü (A.D. 960), on recording the ceremonies performed at the celestial sacrifice, the prayer is given which was offered when the empress went in person to rear the silkworms. From all which we perceive that the empresses through successive dynasties attended in person to the business of rearing the silkworms. By selecting these extracts from the historical documents, we have set this matter in a very clear light, and placed the whole at the head of our treatise."

The Essay from which the preceding extract has been made contains many other interesting details, showing the importance attached in the earlier periods of Chinese history to the manufacture of silk generally, and especially to the cultivation of the mulberry in its various modifications.

"The culture of the mulberry silkworm" (*Bombyx mori*), remarks Dr. Royle*, "was early introduced into India from China, where it flourishes chiefly about Nankin, or in 32° of north latitude; but in India none of the old silk filatures extend to beyond 26° of north latitude. This can, I conceive, be ascribed only to the excessive heat and dryness of the north-western provinces of India being unsuitable to the animal, besides producing a dryer and harder leaf than it likes for its food."

The Rev. W. Fox, Curate of West Malling, Kent †, records the fact of *Bombyx mori* having been found in a wild state in England, and gives the following remarks:—

"On the 10th July 1858, a number of silkworms, estimated at from 80 to 100, were found under a hedge in a place called Banksfield, near West Malling, not far from Maidstone, Kent. There was no appearance of the insects having been scattered accidentally in the place, but, on the contrary, every indication of their having been hatched and sustained for some time in the spot where they were discovered. The leaves of several plants in the immediate vicinity were much eaten, showing plainly that the larvæ had for some time been feeding upon them. A bush of the common Bramble (*Rubus fruticosus*), among others, had been partially despoiled of its leaves. When discovered, about three-fourths of the whole number had spun their cocoons, which were hanging in all directions upon the weeds and the bramble referred to. Some were just commencing the spinning process, while others were yet in the larva state, and were feeding

* Report on the Paris Universal Exhibition, pt. 2. p. 216.

† See 'Athenæum' for October 16th, 1858.

quietly or roving about in quest of suitable places in which to construct their silken cells. Both the silk cocoons and the remaining larvæ were subjected to a close examination by the aid of a microscope, and were compared with other silkworms and cocoons, which had been bred or formed under the shelter of a house, but no perceptible difference of species could be discovered."

2. *BOMBYX RELIGIOSA* (Helfer).

Bombyx religiosa, Helfer, Journ. Asiatic Soc. Bengal, vi. p. 41. pl. 6 (1837); Walker, List Lep. Het. Brit. Mus. pt. vi. p. 1506.

The Deo-mooga Silkworm, Hugon, J. A. S. Beng. vi. pp. 32-41.

The Joree Silkworm, Helfer.

Hab. Assam (*Capt. Jenkins*); Cachar (*Hugon*).

Remark.—Upon examination of typical specimens of *B. huttoni*, and comparing them with the description of Dr. Helfer's *B. religiosa*, I am rather inclined to believe them to be one species.

"The Deo-Mooga," says Mr. Thomas Hugon*, "I accidentally became acquainted with, and it is very little known to the natives, and entirely in the wild state. Three years ago, being employed in Jumna-Mukh (Cachar), I had occasion to take some bearings, for which purpose I had a white cloth put up on a large Bur-tree (*Ficus indica*); the year after, being near the same spot, the ryots came and told me that two months after I left (April) they observed that the tree had lost all its foliage; they went to it and found in the surrounding grass and dry leaves a large number of small cocoons; these they spun like the *Eria* out of curiosity, and used it with the latter. They took no further notice of succeeding breeds, finding the thing of little present use. I lost a few cocoons which I procured at the time, but have lately seen both the worm and the cocoon. The former is quite different from any other; it is more active, its length is under $2\frac{1}{2}$ inches, the body very slender in proportion to its length, the colour reddish and glazed. I could not observe them more particularly, as they were brought to me one evening at dusk: I put them in a box with the intention of examining them the next morning, but they disappeared in the night, although the box was open very little to admit the air. The moth is very much like that of the mulberry; so is the cocoon also in appearance, colour, and size. I have questioned many natives about this worm, but none had ever seen it before."

Capt. F. Jenkins discovered this species in Assam, which "is (says Dr. Helfer) very interesting, as it yields a silk, if not superior, yet certainly equal, to that of *B. mori*. The cocoon shows the finest filament, and has very much silky lustre. It is exceedingly smooth to the touch, and very different from the cocoon of the mulberry moth. The worm lives upon the Pipul-tree (*Ficus religiosa*). Its general introduction would be very easy, as the Pipul-tree grows abundantly over all India."

* J. A. S. Beng. vi. p. 32 (1837).

3. *BOMBYX HUTTONI* (Westwood).

Bombyx Huttoni, Westwood, Cabinet, Orient. Ent. p. 26. pl. 12. f. 4 (1847); Walker, List Lep. Het. Brit. Mus. pt. 6. p. 1506; Moore, Catal. Lep. Mus. India House, ii. p. 379.

Hab. Mussooree (*Hutton*).

"This species," says Capt. Hutton, "is an inhabitant of these hills (Mussooree), occurring abundantly from the Doon upwards to at least 7000 feet; and the caterpillar, like that of *B. mori*, feeds on the leaves of the wild mulberry which grows here in our forests. Unlike the larva of *B. mori*, however, the present species has the caterpillar covered with long spines, although in colouring and shape there is great similarity between the two. The cocoon is spun in the leaf, which is drawn round it, and the silk is very fine and of a very pale yellow tint. I discovered this species on the 7th May 1842, on some mulberry trees growing at an elevation of about 6500 feet above the sea, with a southern aspect. Some of the caterpillars were of a large size, and nearly full-grown at this time, whilst others were in all their intermediate stages of growth. The caterpillar is of a pale yellowish cream-colour, mottled or marbled down the back and sides with a mixture of grey, yellow, and rufous or brownish lines; the anterior segments of the body are mottled above with livid grey, and ornamented with four blackish oblong spots or ocelli placed obliquely; along the back are two rows of long black spines curving backwards, and on the anal segment is one long spine in the middle; the two anterior pair of spines spring from the ocelli, and the last pair are curved forwards, instead of backwards, like the rest; there is also on each side a row of short spines springing from the base of the true legs. The anterior segments swell up into a hump like those of the larva of *B. mori*. As the caterpillar becomes mature, the rufous colouring fades away and gives place to a mottling of pale livid grey; the head is also mottled. It grows to about $2\frac{1}{2}$ inches in length, and spins in the leaf early in May. They are double brooded, for mine all hatched in June, and deposited their eggs, a few of which produced caterpillars that year, but the greater number remained until the following spring."—*Westwood's 'Cabinet of Oriental Entomology.'*

Capt. Hutton, in reply to some inquiries by J. Bashford, Esq., relating to this species, states* that "*Bombyx huttoni* cannot be treated like the domestic kinds, but must (at least for the present) be reared upon the trees. The worms will not remain in the trays, nor even upon twigs placed in water, when once the freshness of the leaf is gone. On the tree it is perfectly free from restlessness, and saves a vast expense in feeding, besides possessing the advantage of always having perfectly fresh food at command,—an essential point in forming good silk, as the quality of this substance must always be greatly influenced by the healthy secretions of the animals producing it.

* Journ. Agri-Horticult. Soc. India, ix. p. 391 (1857).

“Cocoons of *B. huttoni*, produced in the house from worms placed upon small branches set in jars of water to keep them fresh, are always inferior to those produced upon the trees, and I doubt not you would find this to be the case with the domestic species in Bengal.”

The Agri-Horticultural Society of India has lately reported most favourably on the silk of this species, which has been brought into notice by Capt. Hutton. The worm spins in all weathers, whereas the common silkworm, *B. mori*, is apt to be thrown off work by a passing cloud. It is thought that this new silkworm may prove commercially important, and Government is solicited to institute experiments regarding its productive powers (*vide* ‘Madras Journal,’ March 1857, p. 268).

4. BOMBYX HORSFIELDI (Moore).

Bombyx horsfieldi, Moore, Catal. Lep. Mus. India House, ii. p. 380. pl. 11 a. fig. 5 (1858).

Hab. Java. In Museum, India House.

This species, of which a female only was collected in Java by Dr. Horsfield, is of a brownish-grey colour. The fore-wings have two transverse, slightly curved, brown bands, the first one-third from the base, the other one-third from the apex, the latter having undulated margins; between the two bands is a grey-centred brown discal spot; a brown streak immediately below the apex, its inner margin being pale. The hind-wing is pale ferruginous at the base, and has a narrow curved pale submarginal line, the veins being also pale; and on the abdominal margin are two blackish-brown spots, one being near its base, the other about its middle. Expanse $2\frac{3}{4}$ inches.

5. BOMBYX SUBNOTATA, Walker.

Bombyx subnotata, Walker, Journ. Proc. Linn. Soc. Lond. iii. Zool. p. 188 (1859).

“Male. Ferruginous, thick, pilose. Fore-wings rounded at the tips, extremely oblique along the exterior border, which is slightly angular in the middle and slightly excavated on each side; underside with a yellow costal spot near the tip. Hind-wings with the interior border densely fringed towards the tip. Antennæ broadly pectinated. Mouth obsolete. Abdomen much more slender than the thorax, not extending beyond the hind-wings; anal lateral appendages fringed. Legs short, stout. Expanse of the wings 16 lines; length of the body 7 lines.”

Hab. Singapore.

This species was collected by Mr. A. R. Wallace.

6. BOMBYX LUGUBRIS (Drury), Exot. Ins. iii. p. 28. pl. 21. f. 5 (1773).

Described as inhabiting Madras; requires further confirmation before we can say that it belongs to the genus *Bombyx* (as now re-

stricted). To us it appears like a species belonging to a genus of *Drepanulidæ* *.

Genus CRICULA, Walker.

Cricula, Walker, List Lep. Het. B.M. pt. 5. p. 1186 (1855).

Euphranor, Herr.-Schäffer, Lep. Exot. Spec. Nov. p. 61 (1858).

Antennæ in male deeply bipectinated, in female minutely so. Palpi pilose, very short. Proboscis short, distinct. Legs stout, pilose; tarsi short, thick; hind tibiæ with two minute apical spurs. Abdomen short, thick. Wings broad; fore-wing in the male slightly convex along the costa, falcate at the tip, concave along the exterior margin, inner angle rounded; hind-wing shorter, rounded at the angles. Female with the tip of fore-wing less falcate, and the exterior margin nearly straight.

1. CRICULA TRIFENESTRATA (Helfer).

Saturnia trifenestrata, Helfer, Journ. As. Soc. Beng. vi. p. 45 (1837); Herr.-Schäffer, Lep. Exot. Spec. Nov. ser. 1. pl. 17. f. 80 ♀.

Cricula trifenestrata, Walker, List Lep. Het. B.M. pt. 5. pp. 1187, 1196; Moore, Catal. Lep. Mus. India House, ii. p. 384.

Euphranor trifenestrata, Herr.-Schäffer, Lep. Exot. Spec. Nov. p. 61 (1858).

♂ *Saturnia zuleika*, Westwood, Cabinet Orient. Ent. p. 25. pl. 11. f. 1 (1847).

Antheræa zuleika, Walker, List Lep. Het. B.M. pt. 5. p. 1252.

* "Silk is entirely a gum or glutinous substance," says Mr. F. Bashford. "I have extracted it from many hundred worms in every stage. It is deposited in both sides of the worm in two cylindrical shapes, doubled into three layers or folds, thick in the middle, and tapering at both ends, but much more so at the latter end, which accounts for the end of the cocoon giving a thread of a finer and lighter colour. The gum, if instantly taken from the worm, may be pressed and moulded into various shapes, and is very elastic: but very slight exposure gives strength to it, and fixes the thread in the ratio of the cylinders, large in the centre and tapering at the ends. If you expose it to a hot sun, the softer and colouring gummy matter becomes brittle, and may be broken off or separated, leaving the fixed gum in the shape of a thick white thread, strong (if not too much exposed to the sun), and slightly elastic. At the time of spinning, the two cylinders unite in one aperture, and the gummy matter is exuded by the worm in one continued thread; the more sticky nature of the soluble portion fixes the thread to the twigs at first, and ultimately to each other in the formation of the cocoon; the motion of the head of the worm causes it to be drawn out from the cylinders; the peculiar nature of the worm's secretion and the motion of the head enables it to elongate the silky gum, as it is drawn from the body in a soft state, into a thread of considerable length; exposure immediately hardens and fixes it, but it can only be done by the aid of the outer stick (? sticky) and more soluble gum. The two gums, or animal secretions, differ most materially: the one must be boiled out with a solution of alkali, before the other will take a perfect dye; but this solution does not injure the fixed gum or silk thread; a more powerful chemical is necessary to render that soluble; it is soluble, and art may make old silk dresses available some day for weaving and converting into a new fabric, as our Yorkshire friends now do with old woollen cloth rags."—(Extracted from the 'Journal of the Agricultural and Horticultural Society of India,' 1857, ix. p. 269.)

? *Phalæna-attacus fenestrata*, Linnæus, Syst. Nat. i. pt. 11. p. 811 (1767); Mus. Lud. Ulr. 372; Clerck, Icon. pl. 55. f. 1.

? *Phalæna-attacus perspicua*, Linnæus, S. N. i. 11. p. 811.

Var. ♀. *Euphranor multifenestrata*, Herr.-Schäffer, Lep. Exot. Spec. Nov. f. 551. p. 61 (1858).

Hab. N.E. and S. India, Silhet, Assam, Burmah, Java.

The larva, chrysalis, and cocoon of *C. trifenestrata* are figured in the 'Catal. of Lepidoptera' in the Museum, India House, vol. ii. pl. 27. figs. 7, 7 *a*, 7 *b*, copied from the original drawings made under Dr. Horsfield's superintendence in Java. The larva (according to Dr. Horsfield) "feeds on the Teng-gulung (*Protium javanum*), the Kettons (*Canarium commune*), and the Ingas (*Mangifera ingas*?). Abundant during December and January; scarce in March."

The cocoon is of a beautiful yellow colour, and of a rich silky lustre, and constructed like network, the enclosed chrysalis being visible.

Discovered in Assam by Capt. Jenkins, "where it lives on the *Soon* tree, but seems to be not much used" (J. A. S. Beng. 1837, p. 46); and at Moulmein by Capt. J. C. Haughton, who states that he "only observed it upon the Cashew-nut tree (*Anacardium orientale*), which, though exotic, has thoroughly taken root both at Tavoy and at Moulmein, and is now to be found in every native garden (Journ. of the Agri-Horticultural Soc. of India, 1858, p. 101)."

Gen. nov. SALASSA, Moore.

Antheræa (Group III. pt.), Walker, List Lep. Het. B.M. pt. 5. p. 1250.

Antennæ deeply bipectinated. Abdomen short, rather thick. Wings broad; fore-wings *without ocelli*; fore-wing with costal margin convex towards the tip, where the angle is falcated; posterior angle round, inner margin somewhat straight; hind-wings *with ocelli*; the apex round, the anal angle less so.

Remark.—This genus, of which only one species is as yet known, may be distinguished from *Antheræa* by the absence of the ocellus in the fore-wing,—all the known species of *Antheræa* possessing a distinct but varying ocellus in *both* the fore and hind wings, whereas in *Salassa* it is replaced by a small diamond-shaped vitreous spot.

1. SALASSA LOLA (Westw.).

Saturnia lola, Westwood, Cabinet Orient. Ent. p. 25. pl. 12. f. 3 (1847).

Antheræa lola, Walker, List Lep. Het. Brit. Mus. pt. 5. p. 1252.

Wings rich brownish-red; fore-wing with an obscure transverse line near the base, a small diamond-shaped vitreous discal spot, followed by a transverse dark dentated line, beyond which is a greyish-brown fascia bordered on each side by a dark dentated line, and terminated at the apex in a grey patch; hind-wing paler at the base, with a black-centred ocellus, which is encircled by a white and then

by a red ring; around this runs a broad incomplete circular line, extending from above the ocellus and terminating on the abdominal margin; an exterior submarginal dark dentated line.

Expanse $4\frac{1}{2}$ inches.

Hab. Silhet.

Genus ANTHERÆA, Hübner.

Antheræa, Hübner, Verz. bek. Schmett. p. 152 (1816).

Antheræa (part), Walker, List Lep. Het. B.M. pt. 5 (1855).

Phalæna-attacus, pt., Linnæus.

Antennæ broadly bipectinated in male, less so in female. Proboscis invisible or obsolete. Abdomen stout, very thick in female. Wings ample, each with a rounded ocellus, whose disc is partly or wholly vitreous, and is traversed by the discal veinlet; fore-wing convex along the costa; tip falcated in the male, more rounded in the female.

1. ANTHERÆA PAPHIA (Linnæus).

Phalæna-attacus paphia, Linnæus, S. N. i. 2. p. 809 (1767); Mus. Lud. Ulr. p. 369; Cramer, Pap. Exot. ii. pp. 78, 81, 82. pl. 146. f. a ♀, pl. 147. f. a, b ♀, pl. 148. f. a ♂.

Bombyx paphia, Fabricius, Syst. Ent. p. 557; Spec. Ins. ii. p. 168; Mant. Ins. ii. p. 108; Ent. Syst. iii. 1. p. 409; Sykes, Trans. Asiatic Soc. London, iii. p. 541 (with a plate).

Phalæna.paphia, Roxburgh, Trans. Linn. Soc. vii. p. 33 (1804).

Antheræa paphia, Hübner, Verz. bek. Schmett. p. 152 (1816); Moore, Catal. Lep. Mus. Ind. House, ii. p. 385.

Saturnia paphia, Helfer, Journ. As. Soc. Beng. vi. p. 42 (1837).

Phalæna-attacus mylitta, Drury, Ill. Exot. Ins. ii. p. 8. pl. 5. f. 1, App. p. (1773).

Bombyx mylitta, Fabricius, Syst. Ent. p. 558.

Attacus mylitta, Blanchard, in Jacquemont's Voy. dans l'Inde, Zool. Ins. p. 24. pl. 3.

Antheræa mylitta, Hübner, Verz. bek. Schmett. p. 152; Walker, List Lep. Het. B.M. pt. 5. p. 1247.

Saturnia mylitta, Westwood, edit. Drury's Ins. ii. p. 10. pl. 5. f. 1; Royle, Reports on the Paris Universal Exhibit. pt. 3. p. 216; Guérin-Meneville, Rev. et Mag. Zool. (1855), p. 297. pl. 6. f. 2.

Tesser; *Folliculus et Eruca bengalensis*, vocatur *Tesser*, Rumphius, Herb. Amb. iii. p. 115 (1750).

Tusseh Silkworm Moth, Hind., Helfer.

Bughy Silkworm Moth of the Burbhoom Hills, Roxburgh.

Kolisurra Silkworm Moth of the Mahrattas, Col. Sykes.

Munga Silkworm Moth of the Meches, B. H. Hodgson.

Kontkuri Mooga of the Assamese, Hugon*.

Hab. Difficult to determine; but specimens have been received from N.E. India, Silhet, Assam, S. India, Ceylon, and Java.

The transformations of the Tusseh Silkworm Moth are figured in

* J. A. S. Beng. vi. p. 32.

vol. ii. Catal. Lep. Mus. Ind. House, on plate 29, fig. 1, 1 *a*, copied from the original drawings made by Lady Isabella Rose Gilbert.

Also figured among the drawings of the late Gen. Hardwicke.

One of the earliest notices of an insect, very nearly allied to this species, is given by the venerable Rumphius in his 'Herbarium Amboinense,' vol. iii. p. 113. pl. 75 (1750), who discovered the larva in Amboyna feeding on the *Mangium caseolare rubrum* (*Rhizophora caseolaris*, Linn.). The figures of the larva, cocoon, and imago, on Rumphius's plate, show its close affinity to the *Anth. paphia*.

Dr. Roxburgh states this to be the "*Bughy* of the natives of the Burbhoom Hills, where the silk, which the same people call *Tusseh*, is manufactured. It is a native of Bengal, Bahar, Assam, &c. Feeds upon the leaves of *Rhamnus jujuba* (Byer of the Hindoos) and of *Terminalia alata glabra*, Roxb. (Asseen of the Hindoos)."

They are found in such abundance, over many parts of Bengal and the adjoining provinces, as to have afforded to the natives, from time immemorial, an abundant supply of a most durable, coarse, dark-coloured silk, commonly called Tusseh-silk, which is woven into a kind of cloth called Tusseh-doot'hies, much worn by Brahmins and other sects of Hindoos.

Eggs white, which hatch in from two to four weeks. The larvæ acquire their full size, which is about 4 inches in length, and 3 in circumference, in about six weeks. When the larvæ approach their full size, they are too heavy to crawl in search of their food with the back up, as is usual with most caterpillars, but traverse the branch suspended by the feet. When the larvæ are ready to spin the cocoon, each of them connects, by means of the recent glutinous filament of which the cocoon is made, two or three leaves into an exterior envelope, which serves as a basis to spin the complete cocoon in; besides, the cocoon is suspended from a branch of the tree by a thick, strong, consolidated cord. The cocoon is of an exact oval shape, and exceedingly firm texture. The chrysalis remains dormant for about nine months, viz. from October until July, the perfect insect always emerging during the night; and does not exist more than from six to twelve days when confined.

Michael Atkinson, Esq., says, "This species cannot be domesticated. I am informed that the natives cannot even retain any of it for seed. The hill people say that they go into the jungles, and under the Byer and Asseen trees they find the excrement of the insect; on which they examine the tree, and, on discovering the small worms, they cut off branches of the tree sufficient for their purpose, with the young brood upon them; these they carry to convenient situations near their houses, and distribute the branches on the Asseen tree in proportion to the size thereof, but they put none on the Byer tree. The Parieahs, or hill people, guard the insects night and day while in the worm state, to preserve them from crows and other birds by day, and from bats by night."—Dr. Roxburgh, Trans. Linn. Soc. vii. p. 33 (1804).

According to Col. Sykes, this is the "*Kolisurra* silk-worm of the Deccan. It feeds indiscriminately on the Sagwan or Teak-tree

(*Tectona grandis*), the Bor (*Zizyphus jujuba*), the Asana (*Terminalia alata glabra*), and the Mulberry Tut (*Morus indica*). The cocoons are extensively used by matchlock-men, cut into thongs, as ligatures for binding the matchlock barrel to the stock : the thongs are more durable than those of leather."

From the Journal of the Agricultural and Horticultural Society of India, 1848 (vi. p. 167, *et seq.*), we extract the following notes by Messrs. B. H. Hodgson and R. W. G. Frith. According to Mr. Hodgson, "this is the *Munga* silkworm moth of the Meches, and is found wild in the Saul forest. It feeds on the Saul tree (*Shorea robusta*); the fibre yielded is very strong, and must surely be that known to classic commerce, and used by the Romans for the manufacture of the awnings of their immense theatres." Mr. Frith says:—

"As far as my acquaintance with this insect extends, I believe it to be found throughout the whole of this side of India; that is to say, from the north-western range of the Himalaya direct south as far as Midnapore, and also through the north-eastern range to Assam and southwards to Chittagong. I have no doubt but that it extends further, but cannot state so from my own experience. Dr. Royle, in his volume on the productive resources of India, states that it was found by Colonel Sykes in the Bombay, and by Dr. Geddes in the Madras Presidency. I have seen it from Mussooree, and have it in my own collection from Kussowlee, Darjeeling, Assam, Cherra Poonjee, Sylhet, Chittagong, from Chota Nagpore, and from several of the districts of Bengal. In Bengal I have taken the larva at all seasons of the year, except during the cold weather, when the trees constituting its food are useless. It is most abundant, I am informed, in the Bhargulpore district, where the cocoons in their proper season are collected by cart-loads for the manufacture of the *Bhaugulpore* or *Tusseh silk*, as it is called, and now so well known. It is not on account of the great size of the larva that it is obliged to take to the under side of the twigs to enable it to traverse them in search of food (as is [above] stated by Dr. Roxburgh), for it can pass along the twigs in any position when they are strong and thick enough for its powerfully clenching feet to find sufficient to grip hold of. It is clear that when the larva approaches the ends of the thinner branches and twigs (which it frequently does, having taken it on some so slight that it has been in a perfectly pendent position), it would be impossible for it to travel with ease to itself in such a position as to keep itself *upwards*; it therefore prefers to take the *under* side of the twig, and passes along it in a suspended position, with the aid of its powerful feet,—for it takes some little trouble to make them release their hold when once firmly fixed.

"I have known the perfect insect make its appearance out of the cocoon in the rainy season in about twenty days. A great deal depends, however, upon the temperature and the state of the atmosphere as to the number of days that are required ere the moth makes its exit from the pupa state. The food of the larva seems to be confined to the leaves of but a few trees: I found it only upon

the Bair (*Zizyphus jujuba*), both wild and cultivated kinds, and on the Badaam or country almond (*Terminalia catappa*). Mr. Hugon (see Journ. Asiat. Soc. vi. p. 32) states that it feeds, in Assam, not only on the Moonga trees, but also on the former of those mentioned above, and on the Semal (*Bombax heptaphyllum*). Dr. Helfer describes it as being taken upon and from other trees, and these are transplanted on to the Assun tree (*Terminalia alata*), but that they feed most commonly in the wild state on the Bair and Semal trees. Mr. Hodgson again has discovered that its food is the Saul tree (*Shorea robusta*), since writing which I have been informed by a friend that in the Midnapore district the larva feeds upon the Saul tree also.

“Dr. Helfer (J. A. S. Beng. vi. p. 43) states that, ‘according to Michael Atkinson of Jungypore, this species cannot be domesticated, because the moths take flight before the females are fecundated.’ Dr. Helfer’s opinion does not bear out the truth of this remark; and I agree with him, as he further states, in continuation, that, having kept them in a musquito curtain to prevent their escape, they were readily impregnated by the males, and deposited thousands of eggs. The moths no doubt, both male and female, will fly away if not confined in any manner to prevent them, particularly the males, for the sole purpose of seeking the females. I am of opinion that this silkworm might be reared and domesticated with very little care and attention. A female, for instance, produced from the cocoon, and retained captive, can, as above stated, be readily impregnated by the males, which are so eager for the intercourse, that I have at times taken as many as from ten to fifteen individuals in the course of a couple of hours, between the hours of two and four in the morning, and that for three or four times in succession, with the aid of the same decoy female. The moths, both male and female, live for about ten days, if they are not allowed to approach each other for the purpose of reproducing their species, and this without food of any kind, seeing that they are not provided by nature with a mouth.

“Mr. Hugon states that the natives consider there are two varieties of this species, the Bhugy and Jharoo. I do not think so; I believe them to be one and the same species. The larva sometimes, for instance, when feeding on the common Bair of the jungles, is of a very dark green colour, precisely that of the leaf itself, and might by some be considered as a different species, when compared with one that has fed on the Badaam (*Terminalia catappa*), which is of a much lighter and prettier green, with a degree of transparency at the same time, and a slight tinge of yellow pervading it. The fact of the perfect insect being devoid of any mouth has led me to infer that the secretion which it emits for the purpose of softening the substance of the very hard cocoon from which it has to make its escape is voided from the abdomen; and when effected, it has to *turn itself round in the cocoon* to enable it to set to work, with its two fore-feet, which are provided with extremely strong and curved claws, and, thread by thread, works for itself an opening, through which,

while yet moist, its escape from the cocoon is effected, and that too before its wings have in any way enlarged by expansion to impede its exit. It is my intention to endeavour to ascertain this point beyond any doubt, if possible*.”

Mr. Hodgson, again, says :—“With regard to the distribution of the species, I apprehend that Mr. Frith is mistaken in supposing it does or can occur in climates like that of Darjeeling ; for I not only never heard of the species here, but have failed in an experiment to rear it, which was carefully conducted under favourable circumstances, from cocoons got in the Saul forest, by Mechis in my service, who are habituated to rearing silkworms. Gentlemen who make collections in this quarter are apt to blend whatever they procure from the Tarai forest, and lower hills, and from the mountains above them ; and I conjecture that Mr. Frith’s specimens of *Antheræa paphia*, said to come from Darjeeling and Cherra Poonjee, were really obtained in the lowlands beneath those places. I notice this point because of the numerous and important mistakes relative to the geographic distribution of zoological and botanical species which have thus been propagated. For example, Mr. Ogilby was led in this manner to suppose an Otine bird (*Eupodotis bengalensis*) an inhabitant of these vast and precipitous and heavily wooded mountains, and to name the species *Hamalayensis*, though it is really as little capable of dwelling in such a habitat as is, I apprehend, the *Anth. paphia*, or, more generally, any species of silkworm whatever. Silkworms abound south and east upon or near the level of the plains, but I doubt if they pass the limits of Bengal in a north-westerly direction, even upon the plains ; and, so far as I know, the Cusi river is their limit in that direction ; nor do I believe they are ever found, tame or wild, at elevations materially above the plain level in Bengal or in Hindostan. In the Saul forest they may pass up towards the north-west as far as that forest extends, or to Hurdwar. But the Saul forest is hardly elevated at all above the level of the adjacent plain ; and Cherra at 4000 and Darjeeling at 7000 differ *toto celo* in characteristic productions, as in climate, from all places situated on the low open level of the Gangetic plains. The *Anth. paphia* avoids the open plain, as well as the mountainous heights ;

* Captain Thomas Hutton, in the Journal of the Agri-Horticultural Society of India for 1856, p. 166, says, “*I doubt this*, because I have fully ascertained that the species known as *Actias selene*, which is furnished on the shoulder of each wing with a hard brown spine for the purpose of dividing the threads, likewise discharges a moistening liquid ; and although, as in *Saturnia*” (i. e. *Antheræa*), “it is said to have *no mouth*, yet it is nevertheless *from the mouth*, or the place where it should be, that the solvent is discharged. The mouth is an *imperfect* mouth only, and is not organized for the reception of nourishment, although sufficiently perfect, it would appear, to secrete the liquid with which the threads are moistened. When the agglutinizing matter is thus dissolved, the threads are easily separated by the wing spines, and an opening afforded for the egress of the moth. I have this season watched this process in no fewer than 200 specimens of *Actias selene*, and can answer for there being no mistake about the matter, a drop of the clear colourless liquid often remaining upon the tuft of hair or down on the forehead between the eyes, and which tuft appears to be used as a brush for the application of the solvent to the threads of the cocoon.”

and, as it seems to me, is exclusively confined to primitive forests on the level, or near it, of the plains. If, therefore, the species be found wild in Bhaugulpore, Sylhet, Chittagong, or even Choto Nagpore, it is, I apprehend, confined in all those districts to the uncultivated and forest tracts at the base of their respective hill ranges. Further inquiry as to the food of the wild worm of the Saul forest confirms my prior information, that this species feeds almost, if not quite exclusively, on the leaves of *Shorea robusta*: and, as that tree extends not westerly beyond Hurdwar, the habitat of Kussowlee appears to me dubious, unless there be some mistake about the species.

"The above remarks," continues Mr. Hodgson, "may seem tiresome: but those who are aware of the stress now laid on the geographic distribution of species, and of the numerous errors of fact that have crept into the subject, as relates to this quarter, from the source above adverted to, will probably deem otherwise. My attention was drawn to the subject of the distribution of silkworms in India, with reference to the notices which the classics have left us of the ancient trade of India with the west, in the Roman times particularly."

To the above Mr. Frith replies:—"Regarding the geographical distribution of the species, I am almost at a loss how to satisfy Mr. Hodgson as to the circumstance of its being found at Darjeeling, having received it from thence myself, from a party collecting for me. Again, those from Cherra Poonjee were collected by persons on the spot who are employed by me for the sole purpose of forming entomological collections."

Again, Mr. Hodgson writes:—"The wide diffusion of silkworms throughout the continent of India in the plains seems clear, and is a very interesting circumstance with reference to what we find in the classics about the trade of India with Europe in the latter days of Rome and thereafter. Mr. Taylor (Journal Asiatic Society of Bengal) supposed that the chief 'things in commerce' in those days were products of Assam only. But I had long before traced most of them as indigenous products of all India extra Gangem, from Suddiah to Hurdwar, leaving silk only as an apparent exception. It need be no longer; fine wild worms of various kinds being, it now appears, found north-west all the way to the *débouche* of the Ganges into the plains. So far, then, I agree with Mr. Frith. But I confess myself still quite a sceptic as to the alleged fact of the silkworms tenanting these mountains at elevations like that of Darjeeling."

In answer to the above remarks by Messrs. Hodgson and Frith, we quote the following by Captain Thomas Hutton:—

"The Tusseh Moth (*Saturnia paphia*), which Mr. Frith says he has procured from Mussooree and Kussowlee,—a statement doubted by Mr. Hodgson, who confines the insect to the plains and base of the hills, pointing out that collectors are in the habit of jumbling species from various localities into the same box, and calling them a collection of Himalayan species—

"Mr. Frith afterwards appeals to my letter to Mr. Westwood as

showing, as he imagines, from the mention of *Sat. paphia*, that I had procured it at Mussooree. This is rather a bold jump to a conclusion!

"In reply to this part of the discussion, I incline to the side of Mr. Hodgson, whose remarks regarding the mode adopted by collectors of specimens in general, no matter whether birds or insects, are most correct. The practice here at Mussooree is this:—a person wishing to make a collection either takes a native collector into service, or purchases the specimens singly from independent collectors who hawk about insects for sale. These native gentry, whether hired or otherwise, not being over-fond of hard work, invariably *go down from Mussooree into the Doon at the foot of the mountains*, and having there filled their boxes, return to the hills to sell them.

"The collector, in most cases disdaining to know the difference between a moth and a butterfly, stows them all away into his boxes. These collections are then sent off, or carried off, as illustrative of the entomology of Mussooree and Landour, to which the collection bears about as close an affinity as the fauna of Southern India does to that of the Northern Provinces,—species common to both being intermingled with others that exclusively belong to the one locality or the other. Thus the greater portion of species in these collections is exclusively lowland.

"Now among the lowlanders I am inclined to include the Tusseh Moth! I have collected at Simla and its neighbourhood, as well as at Mussooree; but during my long residence at the latter station, I have only once in fifteen years seen the Tusseh Moth; and that one specimen was a female captured *in the Dehra Doon near Hurdwar*; besides that, I am not altogether certain that the species is identical with the true Bengal Tusseh. In fact I doubt the occurrence of that species in the hills, whether at Mussooree or at Kussowlee.

"Thus far the statements of Mr. Hodgson are, I think, correct; but when he proceeds to assert that the Saul tree (*Shorea robusta*) does not extend westward of Hurdwar, he falls into an error that any traveller may correct, since there are splendid forests of Saul throughout the Dehra Doon, and even away as far west as the Jumna, if not farther.

"The Tusseh Moths to which I alluded in my letter to Mr. Westwood were all sent to me in cocoon from Bhagulpore by the late Capt. Don. We have here at Mussooree, and also at Simla, a species of *Saturnia* [*Antheræa*] feeding on the common Hill Oak (*Quercus incana*), and bearing a resemblance to the Tusseh Moth, though much smaller, and quite distinct: can this be Mr. Frith's Kussowlee species?

"Mr. Frith mentions having 'inspected a very fine collection made by a gentleman at Mussooree, in which are no less than eleven species of true *Bombycidae*, viz. nine of the genus *Saturnia*, one of *Actias*, and one of *Saturnia* [*Antheræa*] *mylitta*, or the true Tusseh Moth.' Now if this collection belonged to a son of the late Col. Buckley*, I can easily clear up the mystery of the Tusseh Moth coming from

* This collection was presented to the East India Company's Museum in 1849.

Mussooree, since it was *one of my Bhagulpore specimens* given in exchange for something else : and I may as well point out that the collection to which I allude contained species from various parts of India, I myself having contributed insects from Mirzapore, Nee-much, and even from Afghanistan in exchanges, while there were also a few from China ! Besides which, Mr. Buckley's object being to make a collection without noting or caring for locality, the greater number of his specimens came, as usual, from the Dehra Doon. This (if I am right in my conjecture about the collection alluded to by Mr. Frith) may serve to show with what degree of suspicion any collection, *not made by a naturalist*, should be regarded by scientific men both at home and abroad, since, by taking it for granted that the collection contained only the species proper to the locality in which it is stated to have been made, the closet naturalist may be led to form the most erroneous conclusion in regard to the distribution of species. Nor is this remark to be confined to insects only, since it will equally apply to ornithological collections ; so that any modern Adam who may undertake to form a system, founded rather *upon the length and breadth of an animal's tail* than upon the habits and manners of the species in their native haunts, and who thunders forth his dogmas from his artificial paradise of musty skins, may, and doubtless often has, put forth a host of errors for the acceptance of other *naturals* as little conversant with living species as himself !

"My own limited experience, therefore, leads me to coincide in opinion with Mr. Hodgson, and I accordingly reject the Tusseh Moth from the catalogue of Mussooree and mountain species, not even granting it a place at Kussowlee.

"Of true mountaineers, we have, as far as my knowledge extends, three species of *Saturniæ* ; two others are found only in the depths of the warmest valleys, such as *S. atlas?* and *S. katinka* (Westw.) ; the former occurring likewise in the Doon along with the Tusseh Moth ; thus making in all six species of *Saturniæ*."

In a foot-note Capt. Hutton further remarks :—"In my enumeration of the species found here, I omitted one large *Saturnia*, which I once found upon a quince tree in the Botanical Garden ; the larva when first seen appeared to be a white cocoon on the back of a leaf, but a closer view showed me the caterpillar densely covered with long white hairs. I never procured a second specimen.

"To these we may add one species of *Actias*, which is, I believe, confined to the hills from 5000 feet upwards to 7000 feet, and perhaps higher ; it occurs likewise apparently in Sylhet, as Major Jenkins long ago kindly sent me a drawing of what I take to be this species. And lastly we have one species of true *Bombyx* (*B. hut-toni*, Westw.), which occurs abundantly on the wild mulberry from the Doon upwards to at least 7000 feet ; thus showing a list of known silk-spinners to the number of nine, viz. seven *Saturnia*, one *Actias*, and one *Bombyx* : more there may doubtless be, although as yet unknown to me ; but I strongly suspect that some of those mentioned by Mr. Frith as coming from Mussooree and Kussowlee were in reality natives of other localities.

"Mr. Hodgson likewise notices the occurrence of what he and Mr. Frith pronounce to be the Arrindy Moth (*S. cynthia*) ; and I have it also from the Mussooree, where the caterpillar feeds on the shrub Mussooree (*Coriaria nipalensis*), and from which this station derives its name. Dr. Roxburgh's figure of the caterpillar of *S. cynthia* is, however, so thoroughly unlike those occurring here, that, notwithstanding the identity (if I may so speak) of the imago, I am unwilling to pronounce decisively as to the species until I have compared our larvæ with those of undoubted *S. cynthia* from Bengal. Ours occurs from the foot of the hills up to 6000 feet of elevation."

Lady Isabella Rose Gilbert figures the transformations of *Anth. paphia*, and in her MS. Notes says :—"Tusseh Moths are hatched twice in the year, in May and August : the larvæ go into the chrysalis state in September, remaining so till the May following ; whilst those that enter the chrysalis state in July come out in three weeks. Many of the females lay eggs in eight or ten hours after quitting the chrysalis ; others again do not till the following night, or longer. In ten days the young larvæ make their appearance, and feed on the Assun tree and the Sal sakooa (*Shorea robusta*). In about three weeks from the time of their exclusion from the egg, they attain their full size, and in eight or ten days more prepare for their transformation into the chrysalis. The caterpillar commences its operations by drawing a few leaves slightly together, as if to screen it from observation. It then spins a strong cord, composed of many threads, altogether about the thickness of a crow-quill, at the end of which it weaves the cocoon. The cocoon is so transparent for the first six and thirty hours, that the larva may be distinctly perceived at work in the interior ; after that time the cocoon gradually acquires consistence by the continued industry of the caterpillar, and becomes quite opaque from the addition of a glutinous liquid with which it moistens the whole. When that dries, the cocoon appears as if covered with white powder, and in the course of a couple of days becomes perfectly hard.

"The moth generally deposits its eggs within a few yards of the cocoon ; these the villagers collect and keep in their houses till the young caterpillars come forth, when they are placed on the Assun trees in the jungles, the proprietors remaining to protect them from the birds, and to bring home the cocoons when perfect. The people who rear these silkworms are of the Sontal and Bhouree castes, and practise many superstitious ceremonies while tending them in the jungles."

2. *ANTHERÆA PERNYI* (Guérin).

Saturnia pernyi, Guérin-Méneville, Revue et Mag. de Zool. (1855) p. 297. pl. 6. f. 1.

Antheræa mylitta, var., Walker, List Lep. Het. Brit. Mus. pt. vi. p. 1378.

Hab. China (Guérin). In British Museum Collection.

Mr. Guérin-Méneville observes that *A. pernyi* may be distinguished from *A. paphia* by the form and texture of its cocoon. In his figures

the male of *A. pernyi* differs from the same sex of *A. mylitta* by its less falcate fore-wings, and by the exterior band, which is different in colour, more straight; and in the hind-wings is contiguous to the ocellus. It is well figured in the above work.

3. *ANTHERÆA FRITHI*, Moore. (Annulosa, Pl. LXV. fig. 1.)

Antheræa Frithi, Moore, Catal. Lep. Mus. Ind. House, ii. p. 396 (1858).

Male. Yellowish-ferruginous, the disc suffused with patches of darker ferruginous; the exterior margin and about the base greyish-ferruginous. Fore-wing with the costal band grey; the submarginal dark line evenly undulated, and parallel with it and before the ocellus are two deeply undulated lines, the inner spaces between which are suffused with yellow; a large prominent apical patch and space within the cell yellow. Hind-wing with the submarginal line deeply undulated, with two parallel deeply undulated inner lines, the spaces between which are suffused with yellow, the inner line extending round the ocellus and joining the sub-basal line. Ocelli small, similar to those in *Anth. paphia*. Antennæ yellowish. Frontal band grey. Body yellowish-ferruginous.

Expanse of wings $5\frac{1}{3}$ inches.

Hab. Neighbourhood of Darjeeling. In Museum, India House, London.

4. *ANTHERÆA ROYLII*, Moore. (Annulosa, Pl. LXIV. fig. 1.)

Antheræa Roylii, Moore, Catal. Lep. Mus. Ind. House, ii. p. 397 (1858).

Dull greenish-buff colour. Male.—Fore-wing with the costal band brownish-grey; the subbasal lines and the oblique submarginal line indistinct, greyish. Hind-wing with the submarginal line indistinct. Ocellus of both fore- and hind-wings ill-defined, greenish-buff colour within, but with the inner half suffused with vinaceous; vitreous spot minute, the narrow outer ring black on its exterior half and red on the inner half, with an inner yellow line on the former, and a white line on the latter. Female with the wings somewhat brighter coloured exteriorly; the submarginal line of both wings more distinct; ocelli more distinct. Frontal band brownish-grey. Antennæ brownish. Body buff-colour.

Expanse of wings of male $5\frac{3}{4}$, female $6\frac{1}{2}$ inches.

Hab. Neighbourhood of Darjeeling. In Museum, India House, London.

5. *ANTHERÆA JANA* (Cramer).

Phalæna-attacus jana, Cramer, Pap. Exot. iv. p. 220. pl. 396. f. A (1782).

Bombyx jana, Olivier, Enc. Méth. Ins. v. p. 28.

Antheræa jana, Hübner, Verz. bek. Schmett. p. 152; Walker, List Lep. Het. Brit. Mus. pt. 5. p. 1250.

Hab. Java (Cramer).

Remark.—As yet we have no example of this species in England, but its distinguishing character is its small size; the ocelli being nearly opaque; and the hind-wing has, besides the usual submarginal line, two additional undulated wider lines proceeding from the abdominal margin, the first extending round the ocellus, and the other only to the ocellus.

Expanse of wings $4\frac{3}{8}$ inches.

6. *ANTHERÆA PERROTTETI*, Guérin.

Bombyx perrottetii, Guérin-Ménéville, Mag. de Zool. 1843, pl. 123.

Antheræa perrottetii, Walker, List Lep. Het. Brit. Mus. pt. 6. p. 1379.

Hab. Pondicherry (Guérin). *Non vidi.*

Deep yellow; base of costal margin of fore-wing grey, with indistinct darker submarginal line; ocelli small, round, red, the exterior ring black, the inner whitish, with a small medial yellow spot; thorax in front grey; abdomen deep yellow.

7. *ANTHERÆA SIMLA* (Westwood).

Saturnia simla, Westwood, Cabinet Orient. Ent. p. 41. pl. 20. f. 1 (1847).

Antheræa simla, Walker, List Lep. Het. B.M. pt. 5. p. 1249; Moore, Catal. Lep. Mus. Ind. House, ii. p. 399.

Hab. Simla (*Capt. Boys*); neighbourhood of Darjeeling. In Museum, India House, London, and British Museum.

"Fore-wings very pale fulvous-brown, thickly irrorated with red scales; the costa and an oblique fascia, before the middle of the wings, very much attenuated posteriorly, of a pale pinkish white; the basal portion of the wing reddish, terminated by a dark pink line; the pale fascia is succeeded by a very oblique streak of reddish-brown, which rests on the *anterior edge* of the ocellus, which is rather small and of a dusky colour, with a slender curved white line on its inner side; the succeeding space is thickly irrorated with red-brown scales, followed by two rather indistinct slender and much waved strigæ, which terminate at the apex of the wing in a white angulated mark and a small black patch; the outer margin of the wing is widely ashy-fulvous, followed by a narrow ashy-coloured edging; the hind-wings have the greater portion of a pink colour, traversed basally by a dark pink fascia, which is recurved towards the inner margin; the middle of the wing is occupied by a large black ocellus bearing a dull yellow circle with a slender white curved line, and a dark pink one at its base; between the ocellus and the exterior margin of the wing are two waved red-brown lines, beyond which the colour is of a fulvous red, with a dull pale greyish-buff edging."

Expanse of wings nearly 6 inches.

8. *ANTHERÆA HELFERI*, Moore. (*Annulosa*, Pl. LXIV. fig. 2.)

Antheræa helferi, Moore, Catal. Lep. Mus. Ind. House, ii. p. 397 (1858).

NO. 400.—PROCEEDINGS OF THE ZOOLOGICAL SOCIETY.

Male. — Yellowish-ferruginous, with a vinaceous tinge basally. Fore-wing with the grey costal band; three dark ferruginous pink-margined lines: the first sub-basal, transverse, and curved: the second within and near the base of the cell, oblique: the third above and joining the ocellus; the ocellus without a vitreous spot, which is replaced by a short yellow-margined line; a double submarginal indistinct undulated line, its apical end with a blackish spot; an indistinct suffused inner line close to the ocellus; and a dark marginal line of undulated streaks. Hind-wing with a dark marginal lunulated line; two darker submarginal deeply undulated lines, the inner line extending round the ocellus to the sub-basal line; the ocellus with the black outer line terminating at its upper end in an oval spot, without a central vitreous spot, which is replaced by a narrow yellow line. Antennæ brown; frontal band grey; body yellowish-ferruginous.

Expanse of wings 6 inches.

Hab. Neighbourhood of Darjeeling. In Museum, India House, London.

Remark. — Somewhat allied to *A. simla*; but may be distinguished from that species by its more falcated fore-wings, and by the absence of the obliquely transverse dark band, which ascends from the middle of the posterior margin, touching the ocellus on its inner side, and extends to the costa before the apex. The ocelli are also different, those in *A. helferi* being of a pale colour within, while those in *A. simla* are quite black, and on the hind-wing are much larger.

9. *ANTHERÆA ASSAMA* (Helfer).

Saturnia assamensis, Helfer, Journ. As. Soc. Beng. vi. p. 43 (1837).

Saturnia assama, Westwood, Cabinet Orient. Ent. p. 41. pl. 20. f. 2.

Antheræa assama, Walker, List Lep. Het. Brit. Mus. pt. 5. p. 1249; Moore, Catal. Lep. Ind. House, ii. p. 398.

Mooga or *Moonga* of the Assamese, Hugon, J. A. S. Beng. vi. pp. 26–32; Helfer.

Moonga, Royle, Report of Paris Exhib. pt. 3. p. 216.

Hab. Assam, Silhet, Ceylon. In British Museum Collection.

The larva and cocoon of the Moonga are figured by Mr. Hugon in the Journal of the Asiatic Society above referred to, and he states that “although the Mooga Moth can be reared in houses, it is fed and thrives best in the open air and on the trees. The trees which afford it food are known in Assam by the following names, viz. 1. Addakoory; 2. Champa (*Michelia*, sp. ?); 3. Soom; 4. Kon-tooloa; 5. Digluttee (*Tetranthera diglottica*, Hamilt.); 6. Pattee Shoonda (*Laurus obtusifolia*, Roxb.); 7. Sonhalloo (*Tetranthera macrophylla*, Roxb.). There are generally five broods of Moonga worms in the year.”

10. *ANTHERÆA LARISSA* (Westwood).

Saturnia larissa, Westwood, Cabinet Orient. Ent. p. 49. pl. 24. f. 1 (1847).

Antheræa larissa, Walker, List Lep. Het. B.M. pt. 5. p. 1250 ; Moore, Catal. Lep. Mus. Ind. House, ii. p. 398.

Hab. Java (*Dr. Horsfield*). In Museum, India House, London, and M. Dalen, Rotterdam.

Remark.—This beautiful species may be at once distinguished from all the preceding by the ocellus of the fore-wing, which has the exterior black line dentated towards the costa. It is also more falcated in the male. The figure referred to above is a good representation of the male.

Another species of *Antheræa* inhabits Mantchouria, as appears from the following :—

“It has long been known that in the land of the Mantchour Tartars, in a climate at least as rigorous as our own (*i. e.* England), a kind of silk is obtained, of which very large quantities go into consumption among the Chinese. This species is announced by M. Guérin-Ménéville as having lately been reared in France.

“Some years since Mr. Rutherford Alcock, Her Majesty’s Consul at Shanghai, sent home samples of this material, both manufactured and unmanufactured, along with live chrysalids (cocoons) ; but the latter perished on the voyage, and the samples were accidentally misplaced and lost in the Great Exhibition of 1851. The silk was strong, with little lustre, and resembled some strong thin yellow woollen linen. It now appears that the French have been more successful, some males having already been hatched. Of the other cocoons sent to Italy and Algiers, no account is given.

“According to Guérin-Ménéville, this Silkworm forms a new species of *Saturnia*, and is nearly related to the *S. mylitta*, which produces the Tusseh silk of India. But the peculiarities observable in the form, texture, and mode of attachment of the cocoons forbid the Mantchour Moth being regarded as merely a northern local form of the Tusseh Silkworm. It is also one of the same group as the Moonga Silkworm of Assam (*Sat. assamensis*, Helfer).

“Two circumstances give peculiar interest to the introduction of this useful insect ; namely the coldness of the country it naturally inhabits, and its feeding upon a species of oak, not on a mulberry. The country called Mantchouria is described as mountainous, very cold in winter, and producing *furs* among other articles of trade. Oaks, pines, willows, birches, maples, and wild roses, said to constitute the main feature of its woods, are all indications of a northern climate. The oak on which this silkworm feeds is not clearly described. According to M. Isidore St.-Hilaire, two sorts have been raised in France from the acorns received with the cocoons, one resembling the *Quercus castaneæfolia*, which is well known to be a native of Northern China, and one of a species apparently undescribed. But it is by no means improbable that the common oaks of this country would be taken to by the silkworms in question ; and if so, the sole obstacle to the introduction of silk-growing among our rural population would be removed.

"It is right to add, upon the authority of Mons. St.-Hilaire, that the interesting acquisition is mainly owing to the assistance given by Mons. Verrolles, Bishop of Colomby, and Vicar-Apostolic in Mantchouria, to M. de Montigny, the French Consul at Shanghai." (From Journ. Agri.-Hort. Soc. India, 1856, ix. p. 63, and extracted from 'Gardener's Chronicle,' 30th June, 1855.)

Genus LOEPA, Moore.

Antheræa (Groups II. and III., pt.), Walker, List Lep. Het. B.M. pt. 5. p. 1250.

Loepa, Moore, Catal. Lep. Mus. Ind. House, ii. p. 399 (1858).

Antennæ bipectinated. Palpi very short. Proboscis obsolete. Abdomen not very stout. Wings moderately long and broad, each with an ocellus, whose disc is thinly clothed with hairs; fore-wing convex towards the tip, which, in the male, is somewhat falcated; hind-wing with the angles rounded.

1. LOEPA KATINKA (Westwood).

Saturnia katinka, Westwood, Cabinet Orient. Ent. p. 25. pl. 12. f. 2 (1847).

Antheræa katinka, Walker, List Lep. Het. B.M. pt. 5. p. 1251.

Loepa katinka, Moore, Catal. Lep. Mus. Ind. House, ii. p. 399.

Hab. Assam; Silhet; Java.

Yellow; costa of fore-wings grey. Each wing with a fulvous-brown ocellus, the middle of which is purplish, and has a curved white streak which is bordered by a slender black line; across the middle of the wing is an indistinct, waved and bidentated line, beyond which is a double blackish waved line terminating near the apex in a black demi-oval spot, followed by a fulvous apical patch containing two white lunules; near the exterior margin of the wings is a submarginal row of slender white lunules, and near the base of each wing is a slender rosy zigzag streak.

Expanse $2\frac{3}{4}$ to $3\frac{3}{4}$ inches.

The larva and cocoon of *Loepa katinka* are figured in Catal. Lep. Mus. India House, vol. ii., plate 20. fig. 1, copied from the original drawing made by Dr. Horsfield in Java, where the larva "feeds on the Galing (*Cissus*, sp. —) and the Girang (*Leea*, sp. —). Abundant during December, January and February."

2. LOEPA THIBETA (Westwood).

Saturnia thibeta, Westwood, P. Z. S. (1853) p. 166; Ann. Nat. Hist. 2nd ser. xv. p. 302 (1855).

Antheræa thibeta, Walker, List Lep. Het. Brit. Mus. pt. 5. p. 1250.

Fore-wings yellow, much varied with grey scales, especially at the base and beyond the middle; near the base is a transverse oblique slender red striga. In the middle of all the wings is a moderate-sized oval ocellus, with a black central dot, marked on its inner edge

with a curved white line, the outer part being liver-coloured, edged with a black ring. Outside the ocellus the wings bear a darker fulvous, ill-defined, very oblique fascia, followed by two slender very strongly undulating dark lines; the undulations being much stronger towards the tip of the wing, where the outer one is connected with a white curved line, like a U, which ends on the costa in an oval black patch, and is bounded on its outside by a slender rich red-brown line; parallel and near the apical margin is an interrupted slender black striga, followed by a row of submarginal oblong fulvous spots. The ocellus of the hind-wing is preceded by a curved dark brown line, and is followed by three slender very much undulated lines, the two next the ocellus being chestnut and the outer one black; beyond the last is a broad greyish fascia, edged outwardly with a slender interrupted black line, followed by a row of oblong sublunulated fulvous spots. Antennæ, body, and legs fulvous-yellow; front of thorax with a grey band.

Hab. Thibet (*Westwood*).

GENUS ACTIAS, Leach.

Actias, Leach, Zool. Misc. ii. p. 25 (1815); Macleay.

Tropæa, Hübner, Verz. bek. Schmett. p. 152 (1816).

Plectropteron, Hutton, Trans. Ent. Soc. Lond. v. p. 45 (1847).

Phalæna-attacus, pt., Linnæus.

1, ACTIAS SELENE (Macleay).

Actias selene, Macleay, Leach's Zool. Misc. ii. p. 26. pl. 70 (1815); Hutton, P. Z. S. Lond. (1856) p. 5; Moore, Catal. Lep. Mus. Ind. House, ii. p. 400.

Tropæa selene, Hübner, Verz. bek. Schmett. p. 158; Walker, List Lep. Het. B.M. pt. 6. p. 1262.

Plectropteron selene, Hutton, Trans. Ent. Soc. Lond. v. p. 85.

Plectropteron dianæ, Hutton, Trans. Ent. Soc. Lond. v. p. 45 (1847); Ann. Nat. Hist. xvii. p. 60.

Phalæna attacus luna, Cramer, Pap. Exot. i. pl. 31. f. A, B (nec Drury).

Hab. N. India; Darjeeling; Masuri.

The larva of this curious species is figured by Capt. Hutton in the 'Transactions of the Entomological Society of London,' vol. v. pl. 5. He remarks, "A specimen of this splendid Moth was brought to me on the 13th April 1842, by a boy who had captured it in a deep and warmly sheltered glen at Mussooree. The specimen was a female, and was found clinging to the branches of a tree, or rather shrub, very similar to the Tartarian honeysuckle; it was accompanied by a male (*in coitu*), which effected its escape. As the specimen was much injured by her rough captor, I suffered her to live and deposit her eggs, which she did on the evening of the same day, to the number of thirty-two, each being of the size of a large mustard seed, and of a mottled brownish colour. During the whole of the succeeding day she remained perfectly stationary, but in the

evening deposited 84 eggs; and on the following evenings she again deposited as follows:—On the 15th, 38 eggs; on the 16th, 21; on the 17th, 16; on the 18th, 21; on the 19th, 14; on the 20th, 14; and on the 21st, 7; amounting in all to 246 eggs, and she then died.

“On the 28th April I received a male and female from the same place; and in the evening the female deposited 89 eggs, and continued each night to increase the number until she had deposited 300 eggs, when she died.

“On the 30th April, or eighteen days from the time of deposition, the first batch of eggs began to hatch; the newly born larva is about 3 lines in length, hairy, and of a pale rufous-red, with a single black band across the middle of the body, and a small black transverse mark on the anterior segment; along the back are two rows of small tubercles, and another along each side, from each of which spring a few short hairs, the base of which forms a small black dot; there is also an anal tubercle, larger than the others, and placed between the two last tubercles of the dorsal rows; the head is black. I was now exceedingly puzzled to find out the proper food, and, having unsuccessfully tried several kinds, at last gave them the leaves of our common hill oak (an *Ilex*), of which they ate sparingly and without appetite. This was evidently not the proper food; and although they continued to eat it they did not thrive, but died in such numbers, that I had at last only five larvæ left out of 546, and even these I was in daily expectation of losing; when, by a lucky chance, on the 30th of June, I discovered a single larva in the forest feeding on a tree known to the natives as the ‘*Munsooree*’ (*Coriaria nipalensis*). Branches of this tree were now substituted for the oak, and from thenceforward the larvæ ate greedily and increased rapidly in size. The *first* moult commenced when six days old, and this occupied three days, so that at the end of nine days the larva appeared in its *second* stage. The black transverse band upon the body had disappeared, but the head still remained of that colour, and the rest of the body was hairy and rufous; the tubercles being black on the summit and more prominent; pro-legs brown.

“The period between each change was about ten days in some specimens, but varied in others between that and shorter periods.

“In the *third* stage the caterpillar appeared of a bright rufous colour, the black dots or tubercles being larger and more prominent, but there were no black bands. In the *fourth* stage the change was still more remarkable, for the caterpillar now appeared of a beautiful apple-green, each tubercle headed with bright orange, except the *four* which spring from the second and third segments, which are ringed with black, and crowned with pale yellow; and the *anal* and *two posterior* tubercles, which are green throughout. From each tubercle springs a small tuft of hair, the centre of each being longer than the others; the head and prolegs brown; along each side is a line which is red above and yellow below, and the spiracles are red; there is a line of very small yellow dots along each side, between the rows of tubercles. In the *fifth* stage the colours are the same, as

they are also in the *sixth* and *seventh* stages ; but the caterpillar increases rapidly in size, and is most beautiful and delicate in appearance, with a semi-transparency of hue, which makes it look something like wax-work.

"One of these commenced spinning its cocoon on the 17th July, being then about forty-six or forty-seven days old, and the remainder after the interval of a day or two. The cocoon is formed of coarse brown silken threads, closely interwoven, and of an ovate form ; it is inclosed among the leaves of the tree, which are in fact glued closely round it. It is hard, and not furnished interiorly with a soft silken bed, the chrysalis lying within a hard and hollow chamber. The chrysalis remained thus until the 14th August, when the one which had turned on the 17th July produced a perfect female, after a period of twenty-nine days. Another, which had turned on the 19th July, came forth a male on the 16th August, showing the time to be pretty uniform. A large caterpillar, however, which I found in the forest on the 16th July, turned to a chrysalis on the 24th of that month ; but, instead of coming forth in the autumn, it remained in the chrysalis state throughout the winter, as did some others, coming out in the following summer, namely on the 11th, 14th, and 18th of June.

"The caterpillar feeds upon several trees common on these hills. The most common food appears to be the Munsooree, a shrub which is so common, as to have given rise, I believe, to the name of this settlement, viz. 'Munsoory,' or more commonly among Europeans 'Mussooree' (*Coriaria nipalensis*)."

"I have again reared specimens of *A. selene*, and observed attentively the method by which it *cuts* its way through the cocoon, by means of the instrument which I have named 'the wing spur' or 'spine.' Before proceeding to separate the threads of the cocoon by means of the wing spines, I have ascertained that the Moth ejects from *the mouth* a few drops of a clear colourless fluid, with which the gum is dissolved ; and it appears to use the tuft of down on the front, between the eyes, as a brush for the application of the solvent."

—P. Z. S. 1856, p. 5.

Capt. Hutton further remarks (Journal of the Agri-Horticultural Society of India, ix. p. 167-9 (1856), "I have this season (1855) watched the process of the escape of this Moth from the cocoon in no fewer than 200 specimens, and can answer for there being no mistake in the matter, a drop of the clear colourless liquid often remaining upon the tuft of hair or down on the forehead between the eyes, and which tuft appears to be used as a brush for the application of the solvent to the threads of the cocoon.

"I have this year (1855) reared a number of the caterpillars of *A. selene* for the purpose of ascertaining the value of the silk, but am sorry to say have failed in my attempts to unwind the silk from the cocoons. With some difficulty I managed to procure a supply of eggs from the moths, which came forth in October, and had intended sending them to Europe, when to my regret and surprise they began to hatch on the 4th of November, and are still coming forth

daily (10th). They are at present thriving on the shrub, *Coriaria nipalensis*, growing in the open air; but whether they will be able to spin up again before the frosts set in remains yet to be seen. These caterpillars feed naturally on *Coriaria nipalensis*, *Andromeda ovalifolia*, the walnut, and I think also upon *Carpinus bimana*. The first-named shrub would probably grow well and rapidly in some parts of Europe, and so furnish nourishment both for the larvæ of *Act. selene*, if found worth introducing, and also of *S. cynthia*, which seems to be acclimated in Italy.

"This species, I believe, is confined to the hills from 5000 feet upwards to 7000 feet, and perhaps higher; it occurs also in Silhet, as Major Jenkins kindly sent me a drawing of what I take to be this species."

The transformations of *Act. selene* were also observed by Lady Isabella Rose Gilbert, and are figured among her Ladyship's original drawings, from which those given in the Catal. Lep. Mus. India House (vol. ii. pl. 19.) were copied.

2. ACTIAS MÆNAS, Doubleday.

Actias mænas, Doubleday, Ann. Nat. Hist. 1847, p. 95; Westwood, Cabinet Orient. Ent. p. 45. pl. 22.

Tropæa mænas, Walker, List Lep. Het. Brit. Mus. pt. 6. p. 1263.

Hab. Silhet. In British Museum Collection.

This species differs from *A. selene* in the following characters:—"The wings are yellow; the thorax is wholly purplish in front; the wings are red along the exterior margin, and have no exterior band; the fore-wings have a band between the base and the ocellus, the ocellus being large and sickle-shaped, and very different from that of *A. selene*; and the hind-wings have longer tails."

3. ACTIAS SINENSIS, Walker.

Tropæa sinensis, Walker, List Lep. Het. Brit. Mus. pt. 6. p. 1264 (1855).

Hab. North China. In British Museum Collection.

"Male.—Yellow. Wings with a slender, deeply undulating, tawny middle band; ocellus rose-coloured in the centre, luteous in front, with a brown border, which is much darker and broader in front than elsewhere. Fore-wings rose-coloured along the costa. Hind-wings ferruginous along the exterior border and across the tails, which are much shorter than the breadth of the wings. Thorax rose-colour in front. Expanse about 4 inches."

Genus SATURNIA, Schrank.

Saturnia, Schrank, Faun. Boica, ii. pt. 11. f. 149 (1802).

Pavonia, Hübner, Verz. bek. Schmett. p. 157 (1816).

Phalæna-attacus, pt., Linnæus.

Types *Saturnia pyri*, *S. spini*, and *S. carpini* of Europe.

1. *SATURNIA PYRETORUM*, Boisduval.

Saturnia pyretorum, Boisduval, Westwood, Cabinet Orient. Ent. p. 49. pl. 24. f. 2 (1847); Walker, List Lep. Het. B.M. pt. 5. p. 1273; Moore, Catal. Lep. Mus. Ind. House, ii. p. 404.

Hab. China. In Collection, India House; British Museum.

Milky-white; costal and frontal band white, each wing with a moderate-sized oval black ocellus, having a slender fulvous line surmounted by pale blue lunule, and with a curved vitreous central streak; beyond the middle of the wings are two strongly dentated slender dark lines, resting on a broad brownish submarginal band; a brown band also on the exterior margin, base of fore-wings, and a sub-basal band on both fore- and hind-wings, dark brown. Head, hind part of thorax, and large anal tuft dark brown.

Expanse 3 to $3\frac{3}{4}$ inches.

2. *SATURNIA GROTEI*, Moore. (Annulosa, Pl. LXV. fig. 2.)

Saturnia grotei, Moore, Catal. Lep. Mus. Ind. House, ii. p. 404.

Fore-wing pale buff-colour, brownish along the costa and about the apex, and thickly irrorated with black and brown scales to beyond the middle; a large black-margined, maroon-coloured ocellus, containing a narrow transverse white lunule; a submarginal black band, bounded inwardly by a double zigzag pale margined black line, which extends to near the apex, where the space contains a maroon-coloured patch and a black spot, both of which are irrorated with white scales; exterior margin dull buff, with a row of narrow oval maroon-brown spots. Hind-wing brownish at the base and along the abdominal margin; the disc pink, containing a similar, but smaller ocellus, as the fore-wing; a submarginal black band, bounded inwardly by two undulated black lines, the inner line extending round the ocellus; exterior margin dull buff, with a row of narrow oval maroon-brown spots. Thorax crossed by a pale buff line.

Expanse nearly 3 inches.

Hab. Darjeeling. In Museum, India House, London.

Genus *ATTACUS*, Linnæus.

Phalæna-attacus, Linnæus, S. N. i. pt. 2. p. 808 (1767).

Attacus, Hübner, Verz. bek. Schmett. p. 155 (1816).

Hyolophora, pt., Duncan, Nat. Libr. vii.

1. *ATTACUS ATLAS* (Linnæus).

Phalæna-attacus atlas, Linnæus, S. N. i. pt. 2. p. 808 (1767); Mus. Lud. Ulr. p. 366; Cramer, Pap. Exot. iv. pp. 180, 183, pl. 381. f. C, pl. 382. f. A.

Bombyx atlas, Fabricius, Syst. Ent. p. 566; Spec. Ins. ii. p. 167; Mant. Ins. ii. p. 108; Ent. Syst. iii. 1. p. 407; Olivier, Enc. Méth. Ins. v. p. 24. pl. 69. f. 1.

Attacus atlas, Hübner, Verz. bek. Schmett. p. 156; Walker, List

Lep. Het. B.M. pt. 5. p. 1218; Moore, Catal. Lep. Mus. Ind. House, ii. p. 405.

Var. *Phalæna-attacus atlas*, Cramer, Pap. Exot. i. p. 13. pl. 9. f. A.

Var. *Saturnia silhetica*, Helfer, Journ. Asiat. Soc. Beng. vi. p. 41 (1837).

Hab. China; N. & S. India; Ceylon; Burmah; Java.

The larva and cocoon of this (the largest of all known Lepidopterous insects) are figured on plate 20. of vol. ii. of the Catal. of Lep. Mus. India House, from the collection made by Dr. Horsfield in Java. "The larva feeds on the Molokka (*Phyllanthus emblica*), Kupu-gaja, &c., where it was abundant during December and January."

From the MS. Notes made by Lady Isabella Rose Gilbert in 1825, we extract the following:—"A specimen (female) of this magnificent moth was brought to me on the 4th September. On the following morning she laid several pink-and-white eggs. On the 15th the young caterpillars were hatched. Being uncertain what plant they fed on, I placed them upon slips of different trees, viz. apple, peach, plum, &c. The young caterpillars were black, with numerous white spines; as they grew larger and changed their skins, the spines became covered with a kind of white powder, giving them a very delicate appearance, added to which the ground colour of the body, since the first few days after they were hatched, had become a light green. They always ate their skins after casting them. Those on the apple tree grew to an enormous size, and on the 12th October one of them began to prepare for its transformation, by bending back a large leaf and enclosing itself in a web, which it completed on the 13th. On the 22nd June following the moth came out."

It is said that the Chinese Tusseh silk is obtained from the cocoon of this species.

2. *ATTACUS EDWARDSI*, White.

Attacus edwardsii, White, P.Z.S. (1859) p. 115. pl. 57; Moore, Catal. Lep. Mus. Ind. House, ii. p. 406.

Hab. Darjeeling. In Collection British Museum and India House.

This species is distinguished from *Attacus atlas* "by its intensely dark colour, especially on that band, bounded by angled and curved white, defined lines, in which the fenestræ occur. This band is of a dark blackish-brown, passing into a rich chestnut-brown above the fenestræ of the upper wings and on their posterior margin; the inner margin of the lower wings is of this red-brown also; the fenestræ are not bounded by a margin of black scales as in *Att. atlas*, but by ochreous-yellow squamulation; the part of the fenestra towards the base of the wings, which in *Att. atlas* is curved convexly, is in *Att. edwardsii* straight; the fenestra is longer, the white lines on the wings, breaking up the brown so beautifully, are wider, and that on the lower wing is less scalloped than in *Att. atlas*; the margin of the lower wing on the outside has two much-waved lines; the inner is yellow, with thirteen or fourteen undulations, continued on the

upper wing till it leaves off where the wing is dilated into the lobe, which gives the wing its hooked-like character; the lower line is brownish-black, and is straight, except in six places, where the black runs up the nerves triangularly to a point, and meets two of the yellow lobes, which are conjugate."

3. ATTACUS CYNTHIA (Drury).

Phalæna-attacus cynthia, Drury, Exot. Ins. ii. pl. 6. f. 2; App. p. ii. (1773); Cramer, Pap. Exot. i. p. 62, pl. 39. f. A.

Phalæna cynthia, Roxburgh, Trans. Linn. Soc. vii. p. 42. pl. 3; Buchanan, Descr. Dinajpur, p. 214; Helfer, Journ. Asiat. Soc. Beng. vi. p. 45.

Bombyx cynthia, Olivier, Enc. Méth. Ins. v. p. 30.

Samia cynthia, Hübner, Verz. bek. Schmett. p. 156.

Saturnia cynthia, Westwood's ed. Drury's Ins. ii. p. 12, pl. 6. f. 2.

Attacus cynthia, Walker, List Lep. Het. B.M. pt. 5. p. 1220.

Saturnia arrundi, Royle, Reports on the Paris Universal Exhib. pt. 3. p. 216 (1856).

Arrindy or *Arrundi* Silkworm Moth, Roxburgh, Helfer.

Eria of Assam, Hugon, J. A. S. Beng. vi. p. 21.

Eri or *Eria of Assam*, Royle.

Hab. Specimens in Museum, India House, from China, Assam, N. E. India, Thibet, Java.

4. ATTACUS RICINI (Boisduval).

? *Phalæna ricini*, Sir W. Jones.

Saturnia ricini, Boisduval, Ann. Soc. Entom. France, 3rd ser. ii. p. 755 (1854).

Attacus lunula, Walker, List Lep. Het. B.M. pt. 5. p. 1221 (1855).

Attacus ricini, Moore, Catal. Lep. Mus. Ind. House, ii. p. 407.

Hab. Specimens in the Museum, India House, from N. E. India, Assam; and others in the British Museum from Ceylon.

The specimens from Assam, under examination, are identical with those named *A. lunula* by Mr. Walker, and with others sent from Paris as *A. ricini*. Some of the references to the preceding species doubtless belong to this.

Domesticated in Malta, Piedmont, Tripoli, France, and in the Island of Granada.

The insect known to the Hindoos by the name of Arrindy in some parts, in others Arrundi, appears to be peculiar to the interior parts of Bengal; and, so far as I can learn, to two districts only, viz. Dinagepore and Rungpore, where the natives breed and rear it in a domestic state, as they do the common silkworm. The food of the caterpillar consists entirely of the common *Ricinus*, or *Palma Christi*, which the natives of these districts call Arrindy (hence the name of the insect), and is abundantly reared over every part of India, on account of the oil obtained from the seed.

The late Sir William Jones mentions this insect in a letter to Dr. Anderson, dated 17 May, 1791, under the name of *Phalæna ricini*:—

"Eggs pure white, which hatch in from ten to fifteen days. The larvæ arrive at their full size, which is from $2\frac{1}{2}$ to 3 inches, in about one month, during which they cast their skins three or four times. They are very voracious. The cocoon, or covering thereof, is white or yellowish, of a very soft, delicate texture; in general about 2 inches long and 3 in circumference, pointed at each end; the perfect insect comes out after a period of from ten to twenty days."

Mr. Atkinson remarks, that "they are reared in a domestic state, and entirely feed on the *Palma Christi* plant. The cocoons are remarkably soft and white, or yellowish; the filament so exceedingly delicate, as to render it impracticable to wind off the silk; it is therefore spun like cotton. The yarn, thus manufactured, is woven into a coarse kind of white cloth, of a seemingly loose texture, but of incredible durability, the life of one person being seldom sufficient to wear out a garment made of it."—(Dr. Roxburgh, Trans. Linn. Soc. vii. p. 42, 1804.)

According to Mr. Hugon, the caterpillar of the *Eria* (see Journ. A. S. Beng. vi. pp. 23, 24), in a domesticated state at Assam, "is, when young, about $\frac{1}{4}$ inch in length, and nearly black; as it increases in size it becomes of an orange colour, with six black spots on each of the segments; the head and legs are black; after the second moult they change to an orange colour; that of the body becomes lighter, in some approaching to white, in others to green, and the black spots gradually become the colour of the body; after the fourth and last moult, the colour is a dirty white or a dark green: the white caterpillars invariably spin red silk, the green ones white. On attaining its full size, the worm is about $3\frac{1}{2}$ inches long; its colours are uniform and dull; the breathing holes denoted by a black mark,—the moles have become the colour of the body, and have increased to long fleshy points, without the sharp prickles the Moonga worm has; the body has a few short hairs, hardly perceptible. In four days the cocoon is completed. The hill tribes settled in the plains are very fond of eating the chrysalis.

"The Arrindy, Arria, or *Eria* silkworm is reared over a great part of Hindostan, but more especially in the districts of Dinajpur and Ranjpur, in houses, in a domesticated state, and feeds chiefly on the leaves of *Ricinus communis*. The silk of this species has hitherto never been wound off, but people spun it like cotton. It is so productive as to give sometimes twelve broods of spun silk in the year. The worm grows rapidly, and offers no difficulty whatever for an extensive speculation." (Dr. Helfer, J. A. S. Beng. 1837, p. 45.)

In the Journal of the Agricultural and Horticultural Society of India (vol. ii. pt. 2. p. 61) is an account of the successful experiment of winding off the silk from the cocoon of the *Eria* worm. Some further accounts also appear in the Transactions of the Entomological Society of London for December 1854, and reprinted in the above Agricult. and Horticult. Soc. Journal, vol. ix. pt. 2. p. 29.

"One of the most active and distinguished of the members of the Society of Acclimation, M. Guérin-Méneville, who has been especially interested in the introduction of new silkworms, has recently succeeded

in acclimatizing in France a new silkworm from China, where it lives on the varnish-tree (*Ailanthus glandulosus*). The species is the true *B. cynthia* of Drury (1773), figured for the first time by Daubenton, jun., in his coloured plates, which were published between 1760 and 1765, and raised for some centuries in China, where its silk clothes the people. Roxburgh, in 1804, supposed the *Eria* which is raised in British India to be the same; and this confusion has continued till recently: so that the *Eria* (or 'Arrindy-arria,' as it is called in Hindostan) has gone by the name of *Saturnia cynthia*. The *Eria* is a different species, living on the *Ricinus*.

"The study of the species by Guérin-Ménéville has brought to light differences between the two in the cocoons and the habits of the worms. The cocoons carded give an excellent flock of silk, which is used in China and Bengal for very firm tissues. The colour of the silk is a fine flax-grey; and clothes made of it are not injured by the rain, or oil, and wear long."—(From 'Silliman's Journal,' Nov. 1858; *vide* Ann. N. H. Jan. 1859.)

5. *ATTACUS GUERINI*, Moore. (Annulosa, Pl. LXV. fig. 3.)

Attacus guerini, Moore, Catal. Lep. Mus. Ind. House, ii. p. 409 (1858).

May be distinguished from *A. cynthia* and *A. ricini* by its smaller size and darker colour, the fore-wings having the two transverse white lines joined together about the middle, the junction forming a somewhat rounded spot; and by its being *without* the lunate vitreous streak, which is replaced by a small yellowish spot, which spot, in some specimens, is nearly obsolete. Hind-wing with a small rounded, yellowish, slightly vitreous spot.

Expanse from $3\frac{1}{2}$ to $3\frac{3}{4}$ inches.

Hab. Bengal. In Museum, India House.

The following remarks by M. Guérin-Ménéville appeared in the Annals of Nat. Hist. June 1859, entitled "Fertile Hybrids of two species of *Saturnia*":—

"Last year I succeeded in getting some females of *Bombyx cynthia* fecundated by males of *Bombyx arrindia**, and *vice versa*; and the eggs laid by them produced caterpillars. These caterpillars, reared last autumn, have shown nearly all the characters of *B. cynthia*, which is the wider and more vigorous of the two species. Their cocoons, although resembling a little those of *B. arrindia* by their deeper colour, conducted themselves in the same manner as those of *B. cynthia*; that is to say, being kept in a similar temperature, the moths did not come out in the winter, as those of *B. arrindia* constantly do. However, the influence of this latter species has been felt from this first generation; for, having placed some hybrid cocoons in the reptile-room of the Museum, where the temperature is never below 13° Centigrade, the moths came out at the end of March, whilst those of *B. cynthia* proper, which I had placed by their side for comparison, have not stirred yet. The moths pro-

* I am in doubt as to what species is here indicated.

duced by this hybridation show on the whole, as their caterpillars have done, more of the character of *B. cynthia* than of *B. arrindia*. They are larger; their abdomen is brown, with white tufts,—not white, as in *B. arrindia*; the band across their wings is edged with rosy atoms instead of whitish-grey, as in *B. arrindia*: however, they resemble this species inasmuch as their wings are of a browner and deeper colour than those of *B. cynthia*. The species which predominates physically is *B. cynthia*; but morally, so to speak, the influence of the other species has been more strongly felt; for the hybrids of the two categories give caterpillars which, although resembling those of *B. cynthia*, are less wild, or more domestic, which assimilates them to the caterpillars of *B. arrindia*. These hybrids take from *B. arrindia* the faculty of leaving their cocoons earlier, without, however, continually coming out during winter; and it is worthy of note that hybrids obtained from the female *B. cynthia* and male *B. arrindia* have come out a few days earlier than the opposite hybrids.

“I may add that the hybrids are polyphagous, as nearly all the *Bombyces* are; for they may be fed with teazel-leaves, as well as the ordinary silkworms, which have been fed at all times with lettuce, *Scorzonera*, goat’s-beard, bind-weed, elm, rose-tree, and privet-leaves, &c.”—(*Comptes Rendus*, April 11, 1859; Reprinted in ‘*Annals of Nat. Hist.*’ June 1859.)

In conclusion, I beg to add a few references where additional remarks on silk-producing moths, more interesting to the general reader, will be found, viz. in *Journ. As. Soc. Beng.* 1837, pp. 21, 38; *Trans. Linn. Soc. London*, vol. vii. p. 33; *Journal of the Agri-Horticultural Society of India*, vol. ii. pt. 2. p. 88; vol. ix. pt. 3. pp. 259, 391; *Journ. As. Soc. Beng.* xvi. p. 68; *Proc. Entom. Soc. Lond.* for Dec. 1854; *Journal of the Society of Arts* for Feb. 6th, 1857; the translation from the Chinese of the works of Tseu-kwang-k’he, Shanghai, 1849; and the Report on the Raw Products of Southern India in Madras Exhibition, 1858; *Dr. Balfour’s Cyclopædia of India*; *Noland’s History of the British Empire in India*, pp. 211, 403.

13. A GENERAL REVIEW OF THE GENUS *TEREBRA*, AND A DESCRIPTION OF NEW SPECIES. BY MONS. DESHAYES.

Mr. Hinds, in 1844, published in the ‘*Thesaurus Conchyliorum*’ a very complete Monograph of the genus *Terebra*. When, ten years afterwards, we studied this beautiful group of Molluscs in the magnificent collection of Mr. Cuming, we did not suppose that the number of species would be considerably augmented; but the actual fact disabused us of this notion, for it was not without surprise we saw the number of species had nearly doubled itself.

Mr. Cuming proposed to put at our disposal all these valuable materials, if we would undertake to publish them; and we recognized

in this generous offer that exalted love of science which has always guided him. For we must say that Mr. Cuming is not only the zealous collector who has had the merit of bringing together the most extensive collection of recent shells in existence, but that, whilst adhering faithfully to the rule he has imposed upon himself, to write nothing himself on Conchology, he has exercised notwithstanding for the last five and thirty years the most favourable influence upon that science.

Whilst on his long and arduous travels, Mr. Cuming has often gathered precious observations on the habits of the Molluscous animals, their localities, the various depths of the sea they live in, and the nature of the bottoms they prefer. These observations, communicated without reserve to authors, have become part and parcel of science, and have shown to other investigators that such an example should be followed, in order to obtain in time competent notions of the geographical distribution of molluscous animals.

This knowledge, in its infancy and still imperfect, will become of the last importance to Geology and Palæontology, when the distribution of beings existing during past geological periods comes to be compared with that of those we now witness; for already the first attempt of Forbes shows the interest attached to these questions, to illustrate which the observations of Mr. Cuming have been of such great value.

Adanson, in 1757, in his 'Voyage to Senegal,' instituted the genus *Terebra*, to include those species which Linnæus afterwards included in his genus *Buccinum*. It is true that Adanson's genus brought together two very distinct forms of mollusks; one group belonging to true *Buccinum*, and to be comprehended within that genus; whilst the other contains species which have been considered by Brugière and Lamarck as typical of the genus *Terebra*, and this genus, so reconstituted, has been recognized by all naturalists.

Notwithstanding this unanimity with respect to the genus, an attempt has been made by Schumacher and supported by Blainville, to make an alteration in its constitution. Schumacher, in fact, proposes to give the name *Terebra* to the bucciniform species, and to call the others by a new generic name re-formed by Brugière and Lamarck. This change might have been brought about if, during the time of Adanson, the genus *Buccinum* had not been established by Linnæus, since which period it has only been necessary to embrace under it the two species erroneously referred to *Buccinum* by Adanson, and in this way the genus becomes naturally constituted.

The nomenclature of Brugière and Lamarck ought therefore to be retained. The inutility of the genus *Subula* of Schumacher is in this manner demonstrated.

Heeding but little the nomenclature established before his time, Humphrey, a man remarkable for the sagacity he has shown in an Essay on the classification of shells, called *Terebra* 'Turritella,' and proposed the name of *Acus* for the true *Terebra* of Adanson and Brugière.

No one had dreamt of this genus till the Messrs. Adams recently attempted to establish it in their work intituled 'The Genera of

Recent Mollusca.' These naturalists support their views by a fact mentioned first by Blainville, and confirmed by Souleyet, that the animal of *T. maculata* has the tentacles very thin and short, carrying the eyes at their summits. Messrs. Quoy and Gaimard on the contrary prove that in *T. dimidiata*, referred notwithstanding to the genus *Acus* of Humphrey by the Messrs. Adams, the eyes are placed at the middle of the tentacles.

These are the very words of these naturalists ('Zoology of the Voyage of the *Astrolabe*,' vol. ii. p. 462):—"The animal has a tolerably large head; the distant tentacles are excessively thin and short, and one can hardly perceive *the eyes about the middle of their length*."

On the subject of the *Terebra*, the same naturalists add some interesting details. "This species (*Terebra subulata*) is figured," they say, "at page 465, to show that the animal does not differ from the preceding (*T. dimidiata*); its head is prolonged into the form of a little muzzle, which disappears when the siphon expands and is put out; the tentacles are bigger and less distinct. We believe that in that one which we saw the eyes were placed altogether at their extremities; this arose probably from the contraction of the points which surmount them."

Hence, according to the facts established by Blainville, Souleyet, and Quoy and Gaimard, there would be in the group of *Acus*, as re-employed by the Messrs. Adams, some species having the eyes at the tip of the tentacles, and others bearing them at the middle of those organs. It also follows that in the *Terebra* proper of the Messrs. Adams, to which *T. subulata* belongs, the eyes appeared situated at the extremity of the tentacles, if we admit the doubt expressed by M. Quoy on the subject of the contraction of the upper ends of the tentacles.

What has just been said will tend to weaken much this division into two genera of the species belonging to the old genus *Terebra* of Lamarck. Before we admit the genus *Acus*, we think it more prudent and wise to await the result of further observations. This seems the more necessary, as in the shells we do not notice any constant character by the help of which we could distinctly and easily separate the genera. There are found a great number of links between the different forms of the aperture of the columella, of the notch, and of the short terminal canal. The external form and the diversity of ornamentation, are repeated from one group to the other. Also, in examining the characters given by the Messrs. Adams, we find that the most important, and that to which these authors attribute the most value, is borrowed from the animal; that is to say, the position of the eyes on the tentacles.

It might, perhaps, be interesting to put forth the various opinions of naturalists upon the relative position to be assigned to the genus which occupies us at present, in a natural arrangement of molluscous animals; but, to show with certainty the opinions successively advanced, it would be necessary to enumerate in detail all the facts already known respecting the organization of the animal, to deduce from these facts the whole of the differences and resemblances with

other known genera, and so by these means to ascertain which is the best of these classifications.

Had it been our task to publish a complete monograph of the genus, we should have prosecuted all the researches necessary for thoroughly illustrating this subject; but, as we are confined to a general review for the sake of placing in the genus a description of a great number of new species, we feel bound to abstain from all which does not immediately concern the task we have undertaken, as the reader may supply what is wanting by consulting the works of the naturalists quoted above.

When we enumerate the species of *Terebra*, published by naturalists of the last century, we are astonished at the small number.

In the 12th edition of the 'Systema Naturæ,' Linnæus had put together only ten in the 7th section of his genus *Buccinum*, which includes only *Terebra*.

Martini and Chemnitz in their great work added a few species. Schröter, having observed in the old plates a considerable number of figures that had been overlooked, separated them carefully from each other, and placed them in the genus after the Linnæan species, but only distinguished them by numbers, so preparing the way for Gmelin, who unscrupulously and without quoting him, contented himself with putting a specific name to each of Schröter's numbers, and borrowing his synonyms, good and bad.

A deep study of the two works enabled me some years ago to discover the unscrupulous plagiarism of Gmelin.

In the work of Gmelin, the 13th edition of the 'Systema Naturæ,' the number of species was considerably increased, for we find as many as forty-three. But this number would be greatly diminished if we submitted all the species to a strict examination, and we shall find that, besides a number of species absolutely unascertainable, we have turreted shells of *Melampus*, *Melania*, *Fusus* or *Pleurotoma*, *Ireton*, *Buccinum*, *Cerithium*, *Pyrula*, *Achatina*, *Pyramidella*, and *Turritella*.

If from this miserable list we suppress duplicates, we shall find the number of true *Terebræ* (whose synonymy Gmelin had talent enough to make most incorrect) will exceed but little that of the 12th edition of the 'Systema Naturæ.'

Lamarck has doubled the number of the species of Linnæus in his 'Histoire Naturelle des Animaux sans Vertèbres;' but at the end of the genus he places two which do not possess the generic characters, and should be taken from the *Terebræ* and put with *Buccinum*, where we have already placed them.

Our travelling naturalists, from the great scientific expeditions they have undertaken, have been enabled to enrich the public collections with a great number of new species. Messrs. Quoy and Gaimard contributed a few of them collected during the voyage of the 'Astrolabe.' M. Kiener added some others in his 'Species générales et Iconographie des Coquilles vivantes,' and carried up to thirty-five only the number figured and described. Shortly afterwards Dr. Gray described summarily in the 'Proceedings of the Zoological Society

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of London,' in 1834, twenty new species, among which some remained doubtful; and lastly Mr. Hinds, in 1843, in the work we have previously cited, after having described fifty new species, coming almost all from the Cumington Collection, gave a prodromus of a complete monograph of the genus, and raised the number of the species known to one hundred and eight. This Monograph, accompanied by very good figures, was published by the author the following year in the 'Thesaurus Conchyliorum' of Mr. Sowerby. This very considerable number was still farther augmented by Messrs. Adams and Reeve, who described ten species.

Since the publication of these two works, Mr. Cuming has continually added to his collection all the new species he could obtain possession of. We remark amongst his recent acquisitions some objects most worthy of attention, on account of their elegant ornamentation and colours, as also the novelty of their forms. To these precious materials put at our disposal, we have joined those we had collected ourselves, and M. Edouard Verreaux has permitted us to add some other species in order to render our task more complete.

Thanks to so favourable a combination, we are able now to add seventy-five species to those already known, which has raised the number to nearly two hundred, if we exclude duplicates and doubtful species; for, had we enumerated indiscriminately all the names given, they would have amounted to more than two hundred.

We are happy to do justice to the sagacity displayed by the Messrs. Adams in bringing together and grouping the species of the genus *Terebra* according to their natural affinities. Before we had consulted their work we had arrived at nearly similar conclusions. It is useful and even necessary to multiply, as much as the characters permit, the subdivisions, when so great a number of species have to be arranged. By means of this artifice it becomes more easy to naturalists to determine the characters of the species they possess, —an ungrateful and repulsive task, when they are obliged in every case to wade through nearly two hundred descriptions.

If we had had at our disposal all the species known we should have essayed to divide them by means of the dichotomic method so admirably made use of by Lamarck in the study of plants, for figures can never supply the place of natural objects. Those published by Mr. Sowerby in the 'Thesaurus Conchyliorum' to accompany Mr. Hind's Monograph, have the inconvenience of showing the large species reduced in size and making the smaller of their natural size, whilst, to show their characters well, they should have been considerably enlarged.

In the general catalogue of the species of the genus we shall not repeat the observations already published by us in the 2nd edition of the work of Lamarck, the 'Histoire Naturelle des Animaux sans Vertèbres,' vol. x. p. 236 and following. We applied ourselves in that work to rectify and complete the synonymy of the known species. An attentive comparison of our synonymy with that of Linnæus, Gmelin, and others, will show that we have not spared pains to obtain more favourable results than our predecessors. We shall not therefore

have to repeat here the same labour, but merely to refer to the synonymy only where it is absolutely necessary to guide the reader in his search after species.

Thirty-seven new species have been described and figured in the 'Zeitschrift für Malacologie' for 1846; they were named and placed where they should stand in the completed series. Other species equally new will be described according to natural characters which link them with their congeners: thus will be found completed the series of species that can be at this day admitted into the genus.

Besides the admissible species, there will remain sixty or more names introduced from different motives into the genus, and which we ought to reject. Of these we shall make an alphabetical list, and introduce a few brief observations to show why we have rejected them. Some are names repeated, others are uncertain species insufficiently described or badly figured, and the rest have been given to species not belonging to the genus.

The *Terebræ* have the closest relation to *Buccinum*, as Conchologists well know, and it fell to Lamarck to introduce two species of true *Buccinum* amongst the *Terebræ*. And the reverse has also taken place, for some true *Terebræ* have been ranged with *Buccinum*. These facts show how nearly these two genera are related; and so it seems natural to place first the species most nearly allied to *Buccinum*, and lastly those which are farthest removed from them.

Genus TEREBRÆ.

PREMIÈRE DIVISION (*Acus*, Humphrey).

A. *Coquille buccinoide* (Sous-genre *Euryta*, A. Adams).

1. TEREBRÆ ACICULATA, Lamk.

Buccinum aciculatum, Lamk. An. s. vert. 2^e ed. t. 10. p. 175. no. 41.

Terebra aciculata, Hinds, Thes. Conch. p. 183, pl. 45. f. 104.

Hab. Acapulco; Xipixapi.

2. TEREBRÆ COSENTINI, Phil.

Terebra cosentini, Philippi, Enum. Moll. Sicil. t. 1. p. 227. pl. 11. f. 29; Hinds, Thes. Conch. p. 184. pl. 45. f. 107.

Hab. Tarento (*Philippi*).

Après avoir donné ce nom à cette espèce dans le premier volume de ses Mollusques de Sicile, M. Philippi la réunit à la *T. aciculata* dans le second volume du même ouvrage. Nous aurions suivi cet exemple si déjà plusieurs fois on ne nous avait mentionné cette forme dans le Méditerranée. Avant de supprimer l'espèce il est convenable d'attendre de nouvelles observations.

3. *TEREBRA NODOSOPPLICATA*, Dunker.

Terebra nodosoplicata, Dunker, Zeits. für Malac. 1853, p. 110.
no. 37.

Hab. — ?

4. *TEREBRA FULGURATA*, Phil.

Terebra fulgurata, Phil. Zeits. für Malac. 1846, p. 53. 1847,
p. 181, no. 14.

Terebra arguta, Gould, Mex. et Calif. Shells, p. 7. pl. 14. f. 19.

Hab. California; Mazatlan; Guatemala.

5. *TEREBRA TIARELLA*, Desh. 1857 J. de Conchy 6191

T. testa elongata, turrita, angusta, acuminata, fulva, anfractibus latis, primis longitudinaliter tenue plicatis, alteris ad suturam nodoso-crenatis, transversim obsolete rare striatis, striis exilibus incisis; ultimo anfractu elongato, cylindraceo; apertura intus fulva, elongata, angusta, canali brevi terminata; columella recta, cylindracea, contortula, intus uniplicata.

Var. β . *Testa castaneo fuscescente, tuberculis pallidioribus.*

Var. γ . *Testa omnino candida.*

Long. 32 mill., larg. 8.

Hab. Cape Natal.

Collection Cuming.

B. *Coquille alongée subulée.*6. *TEREBRA CRENULATA*, Lamk.

Buccinum crenulatum, Linn. Syst. Nat. ed. 12. p. 1205.

Var. β . *Buccinum varicosum*, Gmel. p. 3505. no. 165; Seba, Mus.
t. 3. pl. 56. f. 17.

Hab. Madagascar; Ocean de l'Inde, &c.

6. *TEREBRA FIMBRIATA*, Desh. 1857. J. de Conch 6171

T. testa elongato-conica, basi lata, apice acuminata, castaneo-fuscescente alboque marmorata, ad marginem superiorem lineis brevibus, castaneis fimbriata, punctulis castaneis, biseriatim distantibus, in ultimo anfractu triseriatim ornata; anfractibus latis, planis, sulco impresso divis; primis tenue plicatis, alteris lævigatis; margine suturali converiusculo, obsolete noduloso; nodulis sæpius albis; apertura elongato-angusta, subquadrata, intus fusca, basi late emarginata; columella alba cylindracea.

Long. 88 mill., larg. 19.

Hab. — ?

Collection Cuming et la mienne.

8. *TEREBRA INTERLINEATA*, Desh.

T. testa elongato-turrita, conica, valde acuminata, alba pallide flavicante, maculis rufis irregularibus nubeculata et punctulis saturationibus biseriatim et in ultimo anfractu triseriatim dispositis; anfractibus octodecim planis sulco inæqualiter divis, primis plicatis, ultimis obsolete plicatis; margine suturali albo, plicato, linea rufa plicis interposita; ultimo anfractu basi convexo, lævigato, canali brevi profunde emarginato terminato; apertura elongato-subquadrata, albida; columella albida, cylindracea, uniplicata.

Long. 60 mill., larg. 13.

Hab. Les Iles Sandwich.

Collection Cuming.

Elle a des rapports avec le *T. fimbriata*, avec des caractères spécifiques qui lui sont propres.

9. *TEREBRA PATAGONICA*, d'Orb.

Terebra patagonica, d'Orb. Voy. en Amér. Moll. p. 442. pl. 62. f. 1.

10. *TEREBRA TROCHLEA*, Desh. 1857 *Id. Conchy.* 6: 93

T. testa elongato-subulata, turrita, apice acutissimo, fulvo-fuscescente, albo maculata et flammulata, maculis albis multo minoribus; anfractibus latis, longitudinaliter plicatis, sulco lato profundeque in duas areas bipartitis; area angustiore, depressa, minus elevata, nodulosa, in anfractibus ultimis nodulis evanescentibus; apertura ovato-angusta, basi dilatata, late emarginata; columella alba, uniplicata.

Long. 69 mill., larg. 13.

Hab. Zanzibar.

Collection Cuming et la mienne.

11. *TEREBRA SOWERBYANA*, Desh. 1857 *Id. Conchy.* 6: 93

T. testa conico-elongata, albida vel pallide rufescente; anfractibus latis, planis, sulco impresso divis, longitudinaliter undato-plicatis, plicis distantibus, angulatis, interstitiis obsolete bi- vel tri-striatis; ultimo anfractu elongato, basi depressiusculo, striis transversalibus distantibus notato; apertura parum obliqua, elongato-angusta, subquadrangulati, antice canali breve terminata; columella valde contorta, profunde biplicata.

Long. 56 mill., larg. 12.

Hab. La mer de Gambie.

Collection Cuming.

12. *TEREBRA REEVEI*, Desh. 1857 *Id. Conchy.* 6: 88

T. testa elongato-subulata, omnino pallide albo-flavidula; anfractibus numerosis, latis, sulco profundo angusto divis, suturis profundis, crenulatis, longitudinaliter tenue et regula-

riter plicatis ; apertura elongato-angusta, subquadrata, late profundeque emarginata ; columella candida, cylindracea, uniplicata, angulo oblique descendente basi circumdata.

Long. 92 mill., larg. 11.

Hab. Les Iles Moluques.

Collection Cuming.

Belle espèce voisine de la *T. duplicata*, mais plus courte et plus sombre ; elle rappelle un nom cher à la science Conchyliologique.

13. *TEREBRA GOULDI*, Desh. 1859 J. de Conch. 6: 89

T. testa elongato-subulata, crassiuscula, albo-lutescente ; anfractibus planulatis, latis, transversim sulco inæqualiter bipartitis ; area suturali nodoso-plicata, nodulis albis, interstitiis fusciscentibus ; altera latiore tenue plicata, zonula fusciscente superne distincta ; ultimo anfractu elongato, zonulis duabus fuscis ornato ; apertura elongato-subquadrata ; columella alba, erecta, margine dextro parallela, cylindracea, extus angulo acuto separata.

Long. 70 mill., larg. 18.

Hab. Les Iles Sandwich.

Collection Cuming et la mienne.

14. *TEREBRA SENEGALENSIS*, Lamk.

Terebra senegalensis, le Faval, Adanson, Voy. au Sénégal, p. 54, pl. 4. f. 5 ; Hinds, Thes. Conch. p. 160. no. 27. pl. 41. f. 11-14.

Hab. Sénégal.

15. *TEREBRA CINGULA*, Kien.

Terebra cingula, Kiener, Icon. des Coq. Viv. p. 30. no. 25. pl. 9. f. 19.

Hab. Sénégal.

16. *TEREBRA FATUA*, Hinds.

Terebra fatua, Hinds, Thes. Conch. p. 58. no. 20. pl. 42. f. 28.

Hab. St. Christophe (Indes occidentales).

17. *TEREBRA FESTIVA*, Desh. 1859 J. de Conch. 6: 74

T. testa elongato-conica, angusta, acuminata, fulva ; anfractibus latis, sulco impresso divisis ; margine suturali lato, plicis nodulosus, crassiusculus, albicantibus notato, interstitiis castaneis ; altera parte anfractuum tenue et regulariter plicata, interstitiis simplicibus, obsolete maculis pallide castaneis, biseriatim, in ultimo anfractu triseriatim picta ; ultimo anfractu elongato ; apertura oblonga, angusta, late emarginata.

Long. 39 mill., larg. 8.

Hab. Sénégal.

Collection Cuming et la mienne.

18. *TEREBRA SPECIOSA*, Desh.

T. testa elongato-turrita, apice acuminato, flava, in margine anfractuum castaneo regulariter maculata; longitudinaliter tenue plicata, anfractibus latis, planiusculis, sulco impresso, inæqualiter bipartitis; margine suturali, late plicato, albescente; apertura elongato-angusta, subquadrata, basi profunde marginata; columella acuta, conoidea, extus angulo angusto, circumdata.

Hab. — ?

Collection Cuming et la mienne.

Par sa forme et sa coloration cette coquille se rapproche de la *Terebra festiva* : elle s'en distingue par plusieurs bons caractères ; les tours sont élargis, peu convexes ; le bouelet de la suture est assez large, peu proéminent, et il présente avec le reste de la surface un contraste assez remarquable : on y remarque en effet des plis larges, réguliers, blanchâtres, entre chacun desquels se dessine une tache d'un beau brun. Ces plis, au lieu d'être en même nombre que ceux du reste de la surface, occupent un espace beaucoup plus large, de telle sorte que chacun d'eux reçoit deux ou trois des plis qui parcourent la surface supérieure des tours.

Long. 39 mill., larg. 7.

19. *TEREBRA DILLWYNII*, Desh.

T. testa elongato-conica, subulata, in medio ventricosiuscula, pallide fulva; anfractibus quindecim, planulatis, sulco impresso divisus, regulariter costellatis, lævigatis; margine suturali lato, plicis albulis maculisque castaneis interstitialibus notato; ultimo anfractu breviusculo, obtuso; apertura quadrata, breviuscula, antice late profundeque emarginata; columella brevi, fusca, cylindracea, extus angulo acutissimo circumdata.

Long. 40 mill., larg. 9.

Hab. Les mers du Japon.

Collection Cuming et la mienne.

20. *TEREBRA RAPHANULA*, Lamk.

Terebra raphanula, Kiener, Icon. des Coq. Viv. p. 21, no. 16, pl. 10. f. 20 ; Hinds, Thes. Conch. p. 159. no. 23. pl. 44. f. 94.

Hab. Amboine.

En rapprochant les figures que nous citons, on remarque entre elles des différences assez considérables pour faire supposer qu'elles appartiennent à deux espèces distinctes.

21. *TEREBRA MARMORATA*, Desh.

T. testa elongato-turrita, angusta, apice acuto, fusco alboque alternatim et irregulariter maculata, marmorata, ad suturam maculis intensioribus seriatim dispositis; anfractibus primis violaceo-lividis, ultimo ad peripheriam albo cincto; anfractibus angustis, longitudinaliter et regulariter costatis in ultimis cos-

tulis evanescentibus, transversim striato-punctatis, linea punctata profundiore marginatis, margine plicato; ultimo anfractu brevi, basi quinque-sulcato, convexo; apertura ovato-angusta, utrinque attenuato, antice canali angusto, profundo, brevi terminato.

Long. 41 mill., larg. 8.

Hab. Moreton Bay.

Collection Cuming.

22. *TEREBRA CHLORATA*, Lamk.

Buccinum maculatum, var. β , Gmel. p. 3499. no. 130.

Terebra chlorata, Kiener, Icon. des Coq. Viv. p. 24. pl. 6. f. 2.

Hab. Iles Seychelles.

23. *TEREBRA EBURNEA*, Hinds.

Terebra eburnea, Hinds, Thes. Conch. p. 166. no. 45. pl. 45. f. 123.

Hab. Iles Seychelles.

24. *TEREBRA PUNCTICULATA*, Desh.

T. testa elongato-conica, crassiuscula, acuminata, omnino candida, longitudinaliter plicata, interstitiis plicarum profunde puncticulatis; plicis regularibus, depressis, latis, obtusis; anfractibus circiter quindecim angustis, convexiusculis, linea transversali puncticulata subæqualiter divisis; ultimo basi convexo, tenue sulcato; apertura minima, ovato-acuminata, basi angustata; columella conica, uniplicata, basi extus angulo circumdata.

Long. 25 mill., long. 6.

Hab. —?

Ma Collection.

Espèce facile à distinguer par les profondes fourbisations situées entre les plis longitudineaux.

25. *TEREBRA MACULATA*, Lamk.

Buccinum maculatum, Linn. Syst. Nat. ed. 12. p. 1205.

Acus columna trajana, Humphrey, Mus. Calonn. p. 31. no. 865.

Subula maculata, Blainv. Malac. pl. 16. f. 2.

Terebra maculata, Kiener, Icon. des Coq. Viv. p. 4. no. 1. pl. 1. f. 1.

Hab. Iles Moluques.

26. *TEREBRA STRIGATA*, Sow.

Terebra strigata, Sow. Tank. Cat. App. p. 23.

Buccinum elongatum, Gray, Wood, Ind. Test. Sup. pl. 4. f. 25.

Terebra zebra, Kieuw, Icon. des Coq. Viv. p. 5. no. 2. pl. 3. f. 5.

Terebra flammea, Lesson, Illus. Zool. pl. 18.

Hab. Panama, Realejo.

27. *TEREBRA ALBIDA*, Gray.

Terebra albida, Hinds, Thes. Conch. p. 158. no. 21. pl. 43. f. 56.

Hab. Nouvelle Hollande.

28. *TEREBRA MUSCARIA*, Lamk.

Terebra muscaria, Lamk. Anim. s. Vert. 2 ed. t. 10. p. 241 ;
Hinds, Thes. Conch. p. 151. no. 11. pl. 41. f. 17-20, pl. 42. f. 41.
Hab. Iles de la Société, etc.

29. *TEREBRA TIGRINA*, Desh.

Terebra tigrina, Desh. dans Lamk. au. s. Vert. 2 ed. t. 10. p. 253.
Buccinum tigrinum, Gmel. p. 2602.
Buccinum felinum, Dillw. Cat. t. 2. p. 644. no. 135.
Terebra muscaria, var. β , Kiener, Icon. des Coq. Viv. pl. 3. f. 4.
Hab. Ocean indien.

30. *TEREBRA DIMIDIATA*, Lamk.

Buccinum dimidiatum, Linn. Syst. Nat. ed. 12. p. 1206.
Subula dimidiata, Schumacher, Nouv. Syst. p. 233.
Terebra dimidiata, Kiener, Icon. des Coq. Viv. p. 6. no. 3. pl. 2.
f. 2.
Hab. Ocean indien, Moluques, Nicobar.

31. *TEREBRA SPLENDENS*, Desh. 1857. *Jde Conch* 6: 73

T. testa elongato-subulata, turrita, angusta, apice acutissimo, nitente, lævigata; anfractibus latis, convexiusculis, sulco impresso bipartita, primis tenue plicatis; area marginali paulo depressiore, unicolore, flavido-rubente; area altera latiore, maculis flammulatis alternatim albis et flavido-rubescensibus ornata; apertura obliqua, semi-ovata, angusta; basi late emarginata; columella parumper obliqua, intus plana, basi extus angulo acuto circumdata.
Long. 79 mill., larg. 12.
Hab. Les mers de la Chine.
Ma Collection.

32. *TEREBRA PURA*, Desh.

T. testa elongato-subulata, angusta, candida, nitente, eburnea; anfractibus latis, vix convexiusculis, sulco impresso, obsoleto, divisio, primis tenue plicatis, alteris lævigatis vel substriatis, ultimo elongato, attenuato; apertura elongato-angusta, antice late emarginata, columella subcylindracea, extus angulo crasso, decurrente soluta.
Long. 69 mill., larg. 11.
Hab. Zanzibar.
Collection Cuming.

33. *TEREBRA GLABRA*, Desh. 1857. *Jde Conchy.* 6: 101

T. testa turrito-subulata, acuminata, albida, polita, nitida, immaculata, aliquantisper flavicante; anfractibus numerosis, angustis, planulatis, sulco impresso divisio, ultimo brevi, primis

tenuae plicatis, alteris laevigatis; margine suturali paululum prominulo et convexo, ad suturam crenato, in sulco punctato-crenato; apertura elongato-angusta, antice canali brevi terminata, columella contortula, brevi, cylindracea.

Long. 70 mill., larg. 13.

Hab. Les mers de la Chine.

Ma Collection.

34. *TEREBRA BUCCINULUM*, Desh. 1857 J. de Conchy 6:42

T. testa elongato-turrita, brevicula, acuminata, albo-griseola; anfractibus convexiusculis, latis, integris, ad suturas tenuae longitudinaliter plicatis, transversim sub lente minutissime striatis; apertura ovato-oblonga, ad extremitates attenuata, antice profunde emarginata; columella concava, brevi, uniplicata, extus tristriata, basi margine angusto obtuso circumdata.

Long. 37 mill., larg. 10.

Hab. La côte orientale de l'Australie.

Collection Cuming.

35. *TEREBRA HASTATA*, Kiener.

Buccinum hastatum, Gmel. p. 3502. no. 144.

Terebra hastata, Kiener, Icon. des Coq. Viv. p. 22. no. 17. pl. 10. f. 23.

Terebra costata, Menke, Synops. p. 84.

Hab. —?

36. *TEREBRA SOLIDA*, Desh. 1857 J. de Conchy 6:78

T. testa elongata, oblonga, solida, obesula, in medio ventricosa, apice acuto, albo-eburnea; anfractibus planis, contiguis, longitudinaliter plicatis, in primis plicis profundioribus, in ultimis obsoletis, linea pallida translucida in medio bipartitis; ultimo anfractu elongato, attenuato, transversim trifasciato; apertura elongato-angusta, basi late profundeque emarginata; columella crassa, superne uniplicata.

Long. 30 mill., larg. 8.

Hab. Le Japon.

Collection Cuming et la mienne.

37. *TEREBRA CRASSULA*, Desh.

T. testa elongata, subfusiformi, crassa, solida, alba, ad apicem flavida, longitudinaliter plicata, plicis regularibus, obliquatis, undulosis; sutura regulariter crenulata; ultimo anfractu elongato, cylindraceo; apertura elongato-angusta, subquadrata, basi late profundeque emarginata; columella crassa, conica, superne uniplicata, extus sulco impresso marginata.

Long. 27 mill., larg. 7.

Hab. —?

Ma Collection.

38. *TEREBRA OBESA*, Hinds.*Terebra obesa*, Hinds, Thes. Conch. p. 182. no. 94. pl. 45. f. 106.*Hab.* — ?39. *TEREBRA CIRCUMCINCTA*, Desh. 1857. *Nde Conchy.* 6: 77*T. testa elongato-turrita, acuminata, solida, alba, strigis nonnullis raris flavidulis irregulariter sparsa; anfractibus vix convexiusculis, transversim quadrisulcatis, sulcis impressis, multipunctatis; in ultimo anfractu sulcis novem; apertura elongata, angusta, subquadrata, antice anguste emarginata; columella crassa, brevi, uniplicata.*

Long. 40 mill., larg. 8.

Hab. La Mer Rouge.

Collection Cuming.

C. *Coquille subulée, tours aplatis, conjoints, le plus souvent striés sur la suture.*(a.) *Ouverture étroite.*1. *Stries fines sur la suture.*40. *TEREBRA LANCEATA*, Lamk.*Buccinum lanceatum*, Linn. Syst. Nat. ed. 12. p. 1206.*Terebra lanceata*, Hinds, Thes. Conch. p. 178. no. 82. pl. 43. f. 52.*Hab.* Taïti, Ile de France, Moluques.41. *TEREBRA PENICILLATA*, Hinds.*Terebra lanceata*, var., Kiener, Icon. des Coq. Viv. pl. 10. f. 22 a.*Hab.* Iles Seychelles.42. *TEREBRA VENOSA*, Hinds.*Terebra lanceata*, var., Kiener, Icon. des Coq. Viv. pl. 10. f. 22 b.*Hab.* — ?43. *TEREBRA ALBULA*, Menke.*Terebra albula*, Menke, Moll. Nov. Holl. Spec. p. 30. no. 163; Hinds, Thes. Conch. p. 182. no. 93. pl. 45. f. 126.*Hab.* Nouvelle Hollande.44. *TEREBRA INCOLOR*, Desh.*T. testa elongato-turrita, subfusiformi, paulo ventricosa, crassa, solida, candidissima; anfractibus planulatis, primis longitudinaliter plicatis, alteris plicis breviusculis ornatis, in suturam crenulatis; apertura prælonga, ovato-attenuata; columella brevi, crassa, subcylindracea, late profundeque emarginata.*

Long. 34 mill., larg. 8.

Hab. Iles Philippines.

Collection Cuming.

Par sa forme générale cette coquille se rapproche de la *Terebra hastata* de Lamk. ; elle avoisine également notre *Terebra crassula*. Atténuée au sommet elle est légèrement ventral dans le milieu ; ses tours sont très-nettement séparés, ils sont aplatis ou très-médiocrement convexes. Sur les premiers s'étendent d'une suture à l'autre des plis longitudinaux simples et droits ; bientôt ces plis n'atteignent plus que la partie inférieure des tours ; le reste de la surface est lisse ; la suture est crenelée avec beaucoup de régularité. Le dernier tour est allongé, cylindracé ; l'ouverture, très-longue et très-étroite, est largement échancrée à la base. La columelle est plus courte que le bord droit.

45. *TEREBRA CASTA*, Hinds.

Terebra casta, Hinds, Thes. Conch. p. 163. no. 42. pl. 44. f. 84.
Hab. Philippines.

46. *TEREBRA DISPAR*, Desh.

T. testa elongato-subulata, angusta, albo-flavidula, aliquantisper griseo-fasciata, longitudinaliter tenue plicata, transversim acutissime striata; anfractibus numerosis, planulatis, continuis, plicis in medio evanescentibus; apertura elongato-angusta; columella brevi, acuta, late profundeque basi emarginata.

Long. 29 mill., larg. 6.

Hab. — ?

Ma Collection.

47. *TEREBRA BIPARTITA*, Desh.

T. testa elongato-acuminata, subfusiformi, crassa, solida, albo griseoque transversim bipartita; anfractibus convexiusculis, longitudinaliter plicatis, ad suturam crenulatis, plicis superne evanescentibus; ultimo anfractu elongato-attenuato, basi late profundeque emarginato; apertura elongato-angusta, superne attenuata, intus flavidula.

Long. 22 mill., larg. 5.

Hab. Iles Sandwich.

Collection Cuming.

48. *TEREBRA APICINA*, Desh.

T. testa elongato-angusta, apice acutissimo, alba vel flavidula, ad suturam fasciola fuscula, castaneo-punctata; anfractibus numerosis, planis, primis violaceo-lividis, longitudinaliter plicatis, plicis obliquis superne evanescentibus; ultimo anfractu apice attenuato, canali brevissimo terminato, basi late profundeque emarginato; apertura alba, ovato-angusta, utrinque attenuata; labro tenui, convexo; columella brevi, angulo acuto basi circumdata.

Long. 22 mill., larg. 5.

Hab. Singapore.

Collection Cuming.

49. *TEREBRA BACILLUS*, Desh.

T. testa elongato-angusta, subulata, albo-cornea vel atrata, longitudinaliter tenuè plicata, plicis superne evanescentibus; anfractibus numerosis, angustis, planis, continuis, sutura vix distinctis, ultimo brevi, attenuato; apertura minima, superne acute angulata, basi dilatata; columella nigrescente, brevi, late profundeque emarginata.

Long. 23 mill., larg. 5.

Hab. Iles Sandwich.

Collection Cuming.

50. *TEREBRA DUNKERI*, Desh.

Terebra eburnea, Desh. 1853 (nec Hinds, 1844), Zeits. für Malac 1853, p. 96. no. 35.

Hab. —?

51. *TEREBRA CUSPIDATA*, Hinds.

Terebra cuspidata, Hinds, Thes. Conch. p. 181. no. 90. pl. 45. f. 128.

Hab. Côte d'Afrique.

52. *TEREBRA LACTEA*, Desh.

T. testa minima, elongato-turrita, angusta, apice acutissimo, candida, ad suturam lactea, opaca, longitudinaliter tenue plicata; anfractibus planis, ad suturam anguste et obsolete marginatis, margine simplici, primis nigris; ultimo anfractu brevi, basi attenuato, lævigato; apertura minima, brevissima, ad angulum superiorem valde angustata, paullo callosa, basi dilatata, profunde lateque emarginata.

Long. 21 mill., larg. 4.

Hab. Iles Sandwich.

Collection Cuming et la mienne.

53. *TEREBRA TRAILLII*.

T. testa minima, elongato-acuminata, subulata, apice acutissimo, fulva eleganter transversim griseo-fasciata, in ultimo anfractu fasciis duabus; anfractibus planis, continuis, longitudinaliter tenue semiplicatis; apertura minima, triangulari, inferne attenuata, superne dilatata, late profundeque emarginata; columella conoidea, macula fusca notata, callo albo angusto extus circumdata.

Long. 23 mill., larg. $4\frac{1}{2}$.

Hab. Vasingapatam, Océan Indien.

Collection Cuming.

Charmante petite coquille appartenant au même groupe que les *semiplicata*, *bipartita*, *apicina*, &c., mais très-distincte de toutes ses congénères; allongée, étroite, très-aigüe au sommet; ses tours sont plans et conjoints; ils sont ornés de nombreux plis longitudinaux qui naissent à la suture et disparaissent vers le milieu des tours.

La coloration est remarquable : sur un fond d'un beau jaune fauve, tirant un peu à l'orangé, se dessine au-dessus de la suture une large fascie blanche partagée en deux parties presque-égales par un ruban étroit d'un gris ferrugineux sombre : une fascie de la même couleur occupe la base du dernier tour.

54. *TEREBRA MERA*, Hinds.

Terebra mera, Hinds, Thes. Conch. p. 184. no. 102. pl. 45. f. 108, 114.

Hab. Détroit de Malacca.

2. *Plis continus d'un tour à l'autre.*

55. *TEREBRA VERREAUXI*, Desh. 1857 *Jde Conchy.* 6:95

T. testa elongato-subulata, nitidissima; anfractibus latis, planis, continuis, indivisis, plicis appressis, parum obliquis, eleganter regularibus, utrinque sutura sculptis; apertura elongato-angusta, utrinque attenuata; labro tenui, in medio productione; columella alba, cylindracea, obsolete uniplicata, basi extus marginata; colore pallide flavescente, ad suturam fasciola alba, punctis castaneo-rubris ornata; ultimo anfractu fasciola alba altera circumdata.

Long. 38 mill., larg. 9.

An eadem ac *Terebra striatula*, Kiener (non Lamk.), Icon. des Coq. Viv. pl. 9. f. 18?

Hab. —?

Ma Collection, communiquée par M. Verreaux.

56. *TEREBRA ARGENVILLII*, Desh.

T. testa elongato-subulata, pallide rubro-violascente, ad suturam albo fasciata, rubro eleganter punctata; anfractibus numerosis, planis, longitudinaliter costulatis, ad suturam crenulatis; ultimo anfractu elongato, fasciola pallida in medio partito; apertura elongato-angusta, utrinque attenuata, castaneo-rubescence; labro tenui, recto; columella cylindracea, extus marginata, apice acuminata.

Long. 35 mill., larg. 6½.

Hab. —?

Ma Collection.

57. *TEREBRA CONTINUA*, Desh.

T. testa elongato-acuminata, nitida, albo-flavida vel carneola, longitudinaliter regulariterque plicata; anfractibus latis, planis, continuis, sutura impressa vix separatis; ultimo anfractu elongato, basi attenuato; columella alba, brevi, conoidea; apertura elongato-angusta, utraque extremitate attenuata; labro tenui, recto.

Long. 31 mill., larg. 7.

Hab. —?

Collection Cuming et la mienne.

58. *TEREBRA ACUMEN*, Desh.

T. testa elongato-turrita, angustissima, apice acutissimo, castaneo-cinnamomea; anfractibus planulatis, longitudinaliter plicatis, plicis appressis, simplicibus, suturis undulatis, fasciola alba, rubro-punctata ornatis; ultimo anfractu fasciola alba in medio bipartito; apertura elongato-angusta, intus pallide castanea, utrinque attenuata; columella cylindracea, simplici, basi anguste profundeque emarginata.

Long. 22 mill., larg. 3.

Hab. — ?

Collection Cuming et la mienne.

Petite espèce remarquable avoisinant le *Terebra argenvillei* ainsi que le *matheroniana*, mais différente de l'une et de l'autre par la taille, la coloration et les autres caractères spécifiques.

59. *TEREBRA CONCINNA*, Desh.

Terebra concinna, Desh. dans Lamk. An. s. Vert. ed. 2. x. p. 259 ;

D'Argenville, Conch. pl. 11. f. R.

Buccinum strigilatum, var. β . ex parte Gmel. p. 3501.

Buccinum concinnum, Dillw. Cat. t. ii. p. 647. no. 144.

Hab. — ?

60. *TEREBRA MATHERONIANA*, Desh.

T. testa minima, elongato-angusta, acuminata, nitidissima, castanea, ad suturam fasciola angusta alba atro-punctata ornata; anfractibus planiusculis, longitudinaliter plicatis, plicis crassis rectis, in ultimo anfractu evanescentibus; ultimo anfractu elongato, ad aperturam coarctato, in medio fasciola alba bipartito; apertura minima, angusta, basi dilatata, intus castanea.

Long. 18 mill., larg. 3.

Hab. Taïti.

Ma Collection.

61. *TEREBRA SALLÆANA*, Desh.

T. testa elongato-subulata, angusta, apice acuminato, fusco-fuliginosa; anfractibus subplanis, ad suturam semiplicatis, plicis albicantibus, interstitiis fusco-castaneis exilissimis, sub lente transversim striato-punctatis; ultimo anfractu brevi, ad peripheriam fasciola albicante cincto; apertura brevi, subtri-gona, castanea; columella cylindracea, extus alba, basi late profundeque emarginata.

Long. 24 mill., larg. 5.

Hab. Mexico (Sallé).

Collection Cuming.

62. *TEREBRA CALIGINOSA*, Desh.

T. testa elongato-subulata, angusta, castaneo-grisea, livida, lon-

gitudinaliter regulariterque acute costata ; anfractibus planis, conjunctis, linea impressa vix perspicua, inæqualiter divisis, interstitiis costularum obsoletissime transversim striatis ; ultimo anfractu elongato ; apertura minima, ovato-attenuata, fusca, canali brevi latoque terminata ; columella cylindræa, extus angulo acuto marginata.

Long. 30 mill., larg. 6.

Hab. Iles Philippines.

Collection Cuming.

63. *TEREBRA NITIDA*, Hinds.

Terebra nitida, Hinds, Thes. Conch. p. 164. no. 40. pl. 45. f. 103.

Hab. Iles Marquises.

64. *TEREBRA MODESTA*, Desh.

T. testa elongato-subulata, nitida, micante griseo-fuscescente, palide unifasciata, longitudinaliter plicata, transversim obsolete striata ; anfractibus planis, sutura crenulata junctis ; apertura minima, intus castanea, ovato-angusta, utraque extremitate attenuata, zonula alba intus bipartita ; columella acuta, fusco maculata, superne obliquissime uniplicata.

Long. 22 mill., larg. 4.

Hab. L'embouchure de l'Indus.

Collection Cuming.

Malgré son analogie avec le *matheroniana*, le *caliginosa* et quelques autres espèces du même groupe celle-ci se distingue facilement, non-seulement par sa coloration, mais encore par les côtes nombreuses, droites et régulières, que portent les tours. Ses côtes sont peu proéminentes, parfaitement régulières ; elles disparaissent à la circonférence du dernier tour ; la coloration est d'un gris brunâtre, uniforme, si ce n'est à la suture, où elle devient plus blanchâtre.

65. *TEREBRA LEPIDA*, Hinds.

Terebra lepida, Hinds, Thes. Conch. p. 182. no. 92. pl. 45. f. 102.

Hab. Guinée.

66. *TEREBRA BOURGUIGNATI*, Desh.

T. testa minima, elongato-turrita, angusta, atro-fuscescente, ad suturam zonula alba cincta, longitudinaliter costata, costis rectis, angulatis, simplicibus ; anfractibus convexiusculis, linea punctata vix impressa marginatis, ultimo brevi, attenuato, canali brevi, angusto terminato ; apertura minima, ovata, profunde fusca ; columella brevi, cylindræa, biplicata, extus angulo marginata.

Long. 19 mill., larg. 4.

Hab. Les mers de la Chine.

Collection Cuming et la mienne.

67. *TEREBRA CROSSII*, Desh.

T. testa elongato-turrita, angusta, apice acuminata, longitudinaliter plicata, nitida, cærulescente, zona alba maculis rubro-fuscis interrupta ad basin anfractuuum ornata, venulis ramosis sanguineis in parte superiore anfractuuum dispersis; anfractibus plamulatis, linea vix impressa subæqualiter divisis, ultimo brevi, attenuato; columella alba, extus basi angulo acuto circumdata.

Long. 23 mill., larg. 5.

Hab. L'océan de l'Inde.

Collection de M. Crosse.

Espèce remarquable par sa coloration d'un bleu peu foncé, interrompu à la base des tours par une large zone blanche interrompue par des taches d'un beau brun rougeâtre; de ces taches partent des lignes rameuses qui occupent tout la largeur des tours; ces linéoles sont d'un brun rouge foncé et ressemblent à de petites veines sanguinolentes. La surface est brillante, couverte de gros plis; une strie transverse à peine apparente divise les tours en deux parties presque égales.

68. *TEREBRA PHILIPPIANA*, Desh.

T. testa minima, elongato-turrita, angusta, acuminata, zonula fusco-rubescens et zonula alba æqualiter bipartita; anfractibus vix convexis, longitudinaliter tenue plicatis, interstitiis lævigatis; ultimo anfractu basi lævigato et candido, attenuato; apertura minima, candida, ovato-attenuata, profunde lateque emarginata; columella conica, simplici, alba.

Long. 8 mill., larg. $2\frac{5}{8}$.

Hab. Îles Marquises?

Collection Cuming.

Elle est l'une des plus petites espèces du genre; elle se distingue facilement par sa coloration, qui consiste en deux zones d'égale largeur, l'une blanche à la base des tours, l'autre brune qui montent en spirale de la base au sommet.

69. *TEREBRA PYGMÆA*, Hinds.

Terebra pygmæa, Hinds, Thes. Conch. p. 184. no. 103, pl. 45. f. 112.

Hab. Chine; détroit de Malacca.

70. *TEREBRA TENERA*, Hinds.

Terebra tenera, Hinds, Thes. Conch. p. 184. no. 104, pl. 45. f. 111.

Hab. Chine; détroit de Malacca.

(b.) *Ouverture dilatée à la base.*

1. *Tours lisses ou finement striés.*

71. *TEREBRA NIMBOSA*, Hinds.

Terebra nimbosa, Hinds, Thes. Conch. p. 159. no. 26, pl. 42. f. 21.

Hab. Nouvelle Hollande.

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72. *TEREBRA CÆRULESCENS*, Lamk.

Buccinum niveum, Gmel. p. 3504. no. 154 (nec *niveum*, p. 3495).

Buccinum edentulum, Gmel. p. 3505. no. 162?

Buccinum bifasciatum, Dillw. Cat. t. ii. p. 651. no. 155; Kiener, Icon. des Coq. Viv. p. 17. no. 17, pl. 6 et 7. f. 12.

Hab. Nouvelle Hollande; Iles de la Société, &c.

73. *TEREBRA JAMAICENSIS*, C. B. Adams.

Terebra jamaicensis, Lister, Conch. pl. 979. f. 37; C. B. Adams, Contr. to Conch. 1850, no. 4. p. 58.

Buccinum strigatum, var. γ , Gmel. p. 3501.

T. testa elongato-acuta, griseo-fuscescente vel nigrescente; anfractibus latis, contiguïs, sutura lineari junctis, fasciola albidula aliquantisper irregulariter punctata ad suturam notatis, tenue plicatis, plicis in medio anfractuum evanescentibus, undique sub lente minutissime punctulatis; apertura angusta, superne alternata, basi dilatata, late emarginata; columella obliqua, atro-fuscescente, callo albo-flavescente, angulo acuto extus separata. Colore variabili.

Long. 60 mill., larg. 13.

Hab. La Jamaïque; toutes les Antilles.

74. *TEREBRA STYLATA*, Hinds.

Terebra stylata, Hinds, Thes. Conch. p. 161. no. 30, pl. 44. f. 79.

Hab. Philippines; Japon.

75. *TEREBRA LUCTUOSA*, Hinds.

Terebra luctuosa, Hinds, Thes. Conch. p. 181. no. 89, pl. 45. f. 121.

Hab. Golfe de Nicoya; Porto Portrero; côte ouest de l'Amérique.

76. *TEREBRA LAURINA*, Hinds.

Terebra laurina, Hinds, Thes. Conch. p. 161. no. 29, pl. 42. f. 27.

Hab. Côte occidentale de l'Afrique.

Si les échantillons que nous a communiqués M. Cuming, des trois espèces précédentes (*stylata*, *luctuosa*, *laurina*) sont bien identiques à ceux décrits par M. Hinds, il en résulterait qu'ils en diffèrent en rien d'essentiel du *T. jamaicensis* et devront lui être réunis; mais avant de prendre une décision définitive à ce sujet il serait nécessaire d'examiner de nouveau les types eux-mêmes figurés et décrits par Hinds.

77. *TEREBRA CASTANEA*, Kiener.

Terebra castanea, Kiener, Icon. des Coq. Viv. p. 19. no. 14, pl. 7. f. 14.

Hab. Ile de France; Océan Indien.

Cette espèce comme les précédentes a les plus grands rapports avec le *jamaicensis*.

78. *TEREBRA MICANS*, Hinds.

Terebra micans, Hinds, Thes. Conch. p. 181. no. 91, pl. 45. f. 125.
Hab. —?

79. *TEREBRA ADANSONI*, Desh.

T. testa elongato-acuminata, nitida, albo-luteola, aliquantisper griseo vel fusco fasciata; anfractibus latis, contiguïs, sutura lineari vix separatis, tenuiter longitudinaliter semistriatis; ultimo anfractu magno, subventricoso; apertura elongato-acuta, superne attenuata, basi dilatata, profunde lateque emarginata; columella brevi, conoidea, apice acuminata, extus callo albo induta.

Long. 39 mill., larg. 8.

Hab. Sénégal.

Collection Cuming et la mienne.

80. *TEREBRA INCONSTANS*, Hinds.

Terebra inconstans, Hinds, Thes. Conch. p. 179. no. 85, pl. 44. f. 83.

Hab. Iles Sandwich.

2. *Plis continus d'un tour à l'autre.*81. *TEREBRA ANOMALA*.

Terebra anomala, Gray, Proc. Zool. Soc. 1834, p. 62; Hinds. Thes. Conch. p. 180. no. 86, pl. 44. f. 97.

Hab. Singapore.

82. *TEREBRA STRIGILATA*, Lamk.

Buccinum strigilatum, Linn. Syst. Nat. ed. 12. p. 1206; Hinds, Thes. Conch. p. 180. no. 88, pl. 45. f. 101, 102.

Hab. Nouvelle Guinée; Macassar; Philippines.

83. *TEREBRA CINEREA*, Born.

Buccinum cinereum, Born, Mus. p. 267, pl. 10. f. 11, 12.

Hab. Philippines.

En comparant au *cinerea* de Born la coquille figurée sous le même nom par M. Hinds nous remarquons des différences qui nous font soupçonner une erreur dans la détermination spécifique de ce dernier naturaliste.

Le *T. cinerea* de Basterot (Foss. de Bord. p. 52, pl. 3. f. 14) est une espèce très-distincte de celle-ci.

84. *TEREBRA NANA*, Desh.

T. testa minima, elongato-acuminata, subfusiformi, pallide flava, bifariam maculis pallidis fulvis ornata; anfractibus angustis, vix convexiusculis, primis costatis, ultimis simplicibus; aper-

tura minima, basi dilatata; columella brevi, conica, extus angulo acuto angustissimo marginata.

Long. 10 mill., larg. $2\frac{1}{2}$.

Hab. L'embouchure de l'Indus.

Collection Cuming.

D. *Coquille ayant l'ouverture oblongue, étroite, les tours nombreux, sillonnés, plissés ou treillisés (Myurella, Hinds).*

a. *Un sillon transverse partageant presque également la surface des tours.*

85. **TEREBRA DUPLICATA**, Lamk.

Buccinum duplicatum, Linn. Syst. Nat. ed. 12. p. 1206; Kiener, Icon. des Coq. Viv. p. 32. no. 27, pl. 12. f. 26.

Hab. Madagascar; Océan Indien, &c.

Nous avons séparé comme espèce distincte (*T. kieneri*) la variété *junior* de M. Kiener.

86. **TEREBRA LAMARCKII**, Kiener.

Terebra Lamarckii, Kiener, Icon. des Coq. Viv. p. 30. no. 25, pl. 9. f. 19.

Terebra duplicata, var., Hinds, Thes. Conch. p. 155, pl. 41. f. 2. *Hab.* Moluques.

M. Hinds n'a point accepté cette espèce; elle nous paraît distincte après l'examen d'un grand nombre d'individus.

87. **TEREBRA DUSSUMIERI**, Kiener.

Terebra dussumieri, Kiener, Icon. des Coq. Viv. p. 31. no. 26, pl. 8. f. 16.

Hab. Chine.

88. **TEREBRA EVOLUTA**, Desh.

T. testa elongato-turrita, apice acuto, fusco-fuliginosa; anfractibus latis, rapide evolutis, ad suturam marginatis, depresso-canaliculatis, longitudinaliter costatis, costis albicantibus, interstitiis lævigatis; margine suturali depresso, crenulato; ultimo anfractu elongato, basi convexiusculo; apertura ovato-oblonga, fusca, antice profunde lateque emarginata; columella obliqua.

Long. 50 mill., larg. 11.

Hab. Japon.

Collection Cuming.

Belle et remarquable espèce voisin du *Dussumieri*, mais bien distincte par le canal profond qui sépare le bourrelet de la suture. Sur un fond d'un brun enfoncé se détachent des côtes droites et blanchâtres.

89. *TEREBRA ARMILLATA*, Hinds.

Terebra armillata, Hinds, Thes. Conch. p. 173. no. 66, pl. 43. f. 49.

Hab. Panama; Californie; baie de la Madeleine.

90. *TEREBRA BERNARDII*, Desh.

T. testa elongato-subulata, acuminata, grisea, albo superne unifasciata, in ultimo anfractu fasciola alba, mediana; anfractibus latis, convexiusculis, longitudinaliter plicatis, plicis convexis, regularibus, transversim sulco inæqualiter bipartitis, ultimo anfractu ad basin attenuato; apertura intus castanea, labro intus fasciola alba diviso; columella labro brevior, flavicante, angusta, extus basi angulo carinato circumscripta.

Long. 58 mill., larg. 14.

Hab. Les côtes orientales de l'Australie.

Ma Collection, communiquée par M. Bernardi.

91. *TEREBRA JUKESI*, Desh. 1857. *Ide Conchy* 6: 45

T. testa elongato-subulata, turrita, omnino griseo-plumbea, ultimo anfractu fasciola alba in medio cincto; anfractibus latiusculis, sulco profundo bipartitis, longitudinaliter tenue et regulariter plicatis; margine suturali angusto, convexo, plicis apice albis notatis; apertura minima, angusta, obliqua, intus castanea, basi late emarginata; columella cylindraco-conica, extus angulo acuto circumdata.

Long. 33 mill., larg. 8.

Hab. Le Port Essington.

Collection Cuming.

92. *TEREBRA ADDITA*, Desh.

T. testa elongato-turrita, subfusiformi, apice acuminata, griseo-fuscescente, transversim albo-fasciata; anfractibus latis, longitudinaliter plicato-costulatis, linea impressa inæqualiter transversim partitis, ad suturam subcrenulatis, ultimo anfractu cylindraco, antice attenuato, costulis ad basin evanescentibus; apertura elongato-subquadrata, intus castanea; labro fasciolato, albo bipartito; columella elongato-cylindraco, extus angulo acuto marginata, basi profunde emarginata.

Long. 33 mill., larg. 7.

Hab. La Terre de Van Diemen.

Collection Cuming.

93. *TEREBRA PLICATELLA*, Desh. 1857 *Ide Conchy* 6: 96

T. testa elongato-angusta, subulata, acuta, omnino pallide griseo-flavidula; anfractibus numerosis, angustis, longitudinaliter regulariter costulato-plicatis, punctatis, interstitialibus unica serie notatis, ultimo anfractu brevi coarctato, basi lævigato; apertura parvula, intus flavida, utraque extremitate attenuata, an-

tice canali brevi et angusto terminata, margine sinistro proeminente.

Long. 37 mill., larg. 6.

Hab. La Terre de Van Diemen.

Collection Cuming.

94. *TEREBRA LONGISCATA*, Desh.

T. testa elongato-angusta, subulata, livide fusco-grisea, longitudinaliter costulata, transversim obsolete striata; anfractibus numerosis, sulco impresso subæqualiter divisus, planis, subcontinuis, ultimo brevi, apice attenuato; apertura intus castanea, minima, ovato-angusta, utraque extremitate attenuata.

Long. 29 mill., larg. 9.

Hab. Les Iles Philippines.

Collection Cuming.

95. *TEREBRA SPECTABILIS*, Hinds.

Terebra spectabilis, Hinds, Thes. Conch. p. 157. no. 17, pl. 44. f. 88, 89.

Hab. Guinée; Sumatra.

96. *TEREBRA USTULATA*, Desh. 1857. *Ide Conchy 6:97*

T. testa elongato-conica, apice acuminata, basi lata, breviscula, castanea, ultimo anfractu superne castaneo nitentiore picto; anfractibus numerosis, angustis, subæqualiter sulco bipartitis; area inferiore paulo angustiore, multo depressiore, altera longitudinaliter plicata; plicis regularibus crassiusculis; interstitiis simplicibus, in margine suturali minus prominentibus; apertura brevi, angusta, fusca, canali brevissimo terminata.

Var. β . *Testa albido-fuscescente, ultimo anfractu basi fusco.*

Long. 35 mill., larg. 10.

Hab. La Terre de Van Diemen.

Collection Cuming.

97. *TEREBRA KIENERI*, Desh.

Terebra duplicata, var. junior, Kien. Spec. Gen. pl. 12. f. 26 A.

T. testa elongato-turrita, pallide castanea, tenuissime longitudinaliter plicata; anfractibus latis, convexiusculis, sulco impresso inæqualiter bipartitis; margine suturali depressiusculo, ultimo anfractu brevi, basi obtuso; apertura minima, ovata, basi anguste emarginata.

Long. 22 mill., larg. 6.

Hab. La Terre de Van Diemen.

Collection Cuming et celle du Mus. de Paris.

b. *Bourrelet de la suture étroit.*

98. *TEREBRA GEMMULATA*, Kiener.

Terebra gemmulata, Kiener, Icon. des Coq. Viv. p. 15. no. 11, pl. 5. f. 11.

Hab. — ?

99. *TEREBRA DISLOCATA*, De Kay.

Terebra dislocata, De Kay, Zool. of New York, pt. 5. p. 152, pl. 7. f. 158.

Cerithium dislocatum, Say, Journ. Ac. Nat. Sc. Philad. t. ii. p. 235.

Terebra petiti, Kiener, Icon. des Coq. Viv. p. 37, pl. 13. f. 32.

Hab. Maryland.

Le *Terebra petiti* n'appartient pas au *rudis* de Gray, ainsi que l'affirme M. Hinds, mais bien au *dislocata* de Say, ainsi que nous avons pu nous en assurer autrefois dans la collection de M. Petit. La description et la figure de M. Kiener, et la localité qu'il indique ne laissent aucun doute à ce sujet. M. Hinds n'a point connu l'espèce.

100. *TEREBRA SUBNODOSA*, Carpenter.

Terebra subnodosa, Carpenter, Cat. Mazatl. Moll. p. 386. no. 452.

Hab. Mazatlan.

101. *TEREBRA HINDSI*, Carpenter.

Terebra hindsii, Carpenter, Cat. Mazatl. Moll. p. 385. no. 451.

Hab. Mazatlan.

102. *TEREBRA RUFOCINEREA*, Carpenter.

Terebra rufocinerea, Carpenter, Cat. Mazatl. Moll. p. 386. no. 453.

Hab. Mazatlan.

103. *TEREBRA ALBOCINCTA*, Carpenter.

Terebra albocincta, Carpenter, Cat. Mazatl. Moll. p. 384. no. 450.

Hab. Mazatlan.

104. *TEREBRA CHILENSIS*, Desh.

T. testa elongato-subulata, castaneo-fusca, longitudinaliter tenue plicata; unfractibus numerosis, convexiusculis, sulco lato impresso inæqualiter bipartitis; sutura marginata; margine angusto crenulato; ultimo anfractu elongato, attenuato, fasciola albidula, transversim bipartito; apertura ovato-angusta, utrinque attenuata; columella angusta, cylindracea, apice attenuata, canali angusto-emarginata; extus contorta.

Long. 42 mill., larg. 8.

Hab. Les mers du Chili.

Ma Collection.

105. *TEREBRA BICINCTA*, Hinds.

Terebra bicincta, Hinds, Thes. Conch. p. 175. no. 71, pl. 44. f. 72.

Hab. — ?

106. *TEREBRA NODULARIS*, Desh.

T. testa elongato-angusta, acuminata, albida, luteo pallidissime tincta; unfractibus numerosis, circiter septemdecim, angustis, involutis, late bimarginatis, crenato-nodosis, plicatis, superne

transversim bistriatis; margine suturali crassiore, altero angustiore, paulo depressiore, æqualiter noduloso; ultimo anfractu brevissimo, obtuso, transversim basi striato; apertura minima, subquadrangulari, canali brevi et angusto terminata; columella cylindracea, bispicata.

Long. 35 mill., larg. 6.

Hab. Les Iles Sandwich.

Collection Cuming et la mienne.

Coquille remarquable par le double bourrelet noueux qui accompagne la suture; le premier est très-épais, le second est un peu moins saillant et un peu plus étroit; ils envahissent la presque totalité de la surface; le peu d'espace qui reste est occupé par deux, quelquefois trois stries transverses.

107. *TEREBRA VARIEGATA*, Gray.

Terebra variegata, Gray, Proc. Zool. Soc. 1834, p. 61; Hinds, Thes. Conch. p. 173. no. 64, pl. 43. f. 53.

Terebra africana, Gray dans Griff. An. Kingd. pl. 23. f. 5.

Hab. Golfe de Californie.

108. *TEREBRA GEMINATA*, Desh.

T. testa elongato-turrita, subulata, fusco alboque transversim fasciata; anfractibus planulatis, sulco lato profundo bipartitis, utroque latere serie granularum geminatis, superne costellatis; apertura ovato-oblonga, angusta, intus castanea; columella cylindracea, extus angulo albo lato acuto circumdata.

Long. 30 mill., larg. 7.

Hab. Cap Natal.

Collection Cuming.

109. *TEREBRA MARGINATA*, Desh. 1859. J. de Conchy. 6: 86

T. testa conica, turrita, acuminata, griseo-plumbea, basi anfractuum albo marginata, fusco irregulariter maculata; anfractibus latis, sulco divisus, longitudinaliter costellatis, transversim tenue striatis; margine suturali crasso, convexo, albo, nodulis crassis acutis asperato; ultimo anfractu basi obtuso, transversim sulcato, zonula alba notato; apertura elongato-angusta, intus castanea, labro linea alba bipartito; columella contorta, subplicata.

Long. 34 mill., larg. 8.

Hab. L'embouchure de la Gambie.

Collection Cuming.

110. *TEREBRA BREVICULA*, Desh.

T. testa elongato-turrita, griseo-fusca, longitudinaliter plicata, plicis latis, planis, undulatis; anfractibus planis, latis, albo marginatis, margine convexiusculo, fusco irregulariter punctato, ultimo anfractu basi dilatato, fasciola alba in medio bipartito, flammulis castaneis numerosis sæpius ornato; apertura elongato-subquadrata,

intus castanea; columella cylindracea, sub-uniplicata, extus angulo acuto marginata.

Long. 37 mill., larg. 8.

Hab. La Terre de Van Diemen.

Collection Cuming.

111. *TEREBRA BIFRONS*, Hinds.

Terebra bifrons, Hinds, Thes. Conch. p. 174, pl. 43. f. 57.

Hab. Japon.

112. *TEREBRA BRUGUIERI*, Desh.

T. testa elongata, turrita, angusta, apice acuminato, candida, rubro-purpurascens, pallido maculata et strigata; ultimo anfractu ad basin flavo-rubente; anfractibus angustis numerosis, sulco vix impresso divisus, supra marginem suturalem transversim striatis; costulis minutis, longitudinalibus, numerosis, regularibus, decussatis; ultimo anfractu brevi, retuso; apertura parva, ovata, utrinque attenuata, intus rosea; columella brevi, cylindracea, uniplicata, angulo minuto extus vix distincta.

Long. 42 mill., larg. 9.

Terebra hindsii, Desh., non Carpenter, Journ. de Conch. 1857.

Hab. La Chine.

Collection Cuming.

113. *TEREBRA AMÆNA*, Desh.

T. testa elongato-turrita, angusta, apice acuminato, flava, ad suturas albo rubroque alternatim maculata; anfractibus numerosis, angustis, planulatis, linea punctato-impressa inæqualiter divisus, longitudinaliter tenue regulariterque lirato-costulatis, interstitiis transversim tenue striatis; ultimo anfractu brevi, basi depressiusculo; apertura ovato-angusta, intus rufescente; columella cylindracea, subplicata, basi late profundeque emarginata, angulo acuto extus circumscripta.

Long. 24 mill., larg. 6.

Hab. Les mers de la Chine.

Collection Cuming.

114. *TEREBRA PULCHELLA*, Desh. 1859 Jde Conchy 6:94

T. testa elongato-turrita, acuminata, flavida, basi albo cincta; anfractibus planulatis, longitudinaliter arcuatim tenue plicatis, sulco impresso divisus, sulco utroque latere crenato, margine prominulo, convexo, regulariter plicato; apertura intus flava, elongato-angusta, canali brevi terminata; columella cylindracea, parum obliqua, alba, angulo acuto perobliquo extus circumdata.

Long. 40 mill., larg. 8.

Hab. Les mers de la Chine.

Collection Cuming et celle de M. Crosse.

115. *TEREBRA CRENIFERA*, Desh.

*T. testa elongato-subulata, angusta, albo-flavida; anfractibus numerosis, longitudinaliter tenue costellatis, sulco subimpresso divisis, ad suturam regulariter crenulatis, transversim tenue striatis, cre-
mulis albis, punctulis rubris interjectis; ultimo anfractu brevi,
canali elongato terminato; apertura elongato-angusta, flavida; co-
lumella cylindracea, apice contorta.*

Long. 30 mill., larg. 6.

Hab. Les mers de la Chine.

Collection Cuming.

116. *TEREBRA BLANDA*, Desh.

*T. testa elongato-turrita, acuminata, obsolete longitudinaliter plicata,
alba, ad suturam fusco punctata, flammulis pallidioribus ornata;
anfractibus numerosis, angustis, sulco impresso inæqualiter bi-
partitis, marginatis, ultimo breviusculo, attenuato; apertura elon-
gato-angusta, utrinque attenuata, alba, basi anguste emarginata;
columella elongata, apice acuminata.*

Long. 30 mill., larg. 8.

Hab. Les mers du Japon.

Collection Cuming.

117. *TEREBRA NEBULOSA*, Sow.

Terebra nebulosa, Sow. Tank. Cat. App. p. 25; Hinds, Thes. Conch. p. 162. no. 33, pl. 43. f. 51.

Hab. — ?

118. *TEREBRA PERTUSA*, Kiener.

Buccinum pertusum, Born, Mus. p. 267, pl. 10. f. 13.

Buccinum duplicatum, var. β , Gmel. p. 3501.

Terebra pertusa, Kiener, Icon. des Coq. Viv. p. 34. no. 20, pl. 11. f. 24, exclus. variat.

Hab. — ?

M. Kiener confond sous ce nom plusieurs espèces; il faut en exclure toutes les variétés. La première (24 a) nous est inconnue; la seconde (24 b) représente le *Terebra affinis*, Gray; la troisième (24 c) est notre *Terebra approximata*.

119. *TEREBRA ALVEOLATA*, Hinds.

Terebra alveolata, Hinds, Thes. Conch. p. 162. no. 34. pl. 45. f. 120.

Hab. Détroit de Malacca.

120. *TEREBRA UNDULATA*, Gray.

Terebra undulata, Gray, Proc. Zool. Soc. 1834, p. 60; Hinds, Thes. Conch. p. 172. pl. 43. f. 55.

Hab. Nouvelle Guinée; détroit de Malacca.

121. *TEREBRA COLUMELLARIS*, Hinds.

Terebra columellaris, Hinds, Thes. Conch. p. 172. no. 61, pl. 44. f. 77.

Hab. — ?

122. *TEREBRA FLAVESCENS*, Desh.

T. testa elongato-turrita, angusta, apice acuminato, omnino flava; anfractibus latiusculis, convexiusculis, subinvolutis, sulco impresso marginatis, sutura profunde separatis, longitudinaliter et arcuatim multicostatis, primis transversim striatis, alteris obsolete striatis; margine suturali crasso, regulariter crenato; ultimo anfractu basi convexo, canali brevi profunde emarginato terminato; apertura angusta, elongato-quadrata; columella cylindracea, obsolete buplicata.

Long. 45 mill., larg. 9.

Hab. Les Iles Sandwich.

Collection Cuming.

123. *TEREBRA AFFINIS*, Gray.

Terebra affinis, Gray, Proc. Zool. Soc. 1834, p. 60.

Terebra striata, Quoy & Gaim. (non Basterot) Voy. de l'Astr. t. ii. p. 468, pl. 36. f. 23, 24.

Terebra pertusa, var. C, Kiener, Icon. des Coq. Viv. pl. 11. f. 24 C.

Hab. Madagascar; Océan Indien, &c.

124. *TEREBRA CERITHINA*, Lamk.

Terebra cerithina, Kiener, Icon. des Coq. Viv. p. 33. no. 25, pl. 11. f. 25.

Buccinum aciculatum, Gmel. p. 3503. no. 145 ?

Hab. Philippines; Océan Austral.

125. *TEREBRA APPROXIMATA*, Desh.

T. testa elongato-acuminata, turrita, angusta, longitudinaliter costata, costulis apice albis interstitiis flavicantibus; anfractibus numerosis planis, linea vix impressa, inæqualiter bipartitis; interstitiis costularum densissime transversim striatis; ultimo anfractu cylindraceo, basi depressiusculo, costulis evanescentibus; apertura elongato-subquadrata, intus albo-flavicante; columella arcuata, cylindracea, basi canaliculata, late profundeque emarginata.

Var. *Testa paulo angustiore, flavo-ferruginea.*

Long. 42 mill., larg. 8.

Terebra pertusa, var. c, Kiener, Icon. des Coq. Viv. pl. 11. f. 24 C.

Hab. — ?

Ma Collection.

126. *TEREBRA SWAINSONI*, Desh.

T. testa elongato-turrita, solida, angusta, apice acuto, omnino colore mali armeniacy; anfractibus viginti, angustis, longitudinaliter

costatis, convexiusculis, primis transversim striatis, altèris lævigatis, sulco impresso, inæqualiter bipartitis; costis numerosis, acutis, regularibus, rectis; ultimo anfractu brevi, basi convexo; apertura minima, candidula, ovato-angusta, utrinque attenuata, canali brevi, angusto terminata; columella obliqua, uniplicata.

Long. 30 mill., larg. 5.

Hab. Les Iles Sandwich.

Collection Cuming.

127. *TEREBRA SUBANGULATA*, Desh.

T. testa elongato-subulata, flavida, longitudinaliter costata, transversim striata; anfractibus convexiusculis, inferne subangulatis, sulco vix impresso bipartitis, costulis latis, obtusis; ultimo anfractu elongato, superne attenuato, canali brevi, lato, terminato; apertura flava, elongato-angusta, subquadrata; columella angusta, apice acuta, basi cylindracea.

Long. 34 mill., larg. 7.

Hab. — ?

Ma Collection.

128. *TEREBRA COPULA*, Hinds.

Terebra copula, Hinds, Thes. Conch. p. 157. no. 19, pl. 44. f. 76.

Hab. Guinée.

129. *TEREBRA UNDATELLA*, Desh.

Terebra cancellata, Hinds (nec Quoy), Thes. Conch. p. 178. no. 80, pl. 44. f. 80.

Hab. — ?

Ce *Terebra cancellata* de Hinds constitue une espèce bien distincte de celle de MM. Quoy et Gaimard. Il suffit pour s'en convaincre de rapprocher les figures publiées par ces deux auteurs.

130. *TEREBRA BERMONTI*, Lorois.

Terebra bermonti, Lorois, Journ. de Conch. 1857, p. 389, pl. 12. f. 2.

Hab. Taïti.

131. *TEREBRA ROSEATA*, A. Adams et Reeve.

Terebra roseata, A. Adams et Reeve, Voy. du Samarang, p. 30, pl. 10. f. 24.

Hab. Iles Sooloo.

132. *TEREBRA BADIA*, Desh.

Terebra castanea, Hinds (nec Kiener), Thes. Conch. p. 161. no. 31, pl. 43. f. 59.

Hab. Guinée.

Nous avons dû changer le nom de l'espèce de M. Hinds parce qu'elle est très-distincte de celle de même nom publiée par M. Kiener ;

cette dernière est lisse, l'autre est fortement plissée ; elle a les tours simples, la seconde les a partagés par un sillon transverse, &c.

133. *TEREBRA ALBICOSTA*, A. Adams et Reeve.

Terebra albicosta, A. Adams et Reeve, Voy. du Samarang, p. 30, pl. 10. f. 21.

Hab. Mers de la Chine.

134. *TEREBRA PULCHRA*, Hinds.

Terebra pulchra, Hinds, Thes. Conch. p. 178. no. 81, pl. 45. f. 129.

Hab. Iles Marquises.

135. *TEREBRA TEXTILIS*, Hinds.

Terebra textilis, Hinds, Thes. Conch. p. 177. no. 79, pl. 44. f. 73.

Hab. Baie de Manille ; détroit de Macassar.

136. *TEREBRA FLAVA*, Gray.

Terebra flava, Gray, Proc. Zool. Soc. 1844, p. 60 ; Hinds, Thes. Conch. p. 177. no. 77, pl. 44. f. 75.

Hab. — ?

137. *TEREBRA EXIGUA*, Desh.

T. testa minima, elongato-angusta, castaneo-livida ; costellis longitudinalibus sulcisque transversis clathratis ; anfractibus numerosis, angustis ; sulco impresso transversali inaequaliter bipartitis ; margine suturali oblique crenulato, transversim tenue striato ; apertura elongato-angusta, intus castaneo-rubescens ; columella cylindracea, brevi, extus angulo acutissimo angusto basi circumdata.

Long. 19 mill., larg. $3\frac{1}{2}$.

Hab. La côte orientale d'Australie.

Collection Cuming.

138. *TEREBRA POLYGYRATA*, Desh.

T. testa minima, elongato-angusta, subulata, pallide rufescente, fascia alba ad suturam ornata, longitudinaliter plicata, transversim minutissime striata, striis profundis, regularibus ; anfractibus numerosis, angustis, convexiusculis, ultimo basi obtuso, canali brevi, contorto terminato ; apertura minima, angusta, subquadrangulari, superne anguste et profunde emarginata ; columella cylindracea, contorta.

Long. 13 mill., larg. 3.

Hab. Les Iles Philippines.

Collection Cuming.

Petite espèce remarquable par son élégance. Les tours nombreux et étroits sont partagés en deux zones inégales par un sillon légèrement déprimé : elle se sépare plus facilement encore par la différence de coloration ; car la zone marginale est d'un beau blanc, tandis que le reste est d'un fauve pâle. La surface des tours est ornée d'un

grand nombre de petites côtes légèrement courbées, dans l'intervalle desquelles existent un grand nombre de fines stries, transverses, régulières, que l'on voit aussi bien sur le bourrelet marginal que sur le reste de la surface.

139. *TEREBRA RADULA*, Hinds.

Terebra radula, Hinds, Thes. Conch. p. 174. no. 68, pl. 44. f. 95.

Hab. Porto Portrero ; côte ouest de l'Amérique.

140. *TEREBRA ASPERA*, Hinds.

Terebra aspera, Hinds, Thes. Conch. p. 174. no. 67, pl. 43. f. 44.

Hab. Panama ; Monte Christi ; S^{te} Elena.

141. *TEREBRA PETIVERIANA*, Desh.

Terebra petiveriana, Petiver, Gazoph. pl. 75. f. 5.

T. testa elongato-turrita, acuminata, fusco-nigrescente, fasciola albicante basi notata ; anfractibus planiusculis, sulco profundo impresso divisus, longitudinaliter costellatis, transversim striato-sulcatis, profunde decussatis, subgranulosis ; margine suturali regulariter crenato-plicato ; apertura intus nigrescente, ovato-oblonga, antice angusta, canali brevi terminata ; columella atrata, contorta, extus angulo prominente acutissimo circumdata.

Long. 42 mill., larg. 10.

Hab. Panama.

Collection Cuming.

Cette intéressante et belle espèce a été très bien figurée autrefois dans le remarquable ouvrage de Petiver.

142. *TEREBRA GLAUCA*, Hinds.

Terebra glauca, Hinds, Thes. Conch. p. 175. no. 70, pl. 44. f. 85.

Hab. — ?

143. *TEREBRA RUDIS*, Gray.

Terebra rudis, Gray, Proc. Zool. Soc. 1834, p. 60 ; Hinds, Thes. Conch. p. 165. no. 43, pl. 43. f. 60 (exclusa *T. petiti*, Kiener).

Hab. — ?

144. *TEREBRA PEASII*, Desh.

T. testa elongato-turrita, crassa, solida, apice acuta, albo flavidoque pallido alternatim picta ; anfractibus circiter sexdecim, lutis, longitudinaliter tenue plicatis, striis transversis puncticulatis, decussatis, sulco impresso, profundo, inæqualiter divisus ; margine suturali regulariter plicato, plicis albis ; apertura alba, elongato-angusta, subquadrata, canali brevi, angusto, profundo terminata ; columella conica, uniplicata, angulo acuto extus basi marginata.

Long. 45 mill., larg. 9.

Hab. Les Iles Sandwich.

Collection Cuming.

Les stries transverses se voient sur toute la surface, même entre les plis du bourrelet marginal.

145. *TEREBRA TUBEROSA*, Hinds.

Terebra tuberosa, Hinds, Thes. Conch. p. 183. no. 97, pl. 45. f. 99.

Hab. — ?

A la juger par la figure, cette coquille semblerait un Cérîte dont l'ouverture aurait été mutilée ou serait restée imparfaite.

146. *TEREBRA VARICOSA*, Hinds.

Terebra varicosa, Hinds, Thes. Conch. p. 163. no. 37, figuré dans le texte.

Hab. Golfe de Papagayo, côte ouest de l'Amérique.

147. *TEREBRA TUBERCULOSA*, Hinds.

Terebra tuberculosa, Hinds, Thes. Conch. p. 175. no. 73, pl. 43. f. 48.

Hab. Panama ; Golfe de Papagayo ; San Blas.

148. *TEREBRA INTERTINCTA*, Hinds.

Terebra intertincta, Hinds, Thes. Conch. p. 173. no. 65, pl. 44. f. 81.

Hab. Gambie.

149. *TEREBRA PLICATA*, Gray.

Terebra plicata, Gray, Proc. Zool. Soc. 1834, p. 61 ; Hinds, Thes. Conch. p. 165. no. 44, pl. 43. f. 61.

Hab. Guayaquil.

150. *TEREBRA SPECILLATA*, Hinds.

Terebra specillata, Hinds, Thes. Conch. p. 163. no. 35, pl. 44. f. 96, et pl. 45. f. 116.

Hab. San Blas, Mexico.

Lorsque l'on rapproche les deux figures qui, dans l'ouvrage de M. Hinds, doivent représenter la même espèce, on est étonné des différences que l'on y remarque ; elles se montrent non-seulement dans la forme générale et la coloration, mais encore dans les caractères plus essentiels de l'ouverture et de la columelle. Il est probable que deux espèces sont ici confondues.

151. *TEREBRA LARVIFORMIS*, Hinds.

Terebra larviformis, Hinds, Thes. Conch. p. 176. no. 73, pl. 43. f. 46, 47.

Hab. Santa Elena, Monte Christi, côte ouest de l'Amérique.

Nous avons à présenter sur cette espèce la même observation que sur la précédente. Les deux figures citées par l'auteur semblent représenter deux espèces distinctes ; l'une ayant l'ouverture plus courte, le bord droit, plus long que la columelle, &c.

152. *TEREBRA SOULEYETI*, Desh.

T. testa elongato-acuminata, longitudinaliter dense plicata, trans-

versim tenuiter striata, griseo-rufescente; anfractibus numerosis, angustis, vix convexiusculis, sulco impresso, profundeque punctato inæqualiter bipartitis; margine suturali angusto, crenato, plicato; ultimo anfractu brevi, basi obtuso; apertura minima, brevi, angusta; columella cylindræa, contorta, canali brevi terminata.

Long. 49 mill., larg. 8.

Hab. Golfe de Mexique.

Ma Collection.

Le *Terebra larviformis* est l'espèce qui se rapproche le plus de celle-ci; elle en est différente par plusieurs caractères qui nous semblent suffisamment exprimée aussi bien dans la phrase caractéristique de M. Hinds que dans la nôtre. Les tours sont nombreux, étroits, à peine convexes; nous en comptons 24; ils sont chargés de petites côtes un peu obliques, rapprochées, un peu onduleuses sur le dernier tour, vers la base duquel elles disparaissent pour être remplacées par de fines stries transverses: ces stries se continuent sur le reste de la surface dans les interstices des côtes seulement. Le bourrelet marginal est étroit; mais il est nettement séparé par un sillon assez profond dans lequel s'enfonce une ponctuation plus profonde encore. Dans l'intervalle de chaque côte, des plis formant crenelure sur la suture terminent les côtes longitudinales.

153. *TEREBRA DIFFICILIS*, Desh.

T. testa elongato-turrita, albo-flavicante, longitudinaliter densissime costellata; anfractibus numerosis, angustis, sulco impresso inæqualiter bipartitis, transversim superne substriatis; ultimo anfractu brevi, basi obtuso; apertura minima, elongato-angusta; columella cylindræa, contorta, subplicata, basi profunde emarginata.

Long. 33 mill., larg. 8.

Hab. — ?

Ma Collection.

154. *TEREBRA CÆLATA*, A. Adams et Reeve.

Terebra cælata, A. Adams et Reeve, Voy. du Samarang, p. 30. no. 3, pl. 10. f. 22.

Hab. Philippines.

155. *TEREBRA TORQUATA*, A. Adams et Reeve.

Terebra torquata, A. Adams et Reeve, Voy. du Samar. p. 30. no. 6, pl. 10. f. 13.

Hab. Mers de la Chine.

156. *TEREBRA ELATA*, Hinds.

Terebra elata, Hinds, Thes. Conch. p. 177. no. 78, pl. 44. f. 68, 69.

Hab. Baie de Montijo.

157. *TEREBRA CANCELLATA*, Quoy et Gaimard.

Terebra cancellata, Quoy et Gaim. Voy. de l'Astr. t. ii. p. 471, pl. 36. f. 27, 28.

Cette espèce est celle à laquelle le nom de *cancellata* doit rester. La coquille nommée *cancellata* par M. Hinds est très-distincte; nous lui avons donné le nom de *T. undatella*.

158. *TEREBRA CINCTELLA*, Desh.

T. testa elongato-angusta, subulata, longitudinaliter costellata, griseo-fusca, livida, nitida; anfractibus convexiusculis, sulco lato inæqualiter bipartitis, transversim striatis, striis quatuor vel quinque impressis; ultimo anfractu brevi, fasciola pallida cincto; apertura minima, ovato-angusta, extremitatibus attenuata, intus fusca; columella brevi, cylindræa, basi canali brevi terminata.

Long. 29 mill., larg. 6.

Hab. L'embouchure de l'Indus.

Collection Cuming.

159. *TEREBRA AREOLATA*, A. Adams et Reeve.

Terebra areolata, A. Adams et Reeve, Voy. du Samarang, p. 30. no. 4, pl. 10. f. 23.

Hab. Mers de la Chine.

160. *TEREBRA PLUMBÆA*, Quoy et Gaim.

Terebra plumbea, Quoy et Gaim. Voy. de l'Astrol. t. ii. p. 470, pl. 36. f. 29, 30.

Hab. Iles Moluques.

A juger d'après les figures il y aurait trois espèces réunies sous ce nom—celle de M. Quoy, qui reste le type spécifique, celle de M. Kiener, et celle de M. Hinds. De deux choses, l'une ou les espèces sont fidèlement représentées, et alors elles diffèrent entre elles, ou les figures sont mauvaises et les coquilles reproduites ont besoin d'une nouvelle étude comparative.

161. *TEREBRA VIOLASCENS*, Hinds.

Terebra violascens, Hinds, Thes. Conch. p. 177. no. 76, pl. 44. f. 98.

Hab. Nouvelle Guinée; Philippines.

162. *TEREBRA PICTA*, Hinds.

Terebra picta, Hinds, Thes. Conch. p. 176. no. 75, pl. 45. f. 105.

Hab. Philippines.

163. *TEREBRA DECUSSATA*, Phil.

Terebra decussata, Philippi, Zeits. für Malak. 1851, p. 124. no. 48.

Hab. — ?

164. *TEREBRA BELCHERI*, Phil.*Terebra belcheri*, Philippi, Zeits. für Malak. 1851, p. 123. no. 47.*Hab.* — ? (Du Voyage du *Belcher*.)165. *TEREBRA FRIGATA*, Hinds.*Terebra gracilis*, Gray, 1834 (nec Lea, 1833), Proc. Zool. Soc. p. 61 ; Hinds, Thes. Conch. p. 163. no. 38, pl. 44. f. 71.*Hab.* Afrique (*Gray*) ; Iles Galapagos (*Cuming*).166. *TEREBRA CONSPERSA*, Hinds.*Terebra conspersa*, Hinds, Thes. Conch. p. 163. no. 36, pl. 44. f. 74.*Hab.* Ile Samao, Philippines.167. *TEREBRA RUSTICA*, Hinds.*Terebra rustica*, Hinds, Thes. Conch. p. 183. no. 98, pl. 45. f. 113.*Hab.* — ?168. *TEREBRA SUBDIVISA*, Phil.*Terebra subdivisa*, Phil. Zeits. für Malak. 1851, p. 96. no. 46.*Hab.* — ?169. *TEREBRA NASSOIDES*, Hinds.*Terebra nassoides*, Hinds, Thes. Conch. p. 182. no. 95, pl. 45. f. 115.*Hab.* —.170. *TEREBRA FICTILIS*, Hinds.*Terebra fictilis*, Hinds, Thes. Conch. p. 183. no. 96, pl. 45. f. 109, 110.*Hab.* Australie.171. *TEREBRA TRISTIS*, Desh.*T. testa elongato-turrita, conoidea, albo-grisea, longitudinaliter fusco flammulata ; costulis crassis, regularibus, in ultimo anfractu evanescentibus ornata ; anfractibus convexiusculis, ultimo basi obtuso, canali lato, brevi, contorto, terminato ; apertura ovato-angusta, utrinque attenuata ; columella brevi, cylindracea, contorta.*

Long. 19 mill., larg. 9.

Hab. Les mers du Japon.

Collection Cuming.

Petite coquille assez singulière qui devra se placer sur la limite du genre, comme un intermédiaire avec les Buccins : elle est turriculée, mais assez large à la base ; ses tours assez larges sont convexes ; ils portent de grosses côtes longitudinales un peu obliques, larges, obtuses et peu saillantes : il n'existe aucune trace de bourrelet marginal, et l'on n'y trouve aucune strie transverse. Sur un fond d'un blanc grisâtre se dessinent des flammules inégales, d'un brun fauve, interrompues à la circonférence du dernier tour par une large zone blanch-

âtre, au dessus de laquelle est nettement circonscrite une autre zone également large, d'un brun livide, qui occupe toute la base de ce dernier tour.

DEUXIÈME DIVISION (*Terebra*, A. Adams).

172. *TEREBRA ROBUSTA*, Hinds.

Terebra robusta, Hinds, Thes. Conch. p. 155. no. 5, pl. 42. f. 35.

Hab. Panama ; Golfe de Nicoya ; Golfe de Papayo ; San Blas.

173. *TEREBRA OCLATA*, Lamk.

Terebra oculata, Kiener, Icon. des Coq. Viv. p. 11. no. 7, pl. 4. f. 7.

Hab. Moluques ; Iles de la Société, Océan Pacifique.

174. *TEREBRA ORNATA*.

Terebra ornata, Gray, Proc. Zool. Soc. 1834, p. 62 ; Reeve, Conch. Syst. t. ii. p. 245, pl. 274. f. 1.

Hab. Galapagos.

175. *TEREBRA FORMOSA*, Desh. 1857. J.d.C. 6: 65

T. testa turrita, conico-subulata, solida, alba, maculis quadratis inæqualiter biserialiter ornata ; anfractibus planulatis, indivisis, in margine crenulatis, biserialiter granulosis, crenulis granulisque in ultimis anfractibus evanidis, ultimo brevi triserialiter maculato ; apertura brevi, angusta, superne canali lato, elongato, contorto terminata ; columella brevi, crassa, cylindracea.

Long. 72 mill., larg. 13.

Hab. Panama.

Collection Cuming.

176. *TEREBRA SUBULATA*, Lamk.

Buccinum subulatum, Linn. Syst. Nat. ed. 12. p. 1205 ; Kiener, Icon. des Coq. Viv. p. 10. no. 6, pl. 4. f. 6.

Hab. Madagascar ; Océan Indien ; Iles de la Société.

177. *TEREBRA INCOMPARABILIS*, Desh.

T. testa elongato-turrita, acuminata, pallide albo-lutescente maculis magnis castaneis, quadratis, approximatis, biserialiter picta ; ultimo anfractu seriebus tribus ornato ; anfractibus angustis, convexiusculis, subinvolutis, late bimarginatis, transversim striato-punctatis ; margine suturali latiore, in anfractibus primis crenulato, in alteris plicato ; ultimo anfractu basi convexo, lævigato, canali brevi terminato ; apertura alba, elongato-angusta, subquadrata ; columella alba, cylindracea, uniplicata.

Long. 85 mill., larg. 13.

Hab. Panama.

Collection Cuming.

Cette belle espèce a beaucoup de rapports avec le *Terebra maculata* de Lamarck: la coloration est la même, seulement les taches sont plus nombreuses et plus serrées; les tours de spire sont en proportion plus étroits, plus enveloppants, et leur surface présente une structure particulière.

178. *TEREBRA LIGATA*, Hinds.

Terebra ligata, Hinds, Thes. Conch. p. 166. no. 48, pl. 45. f. 117, 118.

Hab. Iles Marquises.

179. *TEREBRA CONSOBRINA*, Desh. 1859 J de Conch 6172

T. testa elongato-subulata, turrita, alba; anfractibus planulatis, sulco vix perspicuo transversim divis, maculis quadratis fuscis, biseriatim cinctis; ultimo tricolorato; primis in margine suturali nodoso-crenatis, transversim striatis, alteris laevigatis; apertura vix obliqua, elongato-angusta, subquadrata, intus alba, canali brevissimo, lato, terminata; columella brevi, alba, superne uniplicata, extus angulo minimo circumdata.

Long. 93 mill., larg. 12.

Hab. La Mer Rouge.

Collection Cuming et la mienne.

180. *TEREBRA INSIGNIS*, Desh. 1859 J de Conch 6170

T. testa elongato-conica, acuminata, solida, alba, in medio anfractuum maculis magnis castaneis quadrato-oblongis irregularibus ornata; anfractibus numerosis, angustis, convexiusculis, sulco impresso divis, primis regularibus, plicato-arcuatis, alteris plicis distantioribus, crassis, ultimis laevigatis, ultimo brevi, biseriatim picto, basi coarctato; apertura angusta, brevi, recta, canali brevi, lato profundoque terminata; columella brevi, cylindracea, superne uniplicata, extus angulo prominenti, acuto, circumdata.

Long. 78 mill., larg. 15.

Hab. Panama.

Collection Cuming.

181. *TEREBRA LINGUALIS*, Hinds.

Terebra lingualis, Hinds, Thes. Conch. p. 167. no. 49. pl. 43. f. 50.

Hab. Golfe de Papagayo; Baie de Montijo.

182. *TEREBRA HISTRIO*, Desh. 1859 J de Conch. 6176

T. testa elongato-subulata, crassiuscula, pallide albo-lutescente, maculis longitudinalibus fusco-castaneis subundatis picta, ad suturas lineis rufo-rubrescentibus fimbriata, maculis in ultimo anfractu ad peripheriam interruptis; anfractibus numerosis, angustis, planis, sulco divis; margine suturali plano, in primis anfractibus granuloso, in alteris plicato; ultimo anfractu basi depressiusculo; apertura angusta, parum obliqua, subquadrata,

canali brevi, contorto terminata ; columella alba, brevi, valde contorta.

Long. 48 mill., larg. 11.

Hab. — ?

Ma Collection.

183. *TEREBRA HOPEI*, Lorois.

Terebra hopei, Lorois, Journ. de Conch. 1857, p. 388, pl. 12. f. 1.

Hab. — ?

184. *TEREBRA FLAMMEA*, Lamk.

Terebra flammea, Kiener, Icon. des Coq. Viv. p. 12. no. 8, pl. 2. f. 10.

Hab. Madagascar ; Océan de l'Inde.

185. *TEREBRA MYUROS*, Lamk.

Buccinum strigilatum (pro parte), Gmel. p. 3501.

Buccinum commaculatum, Gmel. p. 3502. no. 143.

Terebra commaculata (ex parte), Hinds, Thes. Conch. p. 170. no. 58 (exclusa Lamarckii).

Terebra scabrella (vide Lamk. An. s. Vert. 2 ed. t. x. p. 248. note).

Hab. Océan de l'Inde ; les Moluques.

186. *TEREBRA SCABRELLA*, Lamk.

Terebra scabrella, Lamk. An. s. Vert. 2 ed. t. x. p. 247. no. 19.

Terebra myuros, var., Kiener, Icon. des Coq. Viv. pl. 14. f. 34 a.

Terebra commaculata (ex parte), Hinds, Thes. Conch. p. 170. no. 58, pl. 42. f. 37.

Hab. Nouvelle Guinée.

187. *TEREBRA CONSORS*, Hinds.

Terebra consors, Hinds, Thes. Conch. p. 154. no. 9, pl. 42. f. 26.

Hab. Iles de la Société.

188. *TEREBRA ARGUS*, Hinds.

Terebra argus, Hinds, Thes. Conch. p. 154. no. 10, pl. 43. f. 64.

Hab. Iles de la Société.

189. *TEREBRA CHINENSIS*, Desh.

T. testa elongato-turrita, angusta, subulata, albo-flavidula ; anfractibus numerosis, angustis, tenuiter transversim striatis, sulco impresso inæqualiter bipartitis, ultimo anfractu cylindræco, basi attenuato ; apertura elongato-angusta, subquadrata, margine acuto concavo ; columella cylindræca, lata, contorta.

Long. 49 mill., larg. 7.

Hab. Les mers de la Chine.

Ma Collection.

190. *TEREBRA TRICOLOR*, Sow.*Terebra tricolor*, Sow. Tank. Cat. App. p. 24.*Terebra tæniolata*, Quoy & Gaim. Voy. de l'Astr. p. 446, pl. 36. f. 25, 26.*Hab.* Tongatabou ; Ile St. Thomas.191. *TEREBRA LÆVIGATA*, Gray.*Terebra lævigata*, Gray, Proc. Zool. Soc. 1834, p. 61 ; Hinds, Thes. Conch. p. 171. no. 60, pl. 44. f. 93.*Hab.* Ceylon.192. *TEREBRA VIRGINEA*, Desh. 1859 *Id. Conchy* 6: 68*T. testa elongato-angusta, subulata, lævigata, nitida, omnino candidissima ; anfractibus latis, planis, sulco divisis, sutura subcrenulata separatis ; ultimo anfractu brevi, basi obiuo ; apertura brevi, obliqua, ad basin dilatata, profunde emarginata ; columella conica, simplici, basi extus angulo circumdata.*

Long. 52 mill., larg. 11.

Hab. Zanzibar.

Collection Cuming.

193. *TEREBRA OBSOLETA*, Desh.*T. testa elongato-turrita, acuminata, angusta, pallide flavida ; anfractibus numerosis, angustis, stria impressa subæqualiter bipartitis ; margine suturali lato, obsolete plicato, lævigato, candido ; altera parte anfractuum transversim tenuiter striata, striis subæqualibus, minutis ; ultimo anfractu brevi, basi obtuso ; apertura minima, alba, subquadrata, basi anguste profundeque emarginata ; columella brevi, contorta, cylindræa.*

Long. 40 mill., larg. 7 mill.

Hab. — ?

Ma Collection.

194. *TEREBRA BABYLONIA*, Lamk.*Terebra striata*, Gray (fide Hinds), Proc. Zool. Soc. 1834, p. 60 ; Kiener, Icon. des Coq. Viv. p. 38, pl. 14. f. 35.*Hab.* Mers de la Chine ; Iles de la Société, &c.Il faut exclure de l'espèce la Var. 35 a. de M. Kiener ; elle constitue une espèce distincte nommée *Terebra straminea* par M. Gray.195. *TEREBRA COLUMNARIS*, Desh.*T. testa elongato-subulata, angusta, alba ; anfractibus numerosis, primis convexiusculis, marginatis, ultimis convexiusculis, simplicibus, transversim minutissime striatis ; ultimo anfractu brevi, basi obtuso, canali brevi latoque terminato ; apertura minima, ovato-subquadrata ; columella contorta, cylindræa, angulo acuto extus marginata.*

Long. 47 mill., larg. 8.

Hab. — ?

Ma Collection.

196. *TEREBRA STRAMINEA*, Gray.

Terebra straminea, Gray, Proc. Zool. Soc. 1834, p. 62.

Terebra babylonia, var., Kiener, Icon. des Coq. Viv. pl. 14. f. 35 a.

Hab. Tranquebar; mer de la Chine.

197. *TEREBRA PALLIDA*, Desh. 1857. *J. de Conchy.* 6: 87

T. testa elongato-angusta, acuminata, subulata, omnino flavo-aureantia; anfractibus numerosis, angustis, primis planis, ultimis convexiusculis, sulco divisis, transversim tenue striatis, striis incisis, inæqualiter distantibus; margine suturali simplici, vix distincto; ultimo anfractu elongato, basi attenuato, tenuiter et obsolete striato; apertura elongata, angusta, canali longo, recto terminata, late profundeque emarginata; columella cylindræoconica.

Long: 72 mill., larg. 11.

Hab. Les Iles Marquises.

Collection Cuming.

198. *TEREBRA CUMINGII*, Desh. 1857. *J. de Conchy.* 6: 66

T. testa pulcherrima, elongato-angusta, turrita, alba pallide lutescente; anfractibus triginta, angustis, sulco impresso divisis; margine suturali duplicato; altero convexiusculo, eleganter crenulato-plicato, transversim tenuiter striato; altero unica serie granulorum formato; anfractibus in medio parum excavatis, elegantissime costulis longitudinalibus striisque transversalibus clathratis, striis mediis superisque majoribus; ultimo anfractu brevi, superne obtuso, striato; apertura minima, quadrata, canali brevi angusto terminata; columella cylindræa, contorta, simplici.

Long. 95 mill., larg. 12.

Hab. Chine.

Collection Cuming.

La plus belle et la plus remarquable espèce du genre.

199. *TEREBRA PRETIOSA*, Reeve.

Terebra pretiosa, Reeve, Proc. Zool. Soc. 1842, p. 200; Conch.

Syst. t. ii. p. 245, pl. 274. f. 2.

Hab. Chine.

200. *TEREBRA FENESTRATA*, Hinds.

Terebra fenestrata, Hinds, Thes. Conch. p. 176. no. 74, pl. 44. f. 86.

Hab. — ?

201. *TEREBRA REGINA*, Desh. 1857. *J. de Conchy.* 6: 67

T. testa elongato-subulata, angusta, multispirata, alba, triseriatim maculis fuscis vel castaneis parvulis picta; anfractibus angustis, sulco impresso transversaliter divisis, lævigatis; margine tenuiter et eleganter crenulato, crenulis albis, interstitiis macula pallide fusca notatis; ultimo anfractu quadrifariam maculato, superne

coarctato, canali longo terminato; apertura elongato-angusta, subquadrata; columella brevi, uniplicata, valde contorta, extus angulo acuto proeminente oblique circumdata.

Long. 89 mill., larg. 13.

Hab. Le Sénégal.

Collection Cuming.

202. *TEREBRA LIMA*, Desh.

1857 J de Conch 6:69

T. testa elongato-angusta, subulata, turrata, pallide flavicante, flammulis flavo-rufescentibus pallidis picta; ultimo anfractu basi fulvo tincto; anfractibus numerosis, angustis, sulco utroque latere marginato bipartitis, transversim striatis; longitudinaliter plicis undulatis, decussatis, in intersectionibus subgranulatis, asperatis; ultimo anfractu brevi, basi plano; apertura brevi, angusta, subquadrangulati, canali longo, angusto, contorto terminata; columella alba, contorta, in medio extus angulata.

Long. 78 mill., larg. 11.

Hab. Les mers de la Chine.

Collection Cuming.

203. *TEREBRA SUCCINEA*, Hinds.

Terebra succinea, Hinds, Thes. Conch. p. 151. no. 4. pl. 42. f. 40.

Hab. — ?

204. *TEREBRA FORTUNII*, Desh.

1857, J de Conchy 6:99

T. testa elongato-angustissima, subulata, subscalaroides, omnino candida; anfractibus numerosis, latis, convexiusculis, longitudinaliter costatis, transversim tenue sulcatis, decussatis; ultimo elongato, basi attenuato; apertura elongato-angusta, subquadrangulati, antice canali prælongo, angusto terminata.

Long. 69 mill., larg. 9.

Hab. Les mers de la Chine.

Collection Cuming.

205. *TEREBRA MONILIS*, Quoy et Gaim.

Terebra monilis, Quoy et Gaim. Voy. de l'Astr. t. ii. p. 467, pl. 36. f. 21, 22.

Hab. Iles Marquises; Iles de la Société, Tahiti.

206. *TEREBRA SEROTINA*, A. Adams et Reeve.

Terebra serotina, A. Adams et Reeve, Voy. du Samarang, p. 30. no. 1, pl. 10. f. 20.

Hab. Japon.

207. *TEREBRA FUNICULATA*, Hinds.

Terebra funiculata, Hinds, Thes. Conch. p. 168. no. 51, pl. 43. f. 63.

Hab. — ?

208. *TEREBRA CORRUGATA*, Lamk.

Terebra punctata, Gray (teste Hinds), Proc. Zool. Soc. 1834, p. 61.
Terebra corrugata, Kiener, Icon. des Coq. Viv. p. 35. no. 20, pl. 13.
 f. 31 (exclusa varietate).

Hab. — ?

M. Kiener confond évidemment deux espèces sous ce nom. Sa variété *junior* constitue pour nous l'espèce suivante. Nous sommes redevable à M. Crosse de connaître en nature cette belle et rare espèce.

209. *TEREBRA BITORQUATA*, Desh.

Terebra corrugata, var. *junior*, Kiener, Icon. des Coq. Viv. p. 25.
 note, pl. 13. f. 31 a.

T. testa elongato-turrita, angusta, acuminata, multispinata, pallide flava, flammulis longitudinalibus castaneis picta, punctulis concoloribus, interstitialibus in margine suturali regulariter dispositis; anfractibus angustis, superne ad suturam inflato-bimarginatis, marginibus inaequalibus, regulariter granulosis; margine inferiore majore; ultimo anfractu brevi, flammulis ad peripheriam interruptis; apertura brevi, subquadrata, margine dextro paulo excavato; columella brevi, cylindracea, contorta, basi anguste et profunde emarginata.

Long. 75 mill., largeur à la base 15.

Hab. — ?

Collection de M. Crosse.

Nous soupçonnions depuis longtemps que la variété *junior* du *Terebra corrugata* de M. Kiener devait constituer une espèce distincte, mais n'ayant sous les yeux ni le type de Lamarek ni la variété de M. Kiener, nous avons hésité de les séparer jusqu'au moment où M. Crosse voulut bien nous communiquer un bel individu adulte de la variété de M. Kiener. Dès lors les doutes disparurent, car cette coquille est en effet parfaitement distincte du *corrugata*. Elle est particulièrement remarquable par la double collier de perles qui accompagne la suture, la rangée supérieure est la plus grosse et la plus épaisse, et l'intervalle des granulations est occupée par une linéole d'un beau brun.

210. *TEREBRA CINGULIFERA*, Lamk.

Terebra cingulifera, Kiener, Icon. des Coq. Viv. p. 39. no. 34, pl. 13. f. 30.

Hab. Nouvelle Hollande.

En comparant à celle de M. Kiener la figure du *cingulifera* de M. Hinds, on y remarque des différences telles que l'on pourrait séparer cette dernière sous un nom spécifique particulier.

211. *TEREBRA LOROISI*, Desh.

Terebra nebulosa, Lorois (nec Sow. nec Kiener), Journ. de Conch. 1858, p. 90, pl. 1. f. 4.

Hab. — ?

Nous avons substitué au nom de *nebulosa*, qui ne pouvait lui rester, celui de l'amateur plein de zèle auquel est dû la connaissance de cette espèce.

212. *TEREBRA ALBOMARGINATA*, Desh.

T. testa elongato-turrita, angusta, acuminata, aurantiaca, albo-marginata; anfractibus numerosis, angustis, planis, sulco impresso inaequaliter divisus, transversim striato-punctatis, striis quatuor; ultimo anfractu brevi, obtuso, canali brevi, contorto, angusto terminato; apertura minima, pallide lutea, ovato-subquadrata, angusta, extremitatibus attenuata; columella cylindracea, contorta, uniplicata.

Long. 44 mill., larg. 8.

Hab. L'Australie.

Collection Cuming.

Très-belle espèce rapprochée du *cingulifera* de Lamk., mais parfaitement distincte de ses congénères par sa coloration remarquable et les autres accidents de sa surface; le bourrelet blanc qui suit la suture est plissé et finement crénelé.

213. *TEREBRA EXIMIA*, Desh.

T. testa elongato-angusta, subulata, candida, ad suturam rufo regulariter punctata; anfractibus numerosis, angustis, subaequaliter sulco impresso divisus; margine suturali convexiusculo, crenulato; in altera parte anfractuum striis tribus granulosus, profunde punctatis; columella brevi, cylindracea, biplicata.

Long. 92 mill., larg. 8.

Hab. — ?

Ma Collection.

214. *TEREBRA DECORATA*, Desh. 1859. *Ide Conch.* 6:75

T. testa minima, elongato-angusta, acuminata, alba, fusco-castanea, biseriatim punctata, ultimo anfractu punctulis triserialibus; anfractibus numerosis, angustis, laevigatis, sulco impresso divisus; margine suturali candido, convexo, noduloso; apertura brevissima, subquadrangulari; columella brevi, cylindracea, subuniplicata, extus angulo vix prominente circumdata.

Long. 28 mill., larg. 6.

Hab. Pidang (Ile Sumatra).

Collection Cuming.

215. *TEREBRA TESSELLATA*, Gray.

Terebra tessellata, Gray, Proc. Zool. Soc. 1834, p. 61; Hinds, Thes. Conch. p. 166. no. 47, pl. 45. f. 124.

Hab. — ?

216. *TEREBRA ARCHIMEDIS*, Desh.

T. testa elongato-subulata, turrita, albo-eburnea; anfractibus numerosis, angustis, transversim inaequaliter tricostatis, costula suturali

proeminentiore interstitiis profundis, minutissime punctulatis; ultimo anfractu brevissimo, basi depresso, transversim tenuiter sulcato; apertura minima, brevi, ovato-subquadrata, alba; columella cylindracea, brevi, ad apicem contorta, canali brevi, latoque terminata.

Long. 31 mill., larg. 6.

Hab. —?

Ma Collection.

217. *TEREBRA AMANDA*, Hinds.

Terebra amanda, Hinds, Thes. Conch. p. 166. no. 46, pl. 45. f. 100.

Hab. Détroit de Macassar.

218. *TEREBRA CIRCINATA*, Desh. 1857 *Ide Conchy* 6:99

T. testa elongato-subulata, angusta, fusca; anfractibus numerosis, angustis, in medio excavatis, ad suturam biserialim plicato-crenatis, bimarginatis, in medio transversim quadristriatis; ultimis anfractibus plicis longitudinalibus decussatis, ultimo ad peripheriam sulco majore crenulato circumdato; apertura minima, elongato-angusta, canali contorto, brevi latoque terminata; labro sinistro proeminente.

Var. β . *Testa minore margine, suturali latiore.*

Long. 42 mill., larg. 6.

Hab. Mers de la Chine.

Collection Cuming et la mienne.

219. *TEREBRA ACUTA*, Desh. 1857 *Ide Conchy* 6:100

T. testa turrato-subulata, angusta, polygyrata, omnino fusco-fulginea; anfractibus numerosis, angustis, plano-concaviusculis, sulco inæqualiter divisus, transversim tenuè striatis; margine suturali convexo, in anfractibus primis granuloso, in sequentibus plicato, crenato; ultimo anfractu brevi, basi striato; apertura minima, intus fusca, canali brevi lato terminata; columella brevi, cylindracea, marginata.

Long. 97 mill., larg. 7.

Hab. Mers de la Chine.

Collection de M. Cuming.

220. *TEREBRA TRISERIATA*, Gray.

Terebra triseriata, Gray, Proc. Zool. Soc. 1834, p. 61; Hinds, Thes. Conch. p. 171. no. 59, pl. 45. f. 119.

Hab. Philippines.

221. *TEREBRA PRÆLONGA*, Desh.

T. testa elongato-angustissima, acuta, prælonga, polygyrata, omnino fulva; anfractibus triginta, angustis, planis, transversim quinquestriatis, ad suturam inæqualiter bimarginatis, marginibus in anfractibus primis simplicibus, in ultimis granulosis; ultimo anfractu brevi, ad peripheriam angulo granuloso circumdato, basi depresso, striato, canali contorto, brevi, ambitu dilatato, terminato; aper-

tura brevi, minima, quadrangulari; margine sinistro paulo expanso; columella cylindracea, brevi, contorta, paulo excavata.

Long. 93 mill., larg. 9.

Hab. Port Curtis.

Collection Cuming.

La pointe de la coquille est cassée ; entière elle devait avoir au moins dix centimètres de longueur. Il existe peu d'espèces dans le genre *Terebra* qui soient aussi longues et aussi étroites en proportion que celle-ci ; aussi c'est avec le *Terebra triseriata* qu'elle a le plus de rapports.

Notre travail sur le genre *Terebra* resterait incomplet et défectueux, si, à la suite du catalogue général des espèces qui peuvent rester, nous ne donnions la liste de celles qui sont douteuses, ou qui forment de fâcheux doubles emplois dans la nomenclature. Dans cette liste se trouvent comprises celles des espèces de Gmelin réunies dans le groupe du genre *Buccinum*, qui à l'instar de celui de Linné représente le genre *Terebra* d'Adanson et des conchyliologues modernes.

BUCCINUM ACICULA, Gmel. p. 3503. no. 152.

Pour une figure de Lister, pl. 1055. f. 7, représentant le *Pyrena terebralis*, Lamk., *Strombus ater*, Linn.

TEREBRA ACICULINA, Lamk.

Espèce douteuse dont il faut retrancher le *Buccinum cinereum* de Born. M. Kiener la rend plus difficile encore à déterminer parce qu'il range sous ce nom trois espèces bien distinctes. Laquelle représente le type de Lamarck ? nous l'ignorons.

BUCCINUM ACUS, Gmel. p. 3502. no. 141.

Acus sartoria, Martini, t. 4. f. 1451. Espèce indéterminable par la défectuosité de la figure ; il n'est pas bien certain pour nous qu'elle appartienne au genre *Terebra*.

TEREBRA AFRICANA, Gray, Griff. Anim. Kingd. pl. 23. f. 5.

Double emploi du *Terebra variegata*, Gray.

TEREBRA ALBA, Gray, Proc. Zool. Soc. 1834, p. 60.

Espèce douteuse incomplètement décrite et non figurée.

BUCCINUM ASPERUM, Gmel. p. 3503. no. 148.

Deux espèces figurées très-incorrectement dans Lister, des *Fusi* ou des *Pleurotomæ* indéterminables.

TEREBRA BUCCINOIDEA, Blainv.

Nom donné par Blainville au *Miran* d'Adanson, *Buccinum politum*.

BUCCINUM CANALICULATUM, Gmel. p. 3505. no. 164.

Espèce faite sur une mauvaise figure de d'Argenville représentant probablement un tronçon de *Turritella* indéterminable.

TEREBRA CARNEA, Perry.

Double emploi du *T. dimidiata*.

TEREBRA CANCELLATA, Gray (nec Quoy et Gaimard), Proc. Zool. Soc. 1834, p. 61.

Espèce douteuse non figurée et très-incomplètement décrite.

BUCCINUM CHALYBEUM, Gmel. p. 3504. no. 158.

Pour une figure indéterminable de Rumphius appartenant cependant au genre *Terebra*.

BUCCINUM COMMACULATUM, Gmel.

Nous renvoyons aux observations que nous avons faite à son sujet à l'article du *Terebra myuros*.

TEREBRA COSTATA, Menke, Synops. Moll. p. 84.

Double emploi du *Buccinum hastatum*, *Terebra hastata*, Kien.

TEREBRA COSTATA, Küster.

Ce nom avait déjà été employé trois fois avant M. Küster ; par Borson en 1823 pour une espèce fossile, par Menke en 1831 comme nous venons de le dire, enfin par Lea en 1833 pour une espèce fossile d'Amérique. Ce *costata* de M. Küster n'est point figuré ; il reste pour nous parmi les espèces douteuses.

BUCCINUM CUSPIDATUM, Gmel. p. 3505. no. 166.

Pour une figure de Seba représentant une *Melania*.

BUCCINUM DIGITELLUS, Gmel. p. 3504. no. 156.

Un *Triton*, très-jeune, indéterminable, figuré par Rumphius.

BUCCINUM EDENTULUM, Gmel. p. 3505. no. 162.

C'est avec doute le *Terebra caerulea*, d'après une très-mauvaise figure de d'Argenville.

TEREBRA ELEGANS, Küster, Chemn. 2^e ed. p. 31.

Espèce douteuse non figurée, quoique l'auteur renvoie à une planche 6 qui n'a point encore paru.

TEREBRA ELONGATA, Gray, dans Wood, Ind. Test. Supp. pl. 4. f. 25.

Double emploi du *T. strigata* de Sowerby.

BUCCINUM FASCIOLATUM, Gmel. p. 3504. no. 153.

Absolument indéterminable, même le genre. La figure de Bonanni, à la quelle Gmelin renvoie, représente une coquille travaillée et méconnaissable.

TEREBRA FELINA, Sow. Tank. Cat. p. 76.

Double emploi du *Terebra tigrina*.

TEREBRA FLAMMEA, Lesson, Illustr. Zool. pl. 48.

Double emploi de la *Terebra strigata*, Sow.

BUCCINUM FLUMINEUM, Gmel. p. 3503.

La fig. 13 de la pl. 118 de Lister, à laquelle Gmelin renvoie, représente une *Melania*.

BUCCINUM FLUVIATILE, Gmel. p. 3504. no. 159.

Pour une *Melania* mal figurée dans Rumphius, Mus. pl. 30. f. P.

TEREBRA FUSCA, Perry.

Double emploi de la *Terebra subulata*.

TEREBRA FUSCOMACULATA, Sow. Tank. Cat. p. 23.

D'après M. Hinds ce serait un double emploi de la *T. senegalensis*.

BUCCINUM GEMINUM, Linn. Mant. p. 550.

Description malheureusement trop courte ; elle ne permet pas la détermination de l'espèce.

TEREBRA GRACILIS, Gray, Proc. Zool. Soc. 1834, nec Lea, 1833.

M. Hinds a donné à l'espèce le nom de *frigata*.

TEREBRA GRANULOSA, Lamk.

C'est un *Buccinum* du groupe des *Bullia*.

BUCCINUM HECTICUM, Linn.

Espèce incertaine, diversement interprétée par les auteurs. Sous ce nom Chemnitz représente une variété du *dimidiata*, mais en réalité cette opinion n'a rien qui la justifie dans la description et la synonymie de Linné. Voyez nos observations sur cette espèce dans le seconde édition de Lamarck et celles de M. Hanley dans son savant ouvrage, 'Ipsa Linnæi Conchylia,' p. 260.

TEREBRA KNORII, Gray, Proc. Zool. Soc. 1834, p. 61.

Double emploi du *Terebra chlorata*, Lamk.

TEREBRA LÆVIS, Gray, Proc. Zool. Soc. 1834, p. 61.

M. Hinds affirme qu'après l'avoir examinée il a trouvé cette espèce faite avec un misérable specimen de la *T. muscaria* ou de l'*oculata*.

TEREBRA LINEOLATA, Sow. Tank. Cat. p. 76.

Buccinum voisin du *B. vittatum*.

BUCCINUM LIVIDULUM, Gmel. p. 3505.

Espèce faite sur une mauvaise figure de Gualtieri (pl. 56. f. F) représentant un *Cerithium*.

TEREBRA MACULATA, Perry.

Double emploi de la *T. crenulata*, Lamk.

BUCCINUM MONILE, Linn. Mant. p. 550.

Malheureusement la description trop courte de cette espèce la laisse parmi les indéterminables.

BUCCINUM MUCRONATUM, Gmel. p. 3504. no. 155.

La figure de Bonanni à laquelle renvoie Gmelin représente l'*Achatina columna*, Müller.

BUCCINUM MURICINUM, Gmel. p. 3503. no. 149.

La figure de Lister citée représente un *Triton* alongé.

BUCCINUM MURINUM, Linn. Syst. Nat. ed. 12. p. 1206.

Espèce Linnéenne douteuse fondée sur une figure très-incorrecte de Gualtieri (pl. 57. f. P.). La description est tellement brève qu'elle ne peut suppléer à l'insuffisance de la figure. M. Hanley n'ayant pas trouvé l'espèce dans la propre collection de Linné n'a pu faire cesser le doute à son égard.

TEREBRA NEBULOSA, Kiener.

Ce nom de *nebulosa* avait été appliqué dès 1825 (Tank. Cat. par Sowerby) à une espèce que M. Kiener ne connut pas sans doute, car il l'attribua plus tard à une espèce très-différente à laquelle M. Hinds donna le nom de *Terebra argus*.

BUCCINUM NIVEUM, Gmel. p. 3504. no. 154.

Probablement une variété de la *Terebra caeruleascens*.

TEREBRA NUBECULATA, Sow. Tank. Cat. App. p. 25.

Espèce restée incertaine depuis la publication, et que M. Hinds n'a pu retrouver.

BUCCINUM OBLIQUUM, Gmel. p. 3504. no. 157.

La figure de Rumphius citée par Gmelin représente à la vérité une *Terebra* rapproché de notre *T. chinensis*, mais néanmoins indéterminable.

TEREBRA PETITII, Kiener.

Rapportée à tort par M. Hinds à la *T. rudis* de Gray, cette espèce est simplement un double emploi de la *T. dislocata*, Say.

BUCCINUM PHALLUS, Gmel. p. 3503. no. 146.

M. Pfeiffer dans son Index de Martini et Chemnitz rapporte au *Pleurotoma buccinoides* de Lamarck la figure de Martini dont Gmelin s'est servi pour le *B. phallus*.

TEREBRA POLITA, Gray, Proc. Zool. Soc. 1834, p. 63.

C'est le *Buccinum politum* de Lamk., le *Miran* d'Adanson.

BUCCINUM PUGIO, Gmel. p. 3505. no. 163.

Figure de d'Argenville, qui représente probablement une jeune individu de la *T. senegalensis*.

TEREBRA PUNCTATA, Gray, Proc. Zool. Soc. 1834, p. 61.

D'après M. Hinds cette espèce serait un double emploi de la *T. corrugata* de Lamarck.

TEREBRA PUNCTATO-STRIATA, Gray, Proc. Zool. Soc. 1834, p. 61.

TEREBRA PUNCTULATA, Sow. Tank. Cat. App. p. 24.

Ces deux espèces selon M. Hinds sont des doubles emplois de la *T. cingulifera* de Lamarck.

BUCCINUM PUNCTULATUM, Gmel. p. 3503. no. 151.

Lister, Conch. pl. 979. f. 38, *Cerithium* indéterminable.

BUCCINUM RADIATUM, Gmel. p. 3504. no. 160.

La figure citée de Gualtieri (pl. 52. f. D.) représente un *Cerithium* indéterminable.

TEREBRA SANDWIZENSIS.

Nous ne connaissons ni l'origine ni l'application de ce nom mentionné par M. Hinds à la fin de sa Monographie.

TEREBRA STRIATA, Quoy et Gaim. Voy. de l'Astr.

Les auteurs ignoraient que le nom de *striata* avait été donné par Basterot en 1825 à une espèce fossile de Bordeaux ; ils l'ont appliqué à une espèce vivante à laquelle le nom d'*affinis* a été donné par M. Gray. Ce qui n'a pas empêché ce dernier naturaliste d'attribuer ce nom de *striata* à une coquille depuis longtemps connue sous le nom de *babylonia* de Lamk.

TEREBRA STRIATULA, Kiener, Icon. des Coq. Viv. (non Lamk.).

L'auteur confond deux espèces sous ce nom, qui ne sont ni l'une ni l'autre le *striatula* de Lamk. L'une nous paraît être le *Terebra verreauxi*, et l'autre le *strigilata* de Linné.

BUCCINUM SUCCINCTUM, Gmel. p. 3502. no. 142.

Espèce très-douteuse faite sur une très-imparfaite figure de Martini (t. 4. f. 1451) ; nous doutons qu'elle soit du genre *Terebra*. Cependant M. Pfeiffer dans son Index la considère comme bonne espèce et dit l'avoir dans sa collection ; il serait bien utile que le savant conchyliologue en donnât une description et une bonne figure.

TEREBRA TENIOLATA, Quoy et Gaim.

Double emploi de la *Terebra tricolor* de Sowerby.

TEREBRA TAHITENSIS, Gray, Proc. Zool. Soc. 1834, p. 61.

C'est un Buccin, *Buccinum tahitense*, Gmel.

BUCCINUM TUBERCULATUM, Gmel. p. 3503. no. 150.

Gmelin renvoie à une figure de Lister (pl. 958. f. 11 b) qui représente un véritable Buccin.

BUCCINUM VARICOSUM, Gmel. p. 3505. no. 165.

Variété de la *Terebra crenulata*.

BUCCINUM VIRGINEUM, Gmel. p. 3505. no. 168.

C'est encore une *Melania* d'après la figure citée de Lister, pl. 113. f. 7.

TEREBRA VITTATA, Lamk.

C'est un Buccin (*B. vittatum*, Linn.) du groupe de *Bullia* de M. Gray.

TEREBRA ZEBRA, Kiener.

Double emploi de la *T. strigata*, Sow.

Pour compléter notre travail sur le genre *Terebra*, il faudrait ajouter ici la liste des espèces fossiles. Déjà nous avons rassemblé de nombreux matériaux, nous comptons plus de 80 noms inscrits ; mais nous n'avons pu nous procurer un grand nombre d'espèces qu'il faudrait comparer pour en assurer la synonymie. Nous sommes donc forcé d'ajourner à un moment plus propice cet appendix intéressant d'une monographie du genre *Terebra*.

14. A SYNOPSIS OF THE THRUSHES (TURDIDÆ) OF THE NEW WORLD. BY PHILIP LUTLEY SCLATER, M.A., F.L.S., SECRETARY TO THE SOCIETY.

The true Thrushes, of the Linnean genus *Turdus* as now restricted, almost perfectly cosmopolitan in their range, since they occur in every part of the world, tropical and temperate, with the exception of Australia, are found in great abundance in America. Counting the *Merulæ* of some authors amongst their number, for I believe that their structural differences from *Turdus* are unappreciable, we find nearly forty species of this genus already known to occur in the New World ; and, from the number of species which have escaped detection until quite recently, we may reasonably presume that we are not yet acquainted with all the American members of this group. It is useless to enlarge here upon the characteristics of these well-known birds. Suffice it to say, that, as far as we know, their general habits and manners are the same in the New World as in the Old, and that in the few cases in which we are acquainted with the mode of nesting and peculiarities of the eggs, these also are similar. Connected with the typical Thrushes of America is a small group of birds forming the genus *Catharus* of Prince Bonaparte. This section, until lately known to have but one representative, is now extended to embrace seven species,—Mr. Gould's type *Malacocichla*, founded upon one of them, being inseparable generically from *Catharus*. The differences indeed between these birds and the true Thrushes are but slight—consisting in rather longer

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tarsi and shorter wings and tail, which render the group more fit for terrestrial and less adapted to arboreal life. Commencing our subfamily of Thrushes with the six *Cathari*, we enter *Turdus* by the typical small Thrushes of N. America, already alluded to, of which there seem to be eight species, difficult to be distinguished *inter se*. The second group of the genus—a section denominated by Prince Bonaparte *Planesticus*—in which the sexes are similar, and the throat is either spotted or striated,—is composed of twenty species, amongst which is the well-known Robin of the Americans, *Turdus migratorius*. A third group, in which the plumage is dusky and uniform, but the sexes are still alike, may be called *Semimerula*. It is composed of five species. There remain the Black-birds—of the section *Merula*—in which the sexes are different. Of these in the New World there appear, according to the present state of our knowledge, to be at least six, which make up the large number of thirty-nine species of American *Turdi*.

The genera *Cichlerminia* and *Margarops*, which in the greater development of the first spurious primary (always small among the true Thrushes) show an abnormal tendency, contain three or four species peculiar to the Antilles. They may, perhaps, be arranged most naturally next to *Turdus*—and serve to lead off towards the Mock-birds, the several genera of which follow next in my arrangement. The typical Mock-birds show in many respects striking differences, when compared with the true Thrushes. Being adapted for a life inside the thick bushes and near the ground, they are distinguished by their low crown, their short and graduated wings—the first (spurious) primary being much lengthened and generally half as long as the second,—and their longer and more graduated tail.

These characters and the strongly-developed scutella on the front of the tarsi, which are wanting in *Turdus*, have induced recent authors to disconnect them entirely from the Thrushes and arrange them with the Wrens. But there are some forms (such as *Galeoscoptes*, *Cichlerminia*, and *Melanotis*) so clearly intermediate in one or other of these respects, that I am unable to draw the line of demarcation between the two groups, and for the present am inclined to consider the affinities of the Mock-birds as closer with the Thrushes than with the Wrens. In their mode of nesting and in the colour of the eggs (points by no means to be neglected in considering natural relationships), the Mock-birds also exhibit Thrush-like characters.

The series of Mock-birds may be best commenced with *Galeoscoptes*—embracing a well-known North American type—and two Antillean species nearly allied to each other, the strong Thrush-like appearance (and habits) of which have induced me to call them subgenerically *Mimocichla*. Next comes the singular type *Melanoptila*, of which the nearest ally is perhaps *Galeoscoptes carolinensis*. *Melanotis* with its two species is also nearly affine to *Galeoscoptes*, and perhaps hardly separable generically therefrom. *Rhamphocinclus* and *Cincloerthia*, on the other hand, are so aberrant in form that they have been ranged by some authors in a different group altogether; but there can be no doubt that their right place is here. In the

elongated and incurved bill, some species of *Harporhynchus*, which next follows, shows much resemblance to them. These latter birds are clearly connected by *Oreoscoptes* with the typical Mock-thrushes of the genus *Minus*, in which group an accurate comparison of specimens and a careful attention to geographical distribution are requisite to enable the student to distinguish the numerous closely-allied and similarly-clad species.

Genus I. CATHARUS.

Catharus, Bp. Consp. i. p. 278 (1850).

Malacocichla, Gould, P. Z. S. 1854, p. 285.

α. Catharus.

1. CATHARUS MELPOMENE.

Turdus melpomene, Cab. Mus. Hein. p. 5.—*Catharus aurantirostris*, Selater, P. Z. S. 1856, p. 294 ; 1858, p. 97 ; Ibis, 1859, p. 6.

Cinnamomeo-brunneus, uropygio, alis extus et cauda rufescentioribus : subtus pallide cineraceus, gula et ventre medio crisoque dilutioribus, albis : periophthalmiis, rostri basi et pedibus flavis.

Long. tota 7·0, alæ 3·1, caudæ 2·6, tarsi 1·25.

Hab. Southern Mexico, near Cordova (Sallé) ; Orizaba (Bott.) ; Guatemala (Skinner).

Mus. P. L. S.

2. CATHARUS AURANTIROSTRIS.

Turdus aurantirostris, Hartl. Rev. Zool. 1850, p. 158 ; Contr. Orn. 1851, pl. 72.—*Catharus immaculatus*, Bp. Consp. p. 278.

Supra dilute olivaceus : subtus albidus ; pectore, hypochondriis collique lateribus cinerascens : subcaudalibus albis : gula cinerascens paulum variegata : rostro, pedibus et periophthalmiis flavis.

Hab. Venezuela.

Mus. Lugd.

I have not had an opportunity of comparing specimens of these two nearly allied species ; but Dr. Hartlaub considers the present bird as distinct.

3. CATHARUS OCCIDENTALIS, sp. nov.

Cinnamomeo-brunneus, vertice saturatiore : subtus cineraceus, gula albicante, cervice et pectore fusco subobsolete flammulatis : ventre medio et crisso albis : rostro fusco-nigricante, hujus basi et pedibus pallide corylinis.

Long. tota 6·5, alæ 3·5, caudæ 2·9, tarsi 1·15.

Hab. Western Mexico, Oaxaca, Totontepec (Boucard).

Mus. P. L. S.

M. Sallé's recent collections from M. Boucard contain four examples of this *Catharus*. It seems clearly distinct from *C. melpomene* of Eastern Mexico, in its rather larger size, shorter tarsi, and

spotted neck and breast; these parts in *C. melpomene* being immaculate.

β. Malacocichla.

4. CATHARUS DRYAS.

Malacocichla dryas, Gould, P. Z. S. 1854, p. 285, pl. 75; Ibis, 1859, p. 7.

Supra saturate olivaceus, pileo et capitis lateribus nigerrimis; subtus pallide ochraceus, pectore olivaceo variegato: rostro et pedibus flavis.

Long. tota 7·0, alæ 3·75, caudæ 2·8.

Hab. Guatemala (*Skinner*).

Mus. Brit.

5. CATHARUS MACULATUS.

Malacocichla maculata, Sclater, P. Z. S. 1858, p. 64.

Supra nigricanti-schistaceus, pileo et capitis lateribus nigerrimis: subtus ochraceo-albidus, lateraliter schistaceus: gula, pectore et ventris lateribus nigro maculatis: rostro et pedibus flavis.

Long. tota 7·0, alæ 3·6, caudæ 2·8.

Hab. Ecuador, banks of the Napo.

Mus. Brit.

6. CATHARUS MEXICANUS.

Malacocichla mexicana, Bp. Compt. Rend. xliii. p. 998, et Orn. Foss. p. 35.

Cinereo-olivaceus, subtus albedo-fuscescens; abdomine medio albo; pileo nigro: rostro flavo-aurantiaco, pedibus flavo-corneis.

Long. tota 6·0, alæ 3·5, caudæ 2·4.

Hab. Southern Mexico, near Jalapa (*Sallé*); Guatemala, prov. Vera-Paz (*Delattre*).

Mus. Derbiano, P. L. S.

7. CATHARUS FUSCATER.

Myioturdus fuscater, Lafr. Rev. Zool. 1845, p. 341. — *Catharus fuscater*, Sclater, P. Z. S. 1859, p. 136.

Schistacescenti-niger; subtus cinerascens, abdomine medio albo, gutture fuscante: rostro aurantiaco, pedibus flavo-corneis.

Long. tota 6·5, alæ 3·5, caudæ 3·0.

Hab. Interior of New Granada; Ecuador, near Pallatanga (*Fraser*).

Mus. Brit., P. L. S.

Genus II. TURDUS.

Turdus, Linn. S. N. (1766).

Merula, Leach, Cat. Brit. Mus. (1816).

Planesticus, Bp. Ann. Sc. Nat. 1854, p. 118.

α. Turdus.

Minores : subtus plus minusve guttupati : sexus inter se similes.

✓ 1. **TURDUS MUSTELINUS.**

Turdus mustelinus, Gmel. S. N. i. p. 817; Vieill. Ois. Am. Sept. pl. 62; Aud. B. Am. iii. pl. 144; Bp. Consp. p. 270; Baird, Rep. p. 212; Selater, P. Z. S. 1856, p. 294; Cab. Journ. f. Orn. 1855, p. 470; Ibis, 1859, p. 6.—*Turdus melodus*, Wils. Am. Orn. i. pl. 2.

Supra clare cinnamomeo-brunneus, pileo intensiore; subtus pure albus, in lateribus cervicis, pectore et ventre maculis subtriangularibus nigricantibus distincte notatus: rostro corneo, basi flavida: pedibus flavis.

Long. tota 7·5, alæ 4·1, caudæ 2·75.

Hab. Eastern United States to the Missouri; Mexico; Cordova (Sallé); Guatemala; Cuba, and Jamaica (in winter).

Mus. Brit., P. L. S.

I have not seen *Turdus densus*, Bp. (Compt. Rend. xxviii. p. 2; Notes Orn. p. 26), from Tabasco in Mexico, said to be nearly allied to *T. mustelinus*. The type is in the Museum at Brussels. I doubt its distinctness.

2. **TURDUS PALLASI.**

Turdus pallasi, Cab. Wieg. Arch. 1847, i. p. 205; Mus. Hein. p. 5; Journ. f. Orn. 1855, p. 470; Baird, Rep. p. 212.—*Turdus solitarius*, Wils. Am. Orn. v. p. 95; Bp. Consp. p. 270; Selater, P. Z. S. 1857, p. 212.—*Turdus minor*, Bp. Obs. Wils. Orn. no. 72.—*Turdus guttatus*, Cab. in Tsch. Faun. Per. p. 187.

Supra pallide olivaceo-brunneus, uropygio et cauda rufis: subtus albus, pectore ochraceo: gutturi lateribus et pectore nigro triangulariter maculatis: hypochondriis subolivaceis.

Long. tota 7·5, alæ 3·5, caudæ 2·5.

Hab. Eastern N. America to the Mississippi and southwards to Mexico; Orizaba (*Botteri*); Cuba (*Gundlach*).

Mus. P. L. S.

3. **TURDUS NANUS.**

Turdus nanus, Aud. Orn. Biogr. v. p. 201; B. Amer. iii. pl. 147; Baird, Rep. p. 213.

Similis Turdo pallasi, sed minor: subtus purius albus: lateribus magis cinerascens nec cinnamomescentibus: colore caudæ saturatione.

Long. tota 6·5, alæ 3·3, caudæ 2·9.

Hab. Pacific slope of N. America, replacing *T. pallasi*: California and Oregon.

Mus. P. L. S.

4. **TURDUS SILENS.**

Merula silens, Sw. Phil. Mag. 1827, p. 369; North. Zool. ii. p. 186; Selater, P. Z. S. 1858, p. 300.

Similis Turdo pallasi, sed colore corporis superi pallidiore, cinerascens et multo minus cinnamomeo: cauda flavicanti-brunnea et pallidiore.

Hab. Southern Mexico; Oaxaca (Boucard).

Mus. P. L. S.

Further specimens are requisite to confirm the validity of this species of Thrush. Having now examples of *Turdus nanus*, I should be inclined to refer it to that species, were it not of rather larger proportions.

5. TURDUS FUSCESCENS.

Turdus fuscescens, Steph. G. Z. x. p. 182; Baird, Rep. p. 214.—*Turdus mustelinus*, Wils. Am. Orn. v. pl. 43.—*Turdus wilsoni*, Bp.; Cab. in Tsch. Faun. Per. p. 188; Journ. f. Orn. 1855, p. 470.

Supra rufescens-brunneus, subtus albus; gutture et pectore antico flavido-rufescentibus, maculis parvis triangularibus brunnescenti-olivaceis parce aspersis.

Long. tota 6·5, alæ 3·8, caudæ 2·8.

Hab. Eastern North America to the Missouri.

Mus. P. L. S.

6. TURDUS USTULATUS.

Turdus ustulatus, Nutt. Man. Orn. i. p. 400 (1840); Baird, Rep. p. 215.

Hab. Coast region of Oregon and Washington Territory.

I have not seen examples of this Thrush, and can only refer to Prof. Baird's description.

✓ 7. TURDUS SWAINSONI.

Turdus swainsoni, Cab. in Tsch. F. P. p. 188; Mus. Hein. p. 5; Baird, Rep. p. 216; Ibis, 1859, p. 6.—*Turdus minor*, Gm. (part.) et Bp. Consp. p. 271; Selater, P. Z. S. 1857, p. 212.—*Turdus olivaceus*, Giraud.—*Turdus minimus*, Lafr. R. Z. 1848, p. 5; Selater, P. Z. S. 1844, p. 111; 1855, p. 145.

Supra pallide olivaceus unicolor: subtus albus; gula et pectore dilute flavescens-brunneis, gulæ lateribus et pectore toto maculis triangularibus fusco-nigris crebro sparsis.

Long. tota 7·0, alæ 3·7, caudæ 2·8.

Hab. Eastern North America to Greenland, and southwards to Mexico, Orizaba (*Bolt.*); Guatemala; New Granada, Ecuador, and Peru; Cuba (*Gundlach*); Gualaquiza, Ecuador (*Fraser*).

Mus. Brit., P. L. S.

8. TURDUS ALICIÆ.

Turdus aliciae, Baird, Rep. p. 217.

Hab. Interior of N. America—Illinois and Upper Missouri.

I have not seen this bird.

β. *Planesticus*.

Majores : subtus unicolores, gula nigro striata aut punctata : sexus inter se similes.

9. *TURDUS PHÆOPYGUS*.

Turdus phæopygus, Cab. in Schomb. Guian. iii. 666, et Mus. Hein. p. 4; Sclater, P. Z. S. 1858, p. 64.—*Turdus jamaicensis*, Jard. Ann. Nat. Hist. xx. p. 329 (1847), nec Gm.

Supra saturate olivaceo-brunneus, uropygio cinereo : subtus pallide cinereus, gula alba nigro striata ; collo antico et crisso albis : rostro et pedibus nigricanti-fuscis.

Long. tota 7·0, alæ 3·9, caudæ 3·0.

Hab. Guiana (Schomb.); Northern Brazil; Venezuela; Trinidad; Tobago (Kirk); New Granada; Eastern Ecuador, Rio Napo.

Mus. P. L. S.

Easily known by its small size, and grey rump in contradistinction to the cinnamomeous back.

10. *TURDUS JAMAICENSIS*.

Turdus jamaicensis, Gm. S. N. i. p. 809; Gosse, B. Jam. p. 142, et Ill. pl. 24.—*Turdus capucinus*, Hartl.; Bp. Consp. p. 271.—*Turdus lereboulleti*, Bp. Compt. Rend. xxxviii. p. 3, et Notes Orn. p. 27.

Saturate ardesiacus, capite undique et striis in gula alba obscure cinnamomeis : subtus pallide cinereus, collo antico et ventre medio albis : rostro nigro ; pedibus clare fusco-nigris.

Long. tota 8·7, alæ 4·6, caudæ 3·6.

Hab. Jamaica (Gosse).

Mus. Brit., P. L. S.

11. *TURDUS CROTOPEZUS*.

Turdus leucomelas, Vieill. Nouv. Dict. xx. 226, et Enc. Méth. p. 644, ex Azara, no. 80?—*Turdus crotopezus*, Licht. Doubl. p. 38; Cab. Mus. Hein. p. 3; Burm. Syst. Ueb. iii. p. 123; Bp. Consp. p. 272.—*Turdus albicollis*, Spix, Av. Bras. i. p. 71, pl. 70.

Saturate cinnamomeo-brunneus, subtus pallide cinereus, gula alba nigro striata : ventre medio et crisso pure albis ; lateribus fulvis : tectricibus subalaribus pallide cinnamomeis : rostro corneo, mandibulæ inferioris basi flava : pedibus fuscis.

Long. tota 8·5, alæ 4·4, caudæ 3·3.

Hab. South-eastern Brazil.

12. *TURDUS ASSIMILIS*.

Turdus assimilis, Cab. Mus. Hein. p. 4; Sclater, P. Z. S. 1857, p. 202.

Supra olivascenti-brunneus, cauda concolore ; subtus pallide cine-

rascenti-olivaceus; gula alba, nigro striata; collo antico et ventre medio cum crisso albis: rostro omnino corneo: pedibus fuscis.

Long tota 9·5, alæ 5·0, caudæ 4·0.

Hab. Southern Mexico, Vera Cruz (*Sallé*); Orizaba (*Botteri*); Puente Nacional (*Pease*); Oaxaca (*Boucard*).

Mus. P. L. S., Acad. Philadelph.

The under surface of this species much resembles that of *T. crotopezus*, showing only a larger white patch on the neck and a deeper cinereous on the breast. Above, the present bird is wholly of a paler and more cinereous brown.

13. TURDUS LEUCAUCHEN.

Turdus leucauchen, Selater, P. Z. S. 1858, p. 447; Ibis, 1859, p. 6.

Supra nigricanti-cinereus alis et cauda saturatoribus: capite toto et gula nigris, hac albo striata: collo antico pure albo; abdomine toto pallide cinereo, ventre medio crissoque albis: tectricibus subalaribus pallide ochrescentibus: rostro flavo, pedibus pallide brunneis.

Long. tota 9·0, alæ 4·6, caudæ 2·8.

Hab. Guatemala (*Skinner*).

This Guatemalan species is nearly allied to the two latter, but distinguishable by its dark cinereous colour above, more conspicuous white neck-patch and yellow bill.

14. TURDUS ALBIVENTRIS.

Turdus albiventris, Spix, Av. Bras. i. p. 70, pl. 69; Cab. in Schomb. Reisen, iii. p. 666, et Mus. Hein. p. 4; Burm. Syst. Ueb. iii. 124; Selater, P. Z. S. 1858, p. 451.

Brunnescenti-olivaceus, subtus pallide cinereus; gula albida nigro striata; ventre medio et crisso pure albis: tectricibus subalaribus pallide cinnamomeis: rostro corneo: pedibus fuscis.

Long. tota 8·5, alæ 4·5, caudæ 3·8.

Hab. Guiana (*Schomb.*) and valley of the Amazon up to Rio Napo and Eastern Ecuador; Zamora (*Fraser*); Brazil, Bahia, and coast-region generally; Bolivia?

Mus. Brit., P. L. S.

I am unable at present to decide that specimens collected by Mr. Fraser at Pallatanga, on the western slope of the Andes, are really referable to this species; but they appear to be very closely allied to it.

15. TURDUS IGNOBILIS.

Turdus ignobilis, Selater, P. Z. S. 1857, p. 273.

Cinerascenti-fuscus, subtus dilutior; gula albicante, fusco striata; abdomine albo: tectricibus subalaribus fusco-cinereis, rufo vix tinctis: rostro corneo, pedibus fusco-nigris.

Long. tota 9·0, alæ 4·5, caudæ 3·9.

Hab. Interior of New Granada.

Mus. P. L. S. et Acad. Philadelph.

Apparently a larger bird than the preceding, and of more uniform colouring. The colour above is darker, browner, and without any cinereous tinge; the breast is much more brown, and the throat more obsoletely streaked; the tarsi are stouter and thicker.

16. TURDUS ALBICOLLIS.

Turdus albicollis, Vieill. Nouv. Dict. xx. p. 226, et Enc. Méth. p. 640; Cab. Mus. Hein. p. 5; Burm. Syst. Ueb. iii. 125.

Cinnamomeo-brunneus, subtus pallide cinereus, gula alba nigro striata: collo antico, ventre imo et crisso albis: hypochondriis et lateribus ventris saturate cinnamomeo-rufis: rostro superiore nigro, inferiore flavo: pedibus clare fuscis.

Long. tota 9·4, alæ 4·8, caudæ 4·0.

Hab. South-eastern Brazil; Paraguay and La Plata; Monte Video (*Mus. Berol.*).

Mus. P. L. S.

17. TURDUS AMAUROCHALINUS.

Turdus amaurochalinus, Cab. Mus. Hein. p. 5.

Supra olivaceo-viridis, præcipue in capite brunnescens: loris nigricanti-brunneis: subtus brunnescenti-griseus: gula albida fusco striata, plaga mediali immaculata: tectricibus subalaribus dilute ferrugineis: ventre medio et crisso albis: rostro adulti flavo, juvenis fusco (Cab.).

Hab. Brazil.

I have not yet met with specimens of this species.

18. TURDUS GYMNOPHTHALMUS.

Turdus gymnophthalmus, Cab. in Schomb. Guian. iii. p. 665.—*Turdus nudigenys*, Lafr. R. Z. 1848, p. 4.—*Turdus gymnopsis*, Temm. Mus. Lugd., et Bp. Consp. p. 272.

Brunnescenti-olivaceus, orbitis late nudis: subtus cinerascens, gutture fusco striato, ventre medio et crisso albis: subalaribus cinnamomeis.

Long. tota 9·0, alæ 4·5, caudæ 4·0.

Hab. Guiana; Venezuela; Trinidad; Tobago (*Kirk*); Surinam (*Hering* in Mus. Acad. Philadelph.).

Mus. Brit., P. L. S.

19. TURDUS FUMIGATUS.

Turdus fumigatus, Licht. Doubl. p. 38.—*T. ferrugineus*, Wied. Beitr. iii. 649; Burm. Syst. Ueb. iii. 122; Bp. Consp. p. 272; Cab. in Schomb. Guian. iii. 665; Hartlaub, Journ. f. Orn. 1854, p. 260.—*Turdus olivaceus*, Lafr. et D'Orb. Syn. Av. i. p. 16, juv.?

Rufescenti-brunneus, subtus dilutior, gula striata, subalaribus saturate cinnamomeis: rostro et pedibus fuscis. Juv. Fusciscenti-olivaceus, subtus dilutior.

Long. tota 9·0, alæ 4·6, caudæ 3·7.

Hab. Eastern Brazil and northwards to Guiana; Para (*Wallace*).

Mus. P. L. S.

20. *TURDUS GRAYII*.

Merula tristis, Sw. Phil. Mag. 1827, p. 369 ?—*Turdus grayi*, Bp. P. Z. S. 1837, p. 118; Bp. Consp. p. 272; Ibis, 1859, p. 5.—*Turdus tristis*, Scclater, P. Z. S. 1856, p. 294.—*Turdus helvolus*, Licht. Bp. C. R. xxxviii. p. 4; Notes Orn. p. 28.

Supra olivascens—*fuscus*: *subtus flavicanti-cinnamomeus*, *gutturæ vix fusco striolato*: *tectricibus alarum inferioribus pallide ceruinis*: *rostro plumbeo, apice flavo*; *pedibus fuscis*.

Long. tota 9.0, alæ 5.0, caudæ 4.3.

Hab. Southern Mexico; Cordova (*Sallé*); Orizaba (*Botteri*).

21. *TURDUS CASIUS*.

Planesticus casius, Bp. Compt. Rend. xli. p. 657.

Cinnamomeo-ferrugineus; *subtus pallidior*, *gula obsolete striata* (Bp.).

Hab. In isthmo Panama (Mus. Brit.).

Mus. Brit., P. L. S.

I doubt much the real distinctness of this bird from *Turdus grayii*. I have a specimen, believed to be from Guatemala, which agrees nearly with Prince Bonaparte's type in the British Museum. It only differs from the preceding in having rather smaller dimensions and paler colouring, particularly beneath. I am not acquainted with *Planesticus luridus*, Bp. (Compt. Rend. xxxviii. p. 4; Notes Orn. p. 28), said to be from New Granada; but from the characters* assigned to it, I should imagine it to be the same as the present.

22. *TURDUS SERRANUS*.

Turdus serranus, Tsch. Av. Consp. in Wieg. Arch. 1844, i. p. 280, et Faun. Per. p. 186; Cab. Journ. f. Orn. 1854, p. 260.

Supra obscure fuscus, pilei plumarum scapis ferrugineis: *remigibus rectricibusque nigricantibus*: *subtus ex olivaceo fuscus, pectore ferrugineo-fusco*; *crisso saturatiore*: *rostro nigro*; *pedibus flavis* (Tschudi).

Hab. Andes of Western Peru, Sierra-region, alt. 9000 to 14,000 ft. (Tsch.).

Mus. Novo-Castellano.

I have once had the type of this species in my hand. My impression was that it was nearly allied to *Turdus ferrugineus*; but I had no means of comparison.

23. *TURDUS FALKLANDICUS*.

Turdus falklandicus, Quoy & Gaim. Voy. de l'Uranie, p. 104; D'Orb. Voy. p. 202; Darwin, Voy. p. 59.—*Turdus magellanicus*, King, P. Z. S. 1830, p. 14; Bp. Consp. p. 272; Bridges, P. Z. S. 1843, p. 111.—*Merula falklandica*, Cass. U. S. Expl. Exped. Birds, p. 157.

* Plus pâle et moins roussâtre en dessous (sc. compared with *Turdus grayii*).

Brunneo-olivaceus, pileo nigricante : subtus dilute ochraceus, latera-liter cinerascens ; gutture albo, nigro striolato : rostro et pedibus flavis.

Long. tota 10·5, alæ 5·4, caudæ 4·3.

Hab. Falkland Islands, Southern Patagonia, and Chili : Valdivia (Philippi).

Mus. Brit., P. L. S., Derb.

Specimens of this bird vary a little. Those in the Derby Museum from the Falklands are of a deeper rufous tinge below than continental specimens.

24. *TURDUS MIGRATORIUS.*

Turdus migratorius, Linn. S. N. i. p. 292 ; Wils. Am. Orn. i. pl. 2 ; Aud. B. Am. iii. pl. 142 ; Bp. Consp. p. 272 ; Cassin, U. S. Expl. Exp. Birds, p. 157 ; Baird, Rep. p. 218 ; Sw. Phil. Mag. 1827, p. 368 ; Selater, P. Z. S. 1856, p. 294.

Cinereus via olivaceus : capite nigro, regione oculari alba : gula alba nigro striata : abdomine toto et tectricibus subalaribus castaneis : tibiis et crisso albis : rostro flavo, apice obscuro ; pedibus corneis.

Long. tota 8·25, alæ 5·0, caudæ 4·0.

Hab. Whole continent of North America, Eastern and Western States, and down to S. Mexico in winter ; Cordova (Salle) ; accidental in Antilles, Tobago (Kirk).

25. *TURDUS NÆVIUS.*

Turdus nævius, Gm. S. N. i. p. 817 ; Vieill. Ois. Am. Sept. ii. pl. 66 ; Aud. B. Am. iii. pl. 143 ; Bp. Consp. p. 271 ; Baird, Rep. p. 219.

Cinereus : lateribus capitis et torque pectorali nigris : superciliis elongatis, fasciis alarum et corpore subtus ferrugineo-rufis : ventre medio et crisso albis rufo perfusis : caudæ rectricibus albo terminatis : rostro nigro : pedibus flavidis.

Long. tota 9·0, alæ 5·0, caudæ 3·5.

Hab. Pacific Coast of N. America ; Oregon and California ; Monterey (Gambel).

The true type of Prince Bonaparte's subgeneric term *Ixoreus*, used by Professor Baird for this bird, is, as I know from its having been pointed out to me by the founder in the Jardin de Plantes' collection, the S. American *Taenioptera rufiventris* (*Tyrannus rufiventris*, Vieill. ; *Taenioptera variegata*, G. R. Gray ; D'Orb. Voy. Ois. t. 39. fig. 2 ; gen. *Myiotheretes*, Reichb.). It was from confounding this bird with the present, that the strange remark was made, which I have already alluded to (P. Z. S. 1857, p. 4), concerning the natural position of this bird, in Compt. Rendus, xxxviii. p. 3 (Notes Orn. p. 26).

26. *TURDUS FULVIVENTRIS.*

Turdus fulviventris, Selater, P. Z. S. 1857, p. 273.

Nigricanti-cinereus : capite toto cum gutture nigris : cervice antica

cinerascens: abdomine et subalaribus saturate cinnamomeo-rufis :
 rostro flavo : pedibus pallide brunneis.

Long. tota 10·5, alæ 4·8, caudæ 4·0.

Hab. Interior of New Granada.

Mus. P. L. S. et Bruxelliano.

27. TURDUS RUFIVENTRIS.

Turdus rufiventris, Vieill. Nouv. Dict. xx. p. 226, et Enc. Méth. p. 639 ; Azara, no. 79 ; unde *Turdus chochi*, Vieill. Nouv. Dict. xx. p. 226, et Enc. p. 639 ; Max. Beitr. iii. 639 ; D'Orb. Voy. p. 203 ; Burm. Syst. Ueb. iii. p. 122 ; Spix, Av. Bras. i. p. 70, pl. 68 ; Bp. Consp. p. 272 ; Darw. Zool. p. 59.

Brunnescenti-olivaceus ; gutture albo fusco striato : abdomine cum crisso saturate ferrugineis.

Long. tota 9·5, alæ 4·6, caudæ 4·0.

Hab. South-eastern Brazil ; Paraguay (*Azar.*) ; interior of Bolivia and Argentine republic down to Rio Negro (*D'Orb.*).

Mus. Brit., P.L.S., &c.

28. TURDUS FLAVIROSTRIS.

Turdus flavirostris, Sw. Phil. Mag. 1827, p. 369.—*Turdus rufo-palliatus*, Lafr. Rev. Zool. 1840, p. 259.—*Turdus palliatus*, Bp. Consp. p. 272.

Cinereo-olivaceus, dorso et abdomine rufo-cinnamomeis ; ventre medio crisso albis : gula alba, nigro striata : rostro et pedibus flavis.
 ♀ dorso dilutiore.

Long. tota 5·5, alæ 4·9, caudæ 3·75.

Hab. Western Mexico and Lower California ; Monterey (*Lafr.*).

Mus. Brit.

γ. Semimerula.

Majores : *ptilosis unicolor*, fusca aut fusco-nigra : *sexus similes*.

29. TURDUS GIGAS.

Turdus gigas, Fraser, P. Z. S. 1840, p. 59 ; Bp. Consp. p. 275 ; Sclater, P. Z. S. 1855, p. 144 ; 1858, pp. 451 & 550.

Nigricanti-fuscus, *subtus dilutior* : *rostro et pedibus flavis*.

Long. tota 13·0, alæ 6·0, caudæ 6·0, tarsi 1·7.

Hab. Interior of New Granada and Ecuador ; Cuenca, and plateau of Riobamba (*Fraser*).

Mus. Brit., P. L. S.

Easily distinguishable from the next-following species by its larger dimensions. The colouring is also lighter and more greyish below.

30. TURDUS FUSCATER.

Turdus fuscater, Lafr. et D'Orb. Syn. Av. i. p. 16 ; D'Orb. Voy. p. 200, pl. 9. f. 1 ; Bp. Consp. p. 275 ; Gay, Hist. de Chili, Zool. p. 331 ; Fraser in P. Z. S. 1843, p. 120 ; Tschudi, Faun. Per. p. 186.

Fuliginoso-nigricans: *rostro et pedibus flavis*.

Long. tota 10·5, alæ 5·9, caudæ 4·5, tarsi 1·45.

Hab. Andes of Peru and Bolivia; Cochabamba and Chuquisaca (D'Orb.); Mendoza in Argentine republic (*Bridges and Burmeister*).

Mus. Brit., P. L. S.

31. *TURDUS CHIGUANCO*.

Turdus chiguanco, Lafr. et D'Orb. Syn. Av. p. 16; D'Orb. Voy. p. 201, pl. 9. fig. 2; Bp. Consp. p. 275; Sclater, P. Z. S. 1858, pp. 450 & 540.

Fuliginoso-cinereus, subtus dilutior; gula albicante: tectricibus subalaribus rufis: rostro et pedibus flavis.

Long. tota 10·0, alæ 5·3, caudæ 4·4.

Hab. Andes of Peru and Ecuador—Tacna (D'Orb.); Cuenca and plateau of Rio Bamba (*Fraser*).

Mus. Paris., P. L. S.

32. *TURDUS AURANTIUS*.

Turdus aurantius, Gm. S.N. i. p. 832; Bp. Consp. p. 275.—*Turdus leucogenys*, Lath. Ind. Orn. i. p. 341.—*Merula leucogenys*, Gosse, B. Jam. p. 136, et Ill. no. 23.

Nigricanti-cinereus, subtus dilutior; mento, abdomine medio et macula alari albis: rostro aurantiaco, pedibus flavis.

Long. tota 9·0, alæ 4·6, caudæ 3·6.

Hab. Jamaica.

Mus. Brit., P. L. S.

33. *TURDUS OLIVATER*.

Merula olivatra, Lafr. Rev. Zool. 1848, p. 2.

Olivascenti-brunneus, subtus dilutior; ventre medio præcipue pallidior: alis caudaque intus nigricantibus: capite et collo toto undique ad medium pectus nigerrimis: tectricibus subalaribus ventre concoloribus; rostro et pedibus flavis.

Long. tota 9·0, alæ 4·6, caudæ 3·7.

Hab. Venezuela, between La Guayra and Caraccas (*Sallé*).

Mus. Derbiano, Bremensi.

♂. *Merula*.

Sexus inter se dissimilis: mares nigri aut nigro varii: feminae fuscae aut fuscæscientes.

34. *TURDUS ATROSERICEUS*.

Merula atrosericea, Lafr. R. Z. 1848, p. 3.

Turdus atrosericeus, Sclater, P. Z. S. 1859, p. 136.

Atrosericeus, rostro et pedibus flavis: ♀ brunnescenti-olivacea, rostro et pedibus fuscis.

Long. tota 9·0, alæ 4·7, caudæ 4·0.

Hab. Venezuela, New Granada, and Ecuador; Pallatanga (*Fraser*).

Mus. P. L. S.

35. *TURDUS INFUSCATUS*.

Merula infuscata, Lafr. Rev. Zool. 1844, p. 41.—*Turdus infuscatus*, Sclater et Salvin, Ibis, 1859, p. 6; Bp. Consp. p. 275.

Obscure niger: *rostro et pedibus flavis*. ♀ *brunnescenti-olivacea*, *subtus dilutior*, *guttur striato*; *tectricibus subalaribus rufis*: *rostro fusceo*: *pedibus flavis*.

Long. tota 9·5, alæ 5·0, caudæ 3·75.

Hab. Southern Mexico and Guatemala; Jalapa (*de Oca*); Oaxaca (*Boucard*).

Mus. P. L. S.

This Blackbird seems truly different from the preceding, as I judge from the examination of several specimens. It is not of so deep a black; the bill is much shorter (0·9 inch from the gape instead of 1·3); the wings are longer and more pointed, and the tarsi are shorter.

36. *TURDUS XANTHOSCELES*.

Turdus xanthosceles, Jard. Contr. Orn. 1847, p. 14, pl. 1, et Ann. N. H. xx. p. 329 (1847); Bp. Consp. p. 275.

Niger: *rostro et pedibus flavis*. ♀ *fusco-olivacea*.

Long. tota 8·0, alæ 4·3, caudæ 3·5.

Hab. Tobago (*Kirk*).

Mus. Gul. Jardine, Bart., et P. L. S.

37. *TURDUS FLAVIPES*.

Turdus flavipes, Vieill. Nouv. Dict. xx. 277; Enc. Méth. p. 670; Spix, Av. Bras. i. pl. 67. f. 2, p. 69.—*Turdus carbonarius*, Licht. Doubl. p. 37; Max. Beitr. iii. p. 643; Burm. Syst. Ueb. iii. p. 125.

Niger: *dorso toto et ventre imo et laterali schistaceis*; *rostro et pedibus flavis*. ♀ *olivaceo-brunnea*, *subtus dilutior*, *rostro et pedibus fuscis*.

Long. tota 9·0, alæ 4·5, caudæ 3·5.

Hab. S. E. Brazil.

Mus. Brit., P. L. S.

38. *TURDUS RUFITORQUES*.

Turdus rufitorques, Hartl. R. Z. 1844, p. 214; DuBus, Esq. Orn. pl. 19 & 20; Bp. Consp. p. 275; Sclat. et Salv. Ibis, 1849, p. 6.

Nigro-fuliginosus, *mento albo*; *cervice undique et pectore rufocinnamomeis*: *rostro flavo*. ♀ *fusco-brunnea*, *gula striata*, *pectore et collo postico rufo tinctis*.

Long. tota 9·5, alæ 5·0, caudæ 4·0.

Hab. Guatemala (*Salvin*).

Mus. Derbiano, Brit., P. L. S.

39. *TURDUS PINICOLA*, sp. nov.

Fusco-niger, *capitis et dorsi plumarum scapis brunneis*: *alarum tectricibus majoribus fumido-albo extus late limbatis*: *prima-*

riorum parte basali extus et intus macula magna alba occupata : secundariorum apicibus grisescenti-albo late terminatis : cauda nigra, hujus tectricibus superioribus et rectricum apicibus albis : abdomine cum crisso et tectricibus alarum inferioribus albis : rostro nigro, pedibus flavis. ♀ brunnescens : coloribus dilutioribus ; gutture et pectore toto brunneis, colore pallidior marmoratis.

Long. tota 8·28, alæ 5·0, caudæ 3·28, tarsi 1·0.

Hab. Southern Mexico, Pine-forests of the tableland above Jalapa (*de Oca*).

Mus. Bremensi et P.L.S.

Genus III. CICHLERMINIA.

Cichlerminia, Bp. Compt. Rend. xxxviii. p. 3 (1854).

1. CICHLERMINIA BONAPARTII.

Turdus herminieri, Lafr. R. Z. 1844, p. 167.

Saturate brunnea, plumis abdominis albis brunneo marginatis, tanquam squamatis : oculorum ambitu denudato.

Long. tota 8·5, alæ 5·0, caudæ 3·5, tarsi 1·65.

Hab. Island of Guadeloupe (*L'Herminier*).

Mus. Brit.

This is a singular bird, and must be separated from the three following species, differing as it does in its much stronger bill and longer tarsi, which give it somewhat the semblance of an Ant-thrush (*Grallaria*).

Genus IV. MARGAROPS.

Cichlallopia, Bp. Rev. Zool. 1857, p. 205, nec Bp. Compt. Rend. xxxviii. p. 6 (1854).

1. MARGAROPS FUSCATUS.

Turdus fuscatus, Vieill. Ois. de l'Am. Sept. ii. p. 1, pl. 57 *bis* ; Nouv. Dict. xx. p. 226, et Enc. Méth. p. 639 ; Bp. Consp. p. 276 ; *Cichlerminia fuscata*, A. & E. Newton, Ibis, 1859, p. 141.—*Colluricincla fusca*, Gould, P. Z. S. 1836, p. 6.

Fusco-brunneus, plumis colore dilutiore marginatis : subtus albo variegatus : ventre crissoque albis fusco striatis : caudæ rectricibus lateralibus albo terminatis : rostro et pedibus corneis.

Long. tota 10·5, alæ 5·0, caudæ 4·25, tarsi 1·3.

Hab. Islands S. Domingo and Porto Rico (*Vieill.*) ; St. Croix et St. Thomas (*Newton*).

Messrs. Newton have described the nest and eggs of this bird in the 'Ibis' (1859, p. 142).

Not being able to concur in Prince Bonaparte's transfer of his name *Cichlallopia* to this genus, I have used the term *Margarops* (μαργαρος et ὦψ)—sc. "Pearly-eyed Thrush," as Messrs. Newton call it.

2. MARGAROPS DENSIROSTRIS.

Turdus densirostris, Vieill. Nouv. Dict. xx. p. 233, et Enc. Méth. p. 642; Bp. Consp. p. 271; Lafr. R. Z. 1844, p. 167.

Similis præcedenti, sed paulo minor; rostro brevior, et magis crasso: tarsis brevioribus, validioribus: pectore magis striato.

Hab. Island of Guadeloupe (*L'Herminier*); Martinique (*Vieill.*).
Mus. Brit.

3. MARGAROPS MONTANUS.

Turdus montanus, Lafr. R. Z. 1844, p. 167.

Præcedentibus minor, supra unicolor fuscus; secundariis, tectricibus alarum majoribus et cauda albo terminatis: gutturi totius et pectoris plumis nigro-brunnescentibus, albo vix marginatis: ventre imo albido.

Long. tota 9·0, alæ 4·9, caudæ 3·8.

Hab. Island of Guadeloupe (*L'Herm.*).

Mus. Brit.

Genus V. GALEOSOPTES.

Galeoscoptes, Cab. Mus. Hein. p. 82 (1851).

Felivox, Bp. Compt. Rend. xxxviii. p. 56 (1854).

a. *Galeoscoptes*.

1. GALEOSOPTES CAROLINENSIS.

Muscicapa carolinensis, Linn. S. N. i. p. 328.—*Turdus felivox*, Vieill.—*Turdus lividus*, Wils. Am. Orn. pl. 14. f. 3.—*Mimus carolinensis*, Baird, Report, p. 346; Sclater, P.Z.S. 1856, p. 294; Cab. Mus. Hein. 1855, p. 470; Ibis, 1859, p. 6.

Plumbeus, subtus dilutior, pileo nigro; crisso ferrugineo: rostro nigro, pedibus pallide brunneis.

Long. tota 8·0, alæ 3·5, caudæ 3·5.

Hab. Eastern N. America down to Mexico, Guatemala, and Honduras (in winter); Cordova (*Sallé*); Belize (*Salvin*); Cuba (*Gundlach*).

Mus. Brit., P. L. S.

β. *Mimocichla*.

2. GALEOSOPTES RUBRIPES.

Turdus rubripes, Temm. Pl. Col. 409; La Sagra, Cuba Ois. pl. 4.—*Mimus rubripes*, Bp. Consp. p. 276.—*Galeoscoptes rubripes*, Cab. Mus. Hein. p. 82, et Journ. f. Orn. 1855, p. 470.

Dilute plumbeus, mento et crisso albis: gutture toto nigro: ventre rubro: rostro nigricante, pedibus aurantiacis.

Long. tota 10·0, alæ 4·6, caudæ 3·3.

Hab. Cuba.

Mus. Brit., P. L. S.

3. GALEOSOPTES PLUMBEUS.

Turdus plumbeus, Linn. S. N. i. p. 294; Pl. Enl. 560. f. 1; Vieill. Ois. de l'Am. Sept. ii. pl. 58, p. 2. — *Turdus ardosiaceus*, Vieill. Enc. Méth. p. 646. — *Galeoscoptes plumbeus*, Cab. Mus. Hein. p. 82; Sallé, P. Z. S. 1857, p. 231.

Cinereus: lateribus capitis nigris: gula alba nigro striata: ventre imo et crisso albis: cauda nigra, albo terminata.

Long. tota 10·5, alæ 5·1, caudæ 4·5.

Hab. S. Domingo (*Sallé*); Porto Rico (*Maugé* in Mus. Par.).

Mus. Brit., P. L. S.

Genus VI. MELANOPTILA.

Melanoptila, Sclater, P. Z. S. 1857, p. 275.

1. MELANOPTILA GLABRIROSTRIS.

Melanoptila glabrirostris, Sclater, P. Z. S. 1857, p. 275.

Nigra unicolor, cæruleo-nitens: alis caudaque æneo magis splendentibus: rostro et pedibus nigris.

Long. tota 7·8, alæ 3·5, caudæ 4·3.

Hab. Honduras, vicinity of Omoa.

Mus. Derbiano, Brit., P. L. S.

Genus VII. MELANOTIS.

Melanotis, Bp. Consp. i. p. 276 (1850).

1. MELANOTIS CÆRULESCENS.

Orpheus cærulescens, Sw. Phil. Mag. 1827, p. 369. — *Turdus melanotis*, Temm. Pl. Col. 498; Sclater, P. Z. S. 1856, p. 294; Bp. Consp. p. 276.

Schistaceo-cærulescens, facie nigra, rostro et pedibus nigris.

Long. tota 10·0, alæ 4·5, caudæ 4·7.

Hab. Southern Mexico; Cordova (*Salle*).

Mus. Brit., P. L. S.

2. MELANOTIS HYPOLEUCUS.

Melanotis hypoleucus, Hartl. Rev. Zool. 1851, p. 460; Scl. et Salv. Ibis, 1859, p. 7.

Schistaceo-cærulescens, lateribus capitis nigris: subtus candidus, crisso obscure cæruleo: rostro et pedibus nigris.

Long. tota 10·0, alæ 4·3, caudæ 5·0.

Hab. Guatemala, central region (*Salvin*).

Mus. Brit., P. L. S.

Genus VIII. RHAMPHOCINCLUS.

Ramphocinclus, Lafr. R. Z. 1843, p. 66.

Legriocinclus, Less. Ann. Sc. Nat. ix. p. 168 (1838).

Cinclops, Bp. Compt. Rend. xxxviii. p. 1.

No. 405.—PROCEEDINGS OF THE ZOOLOGICAL SOCIETY.

1. RHAMPHOCINCLUS BRACHYURUS.

Turdus brachyurus, Vieill. Nouv. Dict. xx. p. 255, et Enc. Méth. p. 655; Lafr. Rev. Zool. 1143, p. 66; Sclater, P.Z.S. 1855, p. 213.—*Zoothera cinclops*, Bp. Consp. p. 259.—*Cinclops melanoleucus*, Bp.

Nigricanti-fuscus: lateribus capitis nigris: subtus albus, hypochondriis et crisso dorso concoloribus: rostro nigro, pedibus fusco-nigris.

Long. tota 8·0, alæ 3·9, caudæ 3·0.

Hab. Islands of St. Lucia and Guadeloupe (*Mus. Paris.*); Martinique (*Vieill.*).

Mus. Paris., P. L. S.

Genus IX. CINCLOCERTHIA.

Stenorhynchus, Gould, P. Z. S. 1835, p. 186.

Cinclocerthia, G. R. Gray, List. of Gen. 1840, p. 22.

Herminierus, Less. Rev. Zool. 1843, p. 325.

1. CINCLOCERTHIA RUFICAUDA.

Stenorhynchus ruficaudus, Gould, P. Z. S. 1835, p. 186.—*Cinclocerthia ruficauda*, G. R. Gray.—*Ramphocinclus tremulus*, Lafr. Rev. Zool. 1833, p. 67; Sclater, P. Z. S. 1855, p. 214.

Fumoso-brunnea unicolor, paulum rufescens: subtus paulo dilutior magis cinerascens: rostro nigro, basi brunnescente; pedibus fuscis.

Long. tota 9·5, alæ 4·0, caudæ 3·4, rostri a rictu 1·7.

Hab. Island of Guadeloupe (*Lafr.*), Nevis (*Gould*).

Mus. Brit., P. L. S.

2. CINCLOCERTHIA GUTTURALIS.

Ramphocinclus gutturalis, Lafr. Rev. Zool. 1843, p. 67; Sclater, P. Z. S. 1855, p. 214.

Nigricanti-fuscinerea, subtus valde dilutior: gutture et ventre medio albis: tectricibus subalaribus pallide fusco-cinerascens.

Long. tota 9·5, alæ 4·4, caudæ 3·2, tarsi 1·2, rostri a rictu 1·5.

Hab. Island of Martinique (*Mus. Brit.*).

Mus. Brit.

Genus X. HARPORHYNCHUS.

Harpes, Gamb. Pr. Ac. Phil. ii. p. 264.

Harporhynchus, Cab. Wieg. Arch. 1848, i. p. 98.

Toxostoma, Wagl. Isis, 1831, p. 528.

Methriopterus, Reichb. Av. S. N. pl. 55.

a. *Harporhynchus*.1. *HARPORHYNCHUS REDIVIVUS*.

Harpes redivivus, Gamb. Pr. Ac. Phil. ii. p. 264. — *Toxostoma rediviva*, Gamb. Journ. Ac. Phil. i. p. 42 (1847); Bp. Consp. p. 277; Cassin, B. Californ. pl. 43. — *Harporhynchus redivivus*, Cab. Wiegman. Arch. 1848, p. 98; Baird, Rep. p. 349.

Supra brunnescenti-olivaceus: infra pallide cinnamomeus, gula pallidiore, ventre imo et crisso saturatioribus; pectore antico et lateribus brunnescenti-olivaceis, dorso pallidioribus: superciliis et linea infra-oculari, hac obsoletiore, obscure cineraceis: regione auriculari et striga maxillari indistincta obscure fuscis; caudæ apice pallidiore.

Long. tota 11·5, alæ 4·2, caudæ 5·75.

Hab. California.

Mus. Brit.

2. *HARPORHYNCHUS LECONTII*.

Toxostoma lecontii, Lawr. Ann. Lyc. N. Y. v. p. 109. — *Harporhynchus lecontii*, Bp. Compt. Rend. xxviii. p. 57; Notes Orn. p. 39; Baird, Rep. p. 350.

Assimilis præcedenti, sed crassitie inferiore et coloribus dilutioribus.

Hab. Vicinity of Fort Yuma, Gila River, California.

Mus. Institut. Smithsonian.

3. *HARPORHYNCHUS CRISSALIS*.

Toxostoma crissalis, Henry, Pr. Acad. Philad. 1858, p. 117; Baird, Rep. p. 351.

Supra olivaceo-brunneus, grisescente tinctus: infra pallidior, brunnescenti-griseus, gula albicantiore: crisso ferrugineo.

Long. tota 11·0, alæ 4·0, caudæ 5·8.

Hab. Southern Rocky Mountains.

Mus. Institut. Smithsonian.

4. *HARPORHYNCHUS CURVIROSTRIS*.

Orpheus curvirostris, Sw. Phil. Mag. 1827, p. 369. — *Pomatorhinus turdinus*, Temm. Pl. Col. 441. — *Toxostoma vetula*, Wagler, Isis, 1831, p. 528; Baird, Report, p. 351. — *Toxostoma curvirostre*, Sclater, P. Z. S. 1857, p. 212.

Cinereus, alarum tectricibus anguste albo terminatis; subtus albus, pectore cinereo variegato: caudæ rectricibus extimis in pogonio interiore albo terminatis: rostro et pedibus nigris.

Long. tota 9·5, alæ 4·3, caudæ 4·4.

Hab. Southern Mexico; Orizaba (*Botteri*).

Mus. P. L. S.

β. *Methriopterus*.5. *HARPORHYNCHUS LONGIROSTRIS*.

Orpheus longirostris, Lafr. Rev. Zool. 1838, p. 55, et Mag. de

Zool. 1839, Ois. pl. 1; Baird, Rep. p. 352.—*Mimus longirostris*, Slater, P. Z. S. 1856, p. 294.

Sordide castaneus: alarum tectricum apicibus albis, macula subapicali nigricante: subtus albus, nigro longitudinaliter striatus, gula et abdomine medio immaculatis.

Long. tota 11·0, alæ 4·0, caudæ 5·3.

Hab. Eastern Mexico; Rio Grande (*Couch*); Cordova (*Sallé*).

Mus. Brit., P. L. S.

6. HARPORHYNCHUS RUFUS.

Turdus rufus, Linn. S. N. i. p. 293; Wils. Am. Orn. ii. pl. 14.—*Orpheus rufus*, Sw.—*Harporhynchus rufus*, Cab. Mus. Hein. p. 82; Baird, Report, p. 353.

Supra late castaneus, alarum tectricum apicibus albis, macula subapicali nigricante: subtus albus brunnescenti-nigro triangulariter notatus: gula et abdomine medio immaculatis: rostro brevior et mandibula inferiore recta: rostro nigricanti-fusco, pedibus corneis.

Long. tota 11·0, alæ 4·0, caudæ 5·0.

Hab. Eastern N. America.

Genus XI. OREOSOPTES.

Oreosoptes, Baird, Report N. A. Orn. p. 346.

1. OREOSOPTES MONTANUS.

Oreosoptes montanus, Baird, Rep. p. 347.—*Orpheus montanus*, Townsh. Journ. Ac. Philad. vii. 2. p. 192; Aud. B. Am. pl. 139.—*Mimus montanus*, Bp. Consp. p. 276.

Supra fusco-cinereus, subtus albus, maculis parvis triangularibus, nisi in gula et ventre medio notatus: alarum tectricibus et remigibus albo anguste marginatis: rectricibus lateralibus albo terminatis: rostro nigro, pedibus corneis.

Long. tota 8·5, alæ 3·8, caudæ 3·5.

Hab. Rocky Mountains southwards to Mexico, and Gila Valley to California.

Mus. Bremensi et P. L. S.

Genus XII. MIMUS.

Mimus, Boie, Isis, 1826, p. 972.

Orpheus, Sw. Zool. Journ. (1827) iii. p. 167.

α. Species rectrice extima omnino alba.

✓ 1. MIMUS POLYGLOTTUS.

Turdus polyglottus, Linn. S. N. i. p. 293; Wils. Am. Orn. ii. pl. 10. f. 1.—*Mimus polyglottus*, Bp. Consp. p. 276; Baird, Report, p. 344;

Sc Slater, P. Z. S. 1856, p. 212 ; Cab. Journ. f. Orn. 1855, p. 470.—*Orpheus polyglottus*, Sw.

Nigricanti-cinereus, subtus albus : alis nigris, cinerascente limbatis, tectricum et secundariorum apicibus cum speculo magno alari, primariorum basin et alulam spuriam occupante, albis : cauda nigra albo terminata : rectrice extima tota, secundæ pogonio interno, et tertiæ parte mediali albis.

Long. tota 9·5, alæ 4·7, caudæ 5·0.

Hab. North America, eastern and western (?) ; southwards to Mexico, Cordova (Sallé) ; Orizaba (Botteri) ; Cuba (Gundlach).

Mus. Brit., P. L. S.

2. MIMUS ORPHEUS.

Mimus, Briss. Orn. ii. p. 263.—*Turdus orpheus*, Linn. ; Edwards, Birds, pl. 28 ; Vieill. Ois. de l'Am. Sept. ii. p. 12, pl. 68 ; Gosse, B. Jamaica, p. 144.

Albicanti-cinereus, subtus albus : alis nigris cinerascente limbatis, tectricum et secundariorum apicibus cum speculo magno alari albis : cauda nigra albo terminata : rectricibus duabus extimis fere omnino et sequentibus duabus ex majore parte albis.

Long. tota 9·0, alæ 4·0, caudæ 4·3.

Hab. Jamaica.

Mus. P. L. S.

Distinguishable from *M. polyglottus* by its smaller size, and the greater extension of the white on the outer tail-feathers.

3. MIMUS DOMINICUS.

Merula dominicensis, Briss. Orn. ii. p. 284.—*Turdus dominicus*, Linn. i. p. 295 ; Sallé, P. Z. S. 1857, p. 232.

Similis præcedenti et forsan ab illo vix distinctus.

Hab. S. Domingo.

4. MIMUS TRIURUS.

Calandria tres colas, Azara, no. 224, unde *Turdus triurus*, Vieill. Nouv. Dict. xx. p. 276, et Enc. p. 668.—*Orpheus tricaudatus*, Lafr. et d'Orb. Syn. i. p. 18 ; d'Orb. Voy. p. 208 ; Bridges, P. Z. S. 1843, p. 120 ; Bp. Consp. p. 277.

Fusco-cinereus, uropygio rufescente, subtus albus : alis nigris, tectricibus majoribus et secundariis (nisi tribus dorso proximis) omnino albis : cauda nigra, rectricibus duabus extimis omnino albis, sequentibus duabus albo variegatis.

Long. tota 8·5, alæ 3·9, caudæ 4·0.

Hab. Paraguay (*Az.*) ; Bolivia, Chiquitos (*d'Orb.*) ; rep. Argentin., Mendoza (*Bridges*).

Mus. Brit., Derbiano, P. L. S.

5. MIMUS DORSALIS.

Orpheus dorsalis, Lafr. et d'Orb. Syn. Av. i. p. 18 ; d'Orb. Voy. p. 211, pl. 11. f. 2 ; Bp. Consp. p. 277.

Saturate fuscescenti-rufus, superciliis albis : subtus albus : alis nigris, speculo alari magno et tectricum secundariorumque marginibus angustis albis : caudæ rectricibus tribus extimis omnino albis, duabus sequentibus albo variis, ceteris nigris.

Long. tota 10·0, alæ 4·9, caudæ 4·9.

Hab. Interior of Bolivia ; prov. Cochabamba (*d' Orb.*).

Mus. Brit., P. L. S.

β. *Species reatricis extimæ parte basali nigra.*

a. *Supra unicolores.*

6. *MIMUS LIVIDUS.*

Turdus lividus, Licht. Doubl. p. 39.—*Turdus orpheus*, Spix, Av. Bras. i. p. 71, pl. 71.—*Mimus lividus*, Max. Beitr. iii. p. 653 ; Burm. Syst. Ueb. iii. p. 128.

Supra pallide cinereus, superciliis et corpore subtus albis ; hypochondriis nigricante striatis : regione auriculari obscura : alis nigricantibus, albo anguste marginatis : rectricibus nigris, apicibus angustis albis.

Long. tota 10·5, alæ 4·5, caudæ 5·1.

Hab. S.E. Brasil.

Mus. P. L. S.

7. *MIMUS GUNDLACHII.*

Mimus gundlachii, Cab. Journ. f. Orn. 1855, p. 470.

Similis Mimo livido, sed caudæ rectricum apicibus albis angustioribus, rostro longiore, et corpore subtus magis puro.

Hab. In ins. Cuba (*Gundlach*). (Non vidi.)

8. *MIMUS GILVUS.*

Turdus gilvus, Vieill. Ois. de l'Am. Sept. ii. p. 15. pl. 68 *bis* ; Nouv. Dict. xx. p. 296 ; Enc. Méth. p. 678.

Supra fuscescenti-cinereus, superciliis et corpore subtus albis : regione auriculari paulo obscuriore : alis nigricantibus, tectricibus albo terminatis, remigibus cinereo stricte marginatis : cauda nigricante, rectricum apicibus latis albis.

Long. tota 10, alæ 4·5, caudæ 4·5.

Hab. British Guiana (*Schomb.*).

Mus. Brit., P. L. S.

Obs. Affinis *Mimo livido*, sed supra fuscescentius cinereus et rectricum apicibus albis latioribus.

9. *MIMUS MELANOPTERUS.*

Mimus melanopterus, Lawr. Ann. Lyc. N. Y. 1845, p. 35. pl. 2.—*Mimus colombianus*, Cab. Mus. Hein. p. 82.—*Mimus* — ? , Selater, P. Z. S. 1855, p. 145.—*Mimus gilvus*, Jard. Ann. N. H. ser. 2. xx. p. 329.

Cano-cinereus : subtus albus : superciliis albis, regione oculari nigricante : alis nigricantibus, tectricibus albo terminatis, re-

migibus cinereo stricte limbatis: cauda nigricante, rectricum apicibus latis albis.

Long. tota 9·5, alæ 4·4, caudæ 5·0.

Hab. New Granada; Venezuela; Trinidad; Tobago (*Kirk*).

Mus. P. L. S.

Obs. A *Mimo gilvo*, crassitie inferiore, rostro paulo longiore et rectricum apicibus albis minus latis vix distinguendus.

10. MIMUS GRACILIS.

Mimus gracilis, Cab. Mus. Hein. p. 83; Sclater et Salv. Ibis, 1859, p. 5.

Cano-cinereus; subtus albus, alis et cauda nigerrimis: tectricum apicibus angustis albis; remigibus strictissime cinereo marginatis; rectricum apicibus latioribus et unæ utrinque extimæ pogonio interiore a basi albis.

Long. tota 9·3, alæ 4·2, caudæ 5·0.

Hab. Guatemala and Honduras (*Salvin*).

Mus. P. L. S.

Obs. Alis et cauda coracino-nigris primo visu distinctus.

b. *Supra nigro variegatæ.*

11. MIMUS MODULATOR.

Mimus modulator, Gould, P. Z. S. 1836, p. 6.

Supra cinerascenti-brunneus nigro flammulatus, uropygio rufescente: superciliis latis et longis albis: alis nigricantibus, albo et rufescenti-griseo extus marginatis: cauda nigra, rectricum lateralium tertia parte apicali alba: subtus albus, ventre et lateribus rufescente perfusus.

Long. tota 11·0, alæ 4·5, caudæ 5·0, rostri a rictu 1·1.

Hab. Southern Brazil, Rio Grande (*Plant*); Maldonado (*Darw.*).

Mus. Brit., P. L. S.

Obs. Species crassitie majore et rostro brevi insignis, et facile distinguenda.

12. MIMUS CALANDRIA.

Calandria, Azara, no. 223.—*Orpheus calandria*, Lafr. et d'Orb. Syn. Av. i. p. 17; d'Orb. Voy. p. 206. pl. 10. f. 2.—*Mimus orpheus*, Darwin, Zool. Beagle, p. 60; Burm. Syst. Ueb. iii. p. 126?

Supra fusco-fuliginosus, plumis in disco obscurioribus, alarum tectricum et secundariorum apicibus sordide albescentibus; primariis angustissime albo marginatis: flexura alba: superciliis latis et corpore subtus sordide albescentibus: cauda fusco-nigra, rectricibus quatuor extimis late albo terminatis (d'Orb.).

Hab. Paraguay; La Plata, near Monte Video, and Buenos Ayres (*d'Orb.*).

Obs. Minor quam *M. thenca* (teste d'Orbigny), itaque cum *Mimo modulatore*, Gouldii, majore minime confundendus!

Burmeister and other writers unite this species to *M. modulator*, which is certainly wrong. I have a Bolivian bird (agreeing with two specimens in the British Museum from the same country, collected

by Bridges) which I am inclined to refer to it. My example is very like *M. modulator*, but much smaller (Long. tota 9·5, alæ 4·0, caudæ 4·2), though the bill is of the same size.

13. MIMUS PATAGONICUS.

Orpheus patagonicus, Lafr. et d'Orb. Syn. Av. i. p. 16; d'Orb. Voy. p. 210, pl. 11. f. 2; Darwin, Voy. Beagle, p. 60.

*Fusco-cinereus superciliis angustis albicantibus; tergo parum rufescente: alis nigris, primariis anguste, secundariis et tectricibus late albo marginatis: rectricibus nigris, harum laterali-
bus macula cuneiformi alba terminatis: subtus cinerascens,
gula et abdomine medio albis: hypochondriis rufescentibus fusco
striolatis: gutture albo, maculis minutis fuscis utrinque mar-
ginato.*

Hab. Patagonia; Rio Negro (d'Orb. and Darwin).

Mus. Brit.

14. MIMUS THENCA.

Turdus thenca, Molina, Saggio S. N. Chili, p. 213.—*Orpheus thenca*, d'Orb. Voy. p. 209.—*Mimus thenca*, Darw. Zool. Beagle, p. 61.

*Supra fuscus, nigro paulum variegatus, pileo obscuriore: superciliis
latis albis: alis nigris albo limbatis: subtus sordide cinereus,
striga gulari utrinque nigricante: hypochondriis nigro flam-
mulatis: cauda nigra: rectricum laterali- apicibus albis.*

Long. tota 10, alæ 4·5, caudæ 4·8.

Hab. Chile, near Valparaiso (d'Orb.); sea-coast of Central and Northern Chile (Darwin).

Mus. Brit., P. L. S.

Obs. Gula utrinque striata conspicuus.

15. MIMUS LEUCOSPILUS.

Mimus leucospilus, v. Pelzeln, Sitz. Ak. Wien, xxxi. p. 323.—*Mimus peruvianus*, Peale, B. of U. S. Expl. Exp. ed. 1. p. 87?.

*Sordide cinereus, plumis medialiter nigricantioribus, cinereo
circumcinctis: lateribus capitis cervice et corpore subtus albis;
pectore cinereo lavato: lateribus nigro striatis: alis nigricanti-
brunneis extus albo limbatis: tectricibus dorso concoloribus sed
albo limbatis, tectricum primariorum apicibus omnino albis
maculam alarem conspicuam constituentibus: cauda supra
nigricanti-cinerea, subtus pallidior, rectricibus omnibus nisi
duabus intermediis albo late terminatis: rectricibus duabus
extimis item in utroque pogonio anguste albo marginatis:
tectricibus alarum inferioribus albis: rostro et pedibus nigris.*

Long. tota 10·5, alæ 4·8, caudæ 5·5.

Hab. Coast of Ecuador, Bay of S. Elena (Kellott).

Mus. Brit., Vindobiensi.

16. MIMUS SATURNINUS.

Mimus saturninus, Licht. Doubl. p. 59; Max. Beitr. iii. 658;
Burm. Syst. Ueb. iii. 127.

Fusco-cinereus, plumis medialiter nigricantioribus; subtus sordide albido-cinereus, hypochondriis rufescentibus fusco striolatis: vitta lata superciliari albicante, regione auriculari nigra: remigibus totis fuscis, albido marginatis: rectricibus fusco-nigricantibus, albo late terminatis.

Long. tota 9·5, alæ 4·1, caudæ 4·7, rostri a rictu 1·05.

Hab. Coast-region of Brazil; Para (*Licht.*).

Mus. Brit., P. L. S.

17. MIMUS LONGICAUDATUS.

Mimus longicaudatus, Tsch. in Wiegmann. Arch. 1844, i. p. 280; Faun. Per. p. 190, pl. 15. f. 2.

Supra cinereo-fuscus, alis saturationibus albo-vittatis; cauda longa, fusca, apice alba: subtus albicans, pectore dorso concolore: rostro nigro: pedibus fuscis. (Tsch.)

Hab. Wood-region of E. Peru (Tsch.).

I have not seen this species. Tschudi says it resembles *M. thenca* in colouring, but differs in its longer, more compressed, and more incurved bill.

18. MIMUS TRIFASCIATUS.

Orpheus trifasciatus, Gould, P. Z. S. 1837, p. 27; Darwin, Voy. Beagle, Zool. p. 62, pl. 16.

Sordide fusco-nigricans, plumis medialiter obscurioribus, uropygio rufescente; alis albo trifasciatis: superciliis, regione auriculari et corpore subtus albis, vitta lata pectorali ex maculis confluentibus nigra: cauda nigricante, rectricibus lateralibus albo terminatis: rostro et pedibus nigris.

Long. tota 10·6, alæ 5·0, caudæ 5·5.

Hab. Galapagos, Charles Island.

Mus. Brit.

19. MIMUS MELANOTIS.

Orpheus melanotis, Gould, P. Z. S. 1837, p. 27; Darwin, Zool. Beagle, p. 62, pl. 17.

Sordide fusco-nigricans, plumis medialiter obscurioribus: alarum tectricibus et secundariis albo terminatis: loris et regione auriculari nigris: superciliis albis: subtus sordide albus, hypochondriis nigricante striatis: cauda nigricante, rectricibus lateralibus omnibus albo terminatis: rostro et pedibus nigris.

Long. tota 9·5, alæ 4·5, caudæ 4·5.

Hab. Galapagos, Chatham and James Islands.

Mus. Brit.

20. MIMUS PARVULUS.

Orpheus parvulus, Gould, P. Z. S. 1837, p. 27; Darwin, Zool. Beagle, p. 63, pl. 18.

Præcedenti similis, sed paulo minor: forsan vix distinctus.

Hab. Galapagos, Albemarle Island.

Mus. Brit.

CONSPECTUS TURDORUM AMERICANORUM.

1. Eastern North America.	2. Western North America.	3. Mexico.	4. Guatemala and Central America.	5. Antilles.	6. New Granada.	7. Ecuador.	8. Eastern Peru.
<i>migratorius.</i>	<i>migratorius.</i> <i>navius.</i>	<i>infuscatus.</i> <i>pinicola.</i> <i>migratorius.</i> <i>grayii.</i> <i>assimilis.</i>	<i>infuscatus.</i> <i>ryflorques.</i> <i>grayii.</i> <i>leucauchen.</i>	<i>xanthosceles.</i> <i>aurantius.</i> <i>phaeopygus.</i> <i>jamaicensis.</i> <i>mustelinus.</i>	<i>gigas.</i> <i>casius?</i> <i>ignobilis.</i> <i>phaeopygus.</i> <i>fulviventris.</i>	<i>atrosericeus.</i> <i>gigas.</i> <i>chiguanco.</i> <i>albiventris.</i>	<i>fuscater.</i> <i>serranus.</i>
<i>mustelinus.</i> <i>pallasi.</i> <i>fuscescens.</i> <i>swainsoni.</i> <i>aliciae.</i>	<i>nanus.</i> <i>utulatus.</i>	<i>flavirostris.</i> <i>mustelinus.</i> <i>silens.</i> <i>swainsoni.</i>	<i>mustelinus.</i> <i>swainsoni.</i>	<i>swainsoni.</i>	<i>swainsoni.</i>	<i>swainsoni.</i>	<i>swainsoni.</i>

CONSPECTUS (continued).

9. Interior of Bolivia.	10. Chili and Western Peru.	11. Patagonia.	12. Argent. republic. and Paraguay.	13. South-eastern Brazil.	14. North-eastern Brazil.	15. Guiana.	16. Venezuela and Trinidad.
<i>fuscater.</i>	<i>chiquanco.</i>		<i>fuscater.</i>	<i>flavipes.</i>	<i>fumigatus.</i>	<i>gymnophthalmus.</i> <i>fumigatus.</i>	<i>atrosericeus.</i>
				<i>fumigatus.</i>	<i>albiventris.</i> <i>pheopygus.</i>	<i>albiventris.</i> <i>pheopygus.</i>	<i>olivater.</i> <i>gymnophthalmus.</i>
<i>rufiventris.</i>	<i>falklandicus.</i>	<i>falklandicus.</i>	<i>rufiventris.</i>	<i>crotopezus.</i> <i>albicollis.</i> <i>rufiventris.</i>			

15. ON SOME NEW FRESHWATER SHELLS FROM CENTRAL AFRICA. BY S. P. WOODWARD, F.G.S. COMMUNICATED BY PROF. OWEN.

(Mollusca, Pl. XLVII.)

The four shells which form the subject of the present note were collected by Captain Speke in the great freshwater Lake Tanganyika in Central Africa.

The large bivalve belongs to the genus *Iridina*, Lamarek,—a group of river-mussels, of which there are nine reputed species, all belonging to the African Continent. This little group has been divided into several subgenera. That to which the new shell belongs is distinguished by its broad and deeply-wrinkled hinge-line, and is called *Pleiodon* by Conrad. The posterior slope of this shell is encrusted with tufa, as if there were limestone rocks in the vicinity of its habitat.

The small bivalve is a normal *Unio*, with finely sculptured valves.

The smaller univalve is concave beneath, and so much resembles a *Nerita* or *Calyptæa* that it would be taken for a sea-shell if its history were not well authenticated. It agrees essentially with *Lithoglyphus*,—a genus peculiar to the Danube; for the American shells referred to it are probably, or, I may say, certainly distinct. It agrees with the Danubian shells in the extreme obliquity of the aperture, and differs in the width of the umbilicus, which in the European species is nearly concealed by the callous columellar lip.

In the Upper Eocene Tertiaries of the Isle of Wight there are several estuary shells, forming the genus *Globulus*, Sow., whose affinities are uncertain, but which resemble *Lithoglyphus*.

The Lake Tanganyika (situated in lat. 3° to 8° S. and long. 30° E.), which is several hundred miles in length and 30 to 40 in breadth, seems entirely disconnected with the region of the Danube: but the separation may not always have been so complete, for there is another great lake, Nyanza, to the northward of Tanganyika, which is believed by Speke to be the principal source of the Nile.

The other univalve is a *Melania*, of the subgenus *Melanella* (Swainson), similar in shape to *M. hollandi* of S. Europe, and similar to several Eocene species of the Isle of Wight. Its colour, solidity, and tuberculated ribs give it much the appearance of a small marine whelk (*Nassa*); and it is found in more boisterous waters, on the shores of this great Inland Sea, than most of its congeners inhabit.

1. IRIDINA (PLEIODON) SPEKII, n. sp. (Pl. XLVII. fig. 2.)

Shell oblong, ventricose, somewhat attenuated at each end; base slightly concave; epidermis chestnut-brown, deepening to black at the margin; anterior slope obscurely radiated; hinge-line compressed in front and tuberculated, wider behind and deeply wrinkled.

Length $4\frac{3}{4}$, breadth 2, thickness $1\frac{3}{4}$ inches.

*Testa oblonga, tumida, extremitatibus fere attenuata, basi subar-
cuata; epidermide castaneo-fusca, marginem versus nigricante;*

linea cardinali antice compressa tuberculata, postice latiore, paucis rugis arata.

2. *UNIO BURTONI*, n. sp. (Pl. XLVII. fig. 1.)

Shell small, oval, rather thin, somewhat pointed behind; umbones small, not eroded; pale olive, concentrically furrowed, and sculptured more or less with fine divaricating lines; anterior teeth narrow, not prominent; posterior teeth laminar; pedal scar confluent with anterior adductor.

Length 12, breadth $8\frac{1}{2}$, thickness $5\frac{1}{2}$ lines.

Testa parva, ovalis, tenuiuscula, postice subattenuata; umbonibus parvis, acuminatis; epidermide pallide olivacea; valvis lineolis divaricatis, decussatim exaratis; dentibus cardinalibus angustis, haud prominentibus.

3. *LITHOGLYPHUS ZONATUS*, n. sp. (Pl. XLVII. fig. 3.)

Shell orbicular, hemispherical; spire very small; aperture large, very oblique; umbilicus wide and shallow, with an open fissure in the young shell; lip continuous in front with the umbilical ridge; columella callous, ultimately covering the fissure; body-whirl flattened, pale olivaceous, with two brown bands, darker at the apex; lines of growth crossed by numerous oblique, interrupted striae.

Diameter 5-6, height 3 lines.

Testa orbicularis, hemisphaerica, late umbilicata (apud juniores rimata), spira minuta; apertura magna, valde obliqua; labio calloso (in testa adulta rimam tegente): pallide olivacea, fasciis duabus fuscis zonata; lineis incrementi striolis interruptis oblique decussatis.

4. *MELANIA (MELANELLA) NASSA*, n. sp. (Pl. XLVII. fig. 4.)

Shell ovate, strong, pale brown, with (sometimes) two dark bands; spire shorter than the aperture; whirls flattened, ornamented with six brown spiral ridges crossed by a variable number of white, tuberculated, transverse ribs; base of body-whirl with eight tuberculated spiral ridges variegated with white and brown; aperture sinuated in front; outer lip simple; inner lip callous.

Length $8\frac{1}{2}$, breadth $5\frac{1}{2}$ lines.

Testa ovata, solida, pallide fusca, zonis 2 nigricantibus aliquando notata; spira apertura brevior; anfractibus planulatis, lineis 6 fuscis spiralibus et costis tuberculatis ornatis; apertura antice sinuata; labro simplici; labio calloso.

P.S. July 27th.—In addition to the foregoing shells, several others were collected by Capt. Speke, when employed, under the command of Capt. Burton, in exploring Central Africa in the years 1856-9; these were deposited in the first instance with the Geographical Society, and are now transferred to the British Museum.

A specimen of *Ampullaria (Lanistes) sinistrorsa*, Lea, and odd valves of two species of *Unio*, both smooth and olive-coloured, were picked up in the Ugogo district, an elevated plateau in lat. 6° to 7° S., long. 34° to 35° E.

A large *Achatina*, most nearly related to *A. glutinosa*, Pfr., is the "common snail" of the region between Lake Tanganyika and the East coast. Fossil specimens were obtained in the Usagara district, at a place called Maroro, 3000 feet above the sea, overlooking the Lufiji River, where it intersects the coast range (lat. 7° to 8° S., long. 36° to 37° E.).

Another common land snail of the same district is the well-known "*Bulimus caillaudi*, Pfr.," a shell more nearly related to *Achatina* than *Bulimus*.

Captain Speke also found a solitary example of *Bulimus ovoideus*, Brug., in a musjid on the island of Kiloa (lat. 9° S., long. 39° to 40° E.). This species is identical with *B. grandis*, Desh., from the island of Nosse Bé, Madagascar, and very closely allied to *B. libe-rianus*, Lea, from Guinea.

Mr. Hermann Schlagintweit exhibited specimens of heads of a Sheep from Thibet, which showed a curious modification in the form of the horns. He referred them to the sheep described as *Ovis hunia* by Mr. Hodgson (Journ. As. Soc. Bengal, i. p. 348, xvi. p. 1005; and Proc. Zool. Soc. for 1834, p. 99); but the specimens exhibited were remarkable on account of a curious malformation—the horny part of the two horns being entirely grown together so as to form apparently but one single horn. This might, it was stated, not improbably have given rise to one of the various modifications of the fabulous Unicorn of Thibet. This peculiar formation was only met with in tame animals; and in the three specimens laid before the Society (one of which was presented some time ago by Mr. Hodgson to the India House, the two others being from Messrs. Schlagintweit's collections) the upper part of the horns, which perhaps would have touched the animal's neck, had been artificially cut off.

It was considered to be well worthy of notice, that this peculiar malformation seemed to be limited to the *Ovis hunia*, none of the members being aware that a similar malformation was ever met with among either wild or domesticated sheep.

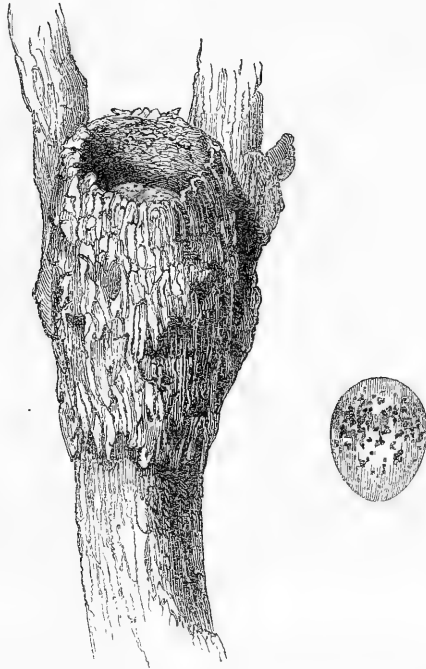
On searching the rich collections of London for similar objects, Messrs. Schlagintweit found one example in the College of Surgeons, where, by an evident mistake, it is called in the Catalogue a malformation of *Ovis ammon*. Another specimen was stated to exist in the British Museum.

The Secretary exhibited an egg laid by the Apteryx (*Apteryx mantelli*) which had been living in the Gardens since 1852. The egg when deposited (June 9th) weighed $14\frac{1}{2}$ ozs., the contents thereof weighing $13\frac{1}{2}$ ozs. The shell was smooth, and of a dirty white colour; the form an elongated oval, slightly tapering towards the small end, 4.75 inches in long, and 2.9 inches in short diameter. The weight of the living bird was ascertained to be 60 ozs.; so that the egg was nearly equal to one-fourth of the weight of the bird.

Mr. S. Stevens exhibited two beautiful new Butterflies collected by Mr. Wallace in the Island of Batchian. One of these was an *Ornithoptera* of the group containing *O. priamus* and its allies; the other a *Papilio* allied to *P. ulysses*.

Dr. George Bennett exhibited specimens of the egg of the Mooruk (*Casuarium bennettii*).

Mr. Gould exhibited specimens of the new Paradise-bird (*Semioptera wallacii*) discovered by Mr. A. R. Wallace in the Island of Batchian, Moluccas, as mentioned at the meeting held on March 22nd (see *antea*, p. 129), and pointed out its peculiarities and supposed affinities, which, as he stated, seemed to be rather with *Ptilorhis* and its allies, than with the true *Paradisææ*. Mr. Gould also exhibited a drawing, by Mr. G. F. Angas of Sydney, of the nest and egg of *Sittella chrysoptera*. (See the accompanying woodcut.)



A series of twelve coloured drawings of various species of Nudi-branchiate Molluscs from the harbour and vicinity of Port Jackson, New South Wales, made by Mr. George French Angas, Secretary of the Australian Museum, Sydney, were exhibited to the Society. The drawings were all taken from living specimens, and afforded

indications of thirty-four new species, and probably of two new genera of this class of animals.

The following list of additions to the Society's Menagerie by presentation and purchase during the month of June was read :—

2 Spring-boks	<i>Gazella euchore</i>	Presented by Sir George Grey, K.C.B.
2 Ostriches	<i>Struthio camelus</i>	Presented by Sir George Grey, K.C.B.
34 Wrasse	<i>Crenilabrus cornubicus</i>	Purchased.
6 Blennies	<i>Blennius pholis</i>	Purchased.
4 Cotti	<i>Cottus gobio</i>	Purchased.
1 Paradoxure	<i>Paradoxurus</i> — ?	Purchased.
1 Cobra	<i>Naia haje</i>	Purchased.
2 Green Tree-Snakes ..	<i>Philodryas viridissima</i>	Purchased.
1 Cirl Bunting.....	<i>Emberiza cirrus</i>	Purchased.
1 Capybara	<i>Hydrochaerus capybara</i>	Purchased.
1 Shieldrake	<i>Tadorna vulpanser</i>	Presented by Mrs. Carew.
1 Capuchin Monkey ..	<i>Cebus</i> — ?	Purchased.
1 Water Lizard	<i>Hydrosaurus salvator</i>	Purchased.
1 Vervet Monkey	<i>Cercopithecus pygerythrus</i> ..	Presented by Comm. Be- dingfield, R.N.
1 Macaque Monkey.....	<i>Macacus cynomolgus</i>	Presented by S. Graham, Esq.
1 Goat (Chinese variety)	<i>Capra hircus</i> , var.....	Presented by J. Bowman, Esq.
18 Wrasse	<i>Labrus maculatus</i>	Purchased.
1 Crested Blenny	<i>Blennius galerita</i>	Purchased.
3 Green Tree-Frogs.....	<i>Hyla viridis</i>	Presented by Adam Duff, Esq.
2 Trumpeters	<i>Psophia crepitans</i>	Purchased.
2 Opossum Squirrels ...	<i>Belideus breviceps</i>	Presented by Charles Hut- ton, Esq.
6 Wonga Pigeons	<i>Leucosarcia picata</i>	Presented by Geo. Mac- leay, Esq., Corr. Memb.
3 Bronze-winged Pigeons	<i>Phaps chalcoptera</i>	Presented by Geo. Mac- leay, Esq., Corr. Memb.
1 Bush Bronze-winged Pigeon.	<i>Phaps elegans</i>	Presented by Geo. Mac- leay, Esq., Corr. Memb.
2 Turquoise Parrakeets	<i>Euphema pulchella</i>	Presented by Geo. Mac- leay, Esq., Corr. Memb.
2 Ichneumons	<i>Herpestes griseus</i> ?.....	Presented by H. Grant, Esq.
1 Black-tailed Parrakeet	<i>Polyteles melanurus</i> ♀	Purchased.
1 Spotted Cavy	<i>Cølogeny's paca</i>	Presented by D. A. Mel- ville, Esq.
8 Guinea-Pigs	<i>Cavia aperea</i>	Presented by Master Ab- bott.
4 Spotted Gunnels	<i>Gunnellus guttatus</i>	Purchased.
3 Eels	<i>Anguilla</i> — ?	Purchased.
20 Viviparous Blennies..	<i>Zoarces viviparus</i>	Purchased.

Of these, the *Philodryas viridissima*, *Hydrosaurus salvator*, *Belideus breviceps*, and *Zoarces viviparus* were stated to be exhibited for the first time.

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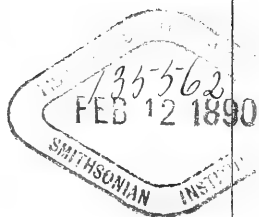
PHILIP LUTLEY SCLATER, M.A.,

Secretary.

11 Hanover Square, W.

THE
PROCEEDINGS
OF THE
ZOOLOGICAL SOCIETY
OF
LONDON.

1859.



PART III.
JUNE—DECEMBER.

PRINTED FOR THE SOCIETY;
SOLD AT THEIR HOUSE IN HANOVER-SQUARE,
AND BY
MESSRS. LONGMAN, GREEN, LONGMANS, AND ROBERTS,
PATERNOSTER ROW.

[Price 2s.]

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November 8th, 1859.

John Gould, Esq., V.P., in the Chair.

Mr. Gould exhibited a specimen of a fine species of Pheasant from Siam, transmitted to him by Sir Robert Schomburgk. He stated that the oldest specific appellation for this bird, which had been called *Diardigallus prælatus* by the late Prince Bonaparte, and *Diardigallus fasciolatus* by Mr. Blyth, appeared to him to be *crawfurdi*. This name was established by Dr. J. E. Gray in Griffith's edition of Cuvier's 'Animal Kingdom' upon a drawing of a bird obtained by Mr. Crawford in Siam many years ago, which Mr. Gould regarded as representing the female of this species. He proposed therefore to call this bird *Diardigallus crawfurdi*.

Mr. Gould also exhibited a specimen of the Royal Spoonbill of Australia, *Platalea regia*.

The Secretary exhibited eggs of Montigny's Crane (*Grus montignesia*), the Demoiselle Crane (*Grus virgo*), and the Common Crane (*Grus cinerea*), laid by birds in the Society's Gardens; and an egg of the *Balaniceps rex*, obtained by Mr. Petherick on the White Nile.

The Rev. H. B. Tristram, F.L.S., exhibited some Mammals, Reptiles, Batrachians, and Fishes, collected by himself in the Algerian Sahara. Among the former were particularly noticed a Genet (*Genetta bonapartii*) and a small species of Hare (*Lepus*) from the oasis of Waregla.

Dr. A. Günther made some observations on the Reptiles, Batrachians, and Fishes exhibited by Mr. Tristram, some of which he considered as undescribed, and promised a full account of them at a future meeting.

The following papers were read:—

1. NOTES ON THE KIANG OF THIBET (EQUUS KIANG).

By MAJOR W. E. HAY, F.Z.S.

(Mammalia, Pl. LXXIII.)

In presenting a "Kiang" to the Zoological Society, I am only trying to merit a further continuance of the approbation so kindly and generously marked by the presentation to me of the Silver Medal in 1857, for the part I took in sending to England the Pheasants of the Himalaya. Together with the animal, the Society may probably expect some remarks from myself, as it has been in my possession for nearly two years.

The animal I now make over to the Society was an exchange present with the Zông-pûn, or Chinese Governor of Rûdôk, a Hill-fort

No. 406.—PROCEEDINGS OF THE ZOOLOGICAL SOCIETY.

situated beyond the Pâng-Kông Lake in Little Thibet. I had sent up from Kùllû to procure two dogs of enormous size, evidently of the same breed as was described by Marco Polo as being of the size of donkeys. One of these, however, had died, and the person deputed, thinking I should prefer a wild horse to a single dog, secured it for me. At that time it had never been haltered or handled. It was said to have been caught in a pit, and was much attached to a white Chûmûrti ghoont, which alone it would follow. In December 1857 it was delivered to me in Kùllû, but, the white ghoont being claimed by a Tibetan Lama, I purchased a Tibetan mule to keep it company. With this it did not agree, and the mule led anything but a happy life. The Kiang would, however, follow it, and was always restless unless it had some horse in company: of colours its preference was for white. It always showed the greatest aversion to pass over any of our vile wooden bridges; and when its companion passed over the bridge, waited until it saw that the latter had gained the opposite bank, and then in a fearless manner it would plunge into the most rapid stream and usually make a nearly straight course across. In leaving Kùllû to take it to Simla, it had to cross the river Blass, which was at that season a foaming torrent. It plunged in, but was carried down the stream several hundred yards, and landed upon an island. Here it remained quietly all night until the following morning, when I had to send the mule across to the island to tempt it to follow to the shore, which it did. It afterwards crossed a broad part of the river with great ease, where it was less rapid. The Sutlej was at this season so full and running at such a frightful pace, that I deemed it advisable to throw the animal and secure it upon a raft, which was with great difficulty got across. I then brought it into Simla, where it gradually became accustomed to see more people and (to it) strange sights. I kept it there during the whole of one rainy season, although rather doubtful of the result, since Adolph Schlagentweit had given it as his decided opinion that the animal could not live under an elevation of 10,000 feet above the level of the sea. At Simla it was never a day sick. I thence had it marched to Ferozepore. On reaching the plains it seemed rather inclined to enjoy freedom, and I was obliged to have as many as four men to hold and lead it; and even then on several occasions it got away, but was not very difficult to secure again.

At Ferozepore I determined to get rid of the mule, which had hitherto accompanied it, and to take it down to Kurrachi by water in a boat purposely fitted up. When first I succeeded with much difficulty in getting it on board, the hollow sound of the boards beneath its feet so alarmed it that it cleared the side of the boat at one spring, carrying hatch and all with it. I then turfed the bottom, and by main force of many men pulled it again on board. It got on well to Kothree, when I again disembarked it, to its great delight. I then marched it across the country to Kurrachi; but, as I sent a strange horse with it, it was very uneasy, and, but for its old servant having accompanied it, would have run back to Kothree.

After keeping it a month at Kurrachi, I took a passage in the

barque 'Sumner,' laying in a large quantity of hay, kirbee, and dried lucern, also grain. The latter was worm-eaten, and it was long before the animal could be induced to touch it. Our passage was very long, and, the captain's people having unceremoniously used my provisions to feed their own stock, the Kiang was *twice* reduced to eat the straw with which the sailors' beddings had been stuffed.

This proves the hardness of the animal. At first it refused to drink any tainted water; but before reaching St. Helena, where I had to lay in fresh supplies, it would eat or drink almost anything.

The putting it on board the ship at Kurrachi was very difficult, and the poor thing struggled so much, that it was painful to watch it as it was lowered into the boat to be conveyed to the ship. So anxious were my friends concerning its safety, that a lady and gentleman who had allowed it to stand in their stables, and had given it many a tid bit of lucern, carrots, &c., came off in the boat with it. The sea was rough, and we had some miles to go to the ship; the shaking of the sails frightened it much. However, at last it was hoisted into the ship and placed in a house which had been built for it, and in which it continued until it reached England.

It became exceedingly knowing, and balanced itself so beautifully that I never had to sling it unless the weather was very rough. In an actual gale the poor creature laboured dreadfully, and seemed grateful for attention. It became latterly extremely docile, and always knew me by my voice. In crossing the line the first time the weather was very trying, and for three or four days the Kiang suffered greatly from the extreme heat. Its urinary organs became disordered; all the medicine I administered was a little sweet spirits of nitre. It recovered, and never afterwards during the whole voyage showed a symptom of sickness; and with the exception of about three days it always had a *voracious* appetite, and consumed in four as much as I had laid in for six months.

During the voyage the Kiang became twice in season for sexual intercourse. I may add that I never have allowed her to be placed with any stallion. That they do breed with the horse I was assured in Tibet, and that their produce was highly valued. It was also stated that the produce bred again, which is an interesting fact, and proves that the Kiang is more nearly allied to the horse than to the ass. Cunningham, in his 'Ladak and Surrounding Countries,' describes its dentition, &c.; but I cannot agree with him that its neigh resembles that of a horse. I have often heard this one attempt a neigh, but it is a sad failure; at the same time it as little resembles the bray of an ass; indeed its mode of calling to its companions is, like itself, quite unique. I feel confident that this female Kiang may be got to breed with a horse, and perhaps she would give the preference to one of a white colour.

I always found the Kiang very susceptible of kindness, its satisfaction being usually expressed by throwing its ears forwards; it generally shows a sort of pettish displeasure when any one is leaving it after giving it bread, &c. I twice placed a native of India on its back, but this was after it had gone a march, when it was slightly

distressed by the heat of the weather: it took no notice whatever of its rider. I have been accustomed to have the animal groomed with a curry-comb. I should recommend this to be continued; it will keep the animal docile and improve its appearance.

I was convinced of the Kiang's specific difference from the wild Ass of Scinde, when I saw one of the latter at Delhi, intended for conveyance to England, and this made me persevere the more to get it home.

I have often watched the herds of this animal on the plains or slopes of hills in Tibet; one invariably stands sentry at from 100 to 200 yards from the flock, and when danger is at hand he commences walking leisurely towards his companions. They take the alarm, and as soon as he comes up, off all go together in a trot or canter as the case may require.

I don't know to what space to limit the range of the Kiang. Marco Polo speaks of Asses, but evidently alludes to those of Persia. Huc and Gabet evidently saw them towards Lassa; and I have been told that they are to be met with on all the level country between Ladak and Lassa, or in the valleys between the various ranges. I have seen them only north of the great Himalayan ranges, first upon the Rupcher plains and in the neighbourhood of the Salt Lakes, often in company with the *Ovis ammon* or "Nyan." I have also seen them north of the Pâng-Kông lake. The passes from Hindustan into Tibet are never open before June, when I have seen flocks of the Kiang feeding almost entirely on the roots of a species of *Artemisia*, or Worm-wood.

Their natural enemies besides man seemed to be a white panther, which lurks amongst the rocks; and a large species of wolf. I have found their skeletons on the melting of the snow.

Beyond the Pâng-Kông lake I was informed that in winter many of them were to be seen in the Shap-Yok valley, in company with wild Yáks or Dông, also the "Nyan" (*Ovis ammon*), and the "Süs" or Tibetan Antelope (*Panthalops hodgsoni*). A few tamarisk bushes seem then to support them, and at the end of winter all these animals are spoken of as being like walking skeletons. I have sometimes approached flocks of Kiang quite close, at other times could not get within a mile of them. On one occasion two Kiangs followed a pony on which I had a servant mounted,—in fact, kept so close that my servant feared they were going to attack him.

I never could ascertain satisfactorily when the Kiang breeds; but I think it must bring forth in winter, for I have seen a mare shot with a young one in the womb, nearly mature, in August; and in the many flocks I have met with running wild I never perceived a foal that I should have taken to be of less than six months old. When very young, the hair of the foal has the appearance of wool. The winter coat of the adult is also very thick and curly, and is of darker colour than its summer coat. It appears to shed its winter coat in May.

The Kiang may be said to inhabit plains and undulating hills, at from 15,000 to 16,500 feet above the sea; if found in the steeper

hills, they have been driven there. It is most wonderful to see the rapidity with which they can ascend mountains, and although they descend quickly I never saw one lose its footing. After they have been pursued for some time on the hills and driven on to the plains, they will frequently make a charge past you at about 100 yards distance in preference to ascending the steep parts again, thus showing their preference for level ground. They are almost always seen in the neighbourhood of lakes or ponds in the unfrequented spots which are usually beyond the sportsman's beat.

2. ON THE SEA-LIONS, OR LOBOS MARINOS OF THE SPANIARDS,
ON THE COAST OF CALIFORNIA. BY DR. J. E. GRAY, F.R.S.,
V.P.Z.S., P.E.S. &c.

(Mammalia, Pl. LXXII.)

Mr. John H. Gurney has kindly presented to the British Museum, along with a very interesting series of *Crustacea*, and the skins of some birds and animals from California, two skulls of Seals from that coast. One is the skull of a young *Arctocephalus*, belonging to a skin which Mr. Gurney gave to the Museum a year or more ago; and the other is a very fine adult skull of that genus, which is labelled—

“Skull and tongue bones of the Californian Sea-Lion (Spanish *Lobo marino*) taken near Monterey.—A. S. Taylor, July 1858.”

This skull is as large as, and very like in external appearance to, the skull of the adult *Otaria leonina*, or Southern Sea-bear of the southern part of the west coast of America, which we have in the British Museum from the coast of Chili.

These two large skulls are easily distinguished, and, when they are more closely examined, prove to belong to two different genera. The Californian skull has the short flat palate, contracted behind, of the genus *Arctocephalus*, and the other the very long deeply concave palate, nearly as wide behind as in front, of the genus *Otaria*. It also has the high nose, with a nearly horizontal facial line over the nose, of the former genus, instead of the low nose shelving towards the edge of the upper jaw of the *Otaria* or Sea-lion of Chili.

The adult skull is more than double the size of the adult skulls of the other species of *Arctocephali* which we have in the Museum Collection, and shows the existence of a Seal of a very large size in these seas,—as large as the Sea-lion of Chili.

It is not improbable that the skin sent some time ago, and the skull belonging to it now sent, may be the young of this species; though the skin is so like that of *Arctocephalus nigrescens*, that we were induced to regard it, before we received the skull, as a second specimen of that species. But the skull of the original specimen of that Seal shows that the adult animal and skull are not nearly half the size of the animal and skull of the *Lobo marino* of Monterey.

I may mention that we have well-developed adult skulls of the following species, which have been compared with the one here described :—

Arctocephalus delalandii, from the Cape, figured Proc. Zool. Soc. 1858, t. 69.

Arctocephalus lobatus, from Australia.

Arctocephalus gillespii, from California, *l. c.* t. 70.

Arctocephalus ursinus, from Behring's Straits, *l. c.* t. 68.

Arctocephalus nigrescens, from Falkland Islands?

The only one that nearly approaches it in size is that of the very old *Arctocephalus lobatus* from Australia; but this skull is at once known from that of the Monterey Sea-lion by having a rather deeply concave palate, much narrowed behind, and with a semicircular edge to the hinder palatine opening; while in the Monterey Sea-lion the palate is nearly flat, slightly concave in front, and not so contracted behind, and with a transverse hinder margin to the posterior opening.

The Monterey species is very distinct from *A. gillespii*, also from California, which, beside being very much smaller, not more than one-third of the size, has a much narrower skull with a longer face, and a very different form to the hinder palatine opening.

I refer the species to the third section, as defined in my previous paper in the Proceedings of the Zoological Society, 1859, p. 109, and propose to designate it by the name of

ARCTOCEPHALUS MONTERIENSIS. (Pl. LXXII., skull.)

Face rather short; palate rather concave in front, nearly flat behind, the hinder aperture rather contracted, with a nearly straight transverse hinder edge. Teeth large; the lower jaw rather elongate.

Hab. California (Monterey). Called *Lobo marino* by the Spaniards.

If the skin sent last year by Mr. Taylor to Mr. Gurney, and by that gentleman presented to the Museum, is the young of this species, the young animal is blackish, silvered by the short white tips to the short black hairs; those on the nape and sides of the hinder part of the body having longer white tips, making those parts whiter and more silvery. The under fur is very abundant, reaching nearly to the end of the hair. The end of the nose and sides of the face are whitish. The whiskers are elongate, rigid, smooth and white. The hind feet are elongate, with rather long flaps to the toes. The skull is very small for the size of the skin, and I should have doubted its belonging to the skin if it were not accompanied by the following label:

"Skull of the Fur-Seal I sent last year. It is very imperfect, from my forgetting where I had put it; but it must do until accident throws another in the way; the other bones were lost.—A. S. T."

It is the skull of quite a young animal, with what I am induced to believe are its milk teeth, and, like the young skulls of most of the species of this genus, is very unlike the adult form. It also

differs from the adult one in the form of the hinder opening of the palate, which is very large and gradually contracted to an angle in front of the mouth. I am not aware that the form of this part is changed by the age of the specimen. It may be the case in this species, but it is not so in the only species with which I have the opportunity of comparing it, that is to say, in a series of skulls of different ages from the young to the adult, of a Seal of the allied genus *Otaria* (*O. leonina*).

The Monterey Seal may be the "Lion Marin de la Californie" of Choris, 'Voy. Pittoresque,' t. 11, from which *Phoca californiana* of Fischer's 'Synopsis Mammalium,' p. 231, the *Otaria californiana* of Lesson, have been derived; but the accounts of the species are so very slight, that there is nothing but the habitat and the name to lead one; and we already have two very distinct species of Sea Lions—*Arctocephalus monteriensis* and *A. gillespii*—from California.

The skull of the Behring Straits Sea-Bear is so distinct from that of the other species, that I am induced to suggest that it should be regarded as a distinct genus from the *Arctocephali* of F. Cuvier. The three genera may be thus defined.

I. CALLORHINUS.

The face short, forehead convex, regularly rounded from the end of the nasal bone to the middle of the vertex; the nasal opening is small; the palate rather concave, contracted behind, short, nearly reaching the middle of the zygomatic arch. Lower jaw short, thick, flattened, expanded beneath just in front of the condyle.

1. CALLORHINUS URSINUS.

Arctocephalus ursinus, Gray, Proc. Zool. Soc. 1859, pl. 68. p. 108.

II. ARCTOCEPHALUS.

The face rather elongate; the forehead flattened and nearly horizontal from the nasal bone to the vertex; the palate rather concave, contracted behind, short, not reaching beyond the middle of the zygomatic arch; the nose aperture large, high; the lower jaws moderate, with a crest-like ridge behind beneath just in front of the condyle.

The crest-like process on the hinder part of the under edge of the large jaw differs rather in shape and development in the different species; but it nowhere resembles the flat expanded disk found in a similar situation in the lower jaw of the preceding genus.

In my former paper I divided this subgenus into two sections, separating *A. hookeri* from the other species; but I had only young or half-grown specimens of the skulls of this species; and, since I have obtained the young skull from California, I am induced to believe the slight convexity of the forehead and the slenderness of the lower jaw to be dependent on the age of the specimen, and that most probably the forehead of the adult animal becomes flatter, and the lower jaw stronger, as the animal increases in age.

The skulls which we have may be divided, according to the form of the hinder edge of the palate, thus :—

* *The hinder edge of the palate, transversely truncated.*

1. *Arctocephalus monteriensis*, pl. 72.

Skull broad.

California.

2. *Arctocephalus hookeri*.

Skull narrow, elongate.

Falkland Islands and Cape Horn.

** *The hinder edge of the palate slightly arched, hemispherical.*

3. *Arctocephalus lobatus*.

Skull broad.

Australia (Port Essington).

4. *Arctocephalus nigrescens*.

Skull broad.

Falkland Islands?

*** *The hinder edge of the palate contracted, ovate.*

5. *Arctocephalus gillespii*, antea p. 110, pl. 70.

The skull elongate, narrow.

California.

6. *Arctocephalus delalandii*, antea p. 107, pl. 69.

Skull short and broad.

Cape of Good Hope.

**** *The palate very short, hind edge contracted, acute, angular.*

7. The young skull from California above noticed.

The skull of *A. hookeri*, in the concavity and comparative greater width of the palate behind, and in the form of the hinder palatine opening, most resembles that of the genus *Otaria*; but it is very distinct from the skulls of that genus, which may be thus defined.

III. OTARIA.

Face short, shelving; the nose aperture large, oblong; the forehead flat, shelving from the edge of the nose-bone to the middle of the vertex; the palate very concave, decurved deeper with age, scarcely contracted behind; ear elongated, extending nearly to the articulation of the lower jaw; the lower jaw with a crest-like ridge on the inner side of the hinder part, just in front of the condyle.

There is doubtless a great difference in the development of the skull in the male and female Seals, but unfortunately the sex of the specimens from which the skulls have been derived is not marked. In the only species where I have been able to observe this fact,

almost the only difference was in the size and in the strength of the marking on the skull, and in the size of the canine teeth. The full number of the teeth of these animals is developed early in life; and the canines of the second set are gradually developed, the roots being far in the socket, and protruded as the jaw enlarges.

The changes in the form of the palate and of the distance between the teeth of the same set in the younger and older skull of the same species after they have obtained their full set of teeth is very great, quite as much as the difference in the external form of the skull produced by the development of the occipital ridges, &c.

The following are the measurements of the different skulls in inches and eighths:—

Extreme length along base of skull...	Length of palate	Length of lower jaw	Breadth of face at ear-bones	Breadth at zygomatic arch	Breadth of conyles	
9 4	4 0	6 2	5 0	5 6	5 0	<i>Callorhinus ursinus</i> , adult.
14 0	7 6	11 0	9 0	9 0	8 2	<i>Arctocephalus monte-</i> <i>riensis</i> , adult.
10 0	4 6	6 6	4 4	4 4	5 6	<i>Arctocephalus hookeri</i> , half-grown.
11 6	6 0	8 6	6 2	6 4	6 0	<i>Arctocephalus lobatus</i> , very old.
8 0	4 0	6 0	4 6	5 6	5 2	<i>Arctocephalus nigres-</i> <i>cens</i> .
11 0	5 2	8 0	6 2	5 4	5 6	<i>Arctocephalus gillespii</i> .
10 4	5 2	7 4	7 0	6 6	6 6	<i>Arctocephalus dela-</i> <i>landii</i> .
7 2	3 1	5 0	3 4	4 2	4 2	<i>Arctocephalus</i> , young from California.
13 2	9 0	10 4	8 4	9 0	9 0	<i>Otaria leonina</i> , aged.
8 4	4 6	5 4	4 2	4 6	4 6	<i>Otaria leonina</i> , half- grown.

3. ON A SERIES OF BIRDS COLLECTED IN THE VICINITY OF JALAPA, IN SOUTHERN MEXICO. BY PHILIP LUTLEY SCLATER, M.A., F.L.S., SECRETARY TO THE SOCIETY.

Mr. J. H. Gurney has kindly placed in my hands for examination a series of about 850 skins of birds collected by Señor Raphael Montes de Oca in the vicinity of Jalapa in the State of Vera Cruz. The greater number of the species have already occurred in M. Sallé's and other collections formed in the same country, which I have from time to time brought before the notice of the Society*; but there are several amongst them which have not been obtained by former collectors, and others of rare occurrence.

The following is a list of all the species, with remarks upon such as are new or rare in each family.

Fam. TURDIDÆ.

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|-------------------------------------|--|
| 1. <i>Turdus infuscatus</i> , Lafr. | 7. <i>Catharus melpomene</i> (Cab.). |
| 2. — <i>migratorius</i> , Linn. | 8. <i>Melanotis cærulescens</i> (Sw.). |
| 3. — <i>grayii</i> , Bp. | 9. <i>Galeoscoptes carolinensis</i> |
| 4. — <i>assimilis</i> , Cab. | (Linn.). |
| 5. — <i>pinicola</i> , Sclater. | 10. <i>Harporkhynchus longirostris</i> , |
| 6. — <i>mustelinus</i> , Gm. | Sw. |

These birds have all occurred in previous collections from this State, with the exception of *Turdus pinicola* and *Turdus infuscatus*. The former of these I described in my "Synopsis of American Thrushes," read before the Society in June last (see *antea*, p. 334), from M. de Oca's specimens, which are now in my collection. M. de Oca informed me that he met with but a single pair of this species on the high land among the pines, whence I named it *pinicola*. The Mexican representative of our Blackbird (*Turdus infuscatus*), I have until lately only seen in collections from Guatemala. The present series contained five males and a single female—so that bird would appear not to be rare in these parts. M. Boucard has recently obtained specimens, as noted below, in the State of Oaxaca.

Fam. CINCLIDÆ.

11. *Cinclus mexicanus*, Sw.

A single specimen of this Dipper was in the collection.

Fam. SYLVIIDÆ.

- | | |
|----------------------------------|--------------------------------|
| 12. <i>Sialia wilsoni</i> , Sw. | 14. <i>Regulus calendula</i> . |
| 13. <i>Sialia mexicana</i> , Sw. | |

Fam. CETHIIDÆ.

15. *Certhia mexicana*, Reichb.

* See P. Z. S. 1856, p. 283; 1857, pp. 81, 201, 210, 226; and 1858, p. 294.

Fam. TROGLODYTIDÆ.

16. *Troglodytes ædon*, Vieill. ? 19. *Campylorhynchus megalopterus* (Lafr.).
 17. *Thryothorus maculipectus*, Lafr. 20. — *zonatus* (Less.).
 18. *Cyphorhinus prosthellus*, Sclater. 21. — *capistratus* (Less.).

Fam. PARIDÆ.

22. *Sitta carolinensis*, Lath. 25. *Poliophtila cærulea* (Linn.).
 23. — *pygmæa*, Vig. 26. — *mexicana* (Bp.).
 24. *Parus meridionalis*, Scl.

The occurrence of *Sitta pygmæa*, a Californian species, now noticed for the first time on this side of Mexico, is curious. I have no northern specimens of *Sitta carolinensis*; but there is considerable difference in the dimensions of these skins from Jalapa and one from Oaxaca, collected by M. Boucard:—

	ex Jalapa.	ex Oaxaca.
Long. tota.....	4·9	4·6
alæ.....	3·6	3·35
caudæ.....	1·85	1·70
rostri a rictu.....	0·75	0·70
tarsi.....	0·70	0·65

Fam. MNIOTILTIDÆ.

27. *Siurus noveboracensis* (Gm.). 37. *Dendræca superciliosa*.
 28. — *ludovicianus*, Bp. 38. — *olivacea*.
 29. *Mniotilta varia* (Linn.). 39. — *icterocephala*.
 30. *Geothlypis trichas* (Linn.). 40. — *æstiva*.
 31. — *macgillivraii* (Aud.). 41. — *maculosa*.
 32. *Helminthos vermivorus*. 42. *Myiodytes pusillus*.
 33. *Helminthophaga rubripilla*. 43. *Cardellina rubra* (Sw.).
 34. *Dendræca virens* (Gm.). 44. *Basileuterus rubrifrons*.
 35. — *coronata* (Linn.). 45. *Euthlypis lacrymosa*, Cab.
 36. — *blackburniæ* (Gm.). 46. *Setophaga miniata* (Sw.).

Of these Wood-warblers, *Geothlypis macgillivraii*, *Helminthos vermivorus*, *Dendræca icterocephala*, and *D. maculosa* have not hitherto been noticed as occurring in collections from Vera Cruz.

Fam. VIREONIDÆ.

47. *Vireosylva olivacea* (Linn.). 50. *Cyclorhis flaviventris*, Lafr.
 48. *Vireo solitarius* (Wils.). 51. *Icteria velasquezii*, Bp.
 49. *Vireolanus melitophrys*, Bp.

The bill of the Mexican *Icteriæ* is always thicker than in N. American birds, and *white* at the base of the lower mandible. I have never yet seen specimens of the true N. American *Icteria viridis* from Mexico.

Fam. HIRUNDINIDÆ.

52. *Progne dominicensis* (Gm.). 54. *Cotyle fulvipennis*, sp. nov.
 53. *Petrochelidon bicolor* (Vieill.).

COTYLE FULVIPENNIS, sp. nov.

Murino-brunnea, alis caudaque obscurioribus, alarum tectricibus omnibus et secundariis fulvescenti-rufo extus late marginatis, dorso imo eodem colore vix tincto: subtus sordide alba, lateraliter obscurior, ventre medio crissoque pure albis: gutture et pectore toto et campterio alarum colore fulvescenti-rufo perfusus: rostro nigro: pedibus pallide brunneis.

Long. tota 4·2, alæ 3·7, caudæ 1·7.

This pretty little *Cotyle* is most nearly allied to *C. flavigastra* of S. America, though considerably smaller in size. The edgings of the wings, which in the latter species are white, are here of a pale tawny rufous, whence I have called it *fulvipennis*; and the same colour pervades the neck, breast, and bend of the wings below. The belly is also white instead of being yellow.

The only other *Cotyle* I consider as undoubtedly Mexican is *Cotyle serripennis*; for I cannot help thinking that the single example of *C. flavigastra*, which occurred in M. Botteri's collection (mentioned in P. Z. S. 1857, p. 211), must have been a South American skin introduced by accident.

Fam. AMPELIDÆ.

55. *Ptilogonys cinereus* (Sw.). 57. *Ampelis cedrorum* (Vieill.).
 56. *Myiadestes obscurus* (Lafr.).

Fam. CEREVIDÆ.

58. *Certhiola mexicana*, Scl. 59. *Diglossa baritula*, Wagl.

Fam. TANAGRIDÆ.

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|---|---|
| 60. <i>Chlorophonia occipitalis</i> . | 70. <i>Phænicothraupis rubicoides</i> (Lafr.). |
| 61. <i>Euphonia elegantissima</i> . | |
| 62. — <i>hirundinacea</i> , Bp. | 71. <i>Buarremon albinuchus</i> (d'Orb. & Lafr.). |
| 63. <i>Tanagra abbas</i> , Less. | |
| 64. — <i>diaconus</i> , Less. | 72. — <i>brunneinuchus</i> (Lafr.). |
| 65. <i>Ramphocelus sanguinolentus</i> , Less. | 73. <i>Chlorospingus ophthalmicus</i> (Du Bus). |
| 66. <i>Pyranga æstiva</i> (Linn.). | 74. <i>Saltator atriceps</i> , Less. |
| 67. — <i>hepatica</i> , Sw. | 75. — <i>magnoides</i> , Lafr. |
| 68. — <i>erythromelana</i> , Licht. | 76. — <i>grandis</i> (Licht.). |
| 69. <i>Pyranga bidentata</i> (Sw.). | |

All these Tanagers have already been noticed as either in M. Sallé's or M. Botteri's collections from Vera Cruz. A curious variety of *Buarremon albinuchus* has the throat nearly of a crimson colour.

Fam. FRINGILLIDÆ.

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| 77. <i>Cardinalis virginianus</i> , Bp. | 86. <i>Chamæospiza torquata</i> |
| 78. <i>Hedymeles ludovicianus</i> . | (Du Bus). |
| 79. — <i>melanocephalus</i> (Sw.). | 87. <i>Passerculus lincolni</i> , Aud. |
| 80. <i>Coccothraustes abeillii</i> , | 88. <i>Spizella socialis</i> (Wils.). |
| Less. | 89. <i>Junco cinereus</i> (Sw.). |
| 81. <i>Guiraca cærulea</i> (Linn.). | 90. <i>Hæmophila rufescens</i> , Sw. |
| 82. — <i>parellina</i> (Bp.). | 91. <i>Chrysomitris mexicana</i> , Sw. |
| 83. <i>Spiza versicolor</i> , Bp. | 92. — <i>notata</i> , Du Bus. |
| 84. <i>Volatinia jacarina</i> (Linn.). | 93. <i>Spermophila moreleti</i> , Bp. |
| 85. <i>Phonipara pusilla</i> (Sw.). | 94. <i>Loxia mexicana</i> , Strickl. |

Two Finches occur in this list which I have not myself previously observed in Mexican collections. The beautiful Mexican Grosbeak (*Coccothraustes abeillii*), a close ally of the North American *Coccothraustes vespertinus*, was only known to me from Guatemalan specimens transmitted by Mr. Skinner*. The Cross-bill I refer to *Loxia mexicana*, described by Strickland from examples collected near the city of Mexico (Contr. Orn. 1851, p. 43 (note)). I have not the means of comparing it with other American species.

Fam. ICTERIDÆ.

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| 95. <i>Hyphantès baltimorensis</i> . | 101. <i>Cassiculus prevosti</i> (Less.). |
| 96. <i>Bananivorus affinis</i> (Lawr.). | 102. <i>Sturnella hippocrepis</i> ? |
| 97. <i>Icterus gularis</i> (Wagl.). | 103. <i>Molothrus pecoris</i> ? |
| 98. — <i>melanocephalus</i> . | 104. — <i>æneus</i> (Wagl.). |
| 99. <i>Cacicus montezumæ</i> (Less.). | 105. <i>Quiscalus sumichrasti</i> , de |
| 100. <i>Agelæus gubernator</i> . | Sauss. |

M. de Oca's collection contained one example of *Quiscalus sumichrasti*, lately described by M. H. de Saussure (Rev. Zool. 1859, p. 19). The same bird was in M. Sallé's first collection (*Quiscalus*, sp. 137, P. Z. S. 1856, p. 300), and I have also examples collected by Botteri.

Fam. CORVIDÆ.

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| 106. <i>Psilorhinus morio</i> (Wagl.). | 110. <i>Cyanocorax unicolor</i> , |
| 107. <i>Cyanocorax luxuosus</i> . | Du Bus. |
| 108. — <i>ultramarinus</i> . | 111. — <i>nanus</i> , Du Bus. |
| 109. — <i>ornatus</i> . | 112. — <i>coronatus</i> , Sw. |

Fam. DENDROCOLAPTIDÆ.

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| 113. <i>Picolaptes affinis</i> (Sw.). | 115. <i>Sittasomus sylvioides</i> , Laf. |
| 114. <i>Dendroornis erythropygia</i> , | 116. <i>Sclerurus mexicanus</i> , Scl. |
| sp. nov. | 117. <i>Anabates rubiginosus</i> , Scl. |

The *Dendroornis erythropygia* has occurred in several previous collections, but I have hitherto confounded it with *D. triangularis* of New Granada, from which it appears truly distinct.

* See "Ibis," 1859, p. 19.

DENDRORNIS ERYTHROPYGIA, sp. nov.

Dendrornis triangularis, Sclater, P. Z. S. 1856, p. 289, nec Lafr.

Supra obscure olivacea, secundariis extus, uropygio toto et cauda rubiginoso-rufis; capite struis, dorso medio maculis ovalibus ochraceiscenti-albidis distincte notato: subtus obscure olivacea, guttis subtriangularibus pallide ochraceiscenti-albidis, in gula crebrioribus, et totas fere plumas occupantibus notata: rostri albicantis parte culminali nigricanti-cornea: pedibus nigris.

Long. tota 9·0, alæ 4·6, caudæ 4·0, rostri a rictu 1·45.

Hab. In Stat. Veræ Crucis et Oaxaca reipubl. Mexicanæ (*Sallé et Boucard*).

Mus. P. L. S.

Obs. Affinis *Dendrornithi triangulari* ex Nova Granada, sed secundariis extus et uropygio omnino rufis, guttis interscapulii ovalibus et gutture fere toto ochraceiscente facile distinguenda.

Fam. FORMICARIIDÆ.

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| 118. <i>Thamnophilus doliatus</i>
(Linn.). | 119. <i>Grallaria guatemalensis</i> ,
Prévost. |
|---|---|

Fam. TYRANNIDÆ.

- 120. *Scaphorhynchus mexicanus*, Lafr.
- 121. *Pitangus derbianus*, Kp.
- 122. *Tyrannus melancholicus* (Vieill.).
- 123. *Contopus borealis* (Sw.).
- 124. *Myiozetetes texensis* (Giraud).
- 125. *Myiodynastes luteiventris*, Sclater.
- 126. *Pyrocephalus mexicanus*, Sclater.
- 127. *Sayornis pallida* (Sw.).
- 128. *Mitrephorus phæocercus*, Sclater.
- 129. *Mionectes assimilis*, Sclater.
- 130. *Legatus variegatus*, Sclater.
- 131. *Myiarchus lawrencii* (Cass.).
- 132. — *fuscus* (Gm.).
- 133. *Empidonax flaviventris*, Baird.
- 134. *Attila citreopygius*, Bp.

Fam. COTINGIDÆ.

- 135. *Tityra personata* (Jard. & Selb.).
- 136. *Platypsaris affinis*, Elliot.
- 137. *Pachyrhamphus major*, Cab.

Numerous specimens of a rosy-breasted Becard are in the collection, which seem all referable to the light-backed bird lately distinguished by Mr. Elliot as *Platypsaris affinis* (Ibis, 1859, p. 394. pl. 13). On the other hand, specimens from Oaxaca and Central America belong to the dark-backed variety, which he considers to be the true *P. aglaia*. There is certainly no difference in size between

some individuals of the two supposed species, for I have examined skins of *P. affinis* quite as large as those of *P. aglaïæ*.

Fam. MOMOTIDÆ.

138. *Momotus cæruleiceps*, Gould.

Fam. CAPRIMULGIDÆ.

139. *Nyctidromus americanus*? 140. *Antrostomus vociferus*?

Fam. TROGONIDÆ.

141. *Trogon caligatus*, Gould. 143. *Trogon mexicanus*, Sw.
142. — *melanocephalus*, Gld. 144. — *puella*, Gould.

Fam. ALCEDINIDÆ.

145. *Ceryle alcyon* (Linn.). 146. *Ceryle americana* (Gm.).

Fam. TROCHILIDÆ.

- | | |
|---|--|
| 147. <i>Phaëthornis adolphi</i> ,
Gould. | 154. <i>Delattria rhami</i> (Less.). |
| 148. <i>Lampornis prevosti</i>
(Bourc. & Muls.). | 155. — <i>clemenciæ</i> (Less.). |
| 149. <i>Campylopterus pampa</i>
(Less.). | 156. <i>Cyanomyia cyanocephala</i> . |
| 150. — <i>delattrei</i> (Less.). | 157. <i>Amazilius arsinoë</i> (Less.). |
| 151. <i>Petasophora thalassina</i>
(Sw.). | 158. — <i>ocai</i> , Gould. |
| 152. <i>Cæligena fulgens</i> (Sw.). | 159. <i>Sporadinus caniveti</i>
(Less.). |
| 153. <i>Delattria henrici</i> (Less.). | 160. <i>Circe latirostris</i> (Sw.). |
| | 161. <i>Trochilus colubris</i> , Linn. |
| | 162. <i>Tryphæna heloisæ</i> (Less.
et Del.). |

The only Humming-bird in this collection not previously well known as an inhabitant of Mexico was *Amazilius ocai*, described from M. de Oca's specimens by Mr. Gould in the 'Annals and Magazine of Natural History' for August last (ser. 3, vol. iv. p. 96).

Fam. PICIDÆ.

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| 163. <i>Dryocopus scapularis</i> (Vig.). | 168. <i>Chloronerpes oleagineus</i> |
| 164. — <i>guatemalensis</i>
(Hartl.). | (Licht.). |
| 165. <i>Colaptes mexicanus</i> (Sw.). | 169. <i>Centurus santacruzi</i> (Bp.). |
| 166. <i>Melanerpes formicivorus</i>
(Sw.). | 170. <i>Picus scalaris</i> , Wagl. |
| 167. <i>Chloronerpes yucata-</i> | 171. — <i>varius</i> , Linn. |
| <i>nensis</i> (Cabot). | 172. — <i>jardini</i> , Malh. |
| | 173. — <i>stricklandi</i> , Malh. |

Picus stricklandi is the same bird as in Sallé's first collection I called *P. cancellatus* upon Prince Bonaparte's authority. It is described by M. Malherbe in the 'Revue Zoologique' for 1845 (p. 375). There was but one specimen in M. de Oca's collection.

Fam. RHAMPHASTIDÆ.

174. *Rhamphastos carinatus*, Sw. 175. *Aulacorhamphus prasinus*, Gould.

Fam. PSITTACIDÆ.

176. *Ara pachyrhyncha* (Sw.). 177. *Conurus holochlorus*, Scl.

Neither of these Parrots have occurred in previous collections from Vera Cruz. The *Conurus* I described from M. de Oca's specimens in the 'Annals and Magazine of Natural History' for July last (ser. 3, vol. iv. p. 224).

Fam. CUCULIDÆ.

178. *Piaya thermophila*, sp. nov. 180. *Dromococcyx mexicanus*, Bp.
179. *Crotophaga sulcirostris*, Sw. 181. *Geococcyx affinis*, Hartl.

Piaya thermophila is the common species of the *tierra caliente*, which I have hitherto referred to Swainson's *Cuculus mexicanus*. Having now received the true *P. mexicana* (with the tail-feathers *red*, as described by Swainson: see below, p. 388), I propose to call this bird

PIAYA THERMOPHILA.

Saturate castanea, subtus cinerea, gutture pallide cinnamomeo-rufescente, ventre imo crissoque nigricantibus: caudæ rectricibus subtus unicolori-nigricantibus, lateralibus in pogonio exteriori et mediis duabus in utroque pogonio rufescentibus, omnibus albo late terminatis: rostri plumbei culmine et apice toto flavo-virentibus: pedibus nigris.

Long. tota 17·0, alæ 6·2, caudæ 10·8.

Hab. In terra calida reipublicæ Mexicanæ et in Guatemala.

Mus. P. L. S.

Fam. FALCONIDÆ.

182. *Polyborus tharus* (Mol.). 187. *Asturina nitida*.
183. *Herpetotheres cachinnans* (Linn.). 188. — *magnirostris*.
184. *Buteo borealis* (Gm.). 189. *Micrastur xanthothorax* (Temm.)?
185. — *erythronotus* (Lafr. et d'Orb.). 190. *Tinnunculus sparverius*.
186. *Asturina albifrons*. 191. *Ictinia plumbea*.
192. *Hypotriorchis femoralis*.

Fam. STRIGIDÆ.

193. *Syrnium virgatum*. 194. *Pholeoptynx hypogæa*.

Fam. COLUMBIDÆ.

195. *Geotrygon montana*. 197. *Zenaida leucoptera*.
196. — *albifacies*, G. R. Gr. 198. *Leptoptila albifrons*.

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| 199. <i>Zenaidura carolinensis</i> . | 202. <i>Columba fasciata</i> . |
| 200. <i>Chamæpelia passerina</i> . | 203. — <i>flavirostris</i> . |
| 201. — <i>rufipennis</i> . | |

Fam. CRACIDÆ.

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| 204. <i>Penelope purpurascens</i> . | 205. <i>Ortalia vetula</i> . |
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Fam. PERDICIDÆ.

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| 206. <i>Dendrortyx barbatus</i> . | 208. <i>Odontophorus thoracicus</i> . |
| 207. <i>Ortyx pectoralis</i> . | |

Fam. TINAMIDÆ.

209. *Tinamus sallæi*, Bp.

GRALLÆ.

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| 210. <i>Gallinago wilsoni</i> . | 216. <i>Butorides virescens</i> . |
| 211. <i>Charadrius virginicus</i> . | 217. <i>Garzetta candidissima</i> . |
| 212. <i>Ægialites vociferus</i> . | 218. <i>Herodias egretta</i> . |
| 213. <i>Calidris arenaria</i> . | 219. <i>Nycticorax gardeni</i> . |
| 214. <i>Canceroma cochlearia</i> . | 220. <i>Fulica americana</i> . |
| 215. <i>Botaurus lentiginosus</i> . | |

NATATORES.

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| 221. <i>Anas maxima</i> , Gosse. | 224. <i>Lophodytes cucullatus</i> . |
| 222. <i>Querquedula carolinensis</i> . | 225. <i>Podiceps dominicus</i> . |
| 223. <i>Fuligula affinis</i> . | 226. <i>Plotus anhingæ</i> . |

Anas maxima of Gosse is, no doubt, the bird referred to in Prof. Baird's Report on N. American Ornithology (p. 774) as the large variety of the Mallard. *Fuligula affinis* has already been noticed as far south as Guatemala (Salvin, in 'Ibis,' 1859, p. 231), though not hitherto brought from Mexico.

4. LIST OF BIRDS COLLECTED BY M. A. BOUCARD IN THE STATE OF OAXACA IN SOUTH-WESTERN MEXICO, WITH DESCRIPTIONS OF NEW SPECIES. BY PHILIP LUTLEY SCLATER, M.A., SECRETARY TO THE SOCIETY.

M. Sallé having kindly submitted to my examination several collections of birds formed by his correspondent M. Adolphe Boucard in various parts of the State of Oaxaca in Southern Mexico during the past eighteen months, I am induced to bring before the Society a list of the species included in them, together with the localities in which they were obtained, at the same time giving characters of no less than twelve amongst them, which, as far as I have been able to ascertain, are hitherto undescribed. Science is greatly indebted to

M. Boucard for the energetic way in which he has worked out the ornithology of Southern Mexico; and, taking his discoveries in connexion with those of M. Sallé himself, Signor Botteri, and Señor R. M. de Oca, we may soon hope to attain a tolerably perfect knowledge of the aspect of the Avi-fauna of this region.

Totontepec, Teotalcingo, Choapam, &c., are villages of more or less importance, as M. Sallé informs me, situated in the mountains of Oaxaca, in the district of Villa Alta. Playa Vicente is a *rancheria* consisting of a group of cabins of bamboo, situated on the confines of the three States of Vera Cruz, Oaxaca, and Tehuantepec on the borders of the Rio Tesechoacan at the foot of the mountains of Oaxaca in the hot country (*tierra caliente*). Here the river first becomes navigable; and at this point, during the war of Independence, the cochineals of Oaxaca destined for Europe were embarked for transportation to Alvarado, the port on the Gulf of Mexico.

Fam. TURDIDÆ.

1. CATHARUS MELPOMENE, Cab.

Totontepec (Jan.).

2. CATHARUS OCCIDENTALIS, Scater, P. Z. S. 1859, p. 323.

Totontepec (Jan.). Described, from the specimens contained in this collection, in my Review of the *Turdidæ* (*antèd*, p. 321), where the synonymy and characters of all the species of this family are given.

3. TURDUS INFUSCATUS, Lafr. R. Z. 1844, p. 41.

Totontepec (Jan.).

4. TURDUS GRAYII, Bp.

Choapam and Villa Alta.

5. TURDUS ASSIMILIS, Cab.

Juquila and Teotalcingo. Rather darker in plumage than specimens from Jalapa, and so resembling somewhat the Guatemalan *T. leucauchen*. Eggs of this bird from Oaxaca are like pale varieties of those of our Blackbird (*Turdus merula*), being of a pale-greenish white, spotted and freckled with two shades of rufous. They measure 1·1 by 0·75.

6. CALEOSOPTES CAROLINENSIS (Linn.).

Totontepec and Playa Vicente.

7. MELANOTIS CÆRULESCENS (Sw.); *antèd*, p. 337.

Talea, Juquila, Villa Alta (Jan.), and Totontepec (Feb.).

8. HARPORHYNCHUS CURVIROSTRIS (Sw.); P.Z.S. 1859, p. 339.

Oaxaca. Females are not so much variegated on the breast. The bird seems to agree with Eastern Mexican specimens.

Fam. SYLVIIDÆ.

9. *SIALIA WILSONI*, Sw.

Juquila.

10. *REGULUS CALENDULA* (Linn.).

Talea.

Fam. TROGLODYTIDÆ.

11. *CAMPYLORHYNCHUS MEGALOPTERUS* (Lafr.) ; P.Z.S. 1857, p. 298.

Llano verde. Sexes alike.

12. *CAMPYLORHYNCHUS CAPISTRATUS* (Less.).

Juquila and Playa Vicente. ♂ et ♀ similes.

13. *CAMPYLORHYNCHUS JOCOSUS*, sp. nov.

Sordide brunneus, capite colloque nigricantioribus, superciliis latis et maculis intercapulii tectricumque alarum triangularibus albis; alis caudaque nigricanti-fuscis, remigum rectricumque pogoniis externis maculis quadrangularibus sordide albis regulariter transvittatis; cauda fusco terminata, et nisi in rectricibus mediis fascia subapicali lata alba: subtus albus, maculis rotundis nigris frequenter aspersus, gula immaculata: rostro et pedibus nigris.

Long. tota 6·6, alæ 2·8, caudæ 2·4, rostri a rictu 1·1, tarsi 0·9.

Hab. In statu Oaxaca reipubl. Mexicanæ.

Mus. P. L. S.

Two specimens of this apparently new species of *Campylorhynchus* were procured by M. Boucard at Oaxaca in March 1858. They are of different sexes, but present no outward distinctions. The bird is most nearly allied to *C. brunneicapillus* of Northern Mexico, but differs in its smaller size, shorter wings, and the shape of the spots below, which are rounded instead of being elongated. The upper surfaces of the two species are not dissimilar.

14. *SALPINCTES OBSOLETUS* (Say) : Baird, Report, p. 3.

Oaxaca (May). ♂ et ♀.

15. *THRYOTHORUS FELIX*, sp. nov.

Murino-fuscus, pileo frontem versus rufo: loris et capitis lateribus albo nigroque striatis: subtus cinnamomeo-rufescens, ventre medio pallidiore, gutture albo; crisso nigro transvittato: cauda pallide murina, nigricante regulariter transfasciata: rostro nigricanti-plumbeo, tomis et apice pallidis: pedibus plumbeis.

Long. tota 5·0, alæ 2·2, caudæ 2·1.

Hab. In statu Oaxaca, reipubl. Mexicanæ.

A specimen of this *Thryothorus* was obtained by M. Boucard at Juquila in May last. It is something like *T. rufalbus* (Lafr.), but

is smaller in size, and has no bars on the wings (these being edged outwardly like the back, only slightly more rufescent in tinge), and is pale rufous below instead of white. It seems to be distinct from any described species.

16. *THRYOTHORUS MACULIPECTUS*, Lafr.

Teotalcingo (March).

17. *THRYOTHORUS BEWICKII* (Aud.): Baird, Rep. p. 363.

Oaxaca.

18. *TROGLODYTES BRUNNEICOLLIS*, Selater, P.Z.S. 1858, p. 297.

Cinco Señores, ♂ (Feb.).

19. *TROGLODYTES* — ? —.

Four specimens of a species of Wren which I have hitherto referred to *T. ædon* of N. America. The recurrence of examples in the same plumage, differing from that of *T. ædon* in being of a pale rufous tinge below, inclines me to think that it is really a distinct species.

20. *CYPHORINUS PROSTHELEUCUS*, Selater.

Llano Verde and Playa Vicente.

21. *CYPHORINUS PUSILLUS*, sp. nov.

Murino-brunneus, loris et superciliis posticis albis: secundariis extus et cauda nigro obsolete transfasciatis: regione auriculari albo variegata: subtus albus, lateraliter cinerascens tinctus, hypochondriis, ventre imo et crisso pallide brunneis: rostro superiore plumbeo, inferiore albido: pedibus pallide corylinis: cauda brevissima: tarsis elongatis.

Long. tota 3·5, alæ 1·75, caudæ 1·1, rostri a rictu 0·7, tarsi 0·75.

Hab. In statu Oaxaca, reipubl. Mexicanæ.

Mus. P. L. S.

Four examples of this Wren were procured at Playa Vicente in May last. The sexes are similarly coloured. The bird belongs to a smaller and weaker form of *Cyphorinus*, as distinguished by its compressed lengthened and incurved bill, short tail, and long tarsi, and is congeneric with the preceding species, though perhaps both are strictly divisible from *C. thoracicus* and *C. cantans*.

Fam. *CERTHIIDÆ*.

22. *CERTHIA MEXICANA*, Reichenb.

Cinco Señores.

Fam. *ALAUDIDÆ*.

23. *OTOCORYS CHRYSOLÆMA* (Wagler).

Oaxaca: several specimens. A male, killed in March in full summer plumage, does not seem different from Californian examples of

O. occidentalis. Perhaps Prof. Baird may be right in uniting all the N. American birds under *O. cornuta*; but there is great difference in size between Eastern and Western birds.

Fam. PARIDÆ.

24. *LOPHOPHANES WOLLWEBERI* (Bp.): P. Z. S. 1857, p. 299.
Talea.

25. *SITTA CAROLINENSIS*, Linn.

Cinco Señores. Smaller than examples from Vera Cruz: see *antea*, p. 363, and P. Z. S. 1857, p. 300.

26. *POLIOPTILA MEXICANA*, Bp.?

Four examples: Oaxaca (March). I am still doubtful about this species, whether it is anything more than *P. cærulea* in winter plumage. One example, marked *male*, shows traces of the black front-band.

Fam. MNIOTILTIDÆ.

27. *SIURUS LUDOVICIANUS*, Bp.; Baird, Rep. p. 262.
Totontepec (Jan.).

28. *MNIOTILTA VARIA* (Linn.).
Juquila and Totontepec.

29. *PARULA SUPERCILIOSA* (Hartl.): P. Z. S. 1857, p. 299.
Talea.

30. *GEOTHLYPIS TRICHAS* (Linn.): Baird, Rep. p. 241.
Totontepec and Oaxaca.

31. *GEOTHLYPIS MACGILLIVRAII* (Aud.): Baird, Rep. p. 244.
Choapam (Feb. 1859); Cinco Señores (Feb.). Males in full plumage, and females.

32. *HELMINTHOPHAGA RUFICAPILLA* (Wils.): Baird, Rep. p. 256.
♂ adult et juv. Oaxaca (Feb.).

33. *HELMINTHOPHAGA CELATA* (Say): Baird, Rep. p. 257.
♀ Oaxaca and Cinco Señores. One specimen is curiously clouded with dark colour. The other shows traces of the vertical spot.

34. *HELMINTHOPHAGA PEREGRINA* (Wils.): Baird, Rep. p. 258.
In a state of plumage which I believe to be the winter dress of this species.

35. *DENDROICA VIRENS* (Gm.).
Talea and Playa Vicente (April).

36. *DENDROICA TOWNSENDI* (Aud.).

Totontepec (Jan.).

37. *DENDROICA NIGRESCENS* (Towns.).

Oaxaca (March), ♂. A male in winter plumage, with the throat white, the black just beginning to appear.

38. *DENDROICA ICTEROCEPHALA* (Linn.).

Playa Vicente (April). ♂, in fine plumage.

39. *DENDROICA MACULOSA* (Gm.).

Playa Vicente. ♂, in fine plumage.

40. *DENDROICA SUPERCILIOSA* (Bodd.): Baird, Rep. p. 289.

Oaxaca. ♂, in good plumage.

41. *MYIODIOCTES PUSILLUS* (Wils.).

Totontepec and Villa Alta.

42. *BASILEUTERUS BELLI* (Giraud).—*Muscicapa belli*, Giraud, B. Texas, pl. 7.—*B. chrysophrys*, Bp. Consp. p. 314; P. Z. S. 1857, p. 202.

Llano Verde and Totontepec.

43. *BASILEUTERUS BRASIERI* (Giraud).—*Muscicapa brasieri*, Giraud, B. Texas, pl. 12.—*B. culicivorus*, Bp. Consp. p. 313.

Teotalcingo.

44. *SETOPHAGA PICTA*, Sw.

Cinco Señores.

45. *SETOPHAGA MINIATA*, Sw.

Cinco Señores and Totontepec.

46. *SETOPHAGA RUTICILLA*.

Playa Vicente (March and April).

47. *CARDELLINA RUBRA* (Sw.): P. Z. S. 1856, p. 292.

Llano Verde and Totontepec.

48. *CARDELLINA RUBRIFRONS*, Giraud; P. Z. S. 1857, p. 299.

Cinco Señores.

49. *GRANATELLUS SALLÆI*, Sclater, P. Z. S. 1856, p. 292, pl. 120.

♂. *Cærulescenti-plumbeus, litura post-oculari alba, abdomine medio cum crisso rosaceo-rubris, lateribus albis.*

♀. *Fuscescenti-plumbea, fronte et litura post-oculari rufis: subtus cinnamomeo-rufescens, gutture et ventre medio dilutioribus, albescentibus: pedibus pallidis.*

I have repeated the characters of the male of this interesting species in order to add those of the female, which M. Boucard has now forwarded with another male specimen from Playa Vicente. *Granatellus venustus* (Bp. Consp. p. 312), of which M. DuBus has kindly sent me a figure, is a closely-allied species, but easily known by its white throat and narrow black breast-band, and white terminations to the external tail-feathers. There is an imperfect specimen of the latter bird in the British Museum.

Fam. LANIIDÆ.

50. *LANIUS MEXICANUS*, Brehm, Cab. Journ. f. Orn. ii. p. 145.
—*L. excubitoroides*, Baird, Rep. p. 327?

Four examples, ♂ and ♀: Oaxaca (Feb. and March 1858).

In the absence of specimens for comparison, I think it best to refer this species to Brehm's *L. mexicanus*, though my impression is that it does not differ from *L. excubitoroides*, as described by Baird. This is the most southern point in the New World at which *Lanius* has yet been noticed.

Fam. VIREONIDÆ.

51. *ICTERIA VELASQUEZI*, Bp.

Playa Vicente.

52. *VIREO SOLITARIUS*, Vieill.

Talca.

53. *VIREOSYLVIA FLAVOVIRIDIS*, Cassin.

Playa Vicente (April).

54. *HYLOPHILUS OCHRACEICEPS*, sp. nov.

Olivacescenti-fuscus, pileo rufescenti-ochraceo, alis nigricantibus pallido brunneo extus limbatis; cauda pallide brunnea: subtus pallide flavicans, gutture grisescenti-albo, pectore et lateribus ochracescenti-fuscis: rostro pallide corneo, pedibus pallide corylinis.

Long. tota 4·3, alæ 2·2, caudæ 1·5, tarsi 0·65.

Hab. In statu Oaxaca reipubl. Mexicanæ.

Mus. P. L. S.

This is the only species of the little genus *Hylophilus* I have yet seen from the country north of Panama. It is tolerably typical in form, the bill being rather longer and more slender than in *H. poecilotis*, and the tail longer. The first primary is short (0·8 inch from the insertion); the fourth, fifth, and sixth nearly equal and longest. Two examples, obtained at Playa Vicente in April 1859, of different sexes, are coloured alike.

Fam. HIRUNDINIDÆ.

55. PETROCHELIDON SWAINSONI, Sclater, P. Z. S. 1858, p. 296.

Oaxaca: ♂ et ♀ similes. Two pairs of this very beautiful Swallow quite confirm the validity of this species as distinct from *P. lunifrons* and *P. fulva*.

Fam. AMPELIDÆ.

56. PTILOGONYS CINEREUS (Sw.).

Totontepec (Jan.). The eggs of this bird, sent by M. Boucard from Oaxaca (May 1858), are minutely freckled and striated with brownish ash-colour on a white ground, the markings being denser and forming a ring round the large end. They measure .875 by .61 inch. They somewhat resemble some varieties of those of *Anthus pratensis*.

57. MYIADESTES OBSCURUS (Lafr.).

Totontepec (Jan.).

M. Boucard has forwarded five eggs belonging to this bird, taken at Yoletpec in May 1858. They are very Robin-like in appearance, being white, minutely spotted and freckled with reddish brown, particularly at the larger end, where the spots cover nearly the entire surface. They measure 0.95 by 0.75 inch.

Fam. CÆREBIDÆ.

58. CÆRTHIOLA MEXICANA, Sclater, P. Z. S. 1856, p. 286.

Playa Vicente.

59. CÆREBA CARNEIPES, sp. nov.?

Cæreba cyanea, Sclater, P. Z. S. 1856, p. 286.

Assimilis C. cyaneæ, ex Cayenna, et rostro brevior, tenuior, pilei colore turcoso magis restricto, nucha cum lateribus capitis concolore, et pedibus vivide carnis specificè vix distinguenda.

Hab. In rep. Mexicana.

There seem to be minute differences which always distinguish this bird from its S. American representative, though it is questionable whether they are sufficient for specific separation. The present examples were obtained at Playa Vicente. M. Sallé procured others at Cordova. I have not yet seen examples of this bird from Guatemala.

60. DIGLOSSA BARITULA, Wagl.

Juquila and Totontepec.

Fam. TANAGRIDÆ.

61. PITYLUS POLIOGASTER, DuBus.

Choapam (Feb.); Teotalcingo (March); Playa Vicente (April and May).

62. *SALTATOR ATRICEPS*, Less.

Playa Vicente.

63. *SALTATOR MAGNOIDES*, Lafr.

Playa Vicente (May).

64. *SALTATOR GRANDIS* (Licht.).

Playa Vicente (May).

65. *ARREMON AURANTIIROSTRIS*, Lafr. : P. Z. S. 1856, p. 83.

Playa Vicente. Two males and a female of this beautiful species. The vertical band in the male is cinereous, and bend of the wing orange. The female is less decidedly coloured,—the vertical band being olivaceous like the back, sides and flanks more greenish, and belly not pure white. I had supposed this *Arremon* to be from Panama, much further south; but, besides these examples, I have also lately met with specimens from Guatemala, in the collections forwarded by Mr. Salvin.

66. *BUARREMON ALBINUCHUS* (d'Orb. and Lafr.).

Totontepec.

67. *BUARREMON BRUNNEINUCHUS* (Lafr.).

Teotalcingo (March). Mexican and New Granadian specimens seem to be really identical.

68. *CHLOROSPINGUS OPHTHALMICUS*, DuBus.

Totontepec (Jan.).

69. *PHÆNICOTHRAUPIS RUBICOIDES* (Lafr.).

Playa Vicente (May).

70. *PYRANGA ERYTHROCEPHALA* (Sw.) : Sclater, P. Z. S. 1856, p. 125.

Juquila; Totontepec.

71. *PYRANGA LUDOVICIANA* (Wils.).

Oaxaca (March).

72. *PYRANGA HEPATICA*, Sw.

Talea (♂ et ♀), Villa Alta, and Choapam.

73. *PYRANGA ÆSTIVA* (Gm.).

Playa Vicente.

74. *RAMPHOCELUS SANGUINOLENTUS* (Less.).

Playa Vicente (March and April).

75. TANAGRA ABBAS, Licht.

Teotalcingo and Villa Alta.

76. EUPHONIA HIRUNDINACEA, Bp.

Playa Vicente (March).

76*. EUPHONIA ELEGANTISSIMA (Bp.).

Eggs of this bird, taken at Juquila in Oaxaca in May, are rounded in shape, and of a creamy white with a few scattered spots and blotches, principally at the larger end, of two shades of brown. They measure .65 by .5 inch. They are the first authentic specimens of the eggs of any *Euphonia* that I have seen.

Fam. FRINGILLIDÆ.

77. CARDINALIS VIRGINIANUS, Bp.

Playa Vicente (May) ♂. In fine plumage.

78. GUIRACA CÆRULEA (Linn.).

Oaxaca (Sept. 1858).

79. GUIRACA CONCRETA (DuBus).

Playa Vicente (April), ♂ et ♀.

♀ *Saturate cafee-brunnea, unicolor, subtus vix dilutior: alarum et caudæ plumis intus nigricantibus, rostro et pedibus nigris.*

Long. tota 6.5, alæ 3.2, caudæ 2.2.

I am not aware that the female of this bird has been hitherto noticed.

80. GUIRACA PARELLINA, Bp. Consp. p. 502.

Totontepec (Jan. and March), ♂ et ♀.

81. ORYZOBORUS FUNEREUS, sp. nov.

Coracino-niger unicolor, subalaribus, campterio et speculo alari, alula spuria obtecta, albis: rostro nigro, pedibus fusciscenti-nigris.

Long. tota 8.8, alæ 2.2, caudæ 2.1, rostri a fronte .45, rostri altitudo .45.

Hab. In statu Oaxaca, reipubl. Mexicanæ.

Mus. P. L. S.

This little black Finch agrees in the structure of the bill with *Oryzoborus crassirostris*, and I have therefore referred it to that genus. M. Boucard's example was collected at Suchapam in April 1859. I have never seen it before, and cannot make it agree with any described species.

82. SPERMOPHILA MORELETI, Puch.: Bp. Consp. p. 497.

Playa Vicente (May 1859).

83. *SPERMOPHILA CORVINA*, sp. nov.

Coracino-nigra, speculo alari parvo et tectricibus subalaribus albis, rostro et pedibus nigris.

Long. tota 4·4, alæ 2·2, caudæ 2·0; rostri altitudo ·3.

Hab. In statu Oaxaca reipubl. Mexicanæ (*Boucard*), et in rep. Honduras.

Mus. P. L. S.

I have had a specimen of this bird in my collection for some time, purchased along with other birds from Honduras, but I never felt certain about the locality. Two examples were obtained by M. Boucard at Playa Vicente in April 1859. The beak is much smaller than in the previous species, and has the culmen incurved as in *Spermophila*.

84. *CYANOSPIZA CIRIS* (Linn.).

Playa Vicente, ♂ (April 1859).

85. *CYANOSPIZA CYANEA* (Linn.).

Playa Vicente, Totontepec, and Oaxaca.

86. *CYANOSPIZA VERSICOLOR* (Bp.).

Oaxaca.

87. *PHONIPARA PUSILLA* (Sw.).

Totontepec (Jan.).

88. *POECETES GRAMINEUS* (Gm.): Baird, Rep. p. 447.

Four examples: Oaxaca (March).

I cannot distinguish between these and specimens from the U. S., except that the present are rather purer in colouring, and in particular more white below.

89. *COTURNICULUS PASSERINUS*, Bp.

Oaxaca (March), ♂.

90. *CHONDESTES GRAMMACA* (Say).

Oaxaca, ♂ et ♀.

91. *ZONOTRICHIA MYSTACALIS*, Hartl.

Four examples, ♂ et ♀, Oaxaca (March). Sexes nearly alike; female rather less strongly coloured.

92. *SPIZELLA PALLIDA* (Sw.): Baird, Rep. p. 474.

Oaxaca (March), ♂ et ♀.

These examples seem to agree with my specimens of *S. pallida*. I do not possess examples of *S. breweri*.

93. *MELOSPIZA LINCOLNI* (Aud.): Baird, Rep. p. 82.

Totontepec, Teotalcingo, and Oaxaca.

94. *PEUCÆA RUFICEPS*, Baird ?; Baird, Rep. p. 486.—*Ammodramus ruficeps*, Cassin.

Three examples, Oaxaca (March 1858). I have no examples of *Peucæa ruficeps* of California, and am consequently unable to say positively that this is the same bird, the species in this group of Finches requiring a close comparison. In my own collection are three specimens of this same species of *Peucæa* obtained by Botteri at Orizaba.

95. *ATLAPETES PILEATUS*, Wagler: Sclater, P. Z. S. 1857, p. 304.
State of Oaxaca.

96. *EMBERNAGRA RUFIVIRGATA*, Lawr.
Playa Vicente (April 1859).

97. *HÆMOPHILA RUFESCENS*, Sw. ?
Juquila and Villa Alta (Jan.).

98. *PIPILO MACULATUS*, Sw.
Cinco Señores.

99. *PIPILO ALBICOLLIS*, Sclater, P. Z. S. 1858, p. 304.
Totontepec (Jan.) and Oaxaca.

100. *CHRY SOMITRIS MEXICANA*, Sw.
Totontepec (Jan.).

101. *CHRY SOMITRIS NOTATA*, DuBus.
Totontepec (Jan. and Feb.).

102. *CARPODACUS HÆMORRHOUS* (Wagl.).
Oaxaca, many examples, ♂ et ♀.

Fam. ICTERIDÆ.

103. *OSTINOPS MONTEZUMÆ* (Less.).
Playa Vicente.

104. *CASSICULUS MELANICTERUS*, Bp. Consp. p. 428.—*Ict. melanicterus*, Bp. Pr. Ac. Phil. iv. 389.
♂ et ♀, Rio Grande.

105. *CASSICULUS PREVOSTI* (Less.).
Teotalcingo and Playa Vicente.

106. *ICTERUS SPURIUS*, Bp. ?

Playa Vicente (March). I find much difference in the size of Mexican specimens of these birds, and am inclined to agree with Prof. Baird that *I. affinis* is not a really distinct species.

107. *ICTERUS AUDUBONI*, Baird, Rep. p. 542.

Juquila.

108. *ICTERUS WAGLERI*, Sclater : Baird, Rep. p. 545.

Villa Alta (Jan.) ; Oaxaca (March).

109. *AGELÆUS PHŒNICEUS* (Linn.).

Oaxaca. Called 'el Collegial.'

110. *MOLOTHRUS ÆNEUS*.

Yetla (Feb.).

111. *STURNELLA HIPPOCREPIS*, Wagl. ?

Oaxaca.

112. *QUISCALUS SUMICHRASTI*, de Sauss., *antea*, p. 365.

Playa Vicente (May).

Fam. CORVIDÆ.

113. *CYANURA CORONATA* (Sw.) : P. Z. S. 1857, p. 302.

Juquila.

114. *CYANOCITTA CALIFORNICA* (Vig.) : Baird, Rep. p. 584.

Cinco Señores. Seems to agree with a specimen from San Francisco : female smaller.

115. *CYANOCITTA ORNATA* (Less.).

Teotalcingo.

116. *CYANOCITTA NANA*, DuBus, Esq. Orn. pl. 25 ; P. Z. S. 1857, p. 204.

Llano Verde.

117. *CALOCITTA FORMOSA* (Sw.).—*Pica formosa*, Sw. Phil. Mag. 1827, p. 437.—*Pica bullockii*, Wagl.

The front of this example is white, and the pectoral band rather broader than in Guatemalan specimens, and the nape has rather more black.

Fam. DENDROCOLAPTIDÆ.

118. *PICOLAPTES AFFINIS*, Lafr. R. Z. 1850, p. 275.

Totontepec (Jan.).

119. *DENDROORNIS FLAVIGASTRA* (Sw.) : P. Z. S. 1856, p. 289.

Playa Vicente (April).

120. *DENDROORNIS ERYTHROPYGIA*, Sclater, *antea*, p. 366.

Oaxaca.

121. DENDROMANES ANABATINUS.

Dendrocincla anabatina, Sclater, P. Z. S. 1859, p. 54, pl. 150 ;
Ibis, 1859, p. 118.

Playa Vicente (April).

The peculiar form of the beak in this and the following species seems to necessitate the formation of a new generic name for them, which I accordingly propose shall be *Dendromanes*. This organ is short, straight, and much compressed, though somewhat broad at the base, but not sufficiently to enable us to arrange it with *Dendrocincla* or *Dendrocops*, as I have previously done. In fact it more resembles that of some species of *Dendroornis*, though so much shorter, smaller, and with the tip more incurved. The stiff spiny tail shows at once that its natural situation is in the subfamily *Dendrocolaptinae*. The following is an outline of the characters of this new form of *Dendrocolaptinae* :—

Rostrum capite vix longius, rectum, subulatum, compressum, ad basin paulum dilatatum, mandibulae superioris apice uncinato: alae subbreves, dimidium caudae superantes, remigibus tertio quarto et quinto longissimis: cauda spinosa, plumarum rachibus denudatis et acutis: pedes scansorii, unguibus acutis.

122. DENDROMANES HOMOCHROUS, sp. nov.

Fusco-rubiginosus, unicolor, gula dilutiore, alis caudaque vegetioribus; loris grisescenti-rufis; remigum sex externorum pogoniis internis nigricante terminatis: rostro fusciscenti-corneo, pedibus pallide corylinis.

Long. tota 7·5, alae 3·8, caudae 3·2, rostri a rictu 1·0, tarsi 1·0.

Hab. In statu Oaxacensi reipubl. Mexicanæ.

Mus. P. L. S.

Only one example of the present bird was in M. Sallé's collections—a male obtained by M. Boucard at Teotalcingo in March 1859. In form it precisely resembles the last species, having only the tail a trifle longer, but just as much rounded, and with the shafts spiny and projecting. The fourth and fifth primaries are equal and rather longer than the third. The sixth is longer than the second.

122*. XENOPS MEXICANUS, Sclater, P. Z. S. 1856, p. 289.

Playa Vicente (April).

123. SYNALLAXIS ERYTHROTHORAX, Sclater.

Playa Vicente (March and April).

124. ANABATES CERVINIGULARIS, Sclater.

Playa Vicente (April).

125. ANABAZENOPS VARIEGATICEPS, Sclater, P. Z. S. 1856, p. 289.

Choapam and Totontepec.

Fam. FORMICARIIDÆ.

126. *THAMNOPHILUS DOLIATUS* (Linn.).

Choapam and Playa Vicente.

127. *THAMNOPHILUS MELANURUS*, Gould?

Playa Vicente (May 1859), ♀.

128. *FORMICIVORA BOUCARDI*, Sclater, P. Z. S. 1858, p. 301.

Playa Vicente (March), ♂ et ♀.

I have already described the female of this species, now sent along with the male by M. Boucard, among the birds collected in Honduras by Mr. Leyland (P. Z. S. 1859, p. 55).

129. *CERCOMACRA TYRANNINA*, Sclater, P. Z. S. 1858, p. 245, et 1859, p. 55.

Playa Vicente (May), two pairs. I have again compared these with New Granadian specimens without finding any material difference.

130. *RAMPHOCÆNUS RUFIVENTRIS* (Bp.).

Playa Vicente (April).

Rather more rufous below than in specimens from New Granada (S. Martha).

131. *FORMICARIUS MONILIGER*, Sclater, P. Z. S. 1856, p. 294.

Playa Vicente (March).

132. *GRALLARIA GUATEMALENSIS*, Prévost.

Playa Vicente. More darkly coloured below than examples from Vera Cruz, but not so intense as in a Guatemalan specimen in my possession.

Fam. TYRANNIDÆ.

133. *ATTILA CITREOPYGIUS*, Bp.

Two examples, ♂, Playa Vicente.

134. *SAYORNIS NIGRICANS*, Sw.

Oaxaca (March); Cinco Señores (Feb.).

135. *MYIODYNASTES LUTEIVENTRIS*, Sclater, P. Z. S. 1859, p. 42.

Juquila.

136. *TYRANNUS INTREPIDUS*, Vieill.

Playa Vicente (May).

137. *TYRANNUS VOCIFERANS*, Sw.

Oaxaca (Feb.).

138. *MILVULUS MONACHUS*, Hartl.

Playa Vicente.

139. *MYIARCHUS LAWRENCII* (Giraud).

Talea. Eggs of this bird from this locality are of a pure white, with spots of two shades of brown principally towards the larger end, where they form a ring. They seem small for the size of the bird, measuring only 0.7 by .525 inch.

140. *MYIARCHUS COOPERI*, Baird, Rep. p. 180.

Oaxaca, ♂ (March 1858).

141. *MYIARCHUS CINERASCENS* (Lawr.).

Oaxaca, ♂ (March 1858).

142. *CONTOPUS BOREALIS* (Sw.).

Cinco Señores (Feb.), ♀.

143. *EMPIDONAX MINIMUS*, Baird.

Playa Vicente (April).

144. *MITREPHORUS PHÆOCERCUS*, Selater, P. Z. S. 1859, p. 44.
Talea.145. *MYIOBIUS SULPHUREIPYGIUS*, Selater, P. Z. S. 1856, p. 296.
Playa Vicente (May).146. *CYCLORHYNCHUS CINEREICEPS*, Selater, Ibis, 1859, p. 443.
Playa Vicente (March 1859).147. *PLATYRHYNCHUS CANCROMA* (Licht.): Selater, P. Z. S. 1856, p. 295.

Playa Vicente (May).

148. *TODIROSTRUM SCHISTACEICEPS*, Selater, Ibis, 1859, p. 444.
Playa Vicente.149. *TODIROSTRUM CINEREIGULARE*, Selater, P. Z. S. 1856, p. 295.

Teotalcingo and Playa Vicente.

150. *LEPTOPOGON AMAUROCEPHALUS*, Cab.

Playa Vicente.

Fam. COTINGIDÆ.

151. *TITYRA ALBITORQUES*, DuBus; Selater, P. Z. S. 1857, p. 71.

Playa Vicente, one example, ♀. I am surprised at finding this Becard so far north, and should like to examine more specimens of

both sexes, as it may prove to be distinct from the New Granadian species.

152. *TITYRA PERSONATA*, Jard.

Playa Vicente.

153. *PLATYPSARIS AGLAIÆ* (Lafr.): Selater, P. Z. S. 1857, p. 74.

This specimen belongs to the dark variety (?), considered by MM. Elliot and Verreaux to be the true *P. aglaïæ* in contradistinction to the *P. affinis* of the former. See 'Ibis,' 1859, p. 394; and above, p. 366.

154. *LIPAUGUS UNIRUFUS*, sp. nov.

Fuscescenti-rufus unicolor, subtus paulo dilutior, præcipue in gutture et ventre medio: remigibus alarum intus obscurioribus: rostro pallescente corneo, mandibulæ inferioris basi albicante; pedibus fusco-cinereis.

Long. tota 9·75, alæ 5·4, caudæ 4·3.

Hab. In statu Oaxacensi Mex. Merid. (Boucard); in rep. Guatemalensi (Skinner).

Mus. Brit. et P. L. S.

This fine large *Lipaugus* is readily distinguishable from every other species of the genus by its size and colour. Besides the present example (a male, obtained by M. Boucard at Playa Vicente in March 1859), I have noticed a specimen in the British Museum, which was received in Mr. Skinner's collections from the province of Vera Paz in Guatemala. Mr. Salvin has also lately forwarded a specimen collected at Coban.

155. *MANACUS CANDÆI* (Parzud.).

Playa Vicente, ♂ et ♀.

156. *PIPRA MENTALIS*, Selater.

Playa Vicente, ♂ et ♀.

Fam. TROCHILIDÆ.

157. *PHAËTHORNIS ADOLPHI*, Gould.

Teotalcingo (March 1859); Playa Vicente (April).

158. *LAMPORNIS PREVOSTI* (Bourc. & Muls.).

Choapam (March 1859).

159. *CAMPYLOPTERUS PAMPA* (Less.).

Teotalcingo. Found breeding in March, and nest and eggs received by M. Sallé.

160. *CAMPYLOPTERUS DELATRII* (Less.).

Teotalcingo.

161. *CÆLIGENA FULGENS* (Sw.).
Totontepec (Jan. 1859).
162. *DELATRIA HENRICI* (Less.).
Totontepec.
163. *PETASOPHORA THALASSINA* (Sw.).
Totontepec (Jan. 1859).
164. *SAPPHIRONIA LUCIDA* (Shaw).
Totontepec (Feb.).
165. *THAUMANTIAS CANDIDUS* (Bourc.).
Playa Vicente (May).
166. *CYANOMYIA VIOLICEPS*, Gould, Ann. & Mag. N. H. 3 ser.
iv. p. 97.
Described from M. Boucard's specimens.
167. *CYANOMYIA QUADRICOLOR* (Vieill.).
Found breeding at Choapam in the month of March, and nest and
eggs transmitted to M. Sallé by M. Boucard.
168. *CYANOMYIA SORDIDA*, Gould, Ann. & Mag. Nat. Hist. 3 ser.
iv. p. 97.
Oaxaca.
169. *AMAZILIUS CORALLIROSTRIS* (Bourc.).
State of Oaxaca.
170. *AMAZILIUS ARSINOË* (Less.).
Playa Vicente (April).
171. *AMAZILIUS DUBUSI*, Bourc. & Muls. Ann. Soc. Lyons, 1852.
Choapam (March); Playa Vicente (April). Is this distinct from
A. riefferi?
172. *TROCHILUS COLUBRIS*, Linn.
Oaxaca.
173. *SELASPHORUS HELOÏSÆ* (Less. & Del.).
Totontepec (Jan. 1859).
174. *CALOTHORAX PULCHRA*, Gould, Ann. & Mag. Nat. Hist.
3 ser. iv. p. 97.
Oaxaca.

Fam. GALBULIDÆ.

175. *GALBULA MELANOGENIA*, Sclater.

Playa Vicente (April).

This is the most northern locality I have yet become acquainted with for *Galbula*. The specimen is marked male, but is in female plumage, being perhaps immature.

Fam. ALCEDINIDÆ.

176. *CERYLE SUPERCILIOSA* (Linn.).

Playa Vicente (April), ♂ et ♀.

Fam. MOMOTIDÆ.

177. *MOMOTUS MEXICANUS*, Sw. Phil. Mag. 1827, p. 442 ;
Sclater, P. Z. S. 1857, p. 253.

Rio Grande.

178. *MOMOTUS LESSONI*, Less.

Playa Vicente and Teotalcingo.

179. *HYLOMANES MOMOTULA*, Licht.

Playa Vicente (April 1859).

Fam. TROGONIDÆ.

180. *TROGON MEXICANUS*, Sw. : Gould, Mon. pl. 1.
Cinco Señores.

181. *TROGON AMBIGUUS*, Gould, Mon. pl. 4.
Talea.

182. *TROGON CALIGATUS*, Gould, Mon. pl. 7.
Playa Vicente.

183. *TROGON MELANOCEPHALUS*, Gould, Mon. pl. 12.
Playa Vicente, ♂ et ♀.

184. *TROGON MASSENA*, Gould, Mon. pl. 16.
Playa Vicente, ♂ et ♀.

185. *TROGON PUELLA*, Gould.
Playa Vicente.

Fam. CUCULIDÆ.

186. *GEOCOCCYX AFFINIS*, Hartl.
Juquila.

187. *PIAYA MEXICANA* (Sw.).—*Cuculus mexicanus*, Sw. Phil. Mag. 1827, p. 440.

♂ Juquila (May 1858). This is a different species of *Piaya* from that which inhabits the tierra caliente of Vera Cruz and Guatemala. The plumage is of a much brighter chestnut-red; the lower belly is hardly darker than the breast; and the tail-feathers are bright rufous, with a well-defined broad subapical band of black, tipped with white. In the common bird of Vera Cruz, which I have until lately supposed to be Swainson's *Cuculus mexicanus*, the tail-feathers, looking at them from below, are nearly black, and have no defined patch towards their termination as in the present bird, and the lower belly is altogether black. See *anteà*, p. 368, for description of *Piaya thermophila*.

188. *CROTOPHAGA SULCIROSTRIS*, Sw.

Oaxaca.

Fam. RHAMPHASTIDÆ.

189. *RHAMPHASTOS CARINATUS*, Sw.

Playa Vicente (March).

190. *PTEROGLOSSUS TORQUATUS* (Wagl.).

Playa Vicente (March).

191. *AULACORHAMPHUS WAGLERI*.

Xacatepec, ♂ (March 1858).

Fam. PICIDÆ.

192. *DRYOCOPUS GUATEMALENSIS*.

Llano Verde and Playa Vicente. Rather small in dimensions.

193. *PICUS VARIUS*, Linn.

Llano Verde; Totontepec (Jan.).

194. *PICUS JARDINII*, Malh.

Oaxaca, ♂.

195. *CHLORONERPES ÆRUGINOSUS* (Licht.).

Teotalcingo (March).

196. *CHLORONERPES OLEAGINEUS*.

Playa Vicente (March).

197. *CELEUS CASTANEUS* (Wagl.).

Playa Vicente (March).

Fam. PSITTACIDÆ.

198. *CONURUS ASTEC*, Souancé, Rev. Zool. 1857, p. 97.

Playa Vicente (April 1859).

199. *CHRYBOTIS OCHROPTERA* (Gm.): Gray, List of Psittacidae, p. 79.

Rio Grande; Playa Vicente.

200. *CHRYBOTIS AUTUMNALIS* (Linn.).

Playa Vicente. I now doubt much whether Bonaparte's *C. aestivalis* is really distinct from this species. The only difference between the representatives of the two species in the British Museum is the presence of rather more red on the lores of the supposed true *C. autumnalis*, in which respect it agrees better with Edwards's plate, upon which the name was founded.

Fam. FALCONIDÆ.

201. *HERPETOTHERES CACHINNANS* (Linn.).

Playa Vicente.

202. *SPIZAËTUS ORNATUS* (Daud.).

Teotalcingo (March 1859).

203. *BUTEO BOREALIS* (Gm.).

In adult and immature plumage.

Talea and Oaxaca.

204. *BUTEO HARLANI*, Aud.

The variety of *B. borealis* alluded to in P. Z. S. 1857, p. 211.

Oaxaca.

205. *BUTEO ERYTHRONOTUS* (Lafr. et d'Orb.).

Talea.

206. *ASTURINA NITIDA*.

Talea and Playa Vicente.

207. *ACCIPITER PILEATUS* (Max.): Temm. Pl. Col. 205.

Adult male: Playa Vicente. This is the first specimen of *Accipiter pileatus* that Mr. Gurney has seen from the northern portion of the American continent, as he informs me.

208. *ACCIPITER COOPERI*, Bp.: Baird, Rep. p. 16.

Totontepec (Jan. 1859) and Oaxaca.

Decidedly distinct from the preceding (with which it is united by many authors—Strickland, Gray, &c.), in Mr. Gurney's opinion:—" *Accipiter pileatus* is distinguishable from *A. cooperi*, (1) by its smaller size; (2) by the whole-coloured hood with which its head is covered in all ages; (3) by the plumbeous colour of the breast and belly in the adult, the corresponding parts in *A. cooperi*, when adult, being rufous, mottled with white. The adult *A. pileatus* has the curious peculiarity of exactly resembling in colour the adult of *Har-*

pagus bidentatus. In the Norwich Museum are specimens of *A. pileatus* from Brazil; Ecuador, Pallatanga (*Fraser*); Chili, and Straits of Magellan,—and of *A. cooperi* from California, Monterey; Texas and Mexico, Orizava. The adult specimens of the present bird from Oaxaca show a whole-coloured hood nearly as dark as in *A. pileatus*, which younger specimens never do, whereas, as stated above, *A. pileatus* does so in all ages.”—J. H. G. *in epist.*

209. TINNUNCULUS SPARVERIUS (Linn.).

Villa Alta (Jan. 1859).

210. HYPOTRIORCHIS RUFIGULARIS (Daud.); Strickl. Orn. Syn. p. 88.

Playa Vicente.

211. ICTINIA PLUMBEA (Gm.).

Playa Vicente (March), ♂ adult.

212. CIRCUS HUDSONICUS (Linn.).

Oaxaca.

Fam. STRIGIDÆ.

213. STRIX PRATINCOLA, Bp.

Oaxaca.

214. BRACHYOTUS CASSINII, Brewer.

Oaxaca.

215. BUBO VIRGINIANUS (Gm.).

Oaxaca.

Fam. COLUMBIDÆ.

216. COLUMBA NIGRIROSTRIS, sp. nov.

Obscure olivascens-fusca æneo vix tincta, capite et collo supero cum corpore subtus et tectricibus subalaribus vinaceis, gula albescentiore, ventre plumbescentiore: remigibus et rectricibus fusco-nigricantibus unicoloribus: rostro nigro: pedibus coralino-rubris.

Long. tota 10·5, alæ 6·5, caudæ 4·6.

Hab. In statu Oaxaca reipubl. Mexicanæ.

In spite of the number of new species that have lately been described among the Pigeons, this bird appears to have remained unnoticed. There is no specimen of it in the British Museum; and it is not included in Bonaparte's 'Conspectus,' which contains such an elaborate account of the family. I therefore consider it to be probably new. Its nearest allies are *Columba flavirostris*, which has the bill yellow, and *C. rufina*, which has a cinnamonous-brown tail,

besides other differences. Its proper place is intermediate between these species.

217. *COLUMBA FLAVIROSTRIS*, Wagl.

Teotalcingo (March).

218. *LEPTOPTILA ALBIFRONS*, Bp. Consp. ii. p. 74.

Playa Vicente.

219. *GEOTRYGON ALBIFACIES*, G. R. Gray : Sclater, P. Z. S. 1858, p. 98.

Latani (Feb. 1859).

220. *PERISTERA CINEREA* (Temm.).

Playa Vicente.

221. *ZENAIIDURA CAROLINENSIS* (Linn.).

Talea and Oaxaca.

222. *CHAMÆPELIA PASSERINA*, Linn.

Oaxaca ; several specimens.

223. *SCARDAFELLA INCA* (Less.).

Oaxaca. The egg of this species, forwarded by M. Sallé, measures 0·9 by 0·6 inch, and is of the usual uniform white.

Fam. CRACIDÆ.

224. *PENELOPE PURPURASCENS*, Wagler.

Rio Grande ; called 'Faisano.'

225. *ORTALIDA VETULA* (Wagl.).

Playa Vicente. I have never seen but two *Ortalidæ* from Mexico—the two here mentioned. I can hardly believe that Baird's *O. maccallii* is different from the present bird.

226. *ORTALIDA LEUCOGASTRA*, Gould.

Rio Grande. The female like the male, but smaller. I have now little doubt that this is really the true *O. poliocephala* of Wagler. It seems to be the representative of *O. vetula* in the Pacific coast-region.

Fam. PERDICIDÆ.

227. *ODONTOPHORUS GUTTATUS*, Gould.

Teotalcingo (March 1859).

Fam. TINAMIDÆ.

228. *TINAMUS BOUCARDI*, Sallé, MS.

Obscure cinereus ; dorso toto et alis extus brunneis, nigro minutis-

sine vermiculatis : remigibus alarum fusco-nigris, scapis plumarum atris : subtus dilutior, gula pallescentiore : ventre toto fulvescenti-brunneo lavato : crisso et tectricibus subcaudalibus nigro variegatis : rostri mandibula superiore plumbea, inferiore albida : pedibus clare corylinis.

Long. tota 10·0, alæ 6·5, caudæ 2·0, tarsi 2·0, rostri a rictu 1·3.

Hab. In statu Oaxaca reipubl. Mexicanæ.

Two examples of this fine Tinamou are in M. Boucard's collections, both males, one from Playa Vicente (May), and the other from Teotacingo (March). The nearest allied species is the S. American *T. cinereus*.

229. *TINAMUS SALLÆI* (Bp.).—*Nothocercus sallæi*, Bp. C. R. xlii. p. 955.

*Nigricans, rufo undulatus : alarum vittis latioribus et flavescen-
tioribus : cervice postica et dorso superiore fere puris ; pileo
nigricante ; nucha rufescente, nigro undulata : lateribus capitis
rufis : subtus cinnamomeo-rufus, cervice obscure cinerea, gula
nivea, lateribus et crisso nigro variegatis : rostro corneo : man-
dibula inferiore et pedibus flavis.*

♀. *Cervice antica rufescente : pileo, sicut nucha, vittato.*

Long. tota 10·0, alæ 6·2, caudæ 1·5, tarsi 1·8.

This is the only Mexican species of Tinamou which is at all like the South American *Tinamus variegatus*, and I believe that it is the same to which Prince Bonaparte applied the name *T. delatirii* in C. R. xlviii. p. 955. I know, from the Prince's own mouth, that he was in doubt upon this point. The examples described above were obtained at Playa Vicente in May 1850. M. Sallé suggests that this bird may be Lesson's *Nothura cinnamomea* (Rev. Zool. 1842, p. 210). Though I know from experience the vileness of Lesson's descriptions, I think this hardly possible.

230. *TINAMUS MESERYTHRUS*, sp. nov.

*Ex olivaceo rufescens ; alis nigricantibus, extus rufo marginatis ;
pileo toto nigricanti-cinereo : subtus saturate ferrugineo-rufus,
medialiter clarior ; crisso pallide cinnamomeo ; hypochondriis et
pectore antico obscurioribus, nigricante adumbratis : remigibus
subtus pallide schistaceis : tectricibus caudæ elongatis, satu-
rate castaneis : rostri mandibula superiore plumbea, inferiore
albicante : pedibus clare corylinis.*

Long. tota 9·5, alæ 5·2, caudæ 1·5, tarsi 1·7, rostri a rictu 1·15.

Hab. In statu Oaxaca reipublicæ Mexicanæ.

This Tinamou is nearly allied to *T. sori* of South America and *T. castaneus* of New Granada. It is easily distinguished by the deep-chestnut medial line below, contrasting with the darker sides of the body. There are but very faint traces of spots on the crissum. The male and female, procured by M. Boucard at Playa Vicente in May, are coloured alike.

Fam. CHARADRIIDÆ.

231. *ÆGIALITES VOCIFERUS* (Linn.).

Oaxaca.

Fam. SCOLOPACIDÆ.

232. *GAMBETTA FLAVIPES* (Gm.) : Baird, Rep. p. 732.

Playa Vicente (April 1859).

Fam. RALLIDÆ.

233. *ARAMIDES CAYENNENSIS* (Gm.).

Oaxaca.

234. *PARRA GYMNOTOMA*, Wagl.

Oaxaca. Two examples in young plumage.

Fam. ANATIDÆ.

235. *QUERQUEDULA DISCORS* (Linn.).

State of Oaxaca.

236. *ERISMATURA RUBIDA* (Wils.).

Oaxaca.

5. DESCRIPTION D'UNE NOUVELLE ESPÈCE DE BARBU DE L'AFRIQUE OCCIDENTALE. PAR JULES VERREAUX, MEMBRE CORRESPONDANT DE LA SOCIÉTÉ ZOOLOGIQUE DE LONDRES.

(Aves, Pl. CLVII.)

LAIMODON ALBIVENTRIS, sp. nov.

Tête et cou rouges ; la base des plumes noire à partir du vertex jusque sur le haut du dos ; ce dernier ainsi que le reste des parties supérieures, le devant du cou et du thorax d'un brun terreux plus foncé au centre de ce dernier, presque toutes les plumes de ces parties ayant le rachis d'un blanc plus ou moins pur ; une tache oblongue de cette couleur au centre du croupion ; ventre, bas ventre et couvertures sous-caudales d'un blanc pur ; les plumes des flancs assez longues et délicates ; cuisses brunes, à plumes bordées de plus clair ; ailes et queue noires. Les mêmes lignes blanches du rachis sont très distinctes sur les couvertures alaires ainsi que sur les rémiges secondaires les plus rapprochées du corps.

Bec plus haut que large, à mandibule supérieure bidentée, bleuâtre à sa base qui est garnie de soies noires dirigées en avant, jaunâtre sale sur le reste ; tarses fortement scutellés, bleuâtres ainsi que les doigts ; ongles assez crochus et bruns ; aile à penne bâtarde très courte, les 4, 5 et 6^{mes} rémiges les plus longues, et les secondaires de

la même longueur ; leurs couvertures inférieures blanches ainsi que la partie interne des rémiges ; queue arrondie.

	cent.	mill.
Long. tot.	16	7
— de l'aile fermée	8	5
— de la queue	7	0
— du bec à partir de l'angle.....	2	7
— tarsi	2	0

Cette description a été prise sur un sujet mâle très adulte, provenant de l'Afrique occidentale, mais sans désignation de localité exacte.

Nous devons à l'obligeance de M. Emile Parzudaki, de la faire connaître au monde savant, ainsi que quelques autres nouveautés que nous ne tarderons pas à publier. Nous saisissons avec empressement l'occasion de le remercier de l'intérêt qu'il porte à cette belle science en nous offrant toutes les facilités de visiter et d'étudier les nombreux objets qui passent chaque jour dans ses magasins.

Nous saisissons avec empressement l'occasion qui se présente par l'espèce nouvelle que nous décrivons, pour indiquer toutes les espèces africaines que nous connaissons sur cette famille, en ajoutant leur synonymie telle que nous nous proposons de la reproduire dans le 'Conspectus Generum Avium' auquel nous travaillons depuis longues années, et que nous espérons livrer au public un jour.

Genre 1. POGONIAS, Illig.

1. POGONIAS DUBIUS.

Pogonias dubius, Bp. Consp. Av. t. i. p. 145. sp. 1 ; id. Consp. Volucr. Zygodactyl. (1854) p. 12. sp. 1 ; Hartl. Syst. Orn. Westafr. p. 169. no. 506.

Bucco dubius, Gm. Syst. Nat. (1796) t. i. p. 414.

Pogonias sulcirostris, Leach, Zool. Misc. i. p. 76 ; Sw. B. West Afr. ii. p. 166.

Pogonias erythromelas, Vieill. Gal. Ois. pl. 32 ; Wagl. Syst. Av. p. 164.

Pogonias major, Less. Trait. d'Orn. p. 159.

Barbican, Levaill. Barb. pl. 18.

Pogonorhamphus, DesMurs et Chenu, Encycl. Ois. ii. p. 14.

Afr. occ. ; Sénégal ; Casamanze ; Bissao.

2. POGONIAS ROLLETI.

Pogonias rolleti, De Filippi, Rev. et Mag. de Zool. (1853) p. 290 ; Bp. Consp. Volucr. Zygodactyl. (1854) p. 12. sp. 1 ; Hartl. Syst. Orn. Westafr. p. 169, note.

Afr. orient. ; Nubie ; Nil blanc.

3. POGONIAS BIDENTATUS.

Pogonias bidentatus, Bp. Consp. Av. t. i. p. 145. sp. 2 ; Hartl. Syst. Orn. Westafr. p. 170. no. 507.

Bucco dubius, var. β , Lath.

- Pogonias lævirostris*, Leach, Zool. Misc. t. 77.
Bucco leuconotus, Vieill. Encycl. Méth. ; Wagl. Syst. Av. p. 164.
 sp. 2 ; Shaw, Nat. Misc. t. 393.
Pogonias levaillantii, Leach, l. c. t. 117.
Bucco levaillantii, Vieill. Encycl. Méth. p. 1422.
Laimodon bidentatus, Gray.
Barbican unibec, Levaill. Barb. Supp. p. 48. t. K. ad.
Barbican à ventre rose, Levaill. Barb. t. A. juv.
Laimodon lævirostris, Heugl. Uebers. p. 47. no. 480.
 Afr. occ. ; Sénégal ; Guinée ; Gabon.

Genre 2. LAIMODON, Gray.

4. LAIMODON ALBIVENTRIS.

Laimodon albiventris, J. Verr. *supra*.
 Afr. occ.

5. LAIMODON LEUCOCEPHALUS.

Laimodon leucocephalus, De Filippi, Rev. et Mag. Zool. (1855)
 p. 291.
 Afr. orient. ; Nubie ; Nil blanc.

6. LAIMODON NIGRITHORAX.

Laimodon nigrithorax, Gray ; Bp. Consp. Volucr. Zygodactyl.
 (1854) p. 12. sp. 3.
Pogonias nigrithorax, Cuv. Règ. An. (1817) t. i. App. p. 428.
Bucco personatus, Temm. Pl. Col. 201 ; Wagl. Syst. Av. sp. 3 ;
 Levaill. Barb. pl. 28.
Pogonias nigrithorax, Bp. Consp. Av. t. i. p. 145. sp. 3.
Pogonias personatus, Less. Trait. d'Orn. p. 160. sp. 1.
 Afr. mér. ; Caffrérie.

7. LAIMODON UNIDENTATUS.

Laimodon unidentatus, Gray ; Bp. Consp. Volucr. Zygodactyl.
 (1854) p. 12. sp. 8.
Pogonias unidentatus, Licht. Verz. Sudafric. Th. p. 17. sp. 179.
Bucco niger, Gm. Syst. Nat. (1796) t. i. p. 411.
Bucco rufifrons, Steph.
Trogon luzoniensis, Scopoli.
Pogonias stephensi, Leach, Zool. Misc. t. 116 ; Vieill. Gal. Ois.
 pl. 33.
Pogonias niger, Less. Trait. d'Orn. p. 160. sp. 2.
Laimodon leucomelas, Gray ; Buff. Pl. Enl. 688. 1 ; Sonner. Voy.
 t. 34 ; Levaill. Barb. t. 29, 30, 31.
Pogonias unidentatus, Bp. Consp. Av. t. i. p. 146. sp. 9.
Pogonias niger, Bp. l. c. p. 145. sp. 6.
Megalæma leucotis, Sundev. Öfvers. (1850) p. 109.
 Afr. mér. et occid. ; Caffrérie.

8. LAIMODON BIFRENATUS.

Laimodon bifrenatus, Gray ; Bp. Consp. Volucr. Zygod. (1854) p. 12. sp. 7.

Pogonias bifrenatus, Ehrenb. Symb. Phys. t. 8. f. 2 ; Bp. Consp. Av. t. i. p. 145. sp. 8 ; Hartl. Caban. Journ. Orn. (1854) p. 197. sp. 418 ; id. Syst. Orn. Westafr. p. 171. no. 510.

Pogonias melanocephalus, Rüpp. Atl. t. 28 A. p. 41.

Afr. orient.

9. LAIMODON SALTII.

Laimodon salti, Gray ; Bp. Consp. Volucr. Zygod. (1854) p. 12. sp. 4.

Bucco salti, Stanley, Salt's Trav. Abyss. App. ; Lath. Gen. Hist. iii. p. 258. t. 53.

Phytotoma tridactyla, Daud.

Ploceus abyssinicus, Steph.

Pogonias hæmatops, Wagl. Syst. sp. 4.

Pogonias rubrifrons, Sw. B. of West Afr. ii. p. 170 ; id. Zool. Ill. pl. 68.

Pogonias brucei, Rüpp. Wirb., Av. t. 20. 1.

Pogonias salti, Bp. Consp. Av. t. i. p. 145. sp. 4.

Laimodon undatus, Rüpp. Faun. Abyss. t. 20. f. 2.

Pogonias undatus, Temm. Mus. Lugd. ; Bp. Consp. Av. t. i. p. 146. sp. 10.

Pogonias salti, Hartl. Syst. Orn. Westafr. p. 170. no. 508.

Afr. orient. et occid. ; Abyssinie ; Nubie ; Sierra Leone ?

10. LAIMODON VIEILLIOTI.

Laimodon vieilloti, Gray ; Bp. Consp. Volucr. Zygod. (1854) p. 12. sp. 5.

Pogonias vieilloti, Leach, Zool. Misc. t. 97 ; Less. Trait. d'Orn. p. 160. sp. 3 ; Bp. Consp. Av. t. i. p. 145. sp. 5.

Barbu rubicans, Levaill. Barb. Suppl. f. D.

Pogonias fuscescens, Vieill. Encycl. Méth. p. 1421.

Pogonias rubescens, Temm.

Pogonias senegalensis, Licht. Doubl. p. 9.

Pogonias rufifrons, Sw. B. of West. Afr. ii. p. 168.

Pogonias hæmatops, Wagl. Syst. Av. sp. 5.

Pogonias vieilloti, Hartl. Syst. Orn. Westafr. p. 170. no. 509.

Afr. occ. et orient. ; Sénégal ; Bissao ; Casamanze ; Guinée ; Nubie.

Genre 3. TRICHOLÆMA, Verr.

11. TRICHOLÆMA HIRSUTA.

Tricholæma hirsuta, Hartl. Syst. Orn. Westafr. p. 172. no. 512.

Pogonias hirsutus, Sw. Zool. Ill. pl. 72 ; id. B. of West Afr. ii. p. 172 ; id. Wagl. Syst. Av. sp. 7 ; id. Steph. Gen. Zool. xiv. p. 149 ; Bp. Consp. Av. t. i. p. 145. sp. 7 ; Hartl. Caban. Journ. Orn. (1854) no. 417.

Laimodon hirsutus, Gray; Bp. Consp. Volucr. Zygod. (1854) p. 12. sp. 9.

Tricholæma flavipunctata, J. Verr. Caban. Journ. Orn. ii. p. 103; id. Rev. et Mag. Zool. (1855) p. 555. pl. 14, juv.; Bp. Consp. Vol. Zygod. (1854) p. 12. sp. 20.

Afr. occid.; Sierra Leone; Dabocrom; Gabon; Calabar.

Genre 4. GYMNOBUCCO, Bp.

12. GYMNOBUCCO CALVUS.

Gymnobucco calvus, Hartl. Caban. Journ. Orn. (1854) p. 195. no. 405; id. Syst. Orn. Westafr. p. 174. no. 519.

Bucco calvus, Lafr. Rev. Zool. (1841) p. 241; Bp. Consp. Vol. Zygod. (1854) p. 12. sp. 10.

Afr. occid.

13. GYMNOBUCCO PELI.

Gymnobucco peli, Hartl. Syst. Orn. Westafr. p. 175. no. 520.

Bucco calvus, Temm. Mus. Lugd.

Gymnobucco calvus, Bp. Consp. Av. t. i. p. 141.

Afr. occid.; Dabocrom; Gabon.

14. GYMNOBUCCO BONAPARTII.

Gymnobucco bonapartei, J. Verr. Caban. Journ. Orn. (1855) p. 102. no. 3; Hartl. ib. p. 410; id. Bp. Consp. Volucr. Zygod. (1854) p. 12. sp. 11; Hartl. Syst. Orn. Westafr. p. 175. no. 521.

Barbatula fuliginosa, Cassin, Proc. Ac. Nat. Sc. Philad. (1855) p. 324; Bp. Compt. Rend. Acad. des Sci. (1856) p. 17.

Afr. occid.; Gabon; Moonda.

Genre 5. XYLOBUCCO, Bp.

15. XYLOBUCCO SCOLOPACEUS.

Xylobucco scolopaceus, Bp. Consp. Av. t. i. p. 141; id. Consp. Vol. Zygod. (1854) p. 12. sp. 12; Hartl. Caban. Journ. Orn. (1854) p. 195. no. 406; id. Syst. Orn. Westafr. p. 174. no. 518.

Bucco scolopaceus, Temm. Mus. Lugd.

Barbatula stellata, Fras. Proc. Zool. Soc. (1843) p. 4; Jard. Contr. Orn. (1851) p. 155.

Barbatula flavisquamata, J. Verr. Caban. Journ. Orn. (1855) p. 101; Bp. l. c. p. 12. sp. 13.

Afr. occid.; Dabocrom; Fernando Po; Gabon; Moonda; Calabar.

Genre 6. BUCCANODON, J. Verr.

16. BUCCANODON DUCHAILLUI.

Buccanodon duchaillui, Hartl. Syst. Orn. Westafr. p. 171. no. 511.

Barbatula duchaillui, Cassin, Proc. Acad. Nat. Sc. Philad. (1855) p. 324.

Barbatula formosa, Verr. Rev. et Mag. Zool. (1855) p. 213. sp. 2. pl. 5.

Afr. occid. ; Moonda ; Gabon.

Genre 7. BARBATULA, Less.

17. BARBATULA ATROFLAVA.

Barbatula atroflava, Bp. Consp. Av. t. i. p. 145. sp. 3 ; id. Consp. Volucr. Zygodactyl. (1854) p. 12. sp. 17 ; Hartl. Journ. Orn. (1854) p. 196. no. 409 ; id. Syst. Orn. Westafr. p. 172. no. 514.

Bucco atroflavus, Blumenb. Abb. Naturh. Gegenst. t. 65 ; Sparrm. Act. Suec. xviii. t. 9.

Bucco erythronotus, Cuv. Règ. An. (1817) t. i. App. p. 428 ; Less. Trait. d'Orn. p. 164. sp. 18.

Barbatula erythronotus, Verr. Rev. et Mag. Zool. (1851) p. 262 ; Strickl. Jard. Contr. Orn. (1851) p. 135. sp. 25 ; Levaill. Barb. pl. 57.

Afr. occid. ; Liberia ; Aguapim ; Galam ; Gabon ; Moonda.

18. BARBATULA SUBSULFUREA.

Barbatula subsulfurea, Hartl. Cab. Journ. Orn. (1854) p. 195. no. 408 ; id. Syst. Orn. Westafr. p. 172. no. 513.

Bucco subsulfureus, Fras. Proc. Zool. Soc. (1843) p. 3 ; Allen Thoms. Nig. Exped. ii. p. 404 ; Fras. Zool. Typ. pl. 52.

Capito subsulfureus, Gray.

Trachyphonus subsulfureus, Bp. Consp. Av. t. i. p. 142. sp. 2 ; id. Consp. Volucr. Zygod. (1854) p. 12. sp. 23 ; Des Murs et Chenu, Encycl. ii. p. 19.

Barbatula flavimentum, Verr. Rev. et Mag. Zool. (1851) p. 262 ; Strickl. Jard. Contr. Orn. (1851) p. 135.

Afr. occid. ; Fernando Po ; Gabon ; Moonda ; Aguapim.

19. BARBATULA LEUCOLAIMA.

Barbatula leucolaima, Verr. Rev. et Mag. Zool. (1851) p. 263 ; Strickl. Jard. Contr. Orn. (1851) p. 135. sp. 27 ; Bp. Consp. Vol. Zygod. (1854) p. 12. sp. 16 ; Hartl. Syst. Orn. Westafr. p. 173. no. 515.

Megalæma bilineata, Sundev. Öfvers. K. Vet. Ac. Förh. (1850) p. 109.

Afr. occid. ; Sénégal ; Gabon ; Aguapim ; Casamanze.

20. BARBATULA CHRYSOCOMA.

Barbatula chrysocoma, Bp. Consp. Av. t. i. p. 145. sp. 4 ; id. Consp. Volucr. Zygod. (1854) p. 12. sp. 14 ; Hartl. Journ. Orn. (1854) p. 196. no. 411 ; id. Syst. Orn. Westafr. p. 173. no. 516 ; Heugl. Uebers. p. 47. no. 481.

Bucco chrysocomus, Temm. Pl. Col. 536. f. 2; Heugl. Uebers. p. 47; Herz. v. Würtenb. Icon. ined. t. 55 C.
Bucco parvus, Less. Trait. Orn. p. 165; Compl. à Buff. ix. p. 292.
 Afr. occid. et orient.; Sénégal; Gambia; Casamanze; Sennaar; Fazoglo.

21. *BARBATULA PUSILLA*.

Barbatula pusilla, Bp. Consp. Av. t. i. p. 144. sp. 1; id. Consp. Volucr. Zygod. (1854) p. 12. sp. 19.

Bucco pusillus, Dum.

Bucco barbatula, Temm. Pl. Col. sp. 18, 19.

Bucco chrysopterus, Sw.

Bucco chrysozonicus, Rüpp.

Bucco nanus, Vig.

Capito rubrifrons, Vieill. Encycl. Méth. p. 1423.

Barbatula nana, Gray.

Megalaima barbatula, Gray.

Bucco parvus, Cuv.; Less. Trait. Orn. p. 164. sp. 19; Buff. Pl. Enl. 742. f. 2; Levaill. Barb. pl. 32.

Barbatula minuta, Bp. Consp. Av. t. i. p. 144. sp. 2; Hartl. Syst. Orn. Westafr. p. 173. no. 517; Bp. Consp. Vol. Zygod. (1854) p. 12. sp. 18.

Afr. mér., orient. et occid.?; Caffrérie; Nubie; Sénégal?

Genre 8. *TRACHYPHONUS*, Ranzani.

22. *TRACHYPHONUS CAFER*.

Trachyphonus cafer, Bp. Consp. Av. t. i. p. 142. sp. 1; id. Consp. Volucr. Zygod. (1854) p. 12. sp. 21.

Picus cafer, Gm. Syst. Nat. (1796) t. i. p. 368. sp. 25.

Trachyphonus vaillanti, Ranz.

Trachyphonus cafer, Gray.

Polysticte quopopa, A. Smith, Rep. Exp. S. Afr. Expl. (1856).

Micropogon sulphuratus, Lafr. Mag. Zool. (1836) pl. 60.

Trachyphonus squamiceps, Heugl. Beitr. t. 28. 2; id. Uebers. p. 47. no. 482.

Afr. mérid.; Kurrichaine.

23. *TRACHYPHONUS MARGARITATUS*.

Trachyphonus margaritatus, Bp. Consp. Av. t. i. p. 142. sp. 3; id. Consp. Volucr. Zygod. (1854) p. 12. sp. 22.

Bucco margaritatus, Rüpp. Atl. pl. 20; Heugl. Uebers. p. 47. no. 483.

Micropogon margaritatus, Temm. Pl. Col. 490.

Tamatia erythropygius, Ehrenb. Icones Av. t. 7.

Capito margaritatus, Gray.

Afr. orient.; Abyssinie; Nubie.

24. *TRACHYPHONUS PURPURATUS*.

Trachyphonus purpuratus, Verr. Rev. et Mag. Zool. (1851) p. 260;

Strickl. Jard. Contr. Orn. (1851) p. 135. sp. 24 ; Hartl. Cab. Journ. Orn. (1854) p. 195. no. 407 ; id. Syst. Orn. p. 175. no. 522 ; Chenu et Des Murs. Encycl. Orn. ii. p. 22 ; Bp. Consp. Volucr. Zygod. (1854) p. 12. sp. 24.

Afr. occid. ; Gabon ; Moonda.

P.S. Nous ne connaissons pas le *Laimodon diadematus*, Heugl. Beitr. t. 28. 1, et Uebers. p. 47. no. 479, de l'Afr. orient.

Paris, le 1^{er} Octobre, 1859.

6. NOTICE OF A RARE ASIATIC PIGEON. BY FREDERIC MOORE.

The bird which I beg leave to bring before the Meeting belongs to that group of Pigeons typified by the common Rockdove (*Columba livia*, L.), being an intermediate *species* between it and the *C. leuconota*, Vigors, and has hitherto been known only as an inhabitant of the mountainous and rocky parts of Dauria and Songaria, in Central Asia. The specimen under examination was procured in Ladakh by Captain Richard Strachey, and is the

COLUMBA RUPESTRIS.

Columba ænas, var. *rupestris*, Pallas, Zoogr. Rosso-Asiat. p. 560, pl. 35.

Hab. Mountainous regions of Central Asia.

Description of Specimen from Ladakh.—Head, throat, and ear-coverts darkish ash-colour ; the feathers round the neck glossed with changeable dark green and reddish-purple ; middle of breast vinous-brown ; upper part of the back, fore part of the wing, the base of the secondaries, the tertiaries, and the lower part of the breast pale ashy-grey ; primaries and speculars ashy-brown ; tertiaries and the greater coverts with a subterminal black band ; lower part of the back, rump, fore part of wings beneath, and sides of body white ; abdomen and under tail-coverts ashy-white ; upper tail-coverts and base of tail for three inches, ash-colour, the tail with a black terminal band and a broad subterminal white band : the latter band does not lessen in width, or curve to the *tip* of the outermost feather, as in *C. leuconota*, but is almost even, curving slightly only *towards the base* of the outer feather ; the base of the outer web of the outermost tail-feather is also white. Bill and legs smaller than in *C. leuconota*, *livia*, or *intermedia*.

Length of unmounted specimen $11\frac{1}{2}$ inches ; of wing 9 inches ; tail $5\frac{1}{4}$ inches, with its outer feather $\frac{1}{2}$ inch less ; tarsus 1 inch ; mid toe and claw $1\frac{1}{4}$ inch ; hind toe and claw $\frac{6}{10}$ ths of an inch ; bill to frontal plumes $\frac{9}{16}$ ths, to gape $\frac{8}{10}$ ths of an inch.

This species was also recently observed in Ladakh by Dr. A. Leith Adams, as appears from the following note in his "List of the Birds of Cashmere and Ladakh," published in the 'Proceedings' of the Society for the present year (*vide antea* p. 187), wherein it is stated that "*flocks of a pied variety of C. livia* (if indeed

it is a variety and not a distinct species, and which might easily be confounded with *C. leuconota*) were seen on the rocky banks of the Dras river, Ladakh, having the back and wings of a light blue; *rump white*; tail-coverts leaden-black; *a broad white band across the middle of the tail*, its tip black; inner surface of wings white; *belly and lower parts bluish-white*. They were mixed up with flocks of *C. livia*; and my reasons for supposing it only a variety were the constant companionship of the two, and some variety as regards the colouring of both; however, it is possible they may be distinct species. *I saw this bird nowhere else* *."

The late Major Boys, of the Bengal Cavalry, a most experienced collector of Indian birds, also distinguished a 'Blue Rock Pigeon,' which he procured at Hāwulbāgh in Kemāon, and which is evidently this species. "This pigeon," he remarks †, "differs considerably from the common Blue Pigeon, particularly in its weight and size. Length of a male $12\frac{3}{4}$ inches by 25 inches; weight 7 ozs. 8 drs. Bill black, the cere grey; iris red; legs pink. Top of head, chin, and sides of face ashy-grey; back of neck and upper part of breast glazed metallic green; bottom of neck metallic purple, blending into ashy light grey on the belly; flanks and vent light grey; wing-coverts and upper part of the back of the same colour; *middle of back white*; upper tail-coverts dark ashy-grey. Quills grey (the shafts black), darker near their tips; second quill longest; outer webs darker than the inner. Some of the larger wing-coverts (those covering the tectrices), together with the last six or seven tertiaries, bear a patch of greyish-black, which, when the wing is extended, forms two indistinct and somewhat curved bands. Tail dark grey at the base, broadly tipped with black, and having between these two colours a *broad stripe of white*. Inferior coverts white, blending with grey towards the anterior margin of the wing. Length of tail 5 inches, the quills (when the wings are closed) reaching to its tip. The exterior tail-feathers are pure white from their bases on the external web, finished off at the tip with black, the inner webs being grey at base, as obtaining in the intermediate feathers."

From the above notes it appears that the range of the *C. rupestris* extends southward as far as Kemāon, on the southern side of the Himalayas.

* Dr. Leith Adams since writes me that he killed several specimens of this bird, which was common on rocky places around the Ladakh Lakes. In his Notebook is the following memorandum:—"Salt Lakes, Ladakh, July 24th, 1852. There is a pigeon in the rocky parts around the Lakes, called by sportsmen the 'Imperial Rock Pigeon.' I fancy they think it is the *C. leuconota*; but from three specimens I have shot to-day, I can make out a decided distinction."

† *Vide* J. A. S. Beng. 1857, p. 224.

7. SECOND LIST OF COLD-BLOODED VERTEBRATA COLLECTED BY
MR. FRASER IN THE ANDES OF WESTERN ECUADOR. BY
DR. A. GÜNTHER, FOREIGN MEMBER ZOOL. SOC.

(Reptilia, Pl. XX.)

The second collection of Reptiles and Fishes sent by Mr. Fraser is richer than the first, in specimens as well as in species. Many have retained their natural colours. There are thirteen species of *Saurians*, six of which are new to science. Three species formerly sent are not in this collection, viz. *Anolis æneus*, *Microphractus humeralis*, and *Amphisbæna fuliginosa*. The species formerly mentioned as *Anolis cristatellus*? (p. 89) has proved to be a new one, of which better specimens are contained in the present collection.

The *Snakes* belong to twenty-one species, several of which have been known for a short period only, and two of which are new. Some are particularly interesting on account of their variation from specimens of the same species collected in other parts of South America. Three species formerly sent are not in this collection, viz. *Erythrolamprus venustissimus*, *Xenodon severus*, and *Spilotes pæciostoma*.

There are nine species of *Batrachians*, two of which are new. *Nototrema marsupiatum* has been procured of a size not seen before; four of the species formerly sent are not in this collection; and it is very strange that Mr. Fraser does not appear to have met with a single *Hyla* in the country he has just examined.

Three species of *Cæcilia* were found, one being new. They are the first specimens met with by Mr. Fraser.

Eleven species of *Fishes*, characteristic of the fresh waters of South America, and different from those sent before, conclude the series of this splendid collection: six of them are new to science.

Typical specimens of the new and interesting species will be retained for the Collection of the British Museum.

SAURIA.

1. CROCODILUS AMERICANUS, Schneid.

2. AMEIVA SEX-SCUTATA, n. sp.

Diagnosis.—Abdominal shields in six longitudinal series. The upper surface of the head covered by a pair of anterior nasals, a single anterior frontal, a pair of posterior frontals with a small single shield between, three pairs of parietals, and many small occipitals. Greenish-olive, speckled with brownish: a whitish dorsal streak from the muzzle to the middle of the tail; on each side of the back from the eye to the loin a black band, edged with whitish.

Description.—The muzzle is rather elongate, pyramidal; the nostril is situated laterally immediately behind the rostral, between four shields, viz. rostral, anterior and posterior nasal, and the first upper labial. The successive series of the shields covering the upper surface of the head is as follows:—1. The rostral shield is obtusely

rounded, as high as wide, with the posterior extremity rectangular and slightly produced backwards on the upper side of the head. 2. A pair of anterior nasals, irregularly quadrangular, united by a suture, and forming the upper margin of the nostril. 3. A single anterior frontal, pentagonal, with the lateral angle in contact with the posterior nasal; its posterior side is very short. 4. A pair of posterior frontals with a single shield between; the former are irregularly elliptical, and form a suture with the loreal; the latter is narrow, oblong. 5. Three pairs of parietals, one behind the other, and occupying the space between the orbits. 6. The occipital region is covered by many small irregular shields. 7. The upper eyelid has two semi-elliptical shields, surrounded by granulations.

Of the lateral shields of the head the posterior nasal is mentioned above; it is in contact posteriorly with the very large loreal, which reaches to the orbit, occupying nearly the whole loreal region; four smaller shields form the lower margin of the orbit. There are five rather narrow upper labial shields with several small ones behind.

The lower jaw has a slightly convex anterior labial, and four lateral ones, the third of which is as long as the others together. There is a single pentagonal chin-shield between the first two labials, forming a straight transverse suture with the front labial. Two series of shields arise from its two posterior sides, parallel to, and broader than, the series of the lower labials; each is formed by five shields. The throat, before the folds, is covered with granular scales. There are the two folds, characteristic of the genus, with the series of shields between.

The back and the sides of the body are covered with minute granular scales, arranged in regular cross series. The ventral shields form six longitudinal and twenty-four transverse rows. A triangular space before the vent also is shielded. The scales of the tail are oblong, strongly keeled, arranged in regular rings.

The fore-leg reaches to the extremity of the snout, if laid forwards. The third and fourth fingers are equal in length, then follow the second, the fifth, and the first; its anterior side and the fingers are covered with one-rowed imbricate shields, those of the fore-arm being the largest. The posterior extremity reaches to the posterior margin of the orbit, if laid forwards. The relative length of the toes does not differ from other species of the genus. The interior side of the limb and the upper parts of the foot are shielded, the remainder being granular. The shields of the upper leg form three rows, those of the lower are larger and form two only; all are imbricate. The series of femoral pores is composed of twenty foramina.

The ground colour of the upper parts is greenish-olive, irregularly and indistinctly speckled with darker. A greenish-white stripe runs from the muzzle along the vertebral line towards the middle of the tail, where it is gradually lost. A little before the eye, and distinctly from the eye begins a black lateral band, edged with greenish-white to the hip, and is lost soon after it has reached the side of the tail. The lower parts are uniformly greenish-white.

A single specimen is in the collection.

inches. lines.

Distance between the extremity of the snout and the tympanum.....	0	10
Distance between the tympanum and the vent ..	2	7
Length of the tail	7	6
Distance between the extremity of the snout and the anterior margin of the orbit	0	5
Distance between the anterior angles of the orbits	0	3½
Length of the anterior extremity	1	3
———— of the third finger	0	5
———— of the posterior extremity	2	7
———— of the foot	1	4
———— of the fourth toe.....	0	11

3. CUSTA BICARINATA, L.

The exact habitat of this species was not known before.

4. MONOPLOCUS, n. g. (*Teidæ*.)

Tongue elongate, free, not sheathed, terminating in two very fine points. Palatine teeth none; the posterior teeth in the jaws bi- or tricuspid. Tympanum distinct. Throat with a single fold. Scales of the back exceedingly small, those of the sides granular; gular and ventral shields keeled. Tail rounded, covered with keeled and verticillated scales of moderate size. Femoral pores none.

MONOPLOCUS DORSALIS, n. sp.

Diagnosis.—A greenish-white longitudinal streak from the extremity of the snout to the middle of the back, where it is gradually lost.

Description.—The general habit is slender. The snout is of moderate length, pyramidal; the nostril is laterally situated between the two nasals. The successive series of shields covering the upper surface of the head is as follows:—1. The rostral shield is obtusely conical, as high as wide, with the posterior angle acute and produced backwards on the upper surface of the head. 2. A pair of anterior nasals, quadrangular, touching each other behind the rostral, and enclosing the greater part of the nostril. 3. A single anterior frontal, hexagonal, with the anterior and posterior angles obtuse, and with the outer sides shortest and in contact with the posterior nasal and the loreal. 4. A pair of posterior frontals, irregularly pentangular. 5. A single anterior parietal, the largest of the shields of the head, pentagonal, with the anterior side rather curved, and with the two hinder ones shortest. 6. A pair of posterior parietals, irregularly quadrangular. 7. Five occipital shields, one forming the centre, the others being symmetrically arranged. 8. The upper eyelid is covered by two larger and two or three smaller shields.

The lateral shields of the head are the posterior nasal, the loreal, which is larger than the former, and three oculars, forming the anterior and lower margin of the orbit. There are six very narrow upper labial shields and several smaller ones behind.

The single anterior labial of the lower jaw is slightly convex, as long as wide; there are five narrow shields along the side of the lip, the third being the longest. There is a single pentagonal chin-shield between the first two labials, forming a straight transverse suture with the front labial. Two series of shields arise from its two posterior sides, parallel to, and broader than, the series of the lower labials; each is formed by four shields. The throat, before the collar, is covered with granular scales; the collar itself is formed by a fold, before which are some keeled scales of moderate size.

The tympanum is round, of moderate extent, and not surrounded by any particular scales.

The scales of the back are exceedingly small, smooth, imbricate, those of the sides finely granular; the ventral shields are quadrangular, keeled, and form eleven longitudinal and thirty-one transverse series. The space before the vent also is shielded. The scales of the tail, which is rounded, are of moderate size, oblong, keeled, verticillated, each *verticillus* being formed by a single ring of scales.

The fore-leg reaches to the extremity of the snout, if laid forwards. The third and fourth fingers are equal in length, then follow the fifth, the second, and the first; its anterior side and the fingers are covered with imbricate scales, those of the upper and fore-arm being keeled. The hind-leg reaches to the anterior margin of the orbit, if laid forwards. The toes have the usual relative length of this family. The interior side of the limb and the upper parts of the foot are similarly scaled as the fore-leg. There are no femoral pores.

The ground colour is greenish-blue; a greenish-white streak runs from the tip of the snout to the middle of the back, where it is gradually lost. A black serrated band on each side of the vertebral streak extends from the nostril to the loin, emitting cross-streaks to its fellow; the anterior part of the tail also exhibits several irregular black cross-streaks.

A single specimen is in the collection.

	inches. lines.	
Distance between the extremity of the snout and the tympanum.....	0	7
Distance between the tympanum and the vent ..	1	7
Length of the tail	4	0
Distance between the extremity of the snout and the anterior margin of the orbit	0	3
Distance between the anterior angles of the orbits	0	2 $\frac{1}{4}$
Length of the anterior extremity	0	10
—— of the third finger	0	3 $\frac{1}{2}$
—— of the posterior extremity	1	7
—— of the foot	0	10
—— of the fourth toe	0	7 $\frac{1}{2}$

5. *CERCOSAURUS GAUDICHAUDI* (*Ecpleopus gaudichaudi*, Dum. and Bibr.), Gray, Catal. p. 60.

6. *CERCOSAURUS RHOMBIFER*, n. sp. (Pl. XX. fig. A.)

Diagnosis.—Scales smooth, in fifty cross series between the occi-

put and the origin of the tail. Brownish-grey, with a vertebral band, composed of rhombic brown spots, beginning on the middle of the trunk and distinct from the origin of the tail; a black band on each side of the neck.

Description.—The head is slightly depressed, with the muzzle rather produced; the body is cylindrical, and continued in a very long and strong rounded tail; the extremities are rather short. The successive series of shields covering the upper surface of the head is as follows:—1. The rostral shield is broader than high, semi-circular, without posterior angle. 2. A single anterior frontal, pentagonal, forming a straight transverse suture with the rostral; its posterior angle is a right one. 3. A pair of posterior frontals, forming a short suture together, each being hexagonal, with three short and three longer sides. 4. A single anterior parietal, hexagonal, broadest anteriorly, with an obtuse angle in front and with the posterior sides shortest. 5. A pair of rather small posterior parietals. 6. Two series of occipital shields, the anterior being formed by three, the posterior by five; those of the anterior series are the largest, and the middle one is hexagonal, elongate. 7. The roof of the orbit is covered by three larger and several smaller shields.

The lateral shields of the head are, a single nasal, pierced in the centre by the nostril, a loreal of moderate size, and two anteorbitals. There are seven upper labials, longer than high. The front labial of the lower jaw is very much like the rostral; there are six rather narrow lower labials. A single pentagonal anterior chin-shield forms a straight transverse suture with the front labial; then follow three pairs of shields, the posterior ones the largest, forming sutures together, and not leaving a free space between them for smaller scales. The temples are scaly. The tympanum is placed immediately behind the cleft of the mouth; it is small, rounded, and rather deeply situated.

All the body and the tail are covered with square smooth scales, arranged in rings, completely surrounding the body; the scales of one ring always alternate with those of the following. There are fifty rings between the occiput and the origin of the tail, thirty on the belly. The scales on the sides are rather smaller. The space before the vent is covered with larger shields, the extremities with hexagonal scales. A trace of a collar fold is just visible.

The extremities are rather short: the fore-leg reaches to the middle of the eye, if laid forwards. The third and fourth fingers are equal in length, then follow the second, the fifth, and the first. The hind-leg reaches a little before the middle of the trunk, if laid forwards; the fourth toe is the longest, the third and fifth are nearly equal in length, then follow the second and the first.

There are no palatine teeth; the posterior maxillary teeth are indistinctly tricuspid.

The ground colour of the upper parts is brownish-grey from the middle of the trunk; the dorsal line appears spotted with darker, the spots assuming the regular form of rhombs at the origin of the tail, and forming a continuous band to its tip; there is a similar

though paler band on each side of the tail. A dark stripe passes the eye and is continued as a black band to the axil. The lower parts are whitish, the tail dotted with greyish.

A single adult female is in the collection.

	inches. lines.	
Distance between the extremity of the snout and the tympanum.....	0	5½
Distance between the tympanum and the vent ..	1	8
Length of the tail	5	0
Distance between the extremity of the snout and the anterior margin of the orbit	0	2½
Distance between the anterior angles of the orbits	0	2
Length of the anterior extremity	0	6
—— of the third finger	0	1½
—— of the posterior extremity	0	8
—— of the fourth toe.....	0	2⅔

7. PROCTOPORUS PACHYURUS, Tschudi.

8. ENYALIUS LATICEPS, Guichen.

A large adult specimen, probably a male; differs from the other smaller ones by having a series of larger scales along the side of the back, by having a distinct black collar, and a yellowish longitudinal band from the tympanum to the shoulder.

9. ANOLIS FRASERI, n. sp.

Diagnosis.—Snout moderately elongate and depressed, with a distinct canthus rostralis, and with a pair of obtuse ridges arising from the bony superciliary margins; a slight groove between those two ridges; the upper surface of the snout and the space between the orbits are covered with innumerable very small shields. Loreal region nearly flat, with five series of small shields. Occipital shield none, or scarcely distinguishable from the others. All the scales exceedingly small, those of the abdomen rather larger and keeled. Neck without any crest; trunk with a very slight serrated ridge, perceptible in large individuals only; tail not crested. Pouch of the throat well developed. Tail not compressed, not verticillated, with the scales keeled and small. Greyish- or brownish-olive; back and tail with indistinct broad brown cross-bands.

Description.—The snout is moderately depressed and slightly elongate, the distance between the anterior angles of the orbits being three-quarters of the distance between the orbit and the extremity of the snout; anteriorly it is rounded. The canthus rostralis is distinct, but not very sharp, and there is another pair of low convergent ridges, arising from the superciliary margin of the bony orbit and extending a little beyond the middle of the snout; there is a shallow groove between those ridges, but the space between the ridges and the canthus rostralis is rather flat.

The species is distinguished (especially from *A. sagræ* and *nebulosus*) by the exceedingly small shields of the upper parts of its head;

it is quite impossible to state their number; there is no occipital shield, or it is very small; in the middle of the upper eyelid is a group of somewhat larger shields, like those along the superciliary margin and the canthus rostralis, but they also are very small, compared with other species. The nostril opens laterally, and is situated immediately behind the extremity of the snout. The labial shields are exceedingly narrow; there are three or four series of smaller shields running parallel to that of the lower labials, the remainder of the throat being covered with granular scales.

The tympanum is a small cleft, without any particular scales round its margin; the scales on the temple and on the neck are exceedingly small, granular. The pouch of the throat is well developed.

There is a very low serrated ridge along the back of the largest of the specimens; the other dorsal scales are minute, those on the sides yet smaller, and those of the belly the largest, ovate and keeled. The scales on the side of the pouch are rather smaller than the others, and those on the pelvis and round the vent are uniformly granular. The tail is rounded, not verticillated or crested, but very slightly compressed in the upper part of the middle of its length. All the scales are sexangular, of moderate size, strongly keeled, the keels forming longitudinal ridges.

The fore-leg does not, or scarcely, reach to the loin, if laid backwards; it is covered with minute keeled scales, with granulations inferiorly. The inner finger is not dilated; the fourth is the longest; then follow, in the order of their length, the third, fifth, second, and finally the first. The total length of the hind-leg appears to vary according to age or sex; it reaches to the humeral joint only in the largest of the specimens, and to the anterior margin of the orbit in the smaller ones. It is covered with minute scales, the anterior ones being keeled.

Nothing can be said of the coloration during life. The ground colour of the upper parts is now a greyish- or brownish-olive, with several indistinct broad bands across the back, and rings of the same colour round the tail; the lower parts are whitish, speckled with brown between the hind-legs; in the largest specimen the throat (not the pouch) and the lower side of the tail are brown.

This is one of the largest species of the genus, as will appear from the following measurements:—

	inches.	lines.
Distance between tympanum and the extremity of the snout	1	4
Distance between tympanum and vent.....	3	8
Length of the tail	11	0
Total length	16	0

10. *LIOCEPHALUS ORNATUS*, Gray, Catal. p. 219.

The specimens sent by Mr. Fraser belong to a variety of this species, without spots before the shoulder, and with a broad black gular band in very old individuals.

11. *LIOCEPHALUS IRIDESCENS*, n. sp. (Pl. XX. fig. B.)

The upper surface of the head covered with scales, without distinct shield; shoulder and throat without any fold. Scales of the upper parts distinctly keeled, of the belly nearly smooth. Above greenish-brown, with a dorsal series of black angular transverse streaks; a black collar.

Description.—The head is rather short and high, above slightly convex, with the interspace between the bony orbits very narrow, and with the muzzle rather short, blunt, and rounded in front; the distance between the extremity of the snout and the anterior margin of the eye is equal to the distance between the anterior angles of the orbits. The nostril is directed upwards, round, situated more on the upper surface of the head than on the side, and formed by a tubular opening at the posterior extremity of a single small shield. The eye is of moderate size, with round pupil and an upper and a lower eyelid. The cleft of the ear is subelliptical, a little behind the cleft of the mouth and in front bordered by some small prominent scales. All the upper surface of the head is covered by scale-like imbricate shields, the two hindmost of which (on the sides of the occiput) are the largest; two series of these shields cover the space between the bony orbits, the roof of the orbit itself being formed by a series of five shields, and by small scales anteriorly and externally. Some of these head-shields exhibit feeble keels. The rostral shield is very low, but broad, covering all the anterior margin of the jaw; four very narrow upper labials, above which is situated another series of similar shields, the loreal region being irregularly shielded. The temples are covered with scales similar to those on the neck. The lower front labial is higher, but shorter, than the rostral; five narrow lower labial shields, internally to which are two other series of small oblong shields; there are two diverging series of broad shields arising from the posterior part of the front labial, passing posteriorly into the ordinary scales of the throat; all the throat is covered with smooth imbricate scales, similar in size and form to those of the belly.

The trunk is subquadrangular, slightly depressed, and covered with rhombic scales of moderate size, keeled, and arranged in series which converge towards the vertebral line. There is a serrated and rather low crest from the neck along the back, which is lost near the middle of the tail. The scales on the belly form oblique series, and are smooth or very indistinctly keeled. No præanal pores, the space before the vent being scaly like the belly. The tail is slightly compressed and covered with scales, arranged and shaped like those of the back, but rather more strongly keeled. The scales of the extremities also do not differ from the others. The fore-leg reaches to the loin, if laid backwards: the fourth finger is very little longer than the third; the second and fifth are considerably shorter, and nearly equal in length to each other; the first is the shortest. They are smooth above, rough beneath, and provided with claws of moderate strength. The hind-leg reaches rather beyond the anterior

margin of the eye, if laid forwards; the toes have the usual relative length of the species of this genus. No femoral pores.

The ground colour of the upper parts is shining brownish-green, darker on the sides; a series of black cross-stripes, angularly bent, and with the angle pointing backwards along the middle of the back; they are more distinct in young than in old individuals; the extremities have some indistinct irregular brown spots: there is, in some of the old specimens, a lighter stripe from above the tympanum along the side of the back to the origin of the tail. A black gular band, with some black dots besides, is complete in mature specimens, indicated by two black lateral spots only in young ones; the throat before the collar is beautifully iridescent, the chest behind it intensely yellow, and the belly and the anterior lower portion of the tail rose-coloured. The latter colours are merely indicated in very young specimens.

	inches. lines.	
Distance between the extremity of the snout and the tympanum.....	0	8
Distance between the tympanum and the vent ..	2	4
Length of the tail	6	0
Distance between the extremity of the snout and the anterior margin of the orbit	0	3 $\frac{1}{2}$
Distance between the anterior angles of the orbits	0	3 $\frac{1}{3}$
Length of the entire fore-leg	1	4
——— of the fourth finger	0	5
——— of the entire hind-leg	2	4
——— of the foot	1	2
——— of the fourth toe	0	9

12. IGUANA TUBERCULATA, Laur.

13. GYMNOTACTYLUS CAUDISCUTATUS, n. sp.

Diagnosis.—Scales of the back and of the sides granular, of the belly rhombic and imbricate. The lower part of the tail with broad shields, extending from one side to the other: five upper labials. Snout rather depressed, nearly twice as long as the distance between the eyes. Head white, reticulated with black.

Hab. Andes of Ecuador.

Description.—This species is allied to *Homonota gaudichaudi* and *Gymnodactylus d'orbignyi*, from which it may be distinguished by the caudal shields. The head and snout, the latter especially, are much more depressed than in *H. gaudichaudi*, and appear also more produced. The rostral shield is large, rounded, extending on to the upper surface of the head; the upper lip is bordered by five plates, all the upper surface of the head and the sides being granular. The lower median labial shield is oblong, far produced backwards, and has a pair of small shields behind: there are three lower labials. The ear-opening is small, situated horizontally on the same level with the cleft of the mouth. All the upper and lateral parts are granu-

lar, the granulations of the posterior part of the back being a little more scale-like. The belly and the inner side of the extremities have rhombic, imbricate scales. The shields of the lower side of the tail are narrow, broad, extending from one side to the other. No præanal or femoral pores.

The fore-leg, if laid forwards, reaches beyond the anterior margin of the orbit. The fingers are slender, of moderate length: the first is the shortest, then comes the second, the third, and finally the fourth and fifth, which are nearly equal. The hind-leg, if laid forwards, reaches to the humeral joint. The toes are similar to the fingers: the first is the shortest, then comes the second, then the third and fifth, which are equal in length, and finally the fourth, which, although the longest, does not extend beyond the tip of the third.

The teeth are small: the palate is toothless.

The ground colour is greyish or brown. Some of the specimens (the light-coloured ones) have a lighter dorsal streak, with pairs of brown spots; the brown specimens have the dorsal streak and spots indistinct, but are irregularly spotted with bluish, each spot being edged with darker colouring. The head of all is whitish, with symmetrical, reticulated black lines, one from the eye towards the snout being very constant. Chin, throat, and breast white, the throat sometimes speckled with black; the belly greyish; the lower parts of the tail grey.

	inches. lines.	
Distance between the extremity of the snout and the tympanum.....	0	5
Distance between the tympanum and the vent ..	1	4
Length of the tail	1	6
Total length.....	3	3

OPHIDIA.

1. RHABDOSOMA CRASSICAUDATUM, Dum. and Bibr. p. 103.

A single specimen, with the back uniform lead-coloured, which colour extends on the sides of the belly; the middle of the belly uniform yellowish.

2. RHABDOSOMA MACULATUM, Gthr. Colubr. Snakes, p. 241.

There are some beautiful specimens of this species in the collection, one of which is twenty-three inches long. The light ground colour becomes darker with age, and is changed into light brown; consequently the brown spots become less distinct, are more dilated, and the white edges nearly lost. Brownish spots appear sometimes on the belly.

3. RHABDOSOMA ELAPS, Gthr. Colubr. Snakes, p. 241.

4. *STREPTOPHORUS DROZII*, Dum. and Bibr. p. 518.

A single specimen, which belongs to a very distinct variety; the collar is absent; the body uniform black above, and brownish below.

5. *HOMALOCRANIUM MELANOCEPHALUM*, L.6. *CORONELLA DECORATA*, Gthr. Colubr. Snakes, p. 35.

A single specimen, which somewhat differs in colour from those described before,—the back and the sides of the belly being greyish-black, and the yellow lateral band on the anterior part of the trunk being reduced to three spots on each side of the head and neck.

7. *LIOPHIS COBELLA*, L.

A single small specimen.

8. *LIOPHIS TÆNIURUS*, Tschudi, Faun. Peruan. Herpetol. p. 51. tab. 5 (not good).9. *HERPETODRYAS FUSCUS*, L., young, = *Dendrophis viridis*, Dum. and Bibr. p. 202. pl. 79; cfr. Gthr. Colubr. Snakes, p. 114.10. *HERPETODRYAS BRUNNEUS*, Gthr. Colubr. Snakes, p. 116.11. *HERPETODRYAS RAPPII*, Gthr. Colubr. Snakes, p. 116.

Three examples, which differ from the typical specimens in having one upper labial shield less, the anterior two being united into one; they all have the dark streak through the eye distinct. In one of the specimens, thirty-one inches long, the three series of quadrangular spots continue to be distinct, whilst they have nearly disappeared in another of forty-one inches length; this specimen has, however, a pair of lighter indistinct longitudinal streaks, like some specimens of *Herpetodryas boddaertii*, running along the line where the dorsal series of spots meets the lateral one. The throat in these two specimens is spotted with black—not entirely black. The third specimen, of thirteen inches length, is beautifully preserved; the ground colour of the back is white, and all the spots are of a deep black; the belly is black, with scattered white spots.

12. *AHÆTULLA OCCIDENTALIS*, n. sp.

Diagnosis.—Loreal shield none; eight upper labials, the fourth and fifth coming into the orbit; the length of the snout equals the distance between the eyes. Scales in fifteen rows, those of the back keeled. Uniform green, rather darker on the back; an indistinct blackish temporal streak.

Hab. The western parts of tropical South America (Ecuador, Guayaquil, New Granada, Peru, Chile).

This species has been confounded with the most common tree-snake of eastern South America, *Ahætulla liocercus*. Schlegel mentions a uniformly greenish variety of the latter from Chile (Essai, ii. p. 226), undoubtedly identical with the present one. On a former

occasion I did not venture to separate a single specimen from Guayaquil, in the collection of the British Museum, and in a bad state of preservation, from the common species (Catal. Col. Snakes, p. 153, spec. α) ; but now, having found a very fine individual in Mr. Fraser's collection, I can no longer doubt its specific difference. The most striking character is the number of the upper labials, which in *A. liocercus* is nine, the fourth and fifth coming into the orbit. It is true that there occur scarce specimens of *A. liocercus* which have one upper labial less, so far agreeing with *A. occidentalis* ; but the relative length of the snout, nevertheless, remains the same. As the snout and the head are considerably shorter in *A. occidentalis*, so are the trunk and the tail ; it is altogether a stouter snake. Corresponding to this, the scales are less elongate, especially those of the outer rows, which are nearly rhombic. Further, the coloration is nearly uniform, as in *Philodryas viridissimus*, the belly not being white—merely of a lighter greenish than the back. The lips and the chin, which are white in *A. liocercus*, are greenish ; and the black streak through the eye in *A. liocercus* is here indicated only by a blackish temporal streak. These differences *together* induce me to separate the two species, which in the dentition agree with each other, although the teeth of *A. occidentalis* appear to be rather stronger and more widely set.

The numbers of the plates are as follows :—

	Ventrals.	Caudals.
In <i>A. liocercus</i> from New Granada*	166	158
In <i>A. liocercus</i> from Demerara	166	163
In <i>A. occidentalis</i> from Guayaquil	172	133
In <i>A. occidentalis</i> from Ecuador	160	130

This similarity in the number of the ventral shields appears to contradict my statement of *A. occidentalis* having a stouter trunk than *A. liocercus* ; but there is a remarkable difference in the form of those shields : *their length is one-half only of their width in A. liocercus, whilst it is nearly one-fourth in A. occidentalis.*

Therefore the diagnosis of *Ahetulla liocercus* will now be :—

Loreal shield none ; nine upper labials, the fifth and fourth coming into the orbit (exceptionally, the second and third united) ; the length of the snout is more than the distance between the eyes. Scales in fifteen rows, those of the back keeled. Green above, white beneath. A black streak through the eye ; the upper lip white.

Berthold, *l. c.*, describes *Dendrophis liocercus* from New Granada, and it appears to me as if that specimen also ought to be referred to *A. occidentalis*. He describes the body as slender, though rather stout. "One would take it for a *Herpetodryas*, the body being at least twice as thick as in *D. liocercus* ; the head also is much broader. The colour is uniform leek-green ; belly and margins of the ribs yellowish-green."

13. LEPTODEIRA (DIPSAS) ANNULATA, Schleg.

* Berthold, Ueber Reptilien aus Neu Granada, p. 11.

14. *LEPTOGNATHUS MIKANII*, Mus. Vienn.

The specimens in the collection are darker-coloured than usually; some have additional præoculars, some not; and all have three pairs of chin-shields, which do not differ in form from those of the Brazil specimens. The lateral blotches extend on the belly, which is densely marbled with black, and posteriorly entirely black. The white edge of the dorsal spots is scarcely visible.

15. *LEPTOGNATHUS CATESBYI*, Weigel.16. *OXYRHOPUS PLUMBEUS*, Wied.

Scales in seventeen series, those of the dorsal series being distinctly larger. In two of the specimens the loreal shield is united with the posterior frontal.

17. *OXYRHOPUS PETOLARIUS*, L.

A single specimen of a variety, apparently not yet recorded, has been sent by Mr. Fraser. The scales of the dorsal series are a little larger. The muzzle and crown are black, the neck red. The body and tail are surrounded by thirty-three black bands, a little broader than the red interspaces between.

18. *ELAPS SEMIPARTITUS*, Dum. and Bibr. p. 1220.

A single beautiful specimen with the colours preserved, thirty-one inches long. The occipital region is light vermilion. The ground colour of the trunk is yellowish-white and appears in very narrow rings, which occupy two scales superiorly and two plates inferiorly; the ground colour of the tail is dark vermilion and forms rather broad bands. The trunk is encircled by seventy-six black rings, the tail by four.

19. *CRASPEDOCEPHALUS ATROX*, L.

One of the young specimens has a whitish tail (*Cr. leucurus*, Dum. and Bibr. p. 1508).

20. *CRASPEDOCEPHALUS BILINEATUS*, Wied.

A single adult specimen of this scarce snake is in the collection.

21. *LACHESIS NITIDUS*, n. sp. (Pl. XX. fig. C.)

Diagnosis.—Nasal single; eight upper labials, the second forming the anterior margin of the loreal pit; a series of rough scales between the superciliary and the orbital margin; all the caudal plates simple. Twenty-two series of scales. Greenish-brown, speckled with black; pairs of darker spots along all the back, the spots of each pair confluent on the vertebral line, laterally including a red, superiorly yellow spot; the yellow parts alternating with those of the other side. A yellow longitudinal band along the two outer series of scales. Belly yellow along the middle, brownish-green on the sides, the latter parts being spotted with red and speckled with black.

Hab. Western Andes of Ecuador.

Description.—Little can be added to the diagnosis of this beautiful species, the colours of which are exceedingly well preserved. The upper part of the head is entirely covered with keeled scales, those on the canthus rostralis being rather larger. The eyebrow is covered with an elliptical shield, separated from the orbital margin by a series of rough scales, as in *Trigonocephalus schlegelii*. The scales of the trunk and tail are strongly keeled. One hundred and fifty-four abdominal, one entire anal, and sixty-five undivided caudal plates. The yellow median line on the belly disappears on the tail, where the lateral streak also is interrupted by the red spots.

	inches.	lines.
Length of the head	0	9
— of the trunk	13	0
— of the tail	3	0
Total length	16	9

BATRACHIA.

1. CYCLORHAMPHUS MARMORATUS, Dum. and Bibr. p. 455.
2. BUFO AGUA, Latr.
3. BUFO INTERMEDIUS, Gthr.
4. BUFO CÆRULEOSTICTUS, n. sp.

Diagnosis.—Crown of the head without bony enlargement, broad, flat. Parotids narrow, oblong, parallel to the vertebral line; tympanum not visible externally. Toes half-webbed; the third finger longer than the fourth. Tarsus with a cutaneous fold. Uniform brownish-black; the posterior part of the sides and the extremities with small, smooth, bluish tubercles.

Description.—The skin of this species is comparatively smooth, there being small and smooth tubercles on the sides of the body only and on the extremities, a few also on the upper eyelids. The head is large and broad, with the sides nearly vertical, with the canthus rostralis angular, and with the upper surface quite flat. The snout is rather short and truncated. The tympanum is not visible; the interior nostrils and the eustachian tubes are small. The tongue is ovate, with the posterior half free. The parotid is narrow, elongate, nearly as long as the head, and situated in a line parallel to the vertebral column. The extremities are more slender than usually in this genus; the total length of the anterior extremity equals the distance between the vent and the ear. The first (interior) finger is the thickest, longer than the second, but rather shorter than the fourth; the third and fourth are united at the base, the third being the longest; the metacarpus with two tubercles, the interior of which at the root of the thumb is elongate, the exterior broad, rounded. The length of the posterior extremity, from the hip to the carpal joint, equals the length of the animal from the snout to the vent;

the tarsus has a cutaneous fold, the metatarsus two tubercles. The toes are half-webbed, the third and fifth being equal in length.

The colour of the upper parts is a uniform brownish-black, of the lower parts a dirty greyish-brown; the upper eyelids, the sides of the trunk, and the extremities exhibit small, smooth, bluish tubercles.

Two specimens are in the collection.

	inches.	lines.
Length from the snout to the vent.....	3	6
Length of the head.....	0	11 $\frac{1}{2}$
Breadth of the head.....	1	3 $\frac{1}{2}$
Length of the parotid.....	0	9
—— of the anterior extremity.....	2	6
—— of the third finger.....	0	8
—— of the posterior extremity.....	4	9
—— of the fourth toe.....	1	5

5. OTILOPHUS MARGARITIFER, Laur.

6. HYLODES UNISTRIGATUS, n. sp.

Diagnosis.—Habit as in *Hyla arborea*. Skin smooth above, granular on the sides and on the belly; a fold across the chest. Vomerine teeth in two oblique series; tongue ovate, with an exceedingly slight nick behind. Olive (in spirits), marbled with darker; a fine white dorsal line from the snout to the vent.

Description.—This species would be taken for a *Hyla* at the first glance: the snout is rather short and rounded anteriorly and over the canthus rostralis; the tongue is ovate, with the posterior two-thirds free, and with a scarcely visible nick. The vomerine teeth are arranged apparently in two oblique series, but can scarcely be distinguished on account of the small size of the species. The width of the tympanum is one-third of that of the eye. There is a distinct fold across the chest, as in many species of *Hyla*. The extremities are short, the disks of the fingers and toes of moderate size; the fifth toe is rather longer than the fourth. The upper parts are dark olive, marbled with brown; a fine white dorsal line reaches from the tip of the snout to the vent; the lower parts are whitish, the throat marbled with brown.

There are several specimens in the collection, among which is an adult female, with the eggs comparatively as large as in *Hyloides conspiciellatus*.

	inches.	lines.
Length from the snout to the vent.....	1	1
—— of the anterior extremity.....	0	7 $\frac{1}{2}$
—— of the posterior extremity.....	1	4

7. HYLODES CONSPICILLATUS, Gthr. Batrach. p. 92.

There are many specimens of this species in the collection, and among them two varieties: the one with a white margin on the upper lip, the other with a white lateral stripe from the tip of the muzzle above the eye to the loin.

8. *NOTOTREMA MARSUPIATUM* (*Hyla marsupiatata*, Dum. and Bibr.), Gthr. Batrach. p. 115.

This species grows to a larger size than was hitherto known, there being specimens in the collection the body of which measures three inches, and the posterior extremity four inches and a half. In such very large specimens the crown of the head becomes rough, as in *Trachycephalus*, although without ridges, and with the skin not firmly adherent.

9. *PHRYNISCUS LÆVIS*, Gthr. Batrach. p. 43.

This species is subject to such variation of colour, that it may prove to be identical with *Phrynisus varius*, which perhaps has been established from specimens which had lost the prickles on the sides. Among the numerous specimens sent by Mr. Fraser are several of a dark bluish-green ground-colour, and with green spots on the back. Others are greenish-grey, with the back spotted with black and yellow; each phalanx with a green spot. Others are intermediate between these and the black variety.

CÆCILIE.

1. *CÆCILIA ROSTRATA*, Cuv.

The habitat of this scarce species has not been hitherto known with certainty.

2. *CÆCILIA GRACILIS*, Shaw.

The circular folds are more distinct than is stated by Duméril, but become very inconspicuous towards the anterior part of the body. The length is to the diameter of the body as 115:1.

3. *CÆCILIA PACHYNEMA*, n. sp.

Diagnosis.—The length of the body is to its greatest diameter as 92:1; body with 168 folds; muzzle depressed, rather truncated anteriorly; posterior extremity of the body obtusely rounded, very short behind the vent.

Description.—This species, which is based on a single specimen in the collection, belongs to those with the body elongate, and is distinguished from *C. gracilis* by having the folds very distinct from behind the head. The folds do not reach entirely round the body, being smoothed down on the dorsal and ventral side. The body is covered all over with rudimentary scales, which have more the appearance of minute granulations. The folds on the posterior portion of the body are not deeper than the others, nor do they contain any scales, as in *C. gracilis*. The head is depressed, with the muzzle obtusely rounded or rather truncated anteriorly, although overlapping the anterior portion of the cleft of the mouth. The latter is wide, reaching as far backwards as the head. The upper and the lower jaws are armed with five hook-like teeth, directed backwards on each side, the anterior of which (and, among these, those of the mandibula) are the strongest. The palate has three similar teeth on each side. I cannot find any

prominences on the tongue, nor distinguish the eyes. The vent is close to the posterior extremity of the body, which is bent downwards over it.

The colour is a blackish-ash; there is a whitish blotch between every pair of folds all along the side of the body.

	inches.	lines.
Total length	34	6
Greatest diameter of the body	0	$4\frac{1}{2}$
Length of the head	0	$8\frac{1}{2}$
Width of the head	0	5
Length of the cleft of the mouth	0	6

PISCES.

1. *LEMBUS MACULATUS*, Gthr. Acanthopt. Fishes, i. p. 505.

2. *CHROMIS RIVULATA*, n. sp.

D. $\frac{13}{11}$. A. $\frac{3}{8}$. L. lat. 28. L. transv. $3\frac{9}{10}$.

Nape of the neck convex; the upper profile of the head is straight, abruptly descending. The total length is three times the height of the body, and $3\frac{2}{3}$ times the length of the head. The width between the orbits equals $1\frac{1}{2}$ diameters of the eye. The posterior dorsal and anal rays reach to the middle of the caudal, if laid backwards, and the ventral to the second anal spine. Greyish-green, with broad dark vertical bars, less distinct with age. A black blotch below the lateral line, corresponding to the last four dorsal spines; præorbital and cheeks with oblique, waving, bluish, shining silvery streaks; the scales of the operculum and of the anterior part of the body with spots of the same colour. Dorsal fin with dark longitudinal streaks; ventral and anal greyish; pectoral and caudal colourless.—Several specimens of different ages; the largest 4 inches long.

3. *LEBIASINA BIMACULATA*, Cuv. et Val.

4. *MACRODON TAREIRA*, Cuv. et Val.

5. *LEPORINUS FREDERICI*, Bloch.

6. *ANODUS TROSCHELII*, n. sp.

D. 12. A. 10. V. 9. L. lat. 46. L. transv. $7\frac{8}{10}$.

The total length is four times the height of the body, and $4\frac{2}{3}$ times the length of the head. The width of the space between the eyes is not quite one-half the length of the head; the diameter of the eye is one-fourth of it. The height of the dorsal is much less than the length of the head, and its origin corresponds to the fourteenth scale of the lateral line; the base of the ventrals falls vertically below the middle of the dorsal. Silvery, back greenish; a black spot on the root of the caudal.

Hab. Western Andes of Ecuador.

	inches. lines.	
Total length.....	5	5
Height of the body.....	1	4
Length of the head.....	1	2
Width between the orbits.....	0	$5\frac{1}{2}$
Diameter of the eye.....	0	$3\frac{1}{2}$
Height of the dorsal.....	0	11
Height of the anal.....	0	7

There can be no doubt that this is quite a different species from *Anodus alburnus*, described and figured by Müller and Troschel in the 'Horæ Ichthyologicæ.' The difference from *Curimatus gilberti*, figured by Quoy and Gaimard, and insufficiently described by Valenciennes, must be rather inferred, by help of the figure of *Anodus alburnus*. Valenciennes describes it as a fish of entirely the same form as *A. alburnus*; therefore it is very improbable that our species is identical with it, as it has the back very little elevated (as in *Leuciscus vulgaris*), the dorsal fin much lower and situated far more backwards, so that its end falls vertically as much behind the ventral as its origin before it. The somewhat greater number of the scales of the lateral line corresponds with these differences.

7. PROCHILODUS HUMERALIS, n. sp.

D. 12. A. 11. V. 10. L. lat. 33. L. transv. 5/7.

The total length is $3\frac{4}{5}$ times the height of the body, and nearly five times that of the head. The width between the eyes is one-half the length of the head, or nearly twice the diameter of the eye; the end of the dorsal falls vertically above the end of the base of the ventral. Back greenish, sides and belly yellowish; each longitudinal series of scales with a shining streak. A black spot behind the shoulder on the fourth, fifth, and sixth scales of the lateral line. No spot on the root of the tail; dorsal dotted with blackish posteriorly; the other fins immaculate.

Hab. Western Andes of Ecuador.

	inches. lines.	
Total length.....	6	0
Height of the body.....	1	7
Length of the head.....	1	3
Width between the orbits.....	0	$7\frac{1}{2}$
Diameter of the eye.....	0	4
Length of the third dorsal ray.....	1	0
Length of the third anal ray.....	0	10

8. CHALCEUS ALBURNUS, n. sp.

D. 11. A. 35. V. 8. L. lat. 60. L. transv. 13/5.

The height of the body is one-fifth of the total length, the length of the head one-fourth. The width between the orbits is rather more than that of the eye, and one-fourth the length of the head. The snout is produced, and equals $1\frac{1}{2}$ diameters of the eye. Anterior teeth rather small; several of the lateral teeth of the mandibula much

stronger than those of the upper jaw. The ventral fin reaches to the origin of the anal, the pectoral somewhat beyond the base of the ventral. Scales very thin; the lateral line descends abruptly above the pectoral towards the belly, and runs much nearer to the abdomen than to the back. Silvery, with a light blackish spot behind the shoulder, above the lateral line; caudal red.

Hab. Western Andes of Ecuador.

	inches.	lines.
Total length	5	3
Height of the body	1	1
Length of the head	1	4
Width between the eyes	0	4
Diameter of the eye	0	$3\frac{1}{2}$
Height of the dorsal	0	$9\frac{1}{2}$
Height of the anal	0	$7\frac{1}{2}$

One of the specimens has blackish vertical lines all along the side, and the fins broadly margined with blackish. Another has the ventral fins very short, only half the usual length, though with the full number of rays.

9. *CHALCEUS BREVIROSTRIS*, n. sp.

D. 11. A. 37. V. 8. L. lat. 46. L. transv. 6/7.

The height of the body is one-fourth of the total length, the length of the head one-fifth. [The width between the orbits equals the diameter of the eye, and is rather more than the extent of the snout*.] The snout is short and obtuse, the upper maxillary slightly overreaching the vertical from the anterior margin of the eye. The anterior teeth are the strongest, those of the lower jaw much stronger than the upper ones. The ventral fin reaches to the origin of the anal, the pectoral somewhat beyond the base of the ventral. Scales very thin. The lateral line descends in a gentle curve from its origin, and runs a little nearer to the ventral margin than to the dorsal. Shining silvery, with an indistinct lateral band, continued to the middle of the caudal margin, where it is black.

Hab. Western Andes of Ecuador.

	inches.	lines.
Total length	2	7
Height of the body	0	$7\frac{1}{2}$
Length of the head	0	6
Diameter of the eye	0	2

10. *PIMELODUS*, sp.?

A single mutilated specimen.

11. *HYPOSTOMUS ERINACEUS*, Cuv. & Val. = *Chaetostoma lobo-rhynchus*, Tschudi, Faun. Peruan. Ichth. p. 29. tab. 4.

D. $\frac{1}{9}$. A. $\frac{1}{3}$.

* These statements may require modification upon examination of mature specimens, as those collected by Mr. Fraser are perhaps young ones.

8. DESCRIPTION OF A NEW SPECIES OF *ANOLIS* FROM CENTRAL AMERICA. BY DR. A. GÜNTHER, FOREIGN MEMB. ZOOL. SOC.

The following new species of *Anolis* was discovered by M. Sallé in Central America, and is now in the Collection of the British Museum.

ANOLIS SALLÉI, n. sp.

Diagnosis.—Snout moderately elongate and rather depressed, with the canthus rostralis sharp, and with a pair of obtuse ridges, arising from the bony superciliary margins and divergent anteriorly; a slight groove between these two ridges; the upper surface of the head is covered with small shields; occipital shield present. Loreal region slightly concave, with four series of small shields. Scales of the back, belly, and tail distinct, imbricate, strongly keeled; those of the sides very small; no trace of a crest; tail rounded, not verticillated; gular pouch small. Greyish or brownish, with a more or less distinct yellowish vertebral band; sides and belly sometimes with fine blackish longitudinal lines.

Description.—The snout is moderately depressed and slightly elongate, the distance between the anterior angles of the orbits being a little less only than that between the orbit and the extremity of the snout. The canthus rostralis is distinct and, near the orbit, rather sharp. There is another pair of low ridges, arising from the bony superciliary margin and divergent anteriorly, with a slight groove between; they extend to the middle of the length of the snout. The shields of the upper surface of the head are small, arranged in irregular transverse series, about seven in the series between the angles of the orbit; the shields along the bony superciliary margin are rather larger, but both series are separated from each other by smaller shields. An occipital shield is distinct. The nostril opens laterally, and is situated immediately behind the extremity of the snout. The labial shields are exceedingly narrow, eight or ten in number; three or four series of smaller shields run parallel to that of the lower labials, the remainder of the throat being covered with very small polygonal scales. The pouch of the throat is very little developed. The tympanum is very small. The temple and the neck are granular.

No crest whatever is visible, but the scales of the back are very distinct, imbricate, keeled; those of the sides are one-half smaller and smooth; those of the belly rhombic and distinctly keeled, rather larger than the dorsal ones. The tail is rounded, not verticillated or crested, covered with rhombic, imbricate, strongly keeled scales, the keels forming longitudinal ridges. The fore-leg does not reach to the loin, if laid backwards; it is covered with rhombic keeled scales, and with minute smooth ones inferiorly; the fingers are slightly dilated; the fourth is very little longer than the third, then follow the fifth, the second, and the first. The hind-leg reaches beyond the tympanum, if laid forwards; it is covered with keeled

scales, except the inferior and posterior sides of the humerus, which are granular.

The ground colour of the upper parts is greyish or brownish, darkest along the margins of the vertebral band; a broad yellowish or yellow dorsal band reaches from the occipital shield to the tail, where it is gradually lost. The lower parts are whitish. In one of the two specimens, the sides, the belly, and the lower part of the tail are longitudinally lined with blackish.

	inches. lines.	
Distance between the tympanum and the extremity of the snout.....	0	5 $\frac{2}{3}$
Distance between the tympanum and the vent ..	1	4
Length of the tail	4	0
Distance between the extremity of the snout and the anterior margin of the orbit	0	2 $\frac{2}{3}$
Distance between the anterior angles of the orbit	0	2 $\frac{1}{3}$
Length of the fore-leg.....	0	8
———— of the hind-leg	1	3

9. DESCRIPTIONS OF BUTTERFLIES FROM THE COLLECTION OF MR. WALLACE. BY W. C. HEWITSON.

(Annulosa, Pls. LXVI. LXVII.)

PAPILIONIDÆ.

1. PAPILIO PARADOXA, var. (Pl. LXVII. figs. 1, 2, 3, and Pl. LXVI. fig. 4.)

Zelima paradoxa, Zinken Sommer, pl. 15.

Papilio paradoxus, Westw. Orient. Ent. pl. 9.

Papilio telearchus, Hewitson, Trans. Ent. Soc. ii. n. s. pl. 6.

Upper side of male (fig. 1) dark brown; both wings with a submarginal band of white spots; anterior wing with its outer half glossed with blue; two spots within the cell, one near the costal margin and one near the costal margin beyond the middle, light blue.

Under side of a uniform rufous-brown, with the submarginal spots as above.

Female (fig. 2) rufous-brown; both wings with a submarginal band of white spots as in the male. Anterior wing with its outer half dark brown glossed with blue; a longitudinal ray and two spots of white within the cell; a transverse curved band of hastate white spots tinted with blue beyond the middle; two rays of dirty white forming a triangle near the inner margin; the margin itself of the same colour. Posterior wing with a loop-ray of white within the cell, and similar rays between the nervures, each ray having at its termination a lunular spot also white; the outer margin spotted with white; under side as above, except that there is no blue.

Variety A, female (fig. 3).

Dark brown ; both wings with a submarginal band of white spots ; anterior wing with two white spots within the cell, and five large white hastate spots near the apex ; posterior wing with the outer margin spotted with white.

Variety B, female (fig. 4).

Anterior wing dark brown ; posterior wing rufous-brown, with a ray of lighter brown within the cell and between each of the nervures ; a submarginal band of rufous lunules ; the outer margin spotted with white.

Expanse, ♂ 4 inches, ♀ $4\frac{7}{10}$ inches.

Hab. Borneo.

Widely as the four Butterflies figured in the two plates differ from each other, I have little doubt that they are of the same species, —varieties of *paradoxa* of Zinken Sommer, and also of *telearchus* of Hewitson.

The typical *paradoxa* is from Java. The insects now described were taken in Borneo by Mr. Wallace. *Telearchus* is a native of Sylhet.

2. *PAPILIO NOCTIS*, Hewitson. (Pl. LXVI. figs. 5, 6.)

Upper side of female dark brown ; all the nervures, except those which enclose the cell, margined with lighter colour, with white near the apex of the anterior wing and the outer margin of the posterior wing ; posterior wing with a band of dirty white near the outer margin ; outer margin of both wings light yellow.

Under side as above, except that the margins of the nervures of the anterior wing are whiter, and that the outer margin of the posterior wing is broadly cream-colour, marked with a double row of black spots.

Expanse $4\frac{9}{10}$ inches.

Hab. Borneo.

I had at first named this Butterfly *Papilio nox*, believing it only a variety of that species. Having since seen several females of *nox*, none of which have either the light margin or black spots of the posterior wing of this insect, I have thought it better to consider it at present as a distinct species ; I have not, however, done so to follow in the steps of those who give names to varieties, because I think that custom entirely indefensible.

The Butterflies of the East seem to be subject to vary more than those of other countries.

It is usual amongst entomologists to argue, that if two insects, however closely resembling each other, come from distant localities, they must be distinct species. I would reverse the argument and say, that two insects, differing but slightly, are most likely distinct species if they come from the same locality ; but if they come from a distance, they are most likely the same species changed by the

difference of locality. Those localities need not be far distant from each other to produce the variety, if the sea divides them.

10. ON A NEW SPECIES OF THE FAMILY PAPILIONIDÆ FROM
BATCHIAN. BY GEORGE ROBERT GRAY, F.L. & Z.S., ETC.

(Annulosa, Pls. LXVIII. LXIX.)

In the Catalogue of the family of *Papilionidæ*, which I formed on the specimens contained in the Collection of the British Museum, I enumerated several species that belong to the subdivision *Ornithoptera*, which had previously been considered as only varieties of *Papilio priamus*. It now falls to my lot to add another splendid species (also supposed by some entomologists to form only a further variety of that insect), sent by the indefatigable collector and naturalist, Mr. A. R. Wallace, from the Island of Batchian, one of the Moluccas.

The beautiful golden colour of the insect about to be described, has induced the discoverer to propose for it the name of *Ornithoptera cræsus*, which I have adopted. I should otherwise have called it after Mr. Wallace himself, as a slight record of the valuable services he has rendered to entomology during his sojourn amongst the Eastern Isles. I am further led to describe this insect as distinct from any hitherto recorded, as, after a careful comparison with all the others, many peculiarities can be pointed out, which will be incorporated in the following account.

PAPILIO (ORNITHOPTERA) CRÆSUS.

Primary wings deep black, with the anterior band widening towards the middle, and this is of a golden orange-colour; this colour is also represented by an abbreviated band at the base of the inner margin, and by a few scattered specks on the inner and outer margins.

Secondary wings of a dull orange-colour, with some spots of kings-yellow; this difference of colour is occasioned by the semitransparency of the more decided spots of the under surface of the wings when the insect is held against the light; the base, subcostal and medial nervures, first subcostal nervules, and the narrow edge on the outer margin are deep black. A black spot is sometimes found between the second and the first discoidal nervules.

The under surface of the primary wings is most like that of *Ornithoptera richmondia* in the form of the markings, but they are of a rich golden-green.

The under surface of the secondary wings also closely approaches that of *Ornithoptera richmondia*; but it is of a golden-green, with a lengthened spot of rich kings-yellow above the black spot between the costal nervure and the first nervule, and a small spot below the black spot; the same kind of yellow spot above and below the black spot in each space between the first and second nervules

and the second and first discoidal nervules ; the next two black spots with a yellow spot beneath each : in the discoidal cell is placed a lengthened spot of kings-yellow. The anal angle kings-yellow, without any black spot such as is found in the other species. The base, nervures, and narrow margin deep black.

Length across the primary wings $6\frac{1}{2}$ inches.

Mr. Westwood has remarked, that he was not sure whether the present insect "might not be a local variety of *Ornithoptera priamus*." I will, however, point out some dissimilarities, which induce me to differ from so high an authority. The form of the primary wings appears rather shorter and thereby broader than in *O. priamus*, while the band that runs near the anterior margin is much broader ; the middle and these wings are without the band that borders the posterior and exterior margins, except at the base of the former, where there is an abbreviated band, and but slight indication of spots (formed by a series of minute specks) on the latter. The dull black hirsute space is formed of a single large spot, which in *O. priamus* is composed of two, a large one and small one.

The under surface of the primary wings has the golden-green spots that occupy the spaces between the nervures divided by a wider irregular band than is found in *O. priamus*.

The secondary wings are without the black spots at the anal angle ; and the marginal border is much narrower, while the edge is less dentated than in *O. priamus*.

The under surface of the secondary wings has various gold marks not found in *O. priamus* : one in the discoidal cell ; and a spot above each of the black spots between the second and third discoidal nervules is very small, while the marginal black spots are further removed from the outer margin : the discoidal cell is more broadly surrounded with black.

Many of these peculiarities cause Mr. Wallace's insect to approach nearer the species I have named *Papilio (Ornithoptera) richmondia*, than any of the others recorded in my Catalogue of the family *Papilionidæ* ; viz. the want of the posterior and exterior band, the single form of the dull black space on the primary wings, the increased number of the golden spots on the under surface of the secondary wings, and the breadth of the black margin within the discoidal cell.

It may also be remarked that the female is decidedly more like that of *P. richmondia* in its colour and markings than the same sex of *P. priamus*.

11. DESCRIPTION OF A NEW SPECIES OF ENTOZOOON, SCLEROSTOMA SIPUNCULIFORME, FROM THE INTESTINES OF THE ELEPHANT. BY W. BAIRD, M.D., F.L.S.

The genus *Sclerostoma*, which forms only a section of the genus *Strongylus* of Rudolphi, but which has been adopted by De Blainville, Dujardin, and Diesing, is not numerous in species. Removing

the genus *Syngamus* of Siebold from it (which, however, is not admitted by Diesing), there would remain only four, or perhaps five species. Two of these have been observed in the Horse (*Equus caballus*), the Ass (*E. asinus*), and in the Mule; a third in the Pig (*Sus scrofa*) and in the Peccaries (*Dicotyles torquatus* and *albirostris*); a fourth in the American Tapir (*Tapirus americanus*); and perhaps a fifth in the Puma (*Felis concolor*). An addition to this small number may not be uninteresting.

The Sclerostome which I am now about to describe is a small Nematoid worm, of from 10 lines to 1 inch in length; of a light flesh-colour when alive, but nearly white in spirits. The body is cylindrical in shape, thicker in the middle, tapering towards each extremity, and finely striated across, though the striæ are rather distant from each other. The head is rather large, cylindrical, about 1 line in length, truncated at the apex, thicker than the neck, and separated from it by a distinct line or groove. The mouth is orbicular, placed in the centre of the truncated part of the head, and surrounded with two horny capsules or bullæ, the limb or margins of which are each armed with a row of numerous teeth. The limb of the external capsule is the larger of the two; and the teeth, though numerous, are less so than in the internal limb, and are stronger and pointed outwards. The limb of the inner capsule is much smaller, the teeth very minute and exceedingly numerous. This portion of the body does not differ in the two sexes.

The tail of the male is in the form of a membranous expansion or pouch surrounding this extremity of the body, and is divided into three lobes. The central lobe is the largest, and is supported by seven ribs or rays, three in the middle and two at each side. The three central ribs are dichotomous, and the middle one of these has its two branches sending off two or three short processes, like buds; the two others are simple. Of the lateral ribs (two on each side), the innermost one is dichotomous, the two branches into which it is divided sending off short processes or buds; the outer rib is simple. The two lateral lobes of this caudal expansion are smaller than the central one, and are each supported by four simple ribs.

The tail of the female terminates in a rather long and sharp point, which is oblique in position to the body, owing to a sort of tubercle, about half a line from its extremity, under which is situated the anus. This aperture is very distinctly seen immediately underneath the tubercle; and the vulva, which is not very conspicuous, and is in the form of a narrow slit across the body, is situated immediately above the tubercle.

The œsophagus is rather long, and terminates in a lobed stomach, which extends for a short distance and then terminates in a straight intestinal canal running through the whole length of the animal. The uterus is peculiar in form, and presents a very pretty appearance under the microscope; it is two-branched, and has during its length several expansions or swellings followed by contractions; and the ovaries are very long and twisted round the intestine.

This species of Sclerostome differs in many characters from any

other that I have seen. From the common Sclerostome of the Horse, *Scl. armatum*, it differs in the position of the vulva in the female, in the sharp pointed tail, and the cylindrical head; from the male it differs in the structure of the caudal pouch and the form of the head. From the other species found in the Horse, *Scl. tetracanthum*, it differs in the form of the head and the circle of teeth round the limb of the external capsule of the mouth, and in the structure of the caudal pouch of the male. They differ also in the relative sizes of the two sexes: in both of these species the female is longer than the male, whereas in the species now described the male is longer than the female; and it is rather curious that there is amongst the specimens collected a much greater proportional number of males than of females. From the two other species of Sclerostome found in the Pig and in the Tapir, this one differs in the structure of the caudal pouch of the male, the shape of the head, &c.

Very few opportunities, apparently, have occurred to helminthologists of examining the bodies of Elephants. In Diesing's enumeration of Entozoa found in the Mammalia, only one species is mentioned by him as having been observed and described as a parasite of this Pachyderm. This is an *Ascaris*, first mentioned by the celebrated Rudolphi as infesting the liver. The same parasitic worm has since then been found in the biliary ducts of a young Indian Elephant in America by Dr. Jackson of Boston. In his mention of this *Ascaris* (*Ascaris lonchoptera*, Diesing), Dr. Jackson states that it occurred along with numerous specimens of a *Distoma*, which he refers to the species *D. hepaticum*. The poor animal from which these worms were taken died of disease of the liver with ascites, and there was found also a large, deep, chronic ulcer in the stomach. The species here described will now make a third parasite recorded as belonging to the Elephant. I am indebted for it to Mr. Edward Gerard of the British Museum, who found it in the large intestines of a young Indian Elephant which recently died in London, after having been only a very short time in England. This animal, from Mr. Gerard's account of it, had suffered also from dropsy, as a large quantity of water escaped upon opening the abdomen.

SCLEROSTOMA SIPUNCULIFORME, Baird.

Caput cylindricum, magnum, truncatum; oris limbo interno denticulis densis, externo aculeis majoribus numerosis, armato. Corpus rectum, utrinque attenuatum, sipunculiforme, bursa maris triloba, lobo intermedio producto, radiis septem (quorum quinque bifurcati sunt) instructo; lobis lateralibus radiis quatuor instructis; extremitate caudali feminae oblique truncata, subulata, apertura genitali supra caudam apicem.

Long. feminae 10 lineae, long. maris 1 uncia.

Hab. In intestinis crassis Elephantici indici.

Mus. Brit.

12. DESCRIPTIONS OF NEW SHELLS IN THE COLLECTION OF
H. CUMING. BY G. B. SOWERBY, F.L.S.

(Mollusca, Pl. XLIX.)

1. SPONDYLUS VICTORIÆ (fig. 8). *S. testa subregulari, depressa, ovali, alba, ad umbones roseo variegata, costis quatuor magnis, paululum elevatis, intermediis alternatis angustioribus; spinis majoribus elongatis, arcuatis, ad terminos palmatis, depressis, ad latera undulatum fimbriatis; spinis minoribus aculeatis, arcuatis, spinis valvæ inferioris elongatis, arcuatis, concavis.*

Hab. Gulf of California.

This beautiful *Spondylus* resembles *S. imperialis* in some respects, but the large spines are depressed and fringed at the sides almost like those of *S. cumingii*.

2. MUREX OCTOGONUS (fig. 7). *M. testa turbinata, subventricosa, spiraliter costata, pallide cinerea, ad costas medio fusco maculata; apertura ovali, cauda recta, laminata; costis octo crassis, nodulosis, imbricatis, superne aculeatim recurvis, medio frondis extantibus, sulcatis ornatis, ad caudam continuiter frondosis; spira obtusa, sutura subexcavata.*

Hab. New Caledonia.

In *M. humilis*, which this species most nearly resembles, there is a space without fronds on the ribs between the swollen part of the body-whorl and the caudal projection, while the ribs of this species are continuously frondose.

3. MUREX EXPANSUS (fig. 5). *M. testa fusiformi, carneola, tricostrata, spiraliter striata, inter costas unituberculata; costis fimbria lata, elevata, superne angulata, infra ad caudam terminali expansis; cauda brevi, spira elevata, acuta.*

Hab. China.

In Mr. Reeve's *M. eurypteron* the expanded fringe on the ribs terminates at the commencement of the caudal process, instead of being continued to the end, as in this species.

4. MUREX NUBILUS (fig. 4). *M. testa fusiformi, fusca, scabra, punctata, spiraliter striata, obscure trifasciata, longitudinaliter tricostrata, inter costas unituberculata; costis crassiusculis, scabrosis, superne spina fimbriata recta, medio fimbria paululum extanti, ad caudam spinis palmiferis tribus parvis armatis; spira elongata, acuta; cauda recta, mediocri.*

Hab. — ?

A dusky, ordinary-looking shell; and yet there is no other species which exactly corresponds with it.

5. MUREX TENIATUS (fig. 3). *M. testa fusiformi, fusco bifasciata, spiraliter costata, costis longitudinalibus octo crassis, imbricatis, frondosis; spinis brevibus, acutis, recurvis armatis; apertura parva, dentata; cauda acuta, obliqua, angusta, extanti; spira acuta, anfractibus quatuor subangulatis.*

Hab. Gulf of California.

6. *MUREX ROSEO-TINCTUS* (fig. 6). *M. testa oblongo-fusiformi, pallide rosea, maculis roseis ornata, oblique tricostata, inter costas medio crenulatum nodulosa; costis elevatis, superne infernibus striatis, ad caudam spinis subfimbriatis tribus parvis armatis; cauda lata, costata; spira elongata.*

Hab. Philippines.

Resembling *M. trigonulus*, but wanting the expanded fringe at the lower part of the fronds of that species.

7. *CONUS PROXIMUS* (fig. 1). *C. testa oblonga, subpyriformi, inferne subcoarctata, spiraliter lineis subelevatis castaneis albo interruptis cincta, medio maculis magnis nigrescentibus in seriebus duabus picta; spira nodulis acutis coronata inter nodis castaneo lineata.*

Hab. — ?

More neatly marked and much more smooth than *C. moluccensis*, which in form it resembles.

8. *CONUS NIGRESCENS* (fig. 2). *C. testa oblonga, tuberculis parvis, acutis, distantibus coronata, medio et infra alternatim striata, prope angulum subrotunda, fusco-nigrescente, maculis cordiformibus rubescentibus, et alteris albis ad angulum, prope medium, et infra medium fasciatim dispositis ornata.*

Hab. — ?

There is a semitransparent appearance about this Cone which, with the smallness of its cordiform white spots, distinguishes it from *C. nocturnus* and others of the same group.

13. DESCRIPTIONS OF NEW UNIVALVE SHELLS FROM THE COLLECTIONS OF H. CUMING AND SYLVANUS HANLEY. BY SYLVANUS HANLEY.

1. *PSEUDOLIVA ANCILLA*. *Testa oblongo-conica, nitida, solida, imperforata, sublævigata, fulvo-rufescens. Ultimus anfractus in medio pallescens et ventricosus; superne late, haud autem profunde, concavus; inferne lente declivis, et sulco lato, qui partem fere quartam superficiei segregat, incisus: cingulum siphonale planum cum cingulo basali vix convexiusculo confluens. Spira producta tertiam partem longitudinis testæ implet; anfractus ejus 4 haud humiles infra suturam conspicuam et profundam retusi sunt, supra eam convexi: apex obtusus. Apertura elliptico-acuminata (duos trientes longitudinis testæ fere æquat), postice callo columellari albo magno prominente et angulato angustata. Labium columellare læve, album, convexum, fulcatum, latiusculum.*

Long. $1\frac{5}{8}$, lat. $\frac{7}{8}$ poll.

Hab. Caffriam.

Mus. Hanley.

I have never seen but a single individual of this remarkable-looking shell, which reminds one alike of *Bullia* and *Ancillaria*. The whorls

of the spire are not twice as broad as high. The basal distinctive groove is nearly square-cut; its bottom is closely traversed by wrinkles of increase, and is flat, not concave.

2. *PSEUDOLIVA NASSOIDES*. *Testa parva, solida, imperforata, ovali-conica, fulvo-rufescens, lævigata. Ultimi anfractus antice satis declivis fere quartam partem segregat sulcus latus profundus. Cingulum siphonale pallidum retusione cinguli basalis fit prominentior. Spira satis producta tertiam partem longitudinis testæ implet; sutura simplex anfractus ejus 4 convexos profunde dividit: apex obtusiusculus. Apertura parva, subelliptica, antice posticeque angustata, dimidiam longitudinem testæ haud multum superat. Labium columellare crassum, album, læve, callo pliciformi nullo postice munitum, sed ad extremitatem anticam subuniplicatum.*

Long. $\frac{3}{8}$, lat. $\frac{3}{16}$ poll.

Hab. Malabaricum littus.

Mus. Hanley.

The only specimen known to me bears the aspect of being fully adult. Its outer lip seems thickened externally, and the tooth-like projection over the characteristic groove is rather conspicuous.

3. *DOLIUM FAVANNII*. *Testa subglobosa, magis minusve valida, longitudinaliter arcte corrugata, fulvo-rufescens, costis (quarum circiter 16 anfractum ultimum, et 4 penultimum cingunt) a maculis brunneis pallidisque remote tessellatis, latiusculis, rotundatis, et valde prominentibus, conspicue ornata. Sulcorum interstitialium (qui costarum magnitudinem æmulantur) pauci in anfractu ultimo superiores, omnesque in gyris spiræ brevissimæ humilibus linea elevata divisi. Sutura excavata. Labium exterius repandum: labii interioris lamella haud (ut in *D. fimbriato*) libera extans. Exitus umbilici satis magni latus et lævis. Extremitas cinguli siphonalis rotundati eminentis et inconspicue porcati haud caudata.*

Long. $2\frac{7}{10}$, lat. $2\frac{6}{10}$ poll.

Hab. —?

Mus. Cuming.

This very rare shell is intermediate in aspect between *D. chinense* and *D. fimbriatum*: from the former it may be distinguished by the pattern of its colouring, and the coarseness and fewness of its ribs; from the latter by its very dissimilar shape, its umbilicus, &c. The whorls, which rise concavely from the profound suture, do not gradually taper above, but seem, as it were, truncated. The rounded body is about as broad as it is long; its anterior declination is sudden. The spots with which all the ribs, but not their intervals, are painted, are often cloudy.

Having as yet seen only two specimens (on one of which the last-formed portion of the ribs was roughened by a few irregular raised spiral lines), I cannot say that the outer lip may not, in perfect and adult individuals, become reflected and dentated.

4. **DOLIUM DUNKERI.** *Testa magis minusve solida, ovato-globosa, fulva aut livido-carnea, maculis parvis brunneis remotis, maculisque majoribus albidis (super costas fere omnes) subtessellatim picta: maculæ sæpissime in seriebus longitudinalibus undulatim ordinatæ. Costæ multæ, confertæ, plano-convexæ, sulcis perangustis subbiangulatis divisæ. Spiræ anfractus breves inflati: corpus ventricosum, antrorsum lente declive. Sutura simplex. Apertura haud valde lata, fauce brunnea. Labium exterius haud reflexum haud dentatum; intus, autem, lyratum. Cingulum siphonale haud prominens, haud caudatum.*

Long. $1\frac{7}{12}$, lat. $1\frac{1}{8}$ poll.

Hab. Portum Natal.

Mus. Cuming.

The sculpture of this rare shell, of which no example is known in fine condition, reminds one of *cumingii*; upon the whole, however, *D. variegatum* is its nearest congener. As the largest specimen examined by me, although solid, and copiously spread with parietal enamel, had only attained to two volutions and a half (the first of a pinkish cast) beyond its smooth yellow nucleus, I am not sure that it was adult. Its body was encircled by eighteen ribs, in the narrow intervals of the few superior ones of which might be discerned the commencement of a raised stria. Its spire was remarkably short in comparison with the elongated and rather narrow aperture: its contracted umbilicus was almost concealed by the pillar-lip.

The following list of additions made to the Menagerie during the month of July was read :—

1 Blenny.....	<i>Blennius viviparus</i>	English Coast...
6 Actinæ.....	<i>Adamia palliata</i>	English Coast...
6 Hermit Crabs.....	<i>Pagurus prideauxii</i>	English Coast...
3 Californian Quails.....	<i>Callipepla californica</i>	California.....
2 Ariel Toucans.....	<i>Rhamphastos artel</i>	Brazil.....
6 White-crowned Pigeons.....	<i>Columba leucocephala</i>	Mexico.....
1 Australian Goshawk.....	<i>Accipiter nova hollandiae</i>	Australia.....
1 Red-billed Toucan.....	<i>Rhamphastos erythrorhynchus</i>	Cayenne.....
3 Wax-wing Chatterers.....	<i>Amphispiza garrula</i>	Norway.....
2 Zebra Wax-bill Finches.....	<i>Estrelda lateralis</i>	W. Africa.....
1 Sooty Phalanger.....	<i>Phalangista fuliginosa</i>	Australia.....
2 Brush-tailed Porcupines.....	<i>Atherura africana</i>	W. Africa.....
2 American Squirrel.....	<i>Spermophilus guttatus</i>	N. America.....
2 Spotted Salamanders.....	<i>Salamandra vulgaris</i>	Europe.....
1 Iguana.....	<i>Iguana</i>	Antilles ?.....
30 Crested Blennies.....	<i>Blennius palmicornis</i>	England.....
2 Jerboas.....	<i>Dipus aegyptius</i>	N. Africa.....
1 Hawk-billed Turtle.....	<i>Chelonia imbricata</i>	W. Africa.....
1 West African Boa.....	<i>Python regius</i>	Java.....
1 Musk Deer.....	<i>Tragulus javanicus</i>	S. America.....
1 Crab-eating Raccoon.....	<i>Procyon cancrivorus</i>	India.....
1 Axis Deer.....	<i>Axis maculata</i>	India.....

Purchased.

Presented by J. T. Clarke, Esq.
Presented by C. Fitzgerald, Esq.
Presented by George Moss, Esq.
Presented by David Ross, Esq.
Presented by W. Maudslay, Esq.

Of these, the *Pagurus prideauxii* and *Rhamphastos erythrorhynchus* were stated to be exhibited for the first time.

The following list of additions to the Menagerie during the month of August was read :—

5	Water Tortoises	<i>Enys tectum</i>	River Ganges
2	Blue-capped Lories	<i>Enys hamiltoni</i>	River Ganges
1	Yellow-headed Amazonian Parrot.....	<i>Lorius domicella</i>	Moluccas
2	Multicolor Parakeets	<i>Chrysotis ochroptera</i>	Mexico
2	Baltimore Orioles	<i>Psepholus multicolor</i>	Australia
1	Young Gulls	<i>Icterus baltimorensis</i>	N. America.....
1	Vulpine Phalanger	<i>Larus</i> — ?	Mogador
2	Kangaroos	<i>Phalangista vulpina</i>	Australia
10	Salamanders	<i>Macropus benettii</i>	Australia
1	Gonga Cockatoo	<i>Halmaturus billardieri</i>	Australia
2	Cranes	<i>Salamandra vulgaris</i>	Europe
1	Sooty Monkey	<i>Calocephalon galeatum</i>	Australia
2	American Blue Jays	<i>Baeurica pavonina</i>	W. Africa
12	Crested Blennies	<i>Cercocebus fuliginosus</i>	W. Africa
1	Wrasse	<i>Garrulus cristatus</i>	N. America.....
12	Prawns	<i>Blennius palmicornis</i>	England
1	Lobster	<i>Labrus maculatus</i>	England
12	Hermit Crabs	<i>Palemon serratus</i>	England
4	Chestnut Weaver-bird	<i>Honarus vulgaris</i>	England
1	Common Weaver-bird	<i>Pagrus berhardi</i>	England
2	Mocking Birds	<i>Hyphantornis castaneifusca</i>	W. Africa
1	Red and Blue Macaw	<i>Hyphantornis textor</i>	W. Africa
1	Yellow and Blue Macaw	<i>Minus polyglottus</i>	N. America.....
1	Chinese Starling	<i>Ara chloroptera</i>	Guiana
5	American Ground-Doves	<i>Ara araraima</i>	Brazil
1	Ocelot (young)	<i>Acridotheres cristatellus</i>	China
1	Black-tailed Parakeet	<i>Geotrygon montana</i>	S. America
1	Green Frog	<i>Felis matis</i> ?	S. America
1	Land Tortoise	<i>Polyteles melanurus</i>	Australia
		<i>Hyla viridis</i>	Europe
		<i>Testudo</i> , <i>sp.</i> ?	

Purchased.

Presented by H. Pollock, Esq.
Presented by Mr. Davidge.

List of additions in August (*continued*).

1 Grey-breasted Conure	<i>Conurus murinus</i>	S. America	Presented by Mrs. Malcolm.
2 Groups of Corynactis	<i>Corynactis allmanni</i>	English Coast	Presented by Mrs. Henry.
2 Groups of Corynactis	<i>Corynactis allmanni</i>	English Coast	Presented by Mrs. Forster.
2 Finches .....	.....	.....	Presented by Major Verner.
1 Elegant Parakeet	<i>Euphonia elegans</i>	Australia	Presented by Mr. Jamrach.
1 Monkey .....	.....	.....	Presented by John Davie, Esq.
2 Horned Toads	<i>Ceratophrys cornutus</i>	S. America	Presented by Captain Abbott.
1 Macaque Monkey	<i>Macacus cynomolgus</i>	Java	Presented by Mr. Bartlett.
12 Actinæ	<i>Actinia troglodytes</i>	England	Presented by Mr. Du Pasquier.
1 Rhesus Monkey	<i>Macacus rhesus</i>	India	Presented by T. Cooke, Esq.
1 Wanderoo Monkey	<i>Slenus ætus</i>	Cochin China	Presented by H. D. Willock, Esq.
1 Crocodile (young)	<i>Crocodilus americanus</i>	Nicaragua	Presented by Mr. Fletcher.
26 Actinæ	<i>Anthea cereus</i>	English Coast	Presented by W. Hindley, Esq.
1 Common Otter	<i>Lutra vulgaris</i>	England	Presented by Mr. Church.
1 Bonneted Monkey	<i>Macacus pileatus</i>	India	Presented by Major Bent.

Of these, *Emys tectum*, *Emys hamiltoni*, *Callocephalon galeatum*, *Hyphantornis castaneofusca*, *Geotrygon montana*, and *Ceratophrys cornuta* were stated to be exhibited for the first time.

The following list of additions to the Menagerie during the month of September was read :—

2 Australian Purple Waterhens	<i>Porphyrio melanotus</i>	Australia	Presented by Dr. F. Müller.
1 Guinea Baboon	<i>Cynocephalus sphinx</i>	Guinea	Presented by J. C. Clarke, Esq.
1 Green Lizard	<i>Lacerta viridis</i>	Europe	Presented by Dr. Bowerbank.
1 Chamaeleon	<i>Chamaeleo africanus</i>	Africa	Presented by J. T. Davidson, Esq.
2 Red-headed Cardinals	<i>Paroaria cucullata</i>	South America	Presented by J. G. Leeming, Esq.
1 Black-crested Cardinal	<i>Gubernatrix cristata</i>	South America	
1 Nonpareil Finch	<i>Spiza ciris</i>	North America	

4 Gannets	<i>Sula bassana</i>	England	Presented by J. Hawkshaw, Esq.
2 Thick-knees	<i>Edicnemus crepitans</i>	England	Presented by Mr. Pell.
1 Chameleon	<i>Chamaeleo africanus</i>	Africa	Presented by R. Ellis, Esq.
6 Kingfishers	<i>Alcedo ispida</i>	England	} Purchased.
1 Philantomba Antelope	<i>Cephalophus marnettii</i>	W. Africa	
1 Osprey	<i>Pandion haliaetus</i>	England	
1 African Horned-Owl	<i>Bubo maculosus</i>	W. Africa	
1 Chanting Falcon	<i>Melierax polyzonus</i>	W. Africa	
2 Bonelli's Eagles	<i>Agulla bonelli</i>	N. Africa	
2 Servals	<i>Felis serval</i>	S. Africa	

Of these, *Bubo maculosus* and *Melierax polyzonus* were stated to be exhibited for the first time.

The following list of additions to the Menagerie during the month of October was read :—

1 Muntjac Deer	<i>Cervulus vaginalis</i>	India	Presented by His Excellency Sir G. Grey, K.C.B.
1 Bald-headed Ibis	<i>Geroniticus cabus</i>	S. Africa	Presented by His Excellency Sir G. Grey, K.C.B.
1 Duyker Bok	<i>Cephalophus</i> , sp. ?	Angola	Presented by George Brand, Esq.
1 Blue and Yellow Maccaw	<i>Ara aracanga</i>	S. America	Presented by A. Russell, Esq., M.P.
8 Actinix	<i>Actinia crassicornis</i>	English Coast	Presented by F. Roxburgh, Esq.
2 Chinese Geese	<i>Anser cygnoides</i>	Foochoo	Presented by Russell Sturgis, Esq.
1 Tibetan Bear	<i>Helarctos tibetanus</i>	N. India	Presented by W. H. Russell, Esq.
2 Common Herons	<i>Ardea cinerea</i>	England	Presented by Hon. C. A. Ellis.
1 Cincereous Eagle	<i>Haliaetus albicollis</i>	England	Presented by Lieut. A. Kinloch.
1 Coati-mundi	<i>Nasua fusca</i>	S. America	Presented by Sir Malcolm McGregor.
1 Kiang	<i>Equus kiang</i>	Tibet	Presented by Major Hay.
1 Perch	<i>Percu fluviatilis</i>	England	} Presented by — Skidmore, Esq.
1 Roach	<i>Leuciscus rutilus</i>	England	
2 Chub	<i>Leuciscus cephalus</i>	England	
3 Lamprens	<i>Petromyzon fluviatilis</i>	England	
1 Loach	<i>Cobitis barbatula</i>	England	

List of additions in October (*continued*).

1 Lepidostiren.....	<i>Lepidostiren annectens</i>	Gambia	Presented by James Thomson, Esq.
1 Indian Bull	<i>Bos zebu</i> , var.....	India	Presented by Dr. Shortt.
1 Common Raven	<i>Corvus corax</i>	England	Presented by Miss Prichard.
2 Hill Minas	<i>Gracula intermedia</i>	India	Presented by M. J. Harpley, Esq., R.A.
1 White-crested Cockatoo.....	<i>Cacatua moluccensis</i>	Moluccas	
1 Ichneumon	<i>Herpestes griseus</i>	India	
10 Shieldrakes	<i>Tadornia vulpanser</i>	Europe	
2 Golden Agoutis	<i>Dasyprocta aurea</i>	S. America	
1 Snake .....	.....	Europe	
1 Canadian Porcupine	<i>Erethizon dorsatum</i>	N. America.....	
1 Suricate	<i>Suricata zenib</i>	S. Africa.....	
1 Chameleon	<i>Chamaeleo africanus</i> .....	.....
3 pairs Bearded Titmice	<i>Calamophilus biarmicus</i>	England	
1 Antelope	<i>Cephalophus</i> .....	.....	Purchased.
5 Californian Quails	<i>Callipepla californica</i>	California	
1 Rhesus Monkey	<i>Macacus rhesus</i>	India	
2 Osbeck's Parrots.....	<i>Pakeornis javanica</i>	Java	
1 Ducorps' Cockatoo.....	<i>Cacatua ducorpsii</i>	Salomon Islands	
1 European Crane	<i>Grus cinerea</i>	Europe	
1 Demoiselle Crane	<i>Anthropoides virgo</i>	Europe	
1 Chamois	<i>Rupicapra</i>	Europe	
3 Gerbilles	<i>Gerbillus</i>	Africa	
2 Flamingoes	<i>Phenicopterus erythreus</i> ?	Egypt	
6 Barbary Partridges.....	<i>Caccabis barbara</i>	N. Africa	
1 Water Rail	<i>Rallus aquaticus</i>	England	

Of these, the *Equus kiang* and *Cacatua ducorpsii* were stated to be exhibited for the first time.

November 22, 1859.

Dr. Gray, V.P., in the Chair.

Mr. Daniel G. Elliot of New York exhibited three specimens of hybrid Ducks from his own collection, which had been obtained on the south shore of Long Island, U. S. A. One of these was considered to have been produced by a cross between the Wild Duck (*Anas boschas*) and Pintail (*Dafila acuta*), the second by the Wild Duck and Muscovy Duck (*Cairina moschata*), and the third probably by the American Scaup (*Fuligula affinis*) and the Canvas-back (*F. valisneria*) or the American Pochard (*F. americana*).

Dr. Hamilton exhibited three curiously plumaged Pheasants shot in Norfolk, which had the appearance of males on the lower surface, and females on the upper. They were birds of the year. Upon careful dissection, no traces of sexual organs, either male or female, were discernible.

The following papers were read :—

1. DESCRIPTION OF MACANDREWIA AND MYLIUSIA, TWO NEW FORMS OF SPONGES. BY DR. J. E. GRAY, F.R.S., V.P.Z.S., P.E.S., ETC.

(Radiata, Pl. XV. XVI.)

In 1841 Mr. Stutchbury described in our Proceedings a Sponge brought from Barbadoes, in the Museum at Bristol, which was peculiar for being entirely formed of agglutinate silicious spicula, forming a tough semitransparent glass-like spongy mass. By exchange I have obtained half the specimen of this most curious and interesting sponge, so that I have the means of comparing those I have described with the one then made known.

In July 1851 Mr. R. MacAndrew kindly presented to the British Museum a Coral from St. Michael's, one of the Azores, which then attracted my attention, but I put it aside in hopes that I might obtain a specimen of it in spirits, which would enable me to understand more completely its history and character. No other specimen having, however, come under my examination, the subject dropped out of my mind.

It was accidentally placed with the Stony Corals, and its hardness and resemblance to the genus *Gemmipora* are some excuse for this mistake. Some time ago Mr. Holdsworth, when studying the corals in the Museum, observed that it evidently did not belong to that group : and a very superficial inspection, indeed its mere lightness, was enough to show that such was the case.

I again placed it aside, thinking that I had seen a figure of the animal as an *Alcyonium* in Messrs. Quoy and Gaimard's 'Voyage,' and in Dana's 'Zoophytes,' and that I would study it when I had

that family under my hands, or leave it for some other person to examine who might take up the group.

Having lately had occasion to consult Messrs. Quoy and Gaimard's work, and the essay of Mr. Dana, I became satisfied that the substance from the Azores could not be the *Alcyonium glaucum* or *Alcyonium latum* (Dana, Zooph. 623. t. 58. f. 6), which I had before thought from recollection might be the case; for these authors describe *A. glaucum* as soft and fleshy, and *A. latum* as "more rigid in its texture than *A. glaucum*." As Mr. MacAndrew's specimen is hard, inflexible, and brittle, though very light, this induced me to examine the specimen more carefully; and I then found that the supposed coral was a silicious sponge, covered below with a thin fleshy envelope without any apparent apertures, and above with a thicker fleshy coat, studded with large-sized, regularly-disposed, circular cells, which look like the cells of the Polypes in the two *Alcyonia* above referred to. The apertures are destitute of a radiating lamina, and appear in their dry state to be subdivided into six or eight small circular tubes, and have all the appearance of being the cells of a pinnated tentacled zoophyte. The small part of the lower surface of the spongy axis, which is exposed, is pierced with minute perforations, and the upper surface is furnished with groups of larger pores, which, as far as I can judge without injuring the specimen, are placed under the cells above described. There are grooves diverging from the small cylindrical perforations in one of the groups to the perforations in the other groups.

I have thought proper to call the genus after the gentleman who discovered it, and who has been very liberal in doing all in his power to extend our knowledge of zoology and geology, and has several times placed his yacht at the command of scientific men, to assist them in their researches.

The genus may be thus defined :—

MACANDREWIA.

Cup-shaped, expanded, more or less sinuated or lobed, affixed by a more solid dilated base, covered with a fleshy bark, which is furnished with cells on the upper surface, supported by a very light porous silicious spongy cup-shaped axis, the upper surface of which is furnished with groups of small cylindrical pores placed in roses, and with grooves radiating between each group of pores; the lower surface uniformly porous.

MACANDREWIA AZORICA. (Pl. XV.)

Hab. St. Michael's, Azores, 1851 (*Robert MacAndrew, Esq., F.R.S., &c.*).

This sponge? has so much the general appearance and habit of a zoophyte with pinnated tentacles like the *Alcyonium* to which I have referred above, that I am as yet by no means certain that it may not be the product of such animals; but I have not been able to find any traces of the remains of them, and therefore must wait the

arrival of some other specimen preserved in spirit to determine the fact. At the same time the bark is unlike that of any sponge that I am acquainted with, the existence of such a bark on any true sponge being as yet unknown to me. On the other hand, the existence of an axis of the spongy texture and the silicious compositions found in this marine body are novelties in the order of zoophytes in which its general appearance would lead one to place it. But that is no reason why it may not prove to be a zoophyte, as the same may be said to be the case with regard to the genus *Hyalonema*, the axis of which is so anomalous that several of the French zoologists—Valenciennes, Milne-Edwards, and others—considered the bark of it as a parasite on some unknown substance, overlooking the fact that the bark is strengthened by fibres exactly like those of which the axis is composed. Such an idea would require a belief in the existence of two bodies always found together, and unknown in any other form, instead of their being regarded as parts of the same animal.

The axis of this body has many characters in common with the body which is called a Sponge described by Mr. Stutchbury in our Proceedings for 1841, p. 87, as mentioned above under the name of *Dactylocalyx pumiceus*, and which has been more lately described under another name by M. Valenciennes, a very fine specimen of which is in my collection; but in this sponge it is the outer surface which is marked "with deep sinuosities radiating from the root to the outer circumference."

We have lately received from Dr. William MacGee of Belfast a very curious specimen of a silicious sponge?, which is also allied to the *Dactylocalyx* and *MacAndrewia*, but so distinct in its form and structure that I am inclined to regard it as a type of a new genus, which may be called

MYLIUSIA.

Sponge? silicious, funnel-shaped, fixed by the base; the upper surface smooth, marked with numerous minute perforations placed in nearly parallel grooves radiating from the centre to the circumference, and with numerous large, oblong, rather unequal-sized perforations, which are fringed on the lower side with a high wall of a similar structure to the rest of the sponge; these edges of the cavities causing the under surface to be covered with unequal irregular shaped tubes of nearly the same length, and more or less confluent together: some of these tubes are simple and subcylindrical, others are expanded out and more or less crumpled on the edge around the cavity, so as to end in two, three, or even four, more or less circular mouths.

MYLIUSIA CALLOCYATHES. (Pl. XVI.)

Hab. West Indies (*Dr. MacGee*).

Dr. Bowerbank informs me that the silicious spicula of this sponge are very different from those of *Dactylocalyx pumiceus*. As he is working on that subject, I leave the peculiarities for him to de-

scribe ; but I should not be in the least surprised if the genera *MacAndrewia*, *Myliusia*, and *Dactylocalyx* should all prove to be a peculiar family of zoophytes rather than sponges. If these bodies are sponges, they will form a family in that group, which may be named *MacAndrewiadae*, characterized by the peculiar form and structure of the axis, the distinctness of the bark, and the position of the oscules or cells.

The structure of the base of *Dactylocalyx* and of the spicula which are found in the interspaces of the network are figured by Mr. Quekett in his 'Lecture on Histology.'

I have named this genus after Christlob Mylius, who first described the curious zoophyte since called *Umbellularia grænlandica* ; and I think that any one who reads his simple and plain account of the animal in his letter to Haller, and the account of the same animal given by John Ellis in his work on Corallines, will be satisfied that the latter was not very liberal in his praise towards his contemporary. There might have been reasons why he did not mention the name of Mylius, but I cannot conceive why those of Collinson and Dunze should have been omitted.

It is much to be regretted that nothing is known as to what became of the two specimens of this animal described by Mylius and Ellis, and that no other specimen has been found since that period, now more than a century ago.

2. ON SOME NEW OR LITTLE-KNOWN BIRDS FROM THE RIO NAPO. BY PHILIP LUTLEY SCLATER, M.A., SECRETARY TO THE SOCIETY.

Among some birds lately received from the Rio Napo, and kindly submitted to my inspection by M. Verreaux of Paris, are several species not included in the series from the same locality which I had the pleasure of bringing before the notice of the Society last year *. To these I now beg leave to call the Society's attention, some of them appearing to be new to science, and others, although already described, to be of rare occurrence.

1. *BASILEUTERUS NIGRI-CRISTATUS* (Lafr.).—*Myiothiolytis nigri-cristata*, Bp. Consp. p. 311.

2. *DIGLOSSA ATERRIMA*, Lafr. Rev. Zool. 1846. p. 319.

3. *CALLISTE RUFIGULARIS*, Sclater, Mon. Call. pl. 13.

The occurrence of this species on the eastern side of the Andes is certainly singular, as M. Bourcier obtained his specimens at Calacali, on the western side of the great range.

4. *CALLISTE CHRYSOTIS*, DuBus ; Sclater, Mon. Call. pl. 43.

* See P. Z. S. 1858, p. 59.

5. *CALLISTE CYANOTIS*, Selater, P. Z. S. 1859, p. 294.

A specimen in more perfect plumage than the bird which I originally described from, but unmistakably recognizable as belonging to the same rare species. Its nearest ally is certainly *Calliste laboridoides* (Mon. of *Calliste*, pl.), from which, however, it is easily distinguishable by the black sides of the head and well-defined superciliary stripe.

6. *BUARREMON CASTANEICEPS*, sp. nov.

Saturate oleagineus, subtus vix dilutior : remigibus et rectricibus nigricanti-fuscis : pileo castaneo, lateribus capitis cum gula nigricanti-cinereis : rostri nigricanti-plumbei basi pallida ; pedibus nigris.

Long. tota 6·5, alæ 3·1, caudæ 2·6.

But one example of this *Buarremon* was in the collection. It may be arranged next to *B. rufinuchus* and *B. latinuchus*, from which, however, it is easily distinguished by its general deep olive colouring.

7. *BUARREMON ASSIMILIS* (Lafr.).

Agrees with New Granadian specimens.

8. *GRALLARIA NUCHALIS*. sp. nov.

Saturate brunnescenti-oleaginea, pileo rufescentiore, nucha et regione post-oculari clare castaneis : subtus nigricanti-schistacea : rostro et pedibus nigris.

Long. tota 7·5, alæ 4·5, caudæ 2·1, rostri a rictu 1·2 ; tarsi 2·15.

This bird is a long-legged *Grallaria* in structure, though in plumage it rather resembles the different species of the allied genus *Formicarius*. I have never seen but this one example, now in my collection.

9. *PIPREOLA CHLOROLEPIDOTA*, Sw. An. in Men. p. 357.

This bird agrees so well with Swainson's description, that I have no hesitation in recognizing it as belonging to his species. It is a female of one of the beautiful green Cotingas of the genus *Euchlornis* or *Pyrrhorhynchus*, as I had always supposed was likely to be the case*. It is *probably* the female of *Euchlornis sclateri*, Cornalia (Contr. Orn. 1852, p. 133. pl. 4), which is from this same country ; but I am not yet clear upon this point. Its identification is of importance, as it proves that the generic name *Pipreola* should be used for this group, in place of *Euchlornis* or *Pyrrhorhynchus*, established many years subsequently.

* Annals of Natural History, June 1856.

3. ON SOME HYBRID DUCKS BRED IN THE SOCIETY'S GARDENS.
 BY PHILIP LUTLEY SCLATER, M.A., SECRETARY TO THE
 SOCIETY.

(Aves, Pl. CLVIII.)

I have the pleasure of exhibiting Mr. Wolf's drawing of both sexes of a Hybrid Duck bred this season in the Society's Gardens, between a male of the Common Shieldrake (*Tadorna vulpanser*) and a female of the White-fronted Shieldrake or Mountain Goose of Southern Africa (*Casarca cana*). The old female *Casarca* was acquired by the Society at the sale of the late Lord Derby's collection in 1851. She has on three previous occasions bred in the Gardens: in the first instance with an Indian male of the Ruddy Shieldrake (*Casarca rutila*), and subsequently twice with one of the male hybrids produced by her union with the Ruddy Shieldrake.

Upon being placed this spring in a small pond in company with a pair of the Common Shieldrake, she so persecuted the male with her attentions that she succeeded in persuading him to tread her, though in the society of his proper mate. The result was that she laid fertile eggs, and hatched and successfully reared three strong hybrid birds (Pl. CLVIII.), two of which appear to be males, and one a female. They present a curious combination of the colours of the two parents, though the dusky-grey flanks seem scarcely deducible from either. The female has the bill black; in the male it is flesh-coloured at the base, as in the male parent. The female also takes rather after her mother's likeness, in possessing white round the beak and round the eye. The black hood in both sexes is derived from the male parent.

In the Gardens this year we have also bred two other broods of Hybrid Ducks. One of these was the produce of a male Dusky Duck (*Anas obscura*), and a cross-bred female between the Dusky Duck and the Wild Duck. The other was the issue, as we believe, of parents themselves *both* cross-bred, and both originating from hybridism between the Tufted Duck (*Fuligula cristata*) and the White-eyed (*Nyroca leucophthalma*). But, as there is a male pure-bred White-eyed Duck in the same pond, we cannot be quite certain on this point.

During the next season we hope to take such measures as will put to test in the case of the *Anatidæ*, a favourite *dictum* of naturalists, and one which has recently met the approval of a high authority* upon such matters, that "it is difficult, perhaps impossible, to bring forward one case of the hybrid offspring of two animals *clearly distinct* being themselves perfectly fertile."

* Darwin, "On the Origin of Species," p. 26.

4. LIST OF MALAYAN BIRDS COLLECTED BY THEODORE CANTOR,
ESQ., M.D., WITH DESCRIPTIONS OF IMPERFECTLY-KNOWN
SPECIES. BY FREDERIC MOORE.

Part II.*

113. PASSER MONTANUS.

Fringilla montana, Linn. S. N. i. p. 324.

Passer montanus, Stephens, Shaw's Zool. xiv. p. 40 ; G. R. Gray, Gen. of B. ii. p. 372 ; Blyth, J. A. S. Beng. xiii. p. 947 ; xiv. p. 553 ; Catal. B. Mus. A. S. Beng. p. 120 ; Moore, Catal. B. Mus. E. I. C. ii. p. 500.

Specimens obtained at Singapore.

"This is the common sparrow of Java, and is the more common species in Arracan generally ; about sixty of this species occurring to one of *Passer indicus*. It is also common in China and Japan, also in the Himalaya, and in Afghanistan, extending westward to the British Islands."—*Blyth*.

114. PADDA ORIZIVORA.

Loxia orizivora, Linn. S. N. i. p. 302 (Vieillot, Ois. Chant. t. 61).

Fringilla orizivora, Horsfield, Trans. Linn. Soc. xiii. p. 161 ; Swainson, Zool. Ill. 1st ser. t. 156.

Munia orizivora, Bonap. C. G. Av. p. 451.

Padda orizivora, Reichenbach (1854) ; Moore, Catal. Birds Mus. East Ind. Comp. ii. p. 504.

Oryzornis orizivora, Cabanis, Catal. Birds Mus. Heine, p. 174.

Loxia javensis, Sparrman, Mus. Carls. t. 89.

Orizivora leucotis, Blyth, Indian Ornithology, MSS.

GLATE, Java (Horsfield).

GELATIK, Sumatra (Raffles).

115. MUNIA PUNCTULARIA.

Loxia punctularia, Linn. S. N. i. p. 302.

Munia punctularia, Blyth, Catal. B. Mus. A. S. Beng. p. 117 ; Bonap. C. G. Av. p. 452 ; Moore, Catal. Birds Mus. E. I. C. ii. p. 505.

Fringilla punctularia, Horsfield, Trans. Linn. Soc. xiii. p. 161.

Amadina punctularia, Hay, J. A. S. Beng. xiv. p. 554.

Uroloncha punctularia, Cabanis, Catal. Birds Mus. Heine, p. 174.

Fringilla nisoria, Temm. Pl. Col. 500. f. 2.

Coccothraustes javensis naevia, Briss. Orn. iii. p. 239. t. 39. f. 2.

The Cowry Grosbeak, Latham.

PEKKING, Javanese (Horsfield).

From Pinang.

Distinguished from *M. undulatus*, Lath., by the whitish-grey on the rump, upper tail-coverts and tail, which is represented by glistering fulvous in *M. undulatus*.

* Continued from Proc. Zool. Soc. 1854, p. 285.

116. MUNIA MAJA.

- Loxia maja*, Linn. S. N. i. p. 301 (Vieill. Ois. Chant. t. 56).
Munia maja, Blyth, Catal. B. Mus. A. S. Beng. p. 116; Moore, Catal. B. Mus. E. I. C. ii. p. 505.
Fringilla maja, Horsfield, Trans. Linn. Soc. xiii. p. 162.
Dermophrys maja, Cabanis, Catal. B. Mus. Heine, p. 174.
Loxia leucocephala, Raffles, Trans. Linn. Soc. xiii. p. 314.
 BONDOL, Java (Horsfield).
 PIPIT, Sumatra (Raffles).
 PETAP WHOBUN, Malays (Blyth).
 From Pinang.

117. MUNIA SINENSIS.

- Coccothraustes sinensis*, Brisson, Orn. iii. p. 238.
Munia sinensis, Blyth, Catal. Birds, Mus. A. S. Beng. App. p. 337; Moore, Catal. Birds Mus. East Ind. Comp. ii. p. 508.
Loxia malacca, var. β , Linn. S. N. i. p. 302.
Munia malacca (part.), Bonap. C. G. Av. p. 432.
Loxia atricapilla, Vieillot, Ois. Chant. t. 53.
 Chinese Sparrow, Edwards, Birds, t. 43.
 Malacca Grosbeak, var. A, Lath. Hist. of B. v. p. 244.
 Obtained at Pinang.

118. MUNIA ACUTICAUDA.

- Munia acuticauda*, Hodgson, As. Res. 1836, p. 153; Moore, Catal. Birds Mus. East Ind. Comp. ii. p. 510.
Amadina acuticauda, Blyth, J. A. S. Beng. xiii. p. 949; Strickland, P. Z. S. 1846, p. 103.
Amadina molucca, apud G. R. Gray, Gen. of B. ii. p. 370.
Uroloncha molucca, apud Cabanis, Catal. B. Mus. Heine, p. 173.
 ? *Loxia molucca*, Linn. S. N. i. p. 302; Lath. Hist. v. p. 246.
 Sarp-tailed Munia, Hodgson.
 PETAP, Pinang (Blyth).
 From Malacca and Pinang.

This bird has the chin and throat *only* blackish, the breast being dark brown, with whitish shafts and borders to the feathers, and the belly dull white, with dusky pencillings; whereas in *M. striata* (Linn.) the throat, to breast inclusive, is uniform blackish, and the belly, vent, and flanks, white. The upper parts of both are nearly similar, but in *M. acuticauda* the brown colour is paler, and the upper tail-coverts are brown; in *M. striata* these being black.

Also inhabits Nepal, Assam, and Tenasserim.

119. PLOCEUS BAYA.

- Ploceus baya*, Blyth, J. A. S. Beng. xiii. p. 945 (1844).
 Pinang and Malacca.

120. EULABES JAVANENSIS.

- Corvus javanensis*, Osbeck, It. p. 102 (1757); Edw. B. t. 17, lower fig.

Eulabes javanus, Cuvier, Règ. Anim.
Pastor musicus, Wagler, Syst. Av. Past. sp. 2.
Gracula religiosa, apud Horsfield et Raffles, Trans. Linn. Soc. xiii.
 pp. 162, 303.

The Malayan Grackle.

BE0 seu MENCH0, Java (Horsf.).

TIONG, Sumatra (Raffles).

Malacca.

Inhabits the Malayan peninsula and archipelago; also the Nicobar Islands.

121. ACRIDOTHERES FUSCUS.

Pastor fuscus, Wagler, Syst. Av. Past. sp. 6 (1827).

Acridotheres fuscus, Bonap. C. G. Av. p. 420; Moore, Catal. Birds Mus. E. I. C. ii. p. 537.

Pastor mahrattensis, Sykes, P. Z. S. 1832, p. 95.

Maina cristatelloides, Hodgs. J. A. S. Beng. v. p. 771 (1836).

Acridotheres griseus, apud Blyth, J. A. S. Beng. xv. p. 33; id. Catal. B. Mus. A. S. Beng. p. 108.

From Pinang and Malacca.

Identical with specimens from Tenasserim, China, and Nepal; and differs from South Indian examples only in being greyer.

122. CALORNIS DAURICUS.

Sturnus dauricus, Pallas, Acta Stockh. iii. p. 198. pl. 7. f. 1 (1778).

Turdus striga, Raffles.

Pastor malayensis, Eyton, P. Z. S. 1839, p. 103.

BRASS-BRASS, Malays.

Malacca.

"Eyes black; legs greenish-brown. Sleeps with the body downwards, suspended by the claws. Common at Malacca."—*Dr. Cantor's MS.*

123. CALORNIS CHALYBEUS.

Turdus chalybeus ♂ et *T. strigatus* ♀, Horsfield, Trans. Linn. Soc. xiii. p. 148 (1820).

Lanius insidiator, Raffles, id. p. 307 ♂.

Lamprotornis cantor, apud Temm. Pl. Col. 149.

TERLING seu PARLIONG, Malays.

From Malacca.

124. CORVUS CULMINATUS,

Corvus culminatus, Sykes, P. Z. S. 1832, p. 96; Blyth, J. A. S. Beng. xv. p. 24, xvi. p. 727; Moore, Catal. Birds Mus. E. I. C. ii. p. 553.

Corvus corax, apud Raffles, Trans. Linn. Soc. xiii. p. 300?

BURONG GAGA-GAGA, Malays.

An adult and young specimen from Pinang, agreeing with Tenasserim and Indian examples.

Remark.—*C. macrorhynchus* is distinct from this, and occurs also at Malacca, and, according to Mr. Blyth (J. A. S. xv. p. 24), “is a much slyer bird, with a different caw, and a longer beak.”

125. *PLATYSMURUS LEUCOPTERUS.*

Glaucoptis leucopterus, Temm. Pl. Col. 265.

Glenargus leucopterus, Cabanis, Catal. B. Mus. Heine, p. 216.

TALONG-GAGA OR KOLONG-GAGA, Malays.

Inhabits Malacca.

126. *PLATYLOPHUS GALERICULATUS.*

Corvus galericulatus, Cuvier, Règ. Anim. i. p. 399 (1817); Levaill. Ois. de Parad. t. 42.

Platylophus galericulatus, Swainson, Classif. of B. p. 263; Moore, Catal. Birds Mus. E. I. C. ii. p. 574.

Lophocitta galericulata, G. R. Gray, Gen. of B. ii. p. 305; Blyth, Catal. B. Mus. A. S. Beng. p. 94; Bonap. C. G. Av. p. 374; P. Z. S. 1850, p. 79; Cabanis, Cat. B. Mus. Heine, p. 218.

Lanius scapulatus, Lichtenstein, Doubl. p. 49.

Lanius coronatus, Raffles, Trans. Linn. Soc. 1822, p. 306 (female).

Vauga cristata, Griffith's An. Kingd. p. 486 (male).

Lophocitta histronica, Müller, Bonap. C. G. Av. p. 374; P. Z. S. 1850, p. 79 (female).

Garrula rufula, Temminck, Mus. Lugdens. (female).

Lophocitta ardesiaca, Cabanis, Catal. B. Mus. Heine, p. 219; Bonap. C. G. Av. p. 374 (young male).

BURONG JERI, Sumatra (Raffles).

“Common at Malacca.”—*Dr. Cantor's MS.*

127. *RHINOPLAX SCUTATUS.*

Buceros scutatus, Boddart, Tabl. des Pl. Enl. d'Aubent. (1783).

Buceros galeatus, Gmel.

TIBBANG MUNTOVAH, Malays (Farquhar).

From Keddah, Malay Peninsula.

“Iris, eyelids, pouch, legs, and feet, Indian red.”—*Dr. Cantor's MS.*

128. *BUCEROS RHINOCEROS.*

Buceros rhinoceros, Linn. (Pl. Enl. 934; Levaill. Ois. d'Amer. et Ind. t. 1, 2; Edw. B. t. 281. f. B); Bontius, Java, t. 64; Raffles, Trans. Linn. xiii. p. 291; Blyth, J. A. S. Beng. xii. p. 993; xiv. p. 188; xvi. p. 993; Moore, Catal. Birds Mus. E. I. C. ii. p. 582.

Buceros africanus, Gmelin, S. N. i. p. 359.

Buceros niger, Shaw, Zool. viii. p. 7 (Levaill. t. 13).

Buceros lunatus, Temm. Pl. Col. 546.

Buceros sylvestris, Vieillot.

Buceros diadematus, Dumont.

INGGANG DANTO, Malays (Raffles).

BURONG TAUN, Sumatra (Marsden).

RANGKOK or YONGRANG, Java (Horsfield).

Male and female obtained at Malacca.

"The sexes of this Hornbill are distinguished by the *posterior* surface of the horn, above the forehead, being black in the male, and concolorous with the rest of the horn in the female; besides which the male has a black line dividing the bill and casque, and continued forward and upward upon the latter, parallel with its anterior margin. It may be remarked further, that this species seems to wear away the cutting edges of its mandibles more than any other; so that, when the tips meet, a wide hollow occurs along the medial portion of its bill."—*Blyth*.

129. HOMRAIUS BICORNIS.

Buceros bicornis, Linn. (Levaill. Ois. d'Am. et Ind. t. 7, 8).

Homraius bicornis, Bonap. Ateneo Ital. (1854); Moore, Catal. Birds Mus. E. I. C. ii. p. 583.

Buceros cavatus, Shaw (Levaill. t. 3, 4, 5); Raffles, Trans. Linn. Soc. xiii. p. 291; Gould, Cent. of B. tab. 44; Jerdon, Madras Journ. xi. p. 37; Blyth, J. A. S. Beng. xii. p. 986; xiv. p. 187; xvi. p. 993; Tickell, J. A. S. Beng. xxiv. p. 279.

Buceros homrai, Hodgson, J. A. S. Beng. i. p. 251 (1832); Asiatic Res. 1833, p. 169, tab.

Bifid-casqued Hornbill, Shaw.

Concave-casqued Hornbill, Shaw.

BAN RAO (*i. e.* Jungle King), Masuri (Hutton).

HOMRAI, Nepal (Hodgson).

GARUDA, natives of Forests of S. India (Jerdon).

MALAH-MORAYKEY, Malyalum (Elliot).

YOUNY-YENG, Arracan (Phayre).

BURONG-OONDAN, Malays (Raffles).

INGGANG PAPAN, Sumatra (Raffles).

Adult male from Malacca, and adult and young female from Penang.

"This bird inhabits the extensive hill forests of all India, Assam, Arracan, Tenasserim, Malayan Peninsula, and Sumatra. It does not appear to be subject to any variation of plumage, either sexual or according to age; but there are some differences in the colouring of the bill and casque of the sexes, and also of the irides."—*Blyth*.

Mr. Hodgson in his description states that "the casque and upper mandible are deep waxen-yellow, passing to rich red on the top of the casque, and towards the tip of upper mandible; the tip itself and the lower mandible ivory white; base of both mandibles, anterior and posterior surface of the casque, a line along the ridge of the bill, its cutting edges, and the whole inner surface of the bill, and naked skin round the eyes, black; iris intense crimson. The female, and young of a year old, has the iris pure hoary, the naked skin of the ophthalmic region pale purpurescent dusky; and the black colour which distinguishes the casque, and ridge, cutting edges, and interior surface of the bill in the male, being red.

"From a comparison of many specimens, showing both sexes in maturity, and the young in various stages of progression towards it, I am led to conclude that the body does not reach its full size under two or three years, and that the bill and casque, especially the latter, are not perfectly developed in less than four or five years."

Mr. Hodgson also gives an elaborate description of the growth of the young, and also a description of the skeleton by Dr. M. J. Bramley. An account of its anatomy is given by Prof. Owen in the Proc. Zool. Soc. 1833, p. 102.

The Rev. J. Mason, in his work on Burmah, states of the Concave Hornbill, "Their nests are constructed in a superior manner of clay in the stumps or hollows of old trees. After the female has laid five or six eggs, the male bird shuts her entirely in with mud, except a small hole where she can only peep out her head. Here she must sit during her incubation, for if she breaks through the enclosure, her life pays the forfeit; but, to compensate for the loss of freedom, her spirited mate is ever on the alert to gratify his dainty mistress, who compels him to bring all her viands unbroken, for if a fig or any fruit be injured, she will not touch it."

Capt. Tickell, writing from the Tenasserim provinces, remarks: "I obtained the egg of *B. cavatus*, and have *seen with my own eyes* that the male builds the female in, by covering the hole in the tree where she incubates with mud, leaving only room for her bill to protrude and receive food from his! I thought that this was a fable."—J. A. S. Beng. 1855, p. 279.

130. HYDROCISSA CONVEXA.

Buceros convexus, Temm. Pl. Col. 530 (♀).

Hydrocissa convexa, Moore, Catal. Birds Mus. E. I. C. ii. p. 591.

Buceros intermedius, Blyth, J. A. S. Beng. 1847, p. 994; xviii. p. 803; Catal. Birds Mus. A. S. Beng. p. 43.

Buceros albirostris, apud Horsfield, Trans. Linn. Soc. xiii. p. 175.

Buceros malabaricus, apud Raffles, id. p. 291; Vigors, App. Mem. Raffles, p. 666.

Buceros violaceus, apud Hay, Madras Journ. xiii. pt. 2. p. 148.

KLINGLINGAN, Java (Horsfield).

ANGKA ANGKA, Sumatra (Raffles).

MATTEE SEE-AWAN, Malays (Cantor).

Adult males from Malacca, and adult and young of both sexes from Pinang.

In plumage this species is like *H. albirostris* (Shaw), but with the four lateral pairs of tail feathers wholly white in adults (in the young these are black at base), and the middle pair tipped with white.

Bill and casque yellowish-white, the latter with a black patch, as in *H. albirostris*. "Naked space round the eyes and sides of throat bluish-white."—Dr. Cantor.

131. HYDROCISSA MALAYANA.

Buceros malayanus, Raffles, Trans. Linn. Soc. xiii. p. 292 (1822);

Temminck, Text de Pl. Col. ; Blyth, J. A. S. Beng. xvi. p. 995 ; xviii. p. 803 ; Catal. B. Mus. A. S. Beng. p. 43.

Hydrocissa malayana, Bonap. C. G. Av. p. 90 ; Moore, Catal. Birds Mus. E. I. C. ii. p. 592.

Buceros anthracinus, Temm. Text. de Pl. Col. 529.

Buceros bicolor, Eyton, P. Z. S. 1839, p. 104 ; Blyth, J. A. S. Beng. xii. p. 995.

Buceros elliotti, Hay, Madras Journ. xiii. pt. 2. p. 152.

QUAY QUAY, Malays (Eyton).

MATTEE SEE-CAWAN, Malays (Cantor).

Two female specimens from Province Wellesley, Malacca.

In the presumed *immature* male the plumage is wholly glossy-black, excepting a superciliary coronal circle and tips of the four outer tail-feathers, which are white ; the bill and casque are spotless yellowish-white, excepting the base of the former and hindmost part of the latter, which are black ; the casque sloping gradually in front to the curvature of the bill. Length of wing $10\frac{1}{2}$ inches ; of tail $12\frac{1}{2}$ inches, its outer feather 3 inches less ; bill from gape $4\frac{3}{4}$ inches, from hindmost part of casque to point of bill, in a straight line, 6 inches, height from chin to top of casque 3 inches.

Presumed *adult* female has the superciliary coronal circle represented by obscure silvery-greyish. Length of wing $13\frac{1}{2}$ inches ; of tail 16 inches ; outermost feather 4 inches less ; bill from gape $5\frac{1}{4}$ to 6 inches ; length of casque 5 to $5\frac{3}{4}$ inches ; height from chin to top of casque 3 to $3\frac{1}{2}$ inches.

The casque in this species is allied in shape to that of *H. albirostris* and *H. convexa*, and is of a totally different form to that of *H. nigrirostris*.

The female, according to Dr. Cantor's notes, has the "Iris greyish-brown. Bill yellowish-white or buff. Naked space round the eyes livid. Feet black."

132. HYDROCISSA NIGRIROSTRIS.

Buceros nigrirostris, Blyth, J. A. S. Beng. xvi. p. 995 (1847) ; xviii. p. 803 ; Catal. B. Mus. A. S. Beng. p. 44.

Hydrocissa nigrirostris, Moore, Catal. Birds Mus. E. I. C. ii. p. 593.

Buceros malayanus, apud Lord A. Hay, Madras Journ. xiii. pt. 2. p. 151.

QUAY QUAY, Malays (Cantor).

Male and female obtained at Malacca.

Plumage in the presumed *male* glossy-greenish black, including the chin and throat, which, and the underparts, are less glossy ; head adorned with a broad yellowish-white superciliary coronal circle ; tips of the four outer tail-feathers yellowish-white ; space round the eyes and basal angle of lower mandible naked, and in the dry specimen yellowish. Presumed *female* as in male, excepting that the superciliary circle is represented by obscure silvery-greyish. Bill and casque blackish, "and in the young," says Mr. Blyth, "white,

the form of the casque is low, thinly compressed towards the front, and abruptly truncate anteriorly, with a longitudinal ridge on each side in old birds, occasioning a broad shallow groove above and another below it. Length about 29 inches; of wing $11\frac{3}{4}$ inches; tail to tip of middle feathers 13 inches; to tip of outer feather $10\frac{1}{2}$ inches; bill from gape $4\frac{3}{4}$ inches; length of casque 3 inches; height from chin to top of casque $2\frac{1}{2}$ inches.

Mr. A. R. Wallace states, in a letter from Singapore (Ann. Nat. Hist. Feb. 1855), that "*B. nigrirostris* is the female of *B. malayanus*, Raffles; I satisfied myself of this fact from the dissection of about a dozen specimens shot off the same tree."

The bill and casque of *B. malayanus* are allied in form to the corresponding parts of *H. albirostris* and *H. convexus*, Temm; and that of *H. nigrirostris* to that of the next species.

We have described these birds as *male* and *female* on the authority of Dr. Cantor.

133. ANORRHINUS GALERITUS.

Buceros galeritus, Temm. Pl. Col. 520.

Hydrocissa galerita, Bonap. Consp. Gen. Av. p. 90.

Anorrhinus galeritus, Reichenbach, Syst. Av. (1849); Moore, Catal. Birds Mus. E. I. C. ii. p. 594.

Buceros carinatus, Blyth, J. A. S. Beng. xiv. p. 187 (1845), xvi. p. 996.

QUAY QUAY, Malays (Cantor).

Colour green-glossed black, with the basal two-thirds of the tail drab-coloured, the wing-feathers slightly margined paler: head fully crested, composed of broad longish feathers. Throat naked, or merely showing two single rows of ill-developed feathers along the middle. Bill and casque black in the one sex, which seems always to have the abdominal region pale; in the other yellowish-white, with black along the summit of the casque nearly to the end, and also occupying the basal two-thirds of the lower mandible, and the tomæ of the upper one, and, according to Dr. Cantor's MS. notes, the "iris vandyke-brown; naked space round the eyes, and pouch black. Feet greenish-grey." The casque is low, and with a keel-shaped ridge, sloping off to the front.

"In a young specimen," remarks Mr. Blyth, "the plumage is quite similar to that of the adult, but has no trace of casque, and the bill is nigrescent with a whitish ridge and tip."

Several specimens obtained at Malacca.

134. BERENICORNIS COMATUS.

Buceros comatus, Raffles, Trans. Linn. Soc. xiii. p. 339 (1822); Schlegel et Müller, Verh. Naturl. Gesch. Aves, p. 29. t. 4; Temm. Text. de Pl. Col.; Hay, Madras Journ. xiii. pt. 2. p. 149; Blyth, J. A. S. Beng. xvi. p. 996. t. 44. f. 2 ♀.

Berenicornis comatus, Bonap. C. G. Av. p. 91; Moore, Catal. Birds Mus. E. I. C. ii. p. 594.

Buceros lugubris, Begbie, Ann. Nat. Hist. xvii. p. 405.

A single specimen of the female obtained at Malacca.

In this species the adult males have the finely plumed head, neck, breast, abdomen, tail, and tips of the wings pure white; the remainder being black, a little tinged with brown upon the back: whereas the females have the neck, breast, and abdomen, also black. Raffles described the young male only with "back, wings, and tail, of a dark brown; the belly of the same colour, mixed with white; and the wing- and tail-feathers all tipped with white at their points." Colour of the beak and casque dusky, the former laterally whitish towards its base. Throat moderately well feathered.

Size rather large, intermediate to *B. pica* and *B. rhinoceros*, with proportionally long and broad cuneated tail.

Inhabits the Malayan Peninsula and Sumatra.

135. RHYTICEROS PLICATUS.

Buceros plicatus, Lath. Ind. Orn. i. p. 146 (Levaillant, Ois. d'Afr. t. 239 ♂).

Rhyticeros plicatus, Reichenbach, Syst. Av. (1849); Moore, Catal. Birds Mus. E. I. C. ii. p. 598.

Calao plicatus, Bonap. C. G. Av. p. 90.

Buceros obscurus, Gmelin.

Buceros undulatus, Shaw (Levaill. Ois. d'Am. et Ind. t. 20, 21 ♀); Horsfield, Trans. Linn. Soc. xiii. p. 175.

Buceros javanicus, Shaw (Levaill. Ois. d'Am. et Ind. t. 22, jun.).

Buceros javanus et niger, Vieillot.

Buceros annulatus, Drapiez.

Buceros pusaran, Raffles, Trans. Linn. Soc. xiii. p. 293; Blyth, J. A. S. Beng. xii. p. 990; xvi. p. 998.

Wreathed Hornbill, Lath. Syn. i. p. 358.

Adult and young male and female obtained at Pinang.

"Male with the medial part of the crown and the whole occiput and nape dark rufous bay, or deep marronne, and the sides of the head and neck, with the front of the latter glistening yellowish-white; all the other parts are greenish-glossed black, except the tail, which is buffy-white. Bill yellowish-white, the basal portion of both mandibles dark reddish-brown laterally, with a series of narrow transverse, whitish ridges, nearly similar to those of *Rhyticeros cassidix*; the casque is scarcely elevated above the outline of the rest of the upper mandible, but is broad and flat above, having a series of narrow transverse plaits, the intervals between which are nearly filled up with a brownish substance, so that the profile is almost even, and towards the front is quite so. Length above 3 feet; of wing 19 inches; tail $10\frac{1}{2}$ inches; bill to gape $7\frac{1}{2}$ inches, and with casque 3 inches high, the latter nearly 2 inches broad."

"The female has the head and neck also black, and is smaller in size. In the full-grown young, the lateral ridges of the bill do not appear," remarks Mr. Blyth, "till after three or four corrugations are exhibited on the casque, prior to which the bill much resembles that of *B. nipalensis* Hodgs., of corresponding age, except that the bulge in place of the casque is more decided."

Dr. Cantor states that "the male has the bill [yellowish] white. Iris pale crimson. Gular pouch rich gamboge yellow. Feet blackish, and the female has the iris narrow, golden round the pupil, the rest golden vandyke. Eyelids brick-colour. Pouch dirty azure, with two transverse black lines. Feet blackish-grey. The young male has the iris mother o'pearl colour. Bill yellow at the point, and bluish-green at the base. Space round the eyes and pouch yellow, with the transverse black bars indistinct. Feet bluish-black."

Inhabits Sylhet, Arracan, Tenasserim Provinces, Malayan Peninsula, and Sumatra. The Rev. J. Barbe states (J. A. S. Beng. x. p. 922) that "both this species and *R. subruficollis*, Blyth, are very common in the Tenasserim provinces, associating in flocks of a dozen or twenty birds, but the two species do not mingle in the same flock."

R. subruficollis Blyth, J. A. S. Beng. 1843, p. 177, may be distinguished from *R. plicatus* by its much inferior size, though, the wings and tail being proportionally longer, the difference in actual admeasurements is not great, though that of the weight would be considerable; the casque is also much more elevate and highly convex, instead of being flattened above; there are also no lateral transverse ridges at the basal part of the mandibles. "In the living bird," says the Rev. J. Barbe, "the naked skin of the throat and around the eyes is of a beautiful blue, instead of yellow, as in *R. plicatus*." Length about 32 inches; of wing $16\frac{1}{2}$ inches; tail $9\frac{1}{2}$ inches; bill to gape $6\frac{3}{8}$ inches, and with its casque nearly 3 inches high, of which the latter occupies a full inch; it is also broad behind, becoming gradually narrower to the point, whereas that of *R. plicatus* is much more uniform in its breadth throughout.

136. PSITTINUS MALACCENSIS.

Psittacus malaccensis, Lath.* Ind. Orn. i. p. 130 (1790); Swains. Zool. Ill. t. 154.

Psittinus malaccensis, Blyth, J. A. S. Beng. xi. p. 789 (1842); Moore, Catal. Birds Mus. E. I. C. ii. p. 608.

Psittacus incertus, Shaw, Nat. Misc. t. 769.

Agapornis azureus (Temm.), Bonap. C. G. Av. p. 6.

Psittacula reticulata, Lesson.

TANA, Malays.

Male: crown, rump, and upper tail-coverts bright purplish smalt-blue, passing into greyish on the nape, and then to greyish-dusky on the back; under-parts yellowish-olivaceous, the medial portion being tinged with brownish-ruddy, and edged with bluish; lower tail-coverts yellowish-green, tipped with blue; tibial plumes mingled blue and green; uropygials deep green; and the rest of the tail-feathers yellow, more or less green-edged; wing-feathers deep green, margined with yellowish on the coverts, except those of the primaries, secondaries, tertiaries, speculars, and shoulder, which are bluish or

* But not of Gmelin.

purple; extreme edge of shoulder yellowish-green; wing-spot marrone, and the coverts underneath the wing and axillaries crimson.

Female: crown greenish-marrone, on the forehead lighter and bluish, passing on the nape to the deep green of the back; the blue of the rump and upper tail-coverts is tinged with bright green; sides of face intermixed yellowish-marrone; throat greenish-yellow; underparts light-green; wing, wing-spot, under wing-coverts, and axillaries as in male.

Young: lighter green, yellowish beneath, and more broadly margined with yellow on the wings; forehead and rump bluish; upper tail-coverts bright green; wing-spot, under wing-coverts, and axillaries as in adults.

The upper mandible in the male is bright coral-red, paler at the tip; the under mandible dusky, in female lighter; in the young yellowish-white; and, according to Dr. Cantor's notes, "has the inner ring of the iris greenish, outer ring pale yellow; feet dark green."

From Pinang.

137. *PALÆORNIS TORQUATUS*.

Psittaca torquata, Brisson (Lear, Psitt. t. 33).

From Pinang.

138. *PALÆORNIS LONGICAUDA*.

Psittacus longicaudus, Boddært, Tabl. des Pl. Enl. d'Aub. p. 53 (1783); Gould, Birds of Asia, 1858, plate.

Psittacus malaccensis, Gmelin.

Pal. erythrogenys, Lesson (nec Blyth, nec Fraser).

Adult and young from Pinang and Malacca.

The young has the plumage yellowish-green, darkest on the crown, and palest beneath; a still darker green moustachial streak; space before the eye, slightly above, broadly beneath, and on lower part of ear-covert ferruginous, intermixed with greenish-yellow; upper part of ear-covert green, slightly tinged with verditer; wings above yellowish-green, and having the primaries, secondaries, portion of tertiaries, and speculars indigo-blue on their outer webs, and the three former narrowly edged with yellow; under wing-coverts and axillaries green; rump bluish-green, upper tail-coverts yellowish-green; tail above green, tinged with indigo-blue, and edged with yellowish-green, beneath dusky golden-yellowish; upper mandible red, pale at tip; under mandible also pale.

Length 8 inches, of wing $5\frac{3}{8}$ inches; tail 3 inches, its outermost feather 1 inch less; tarsus $\frac{7}{10}$ inch; outer fore-toe $\frac{8}{10}$ inch; ditto with claw $1\frac{1}{8}$ inch.

139. *PALÆORNIS CANICEPS*.

Palæornis caniceps, Blyth, J. A. S. Beng. pp. 23, 51, 368 (1846); id. xix. p. 233; Moore, Catal. Birds Mus. E. I. C. ii. p. 621; Gould, Birds of Asia, 1857, plate.

Male : general colour vivid yellowish-green, with the winglet and base of the secondaries indigo-blue, and the medial portion of the secondaries inclining to emerald-green ; primaries black, the longest tinged with indigo towards the base ; cap grey ; a broad black frontal band, continued to the eyes, and a broad black moustache, with some black feathers also on the throat ; above the moustache, between it and the frontal band, the feathers are of the same grey colour as those of the crown ; tail green above, with some blue on its middle feathers, and dull golden-yellowish below ; upper mandible coral-red, tip white ; lower mandible black. The *female* differs in having the head less pure grey, and the bill is wholly black, and the primaries dull black, margined with dark grass-green. Length of female about 20 inches, of which the middle tail-feathers occupy $9\frac{1}{2}$; of wing 7 inches.

The female has the "iris golden-yellow ; bill black ; feet blackish-grey."—*Cantor's Notes*.

A single female from Pinang, being the only example that has as yet been brought to Europe. Inhabits also the Nicobar Islands.

140. LORICULUS GALGULUS.

Psittacus galgulus, Linn. (Pl. Enl. 190 ; Edw. B. t. 293. f. 2).

SEREN-DAK, Sindada, Malacca.

From Malacca.

141. EOS RUBRA.

Psittacus rubra, Gmel. S. N. i. p. 335 (Pl. Enl. 519 ; Edw. B. t. 173 ; Le Vaill. Perr. t. 93, 94).

Locality not stated.

142. MEGALAIMA CHRYSOPOGON.

Bucco chrysopogon, Temm. Pl. Col. 285.

Malacca.

143. MEGALAIMA VERSICOLOR.

Bucco versicolor, Raffles, Trans. Linn. Soc. xiii. p. 284 (1822).

Bucco rafflesii, Lesson, Rev. Zool. (1839) p. 137.

TAKOOR, Malays.

From Pinang and Malacca.

144. MEGALAIMA MYSTACOPHANOS.

Bucco mystacophanos, Temm. Pl. Col. 315.

Bucco quadricolor, Eyton, P. Z. S. 1839, p. 105.

TAKOOR CAPATA CUNING, Malays.

From Malacca.

145. MEGALAIMA INDICA.

Bucco indicus, Lath. Ind. Orn. i. p. 205 (1790).

Megalaima philippensis auctorum.

Bucco rafflesius, Boie (nec Lesson).

CHANDA, Malays of Sumatra (Raffles).

From Keddah and Province Wellesley, Malacca.

146. MEGALAIMA DUVAUCELLI.

Bucco duvaucelli, Lesson, Tr. d'Orn. p. 164 (1831).

Bucco trimaculatus, Gray, Zool. Misc. (1832) p. 3. t. 3.

Bucco frontalis, Temm. Pl. Col. 536. f. 1; Guérin, Icon. Règ. Anim. Aves, t. 34.

Bucco australis apud Raffles.

Bucco cyanotis, Blyth, J. A. S. Beng. (1847) p. 465, variety.

TANDA or TANHAK, Malays.

Adult and young from Malacca.

Inhabits the Malayan peninsula, Sumatra, with a variety in Arracan, and Tenasserim, having the ear-coverts of the same verditer-blue as the throat, and the crimson spots much weaker.

147. MEGALORHYNCHUS HAYI.

Bucco hayi, J. E. Gray, Zool. Misc. p. 33 (1832).

Micropogon fuliginosus, Temm. Text. de Pl. Col.

Megalorhynchus spinosus, Eyton, P. Z. S. 1839, p. 106.

Bucco lathamii apud Raffles.

ARIKO BERINE, Malays (Eyton).

UNKOT BESEA, Pinang (Dr. Cantor).

Malacca.

148. HEMICERCUS CONCRETUS.

Picus concretus, Reinwardt, Temm. Pl. Col. 90. f. 1, 2.

Dendrocopus sordidus, Eyton, Ann. Nat. Hist. xvi. p. 229.

Picus hartlaubii, Malherbe, MS. Mus. Ind. House.

Malacca.

149. REINWARDTIPICUS VALIDUS.

Picus validus, (Reinwardt) Wagler, Syst. Av. Pic. sp. 13 (1827); Temm. Pl. Col. 378 ♂, 402 ♀.

Adult and young from Malacca.

150. MULLERIPICUS PULVERULENTUS.

♂ *Picus pulverulentus*, Temm. Pl. Col. 389; Less. Tr. d'Orn. p. 222.

♀ *Picus machloti*, Wagler, Syst. Av. Pict. sp. 4 (1827).

♂ *Picus javensis* (♀, nec ♂), Horsfield, Trans. Linn. Soc. xiii. p. 176.

♂ *Picus horsfieldii* (♀, nec ♂), Wagler, Syst. Av. Pic. sp. 5. Pinang.

"Bill, iris, and feet blackish."—Cantor's Notes.

151. MULLERIPICUS JAVENSIS.

Picus javensis (♂, nec ♀), Horsfield, Trans. Linn. Soc. xiii. p. 175 (1821).

Picus leucogaster, Reinwardt, Temm. Pl. Col. 501.

Picus horsfieldii (♂, nec ♀), Wagler.

Picus crawfordii, J. E. Gray, Griff. An. Kingd. Aves, ii. p. 513, fig.
GULATOH, Malays.
Malacca.

152. *CHRYSOCOLAPTES SULTANEUS*.

Picus sultaneus, Hodgson, J. A. S. Beng. vi. p. 105 (1837).

Picus strenuus (Gould), McClelland, P. Z. S. 1839, p. 165.

Picus strictus apud Jerdon et Blyth.

From Pinang.

Also inhabits India generally, chiefly the hill-forests, being rare in the plains; also Assam, Bootan, Sylhet, Arracan, Tenasserim, and Malayan peninsula southward as far as Malacca.

153. *CHRYSONOTUS INTERMEDIUS*.

Tiga intermedia, Blyth, J. A. S. Beng. xiv. p. 193 (1845).

Picus Tiga apud J. E. Gray, Ill. Ind. Zool. i. t. 30. f. 2.

From Pinang.

Intermediate in size between *C. shorei*, Vig., and *C. tiga*, Horsf. Common also in Nepal, Assam, Sylhet, Tipperah, Arracan, Tenasserim, and Southern India.

154. *CHRYSONOTUS (?) RAFFLESII*.

Picus rafflesii, Vigors, App. Memoir, Raffles, p. 669 (1829); Strickl. P. Z. S. 1846, p. 103.

Picus labarum, Lesson.

Tiga amictus, G. R. Gray, Gen. of B. ii. p. 441.

Malacca. Also inhabits Sumatra.

155. *VENILIA PUNICEA*.

Picus puniceus, Horsf. Trans. Linn. Soc. xiii. p. 170 (1827); Temm. Pl. Col. 423.

Malacca.

The figure in Temminck's Pl. Col. is that of the male bird, the female differing only in the absence of the crimson whiskers. Inhabits the Tenasserim provinces, Malayan peninsula, Sumatra, and Java.

156. *VENILIA MINIATA*.

Picus miniatus, Forster, Ind. Zool. p. 14. t. 4; J. E. Gray, Ill. Ind. Zool. i. t. 30. f. 1.

Picus malaccensis, Lath. Ind. Orn. i. p. 241.

GLATO MERRA, Malays.

Malacca.

157. *VENILIA MENTALIS*.

Picus mentalis, Temm. Pl. Col. 384.

Picus gularis, Wagler, Syst. Av. Pict. sp. 89 (1827).

Malacca.

158. VENILIA MELANOASTRA.

Picus melanogaster, Hay, Madras Journ. Lit. & Sci. xiii. pt. 2. p. 153 (1844).

Picus rubiginosus, Eyton, Ann. N. H. 1845, p. 229.

GLATO GADING, Malays (Cantor).

Malacca.

159. MICROPTERNUS BADIUS.

Picus badius, Raffles, Trans. Linn. Soc. xiii. p. 289 (1821).

Picus brachyurus, Vieill. Nat. Dict. xxvi. p. 103.

Picus phæopus, Malherbe, MS. Mus. Ind. House.

GLATO AHBOS, Malays.

Malacca.

"Iris, bill, and feet black."—*Cantor's Notes*.

160. MEIGLYPTES TRISTIS.

Picus tristis, Horsf. Trans. Linn. Soc. xiii. p. 177 (1821).

Picus poecilophus, Temm. Pl. Col. 197. f. 1.

GLATO BAWAN, Malays.

Pinang and Malacca.

161. MEIGLYPTES BRUNNEUS.

Hemicercus brunneus, Eyton, P. Z. S. 1839, p. 106.

GLATO ETAM, Malays.

Malacca.

162. PICUS MOLUCCENSIS.

Picus moluccensis, Gmel. S. N. i. p. 439 (Pl. Enl. 748. f. 2).

Tripsurus auritus, Eyton, Ann. N. H. 1845, p. 229.

Malacca. Inhabits the Malayan peninsula, Sumatra, and Java.

As compared with the Indian species (*P. variegatus*, Wagl. figured in Gray's Ill. Ind. Zool.), this has rather larger bill and feet; the crown is darker coloured, passing to blackish, or deeply infuscated, on the occiput and median line of nape; the wings are shorter, and there is a difference in the barring of the tail-feathers, and in the form of the tips of the more outer ones, which in the Indian bird are more rounded, or somewhat truncated, with a slight emargination at the tip of the shaft; while in the Malayan bird they attenuate, and are obtusely pointed; the white bars also assume more the appearance of transverse bands in the Malayan species, and of separated round spots in the Indian, while the outermost feather is in the former tipped with white, and the penultimate has an all but terminal white bar, both these feathers in the Indian bird being broadly black-tipped, with a more interrupted white bar above.

163. CENTROPUS VIRIDIS.

Cuculus viridis, Scopoli, Del. Flor. et Faun. Insub. (1786).

Cuculus bengalensis, Gmel. S. N. i. p. 412 (1788).

Centropus affinis ♂ et *C. lepidus* ♀, Horsf. Trans. Linn. Soc. xiii. p. 180.

Pinang and Malacca.

164. *PHENICOPHAUS CURVIROSTRIS*.

Cuculus curvirostris, Shaw, Nat. Misc. t. 905.

KADO BESAR, Malays.

Malacca. A common species at Malacca.

165. *ZANCLOSTOMUS JAVANICUS*.

Phenicophaus javanicus, Horsf. Trans. Linn. Soc. xiii. p. 178 ;
id. Zool. Res. in Java, t. 57.

KAKA APIE, Malays.

Malacca.

166. *ZANCLOSTOMUS SUMATRANUS*.

Cuculus sumatranus, Raffles, Trans. Linn. Soc. xiii. p. 287 (1821).

Phenicophaus crawfordii, J. E. Gray, Zool. Misc. p. 3. t. 2 (1832).

Malacca.

167. *ZANCLOSTOMUS DIARDI*.

Melias diardi, Lesson, Tr. d'Orn. (1831) p. 132.

CADOW KACHIE, Malays.

Malacca.

168. *RHINORTHA CHLOROPHÆA*.

♀ *Cuculus chlorophæus*, Raffles, Trans. Linn. Soc. xiii. p. 288 (1821).

♂ *Rhinorthis caniceps*, Vigors.

♀ *Coccyzus badius*, J. E. Gray, Zool. Misc. p. 3. t. 1 (1832).

♀ *Phenicophaus viridirostris*, Eyton, P. Z. S. 1839, p. 105.

SLAYA, SEE-SAYA, Malays.

Pinang and Malacca.

169. *POLYPHASIA MERULINA*.

Cuculus merulinus, Scopoli, Del. Flor. et Faun. Insub. (1786) ;
Sonnerat's Voy. t. 81.

Cuculus flavus, Gmel. (Pl. Enl. 814).

Pinang.

"Iris pale lake-colour ; legs pale orange."—Cantor's Notes.

170. *POLYPHASIA TENUIROSTRIS*.

Cuculus tenuirostris, J. E. Gray, Ill. Ind. Zool. ii. t. 34. f. 1 (1833).

Pinang.

171. *POLYPHASIA SONNERATI*.

Cuculus sonneratii, Lath. Ind. Orn. i. p. 215 (1790).

Cuculus pravata, Horsf. Trans. Linn. Soc. xiii. p. 179.

Cuculus venustus, Jerdon, Madras Journ. Lit. et Sc. xiii. pt. 2.
p. 140.

Malacca.

172. COCCYSTES COROMANDUS.

Cuculus coromandus, Linn. S. N. i. p. 171 (Pl. Enl. 274. f. 1).

Cuculus collaris, Vieillot (Le Vaill. Ois. d'Afr. t. 213).

Red-winged Crested Cuckoo.

Pinang.

173. SURNICULUS LUGUBRIS.

Cuculus lugubris, Horsfield (Zool. Res. in Java, t. 58).

Cuculus albopunctatus, Drapiez.

Malayan Drongo-Cuckoo.

Malacca.

174. HIEROCOCCYX VARIUS.

Cuculus varius, Vahl (Strickland, Ann. N. H. xviii. p. 399).

Cuculus fugax, Horsfield, Trans. Linn. Soc. xiii. p. 178 (1821).

Cuculus lathamii, J. E. Gray, Ill. Ind. Zool. ii. t. 34. f. 2.

C. nasicolor, Hodgs. J. A. S. Beng. xii. p. 943.

Malacca.

175. ? CUCULUS STRIATUS.

Cuculus striatus, Drapiez, Dict. Class. d'Hist. Nat.

Cuculus micropterus, Gould, P. Z. S. 1837, p. 137.

Young specimens, Malacca.

176. CHRYSOCOCCYX MALAYANUS.

Cuculus malayanus, Raffles, Trans. Linn. Soc. xiii. p. 286 (1821).

Cuculus lucidus apud Temm. Pl. Col. t. 102. f. 1.

Malacca.

177. EUDYNAMYS ORIENTALIS (Linn.).

Adult and young, Malacca.

178. HARPACTES DUVAUCELI.

Trogon duvaucelii, Temm. Pl. Col. 291 ; Gould, Monogr. Trog. pl. 32.

Trogon rutilus, Vieill. Nouv. Dict. d'Hist. Nat. 2nd ed. viii. p. 313 ;
Le Vaill. Hist. Nat. des Cour. t. 14.

Harpactes duvauceli, Gould, Birds of Asia, 1859.

Trogon kasumba (jun.), Raffles.

RAMGUBA, Malays.

Malacca (*Cantor*).

Male : head and throat jet black ; breast, under-surface, rump, and upper tail-coverts fine scarlet ; back reddish cinnamon brown ; wings black, coverts and secondaries crossed by numerous white lines ; primaries margined basally externally with white ; two medial rectrices dark cinnamon brown, tip with black ; the two next blackish-brown ; the three outer being blackish-brown at the base, and largely tip with white. Female differs in having the head dark-brown ; back dark cinnamon-brown, lighter and suffused with scarlet on the

rump and upper tail-coverts ; wing-coverts crossed with ochreous lines ; under surface orange-brown, washed with scarlet on the abdomen and under tail-coverts.

179. *HARPACTES KASUMBA*.

Trogon kasumba (adult), Raffles, Trans. Linn. Soc. xiii. p. 282 (1821).

Trogon fasciatus, Temm. Pl. Col. 321.

Trogon temminckii, Gould, Monogr. Trog. t. 29.

Harpactes kasumba, Gould, Birds of Asia, 1856.

BURONG KASUMBA, Malays.
Malacca.

180. *HARPACTES DIARDI*.

Trogon diardi. Temm. Pl. Col. 541.

Harpactes diardi, Gould, Monogr. Trog. t. 30.
Malacca.

181. *ARACHNOTHERA FLAVIGASTRA*.

Anthreptes flavigaster, Eyton, P. Z. S. 1839, p. 105.

Arachnothera flavigaster, Blyth, J. A. S. Beng. xii. p. 981 ; xiv. p. 557 ; xv. p. 43.

Arachnoraphis flavigaster, Reichenbach (1854).

CHICHAP RIMBA, Malays (Eyton).

COLEECHAP PANGONE, Malays (Blyth).

CHRECHUP BASAR, Malacca.

From Malacca.

Length about 8 inches ; of wing 4 ; tail 2 ; bill to forehead $1\frac{3}{4}$; and tarse $\frac{7}{8}$ ths.

182. *ARACHNOTHERA CHRYSOGENYS*.

Arachnothera chrysogenys, Temm. Pl. Col. 388. f. 1 (1826).

Arachnothera flavigenis, Swains. Classif. of B. ii. p. 329 (1837).

Certhia longirostra, apud Horsfield, Trans. Linn. Soc. xiii. p. 167.

PRIT-ANDUN, Java (Horsf.).

SIAP JANTUNG, Sumatra (Raffles).

Remark.—*A. chrysogenys* and *A. flavigaster* are allied, but the former is much less in size, and the latter has a broad circle of yellow feathers surrounding the eye, in addition to the ear-tuft ; whereas *A. chrysogenys* is naked under the eye, and has a semicircle of yellow feathers above it.

183. *ARACHNOTHERA MODESTA*.

Anthreptes modesta, Eyton, P. Z. S. 1839, p. 105.

Arachnothera modesta, Blyth, J. A. S. Beng. xii. p. 981.

Arachnothera latirostris, Blyth, J. A. S. Beng. xii. p. 982 (1843).

CHICHAP NIO, Malays (Eyton).

Upper-parts bright yellowish olive-green, the lower pale ashy-green, and obscurely striated ; lower tail-coverts tipped with whitish ;

tail with a subterminal dusky band, all but the medial two pairs having a well-defined pure white spot near the extremity of the outer web, successively larger to the outermost. Bill dusky-brown, pale below. Feet yellowish. Length 6 inches; of wing $2\frac{7}{8}$; middle rectrices $1\frac{3}{4}$ inch, the outermost above $\frac{3}{8}$ less; bill to forehead $1\frac{1}{4}$ inch; tarse $\frac{5}{8}$ inch.

Malacca.

184. *ÆTHOPYGA SIPARAJA*.

♂ *Certhia siparaja*, Raffles, Trans. Linn. Soc. xiii. p. 299 (1822); Vigors, Mem. Raffles, p. 673.

Nectarinia siparaja, Jardine, Nat. Libr. Nect. pp. 235, 273.

Nectarinia mystacalis, Temm. Pl. Col. 126. f. 3 ♂; Müller, Verh. Naturl. Gesch. Ned. Ind. Zool. Aves, p. 54. pl. 9. f. 1 ♀.

♂ *Nectarinia lathamii*, Jardine, Nat. Libr. Nect. pp. 233, 268 (1842).

SIPA-RAJA, Sumatra (Raffles).

Sir Stamford Raffles in his description of this species evidently omitted describing the rump as *yellow*. This I find is the case upon examining a typical drawing from his collection, and also specimens before me from Pinang.

Jardine's description of *N. lathamii* certainly agrees with this species, both in the colour of the crown, and deep yellow of the rump, and in the gradation of the tail-feathers; but I have still some doubt about Temminck's *N. mystacalis*.

Pinang.

185. *ANTHREPTES MALACCENSIS*.

Certhia malaccensis, Scopoli, Del. Floræ et Faunæ Insub. (1786); Sonn. Voy. pl. 116. f. 1.

Anthothreptes malaccensis, Cabanis, Catal. B. Mus. Heine, p. 104.

Certhia lepida, Sparrman, Mus. Carls. pl. 35 (1787).

Nectarinia lepida, Temm. Pl. Col. 126. f. 1, 2.

Nectarinia javanica, Horsf. Trans. Linn. Soc. xiii. p. 167 (1820).

Cinnyricinclá javanica, Reichenbach (1854).

PRIT-GANTIL, Java (Horsf.).

From Malacca and Pinang.

Inhabits the Burmese and Malay countries, Java, Sumatra, Borneo, and Macassar (Wallace).

186. *ANTHREPTES HYPOGRAMMICA*.

♂ *Nectarinia hypogrammica*, Müller, Verh. Nat. Gesch. Ned. Ind. Zool. Aves, p. 63. pl. 8. f. 3 (1839-44).

♀ *Anthreptes macularia*, Blyth, J. A. S. Beng. xi. p. 107 (1842).

♂ *Anthreptes nuchalis*, Blyth, J. A. S. Beng. xii. p. 980 (1843).

Hypogramma nuchalis, Reichenbach (1854).

Upper parts rich dark olive-green; the tail dusky, its outer feathers successively more broadly margined with whitish, chiefly on their inner webs; base of hind-neck and the upper tail-coverts (of the male only) brilliant steel-blue; under-parts streaky, each

feather being broadly marked with dark olive-green along the middle, and laterally margined with pale sulphur-yellow, brightest on the belly. Bill dusky-brown. Legs leaden-colour. Length about $5\frac{1}{2}$ inches; of wing $2\frac{5}{8}$; tail $1\frac{7}{8}$; bill to forehead above $\frac{3}{4}$; and but little curved; and tarse $\frac{5}{8}$ inch.

From Pinang.

Inhabits the Malayan Peninsula, Sumatra, Borneo.

187. CYRTOSTOMUS FLAMMAXILLARIS.

Nectarinia flammaxillaris, Blyth, J. A. S. Beng. xiv. p. 557 (1845); xv. p. 370.

Nectarinia jugularis apud Blyth, J. A. S. Beng. xii. p. 979.

Male. Colour of the upper-parts dull olive-green, brightening a little on the rump; beneath moderately bright chrome-yellow; and the axillary tuft intense yellow, with flame-colour anteriorly; throat and front of neck very dark glossy purple, margined laterally and at the gorget with bright steel-purple, below which is a narrow cross-band of dark red.

Female. Colours similar, except in wanting the axillary tuft, and having the throat and fore-neck yellow, like the rest of the lower-parts. Tail blackish, its outermost feathers tipped with pure white, this successively decreasing in quantity on the two or three next.

Length $4\frac{1}{8}$; wing $2\frac{1}{8}$; tail $1\frac{5}{8}$; bill to forehead $\frac{5}{8}$; tarse $\frac{1}{2}$ inch.

A presumed young male has the chin and middle of neck to breast dark glossy purple, with a few steel-blue feathers laterally from the chin, the sides of the neck from base of bill being yellow; no flame-coloured axillary tuft.

From Pinang. Also inhabits Arracan and Tenasserim.

188. LEPTOCOMA HASSELLTI.

Nectarinia hasseltii, Temminck, Pl. Col. 376. f. 3; Jardine, Nat. Libr. Nect. pp. 218, 262. pl. 22; Müller et Schlegel, Verh. Nat. Gesch. Zool. Aves, p. 59. pl. 10. f. 5 ♀.

Leptocoma hasselti, Cabanis, Catal. B. Mus. Heine, p. 104.

Certhia brasiliiana, Shaw, Zool. viii. p. 257.

Certhia sperata apud Raffles, Trans. Linn. Soc. xiii. p. 298.

Nectarinia phayrei, Blyth, J. A. S. Beng. xii. p. 1008 (1843).

CHIRICHT, CHECHAP SEU SIAP, Sumatra (Raffles).

Male. Crown brilliant golden-green; cheeks, sides and back of neck, interscapularies, and wings, deep black; tail also black, but richly glossed with purple; scapularies, rump, and upper tail-coverts brilliant steel-blue; throat and fore-neck splendid amethystine-purple; breast and flanks anteriorly rich dark red, posteriorly with the vent and under tail-coverts dull greyish-black.

Female. Upper-parts including the shoulder and upper tail-coverts dull olive-green; crown tinged with grey; wings dusky-black, the larger range of wing-coverts margined with grey, the primaries with cinnamon-yellow; tail blue-black; cheeks, throat,

and breast, dull greenish-yellow ; abdomen and under tail-coverts pale yellow, the abdomen more or less tinged with dark chrome-yellow. Length $3\frac{3}{4}$ inches ; wing $1\frac{7}{8}$ inch ; tail $1\frac{1}{4}$ inch ; bill to forehead $\frac{1}{2}$ inch.

Obtained plentifully at Pinang and Malacca. Also inhabits Borneo, Sumatra, Tenasserim, and Arracan.

189. CHALCOPARIA PHÆNICOTIS.

Nectarinia phænicotis, Temm. Pl. Col. 108. f. 1 ♂. 388 ; f. 2 ♀ (182).

Anthreptes phænicotis, Blyth, J. A. S. Beng. xii. p. 979 (1843) ; xiv. p. 557.

Nectarinia cingalensis, Gray, Gen. of B. i. p. 99.

Chalcoparia cingalensis, Cabanis, Catal. B. Mus. Heine, p. 103.

? *Motacilla cingalensis*, Gmel. S. N. i. p. 964 (Brown's Ill. pl. 32).

Male. Upper-parts glossy bronzed-green, including the crown and wing-coverts ; upper tail coverts glossy-green, without the bronzing ; rest of the wings and tail dusky, the latter margined exteriorly with shining-green, and the secondaries and tertiaries with faint purple ; throat, fore-neck, and breast, light-ferruginous ; the rest of the under-parts bright yellow ; ear-coverts amethystine, passing into ruby-red on the sides of the neck, and separated from the hue of the throat by a stripe of glossy purple ; bill dull black ; legs greenish.

Female. Upper-parts glossless olive-green, tinged with grey ; throat and breast as in male, but paler ; under-parts dull greenish-yellow ; wings and tail margined with aureous-green. The young resemble the female, except in the more downy texture of their feathers, and the chestnut colour of the throat and breast is reduced to a slight tinge.

Male, female, and young from Malacca.

Inhabits the Burmese and Malay countries.

190. PRIONOCHILUS PERCUSSUS.

Pipra percussa, Temminck, Pl. Col. 394. f. 2.

Prionochilus percussus, Strickl. P. Z. S. 1841, p. 29.

Dicaeum ignicapillum, Eyton, P. Z. S. 1839, p. 105.

NALOW, Malays (Eyton).

Adult male. Upper parts dull lavender-blue, the lower parts bright yellow, passing to whitish on the lower tail-coverts ; a large igneous-red spot on the vertex, and another along the centre of the breast ; a white streak from the side of lower mandible, divided from the yellow of the throat by another of lavender-blue. Primaries narrowly margined with pale lavender-blue, secondaries with olive-green, and the tertiaries with dull lavender-blue. Bill black above, more or less whitish beneath, legs lead-coloured.

Young male. Upper-parts as in adult, but intermixed throughout with olive-green, igneous spot on vertex smaller and less bright ;

wings margined with olive-green ; white streak from lower mandible and under-parts paler and duller coloured, the igneous spot smaller.

Female. Olive-green above, paler and more yellowish below, with pale yellow along the throat, and darker yellow along the breast ; streak from bill whitish. Coronal spot igneous-yellow. In both sexes the axillaries and under wing-coverts are pure white.

Length about $3\frac{1}{2}$ inches ; wing 2 to $2\frac{1}{4}$ inches ; tail $1\frac{1}{4}$ inch ; bill to gape $\frac{5}{12}$; and tarse $\frac{1}{2}$ inch.

Pinang and Malacca. Common.

191. PRIONOCHILUS MACULATUS.

Pardalotus maculatus, Temm. Pl. Col. 600. f. 3.

Prionochilus maculatus, Strickl. P. Z. S. 1841, p. 29.

Adult. Upper-parts olive-green, the igneous coronal spot pale ; lores dull whitish ; a whitish streak from base of lower mandible separating another of olive-green from the yellowish-white of the middle of the throat ; under-parts yellow, brightest along the middle, and streaked laterally with olive-green. Axillaries and under wing-coverts pure white. Size of *P. percussus*.

From Pinang and Malacca. Also inhabits Borneo.

192. BUTRERON CAPELLII.

Columba capellei, Temm. Pl. Col. 143 ; Knip. et Prev. Fig. t. 38.

Vinago capellei, Cuv. Règ. Anim. i. p. 492 (1829).

Toria capellei, Blyth, J. A. S. Beng. xiv. p. 848.

Vinago giganteus, Vigors, Zool. App. Mem. Raffles, p. 674.

Treron magnirostris, Strickland, Ann. Nat. Hist. 1844, p. 115.

Butreron capellii, Bonap. C. G. Av. ii. p. 9.

From Pinang.

In this species the beak is lengthened by the prolongation of its soft and tumid basal portion, becoming, as remarked by Mr. Strickland, "almost vulturine in form."

Iris blackish-brown ; bill pale yellow ; feet pale orange.—*Cantor, MS. Note.*

193. TRERON NIPALENSIS.

Toria nipalensis, Hodgson, Asiatic Res. xix. p. 164. t. 9, fig. (1836) ;

Blyth, J. A. S. Beng. xiv. p. 847.

THORIA (*i. e.* beaked), Nepal (Hodgson).

KROCHA, Malays (Blyth).

POONAI CAHIO-ARA, Malacca (Cantor).

Green, yellowish beneath and towards the tail ; crown ash-coloured ; mantle of the male, deep marrone-red, and a faint tinge of fulvous on the breast ; primaries and their larger coverts black, the latter margined with yellow ; middle tail-feathers green, the rest with a blackish medial band, and broad grey tips ; lower tail-coverts cinnamon-coloured (more or less deep) in the male ; subdued white, marked with green in the female. Bill greenish-white, with a large vermilion spot occupying the membrane at the lateral base of the

mandibles; legs also vermilion; irides deep red-brown, with a blue inner circle; orbital skin bright green.

Length $10\frac{3}{4}$ by 17 inches; closed wing $5\frac{3}{4}$ inches.

Inhabits the central and lower hilly regions of Nepal, and more abundantly those of Assam, and Arracan, spreading southwards to the Tenasserim Provinces and Malayan Peninsula. It also occurs, says Mr. Blyth, in the hilly districts of Bengal, but rarely strays into the plains, though specimens are occasionally met with even near Calcutta.

194. OSMOTRERON VIRIDIS.

Columba viridis, Scopoli, Del. Flor. et Faun. Insub. p. 94 (1786); Pl. Enl. 138; Sonn. Voy. t. 64, 65.

Columba vernans, Gmel. Syst. Nat. i. p. 789 (1788); Horsfield, Raffles.

Treron vernans, Blyth, J. A. S. Beng. xiv. p. 851; Mosley et Dillwyn, Nat. Hist. Labuan, p. 30.

Osmotreron vernans, Bonap. C. G. Av. ii. p. 12.

Col. purpurea, Gmel. (Brown's Ill. pl. 18).

KATE ♂, JOWAN ♀, Java (Horsf.).

POONAI CROCHI, Malays (Eyton).

POUYE, Malays (Blyth).

Malacca and Pinang. Common.

195. OSMOTRERON OLAX.

♂ *Columba olax*, Temm. Pl. Col. 241; Knip, et Prev. Fig. t. 12.

Osmotreron olax, Bonap. C. G. Av. ii. p. 15.

SEMBOAN, Malays.

Malacca.

Male. The whole head, nape, throat, flanks, rump, and upper tail-coverts ash-colour, palest on the forehead and throat; mantle very dark maroon; wings black, the larger coverts margined with yellow; tail ashy-black, each feather, except the two medial, with a pale tip; breast with a buff-orange patch, passing to green along the middle of the abdomen; tarsal plumes, vent, and under tail-coverts dark cinnamon, mingled on the former with ashy.

Female. Differs in having the forehead and crown only ash coloured; the upper parts being dark green, and the medial rectrices above wholly green, with the two next also greenish basally along the outer web; throat pale ashy, passing to yellowish-green on the breast and middle of abdomen, the sides of the latter, below the ashy flanks, being dark green; tarsal plumes, vent, and under tail-coverts cinnamon-white, mingled on the two former with dark green, the latter dusky along the shafts.

Length about 8 inches, of wing 5 inches, tail 3 inches.

196. RAMPHICULUS JAMBU.

Columba jambu, Gmel. S. N. i. p. 784 (1788); Temm. Fig. t. 27, 28; Raffles, Trans. Linn. Soc. xiii. p. 316.

No. 413.—PROCEEDINGS OF THE ZOOLOGICAL SOCIETY.

POONAI JAMBOO, Sumatra (Marsden ; Raffles).

POONAI GADING, Malays (Eyton ; Cantor).

From Pinang and Malacca.

Adult male. Head deep crimson, this colour extending from the front to the middle of the crown, behind the eyes, and across the ear-coverts to lower part of the throat ; a cinnamon-black stripe down the throat ; hind part of the head, nape, and whole upper parts dark green, but with a buffy caste of plumage ; primaries black, their outer webs dark greenish ; secondaries and tips of primaries narrowly margined exteriorly with buffy-white ; tail green, exterior feathers with the inner webs black, the whole with a broad pale terminal band ; hind part of ear-coverts, sides, and front of neck pure white, passing to buffy-white along the sides of the breast and whole of abdomen, the middle of the breast being of a beautiful suffused-pink colour ; flanks and axillaries greyish-green ; under tail-coverts deep cinnamon.

Female. Wholly green, with the crimson of the head and gular stripe very dull and pale ; abdomen mingled green and buff ; under tail-coverts paler.

Young male. Head and sides of throat greyish-green, gular stripe dark cinnamon ; breast mingled green and pink ; abdomen and under tail-coverts buff-white.

A still younger specimen is like the female, but has no trace of crimson about the head ; the throat being pale cinnamon-brown.

Length of adult about 9 inches ; of wing $5\frac{1}{2}$; tail $3\frac{1}{2}$ inches.

197. CARPOPHAGA SYLVATICA.

Columba sylvatica, Tickell, Journ. As. Soc. Beng. ii. p. 581 (1833).

Carpophaga sylvatica, Blyth, Journ. A. S. Beng. xiv. p. 856 ; Ann. N. H. xix. p. 52 ; Bonap. C. G. Av. p. 33 ; G. R. Gray, List of Columb. Brit. Mus. p. 17.

Carpophaga ænea of India, Auctorum.

Pinang.

"Iris and tarsus palpebrarum and feet crimson ; bill pale crimson, apex light grey."

198. MYRISTICIVORA BICOLOR.

Columba bicolor, Scop. Del. Flor. et Faun. Ins. p. 94 (1786) ; Sonn. Voy. t. 103.

Myristicivora bicolor, Reichenbach, Bonap. C. G. Av. ii. p. 36.

Carpophaga myristicivora (Scop.), G. R. Gray.

Columba alba, Gmelin.

Columba litoralis, Temm. Fig. t. 7.

"Iris blackish-brown. Tarsus palpebrarum cobalt. Bill cobalt, apex of mandibles black. Feet cobalt."

Province of Wellesley.

199. GEOPELIA STRIATA.

Columba striata, Linn. S. N. i. p. 282 (1767) ; Edw. Birds, pl. 16.

Columba malaccensis, Gmelin.

Columba bantamensis, Sparrman, Mus. Carls. iii. t. 67; Horsfield et Raffles.

KATITIRAN, Sumatrans (Raffles).
Pinang.

200. CHALCOPHAPS INDICA.

Columba indica, Linn. S. N. i. p. 284 (1767); Edw. B. pl. 14.

Columba javanica, Gmel. S. N. i. p. 781; Horsfield, Trans. Linn. Soc. xiii. p. 183; Raffles, id. p. 317.

Columba cæruleocephala, Gmel.

Columba superciliaris, Wagler, Syst. Av. Col. sp. 80.

Monornis perpulchra, Hodgson.

Chalcophaps augusta, Bonap. C. G. Av. ii. p. 92.

TAKOAT et POONAI TANNA, Malays.

From Pinang and Malacca. Identical with Indian and Javanese specimens.

"Iris dark brown; bill light scarlet; feet pale lake."—*Cantor's Notes*.

201. TURTUR TIGRINUS.

Columba tigrina, Temm. Fig. t. 43 (1808); Horsf. Trans. Linn. Soc. xiii. p. 183.

Turtur tigrinus, Blyth, Journ. As. Soc. Beng. xxiv. pp. 263, 480.

Turtur chinensis (pt.), Bonap. Consp. Gen. Av. ii. p. 63; G. R. Gray, List of Columbæ, Brit. Mus. p. 42.

DERO seu DERKUKU, Java (Horsfield).

Adult and young.

Specimens procured at Pinang and Malacca.

"This species resembles *T. suratensis*," says Mr. Blyth, "but wants the pale vinaceous spots on the scapularies and wings, whilst it retains the black mesial streaks, which are wanting in *T. chinensis*, Scop. (Sonn. Voy. t. 102): there is also much less ash-colour on the wings than in *T. suratensis*, but it is of the same size as the latter, or much smaller than *T. chinensis* (which last has also deep ash-coloured lower tail-coverts)."

5. REMARKS ON THE HABITS OF A HERRING GULL (*LARUS ARGENTATUS*). BY A. D. BARTLETT.

In calling attention to the singular and remarkable habits of a bird of this species, permit me to give an extract from the 'Garden Guide' of 1852, in order that the origin of this individual specimen may be perfectly known.

"In the beginning of June 1850, a Herring Gull (*Larus argentatus*) hatched out her young ones in the enclosure (No. 17), which is overshadowed by two weeping ash trees. The male bird had assisted her so constantly in incubation, that his strength gave way,

and he died just as the young birds were chipping out of the shell. The female then became restless, left the eggs, and was only induced to resume her place for the few hours which were necessary to complete the hatch by the keeper having arranged the dead body of her mate in counterfeit presentment of the position he generally took up near her when not himself upon the eggs."—*Extract from 'Garden Guide,' 1852*

It will, I hope, be understood that the birds so hatched in 1850 were the parents of the individual whose habits I now wish to record.

This bird was one of two hatched about the latter end of May 1857, and was reared by its parents in the gardens, where it remained during the summer and autumn of that year. At the commencement of the winter he was in the habit of flying about (not having been pinioned), and occasionally staying away a *day* or *two*, then *for a week or more*, returning again generally about feeding-time, and alighting among the other gulls and feeding with them. This continued till the end of March 1858, at which time he disappeared. Nothing more was seen or heard of him until the middle of November 1858, when, to the delight and astonishment of all who knew him, he returned one afternoon at the usual time. *Meeting the keeper with the box of food, he followed him* to the enclosure where he was hatched, and settling down among the other gulls, took his dinner as though he had never been away, not appearing the *least shy or wild*. Here he remained with his parents and the other gulls, occasionally flying off for a *day* or *two*, until the beginning of February 1859.

He again departed and by many was given up for lost; others, however, thought he might again return. And on the morning of *Saturday last, between eight and nine o'clock*, we were gratified to behold the long-lost Gull making his way to his old quarters much improved in his appearance, having nearly completed his adult plumage. He immediately came down and was greeted by his old friends, who evidently recognized him. He *appeared fatigued and hungry*: I sent for some food, and he came boldly towards us, and fed almost from the hand. As soon as his appetite was satisfied, he walked about, quite at home among the other gulls. Since Saturday I have seen him flying now and then over the Gardens and Park, but returning after a short flight.

In conclusion, I beg to say I am indebted to one of the Society's most careful and very intelligent keepers (B. Misselbrook) for some of the facts which have enabled me to bring before you these very interesting particulars.

6. ON THE MOST EFFICIENT MEANS OF PRESERVING THE EGGS OF BIRDS IN ORDER THAT THEY MAY BE AFTERWARDS HATCHED. BY A. D. BARTLETT.

I believe there are but few persons who are quite satisfied by seeing and examining the dried skins and feathers of birds.

The great desire, therefore, to see, or to possess, in a living state,

these wonderful and generally beautiful creatures, has led me to consider the possibility of preserving their eggs for a sufficiently long period to allow of their being brought from distant places and afterwards hatched. We might thus be able to obtain some of the more delicate species, and many perhaps that a long sea voyage would prevent our obtaining by any other means.

The mere keeping fresh and sweet the eggs of birds has been accomplished in many ways : for instance, they will keep for a long period imbedded in lime and water, or in fat or salt ; but by these means the vitality is destroyed. It appears to me, therefore, to be essentially necessary, not only to prevent evaporation, but also to keep the texture and surface of the shell in its pure and perfect condition. To accomplish this object the eggs must be newly laid, or nearly so, and the following is the best method of preserving them.

Obtain the gut of any animal whose intestine is large enough to admit the egg intended to be preserved, and, having carefully cleaned the gut and rendered it free from fat, dry it as much as possible in powdered chalk or other earthy matter. Pass the egg into the gut, tying it close to the shell at both ends of the egg, and hang it up in a *cool, dry place* until it is quite dry. Two, three, or more eggs can be tied in the same gut like a string of beads, or they can be tied separately. When thoroughly dry, they may be packed up in a box with oats, wheat, or any *other dry grain or seeds*, until the box is quite full. The object in having the box full is for the great convenience of turning the eggs. This is accomplished by turning the box bottom upwards, which should be done occasionally. Thus the whole of the eggs may be effectually turned with very little trouble. The eggs thus packed must be kept in a dry, cool place, and ought not to be taken out or unpacked before the means are at hand for hatching them. Upon wishing to place them under a hen, or otherwise, if the dry gut be cut with a sharp knife, it will peel off without in any way injuring the shell of the egg.

I was successful in hatching and rearing the young from some eggs kept three months in this manner, and I have no doubt that under favourable circumstances they may be kept for a longer period.

7. ON THE REPTILES AND FISHES COLLECTED BY THE REV. H. B. TRISTRAM IN NORTHERN AFRICA. BY DR. A. GÜNTHER, FOR. MEMB. ZOOLOGICAL SOCIETY.

(Pisces, Pl. IX.)

A small collection of Reptiles and Fishes, made by the Rev. H. B. Tristram in the Desert, southwards of Algeria and Tunis, and kindly forwarded by him for my examination, has served to give valuable information on the southward extent of several known species, and proves to contain two others new to science. The collection is composed of twelve Reptiles and two Fishes, most of the species being represented by several specimens.

REPTILIA.

- | | |
|------------------------------------|----------------------------------|
| 1. <i>Chamaeleo vulgaris</i> . | 7. <i>Scincus officinalis</i> . |
| 2. <i>Tarentola mauritanica</i> . | 8. <i>Gongylus ocellatus</i> . |
| 3. <i>Uromastix spinipes</i> . | 9. <i>Seps tridactylus</i> . |
| 4. <i>Agama colonorum</i> . | 10. <i>Coronella cucullata</i> . |
| 5. <i>Lacerta ocellata</i> . | 11. <i>Rana esculenta</i> . |
| 6. <i>Zootoca deserti</i> , n. sp. | 12. <i>Bufo viridis</i> . |

PISCES.

1. *Haligenes trisrami*, n. sp. 2. *Cyprinodon dispar*.

I first proceed to give descriptions of the new species.

ZOOTOCA DESERTI, Gthr.

Diagnosis.—The posterior portion of the vertical shield very narrow, the width of the interorbital space being one-third only of that of the superciliary plate. Twelve longitudinal series of rhombic ventral shields. Above greenish-blue, reticulated with black.

Hab. N'Goussa, oasis between Waregla and the M'zab Country, Southern Sahara.

Description.—This species may be readily distinguished from all the other *Lacertæ* and *Zootocæ* by its very narrow interorbital space. 1. The rostral is obtusely conical. 2. The nostril is formed by three plates: the superior nasal, which forms a suture with its fellow behind the rostral, the first upper labial, and a single small posterior nasal. 3. There are three frontal plates, a single anterior one, six-sided, broader than long, with a longitudinal impression, and a pair of posterior ones. 4. The vertical is cuneiform, its anterior portion being broadest, with a longitudinal impression; it tapers posteriorly, and is very narrow between the orbits. 5. The occipital region is covered by two pairs of plates, one pair behind the other; there is a small plate in the centre of their meeting angles; the plates of the anterior pair are triangular, those of the posterior quadrangular. 6. The roof of the orbit is formed by a pair of semi-elliptical superciliaries, in front of which is a small triangular plate; the orbital margin itself is bordered by two series of very small scales. 7. One loreal and one ante-orbital, the latter being bent on the upper surface of the head, but not reaching to the vertical. The lower eyelid is opaque and covered by very minute scales. There is a long, low, triangular plate below the eye (suborbital), interrupting the series of the upper labials. 8. Four upper labials before, and four much smaller ones behind the sub-orbital. 9. Six lower labials; the chin-shields are arranged as usually in the species of this genus, without showing any peculiarity. 10. The upper portion of the cheeks is granular, like the back; the lower is covered with small plates.

The collar-fold is shallow, and formed by scales of moderate size; a very indistinct groove reaches from one ear to the other across the throat. The upper and lateral parts of the extremities and of the body are granular; the ventral shields are nearly regular rhombs and arranged in twelve longitudinal series. The space between the

symphysis and the vent is covered by rhombic scales, the medial series of which contains the largest, the posterior being as large as one of the ventral shields. The series of femoral pores meet at a right angle.

The fore-leg reaches to the extremity of the snout, if laid forwards, —the hind-leg nearly to the ear.

The ground-colour is bluish-green, the upper parts being reticulated with black ; whitish spots appear on the hind-legs ; the lower side white.

	inches.	lines.
Total length	4	3
Distance between the extremity of the snout and the tympanum	0	5
Distance between the tympanum and the vent ..	1	3
Length of the tail	2	7
—— of the fore-leg	0	7½
—— of the hind-leg	1	0½

HALIGENES, Gthr.

Body compressed, rather elevated, covered with cycloid scales of moderate size ; cheeks and opercles scaly ; lateral line interrupted. One dorsal with fourteen spines ; the anal with three. Each jaw with a series of teeth, compressed and notched at the top ; a second series of smaller ones in the upper jaw, separated from the anterior by a groove ; no teeth on the palate. The lower pharyngeal bone triangular, with cardiform teeth. Branchiostegals five ; air-bladder present.

This form belongs to the family *Chromidæ*, and may be distinguished from *Chromis* and *Hemichromis*, Peters, by the teeth, from *Sarotherodon*, Rüpp., by the scaliness of the opercles and by the teeth, from *Glyphisodon* by the lateral line, &c.

HALIGENES TRISTRAMI, Gthr. (Pl. IX. fig. B.)

Diagnosis.—B. 5. D. $\frac{14}{12}$. A. $\frac{3}{9}$. V. 1/5. L. lat. 28. L. trans. 3/11. Body greenish, with seven or eight dark vertical bars ; an ovate black spot behind the last dorsal spine.

Hab. Salt Lake and ditches of Tuggurt, Eastern Sahara.

Description.—The body is compressed, of semielliptical form, its greatest height, above the root of the ventral, being $3\frac{1}{2}$ in the total length. The profile of the nape of the neck is curved, that of the head straight, obliquely descending downwards. The profile of the back is a slight curve, that of the belly nearly straight. The length of the head is $3\frac{2}{3}$ in the total. It is covered with scales, except on the snout, and on the præorbital, and on the præopercular margin. The snout is rather short, somewhat longer than the diameter of the eye. The mouth is slightly oblique, with the jaws equal anteriorly, and with the upper maxillary reaching to the vertical from the anterior margin of the eye. There is one nostril only on each side, situated midway between the eye and the extremity of the snout. The eye is placed high up the side, but it does not interfere with the upper

profile ; the length of its diameter is $4\frac{1}{4}$ in that of the head, and less than the width of the infraorbital space, which is flat. The præoperculum is much higher than wide, with the posterior margin vertical and with the inferior and the angle rounded. The margins are entirely smooth, and there are no scales between them and the fleshy portion of the cheeks. The operculum and suboperculum are covered with large scales ; the former is rounded posteriorly, the latter has a shallow notch before the root of the pectoral.

The *dorsal* fin begins in the vertical from the base of the pectoral and terminates in that from the twenty-second scale of the lateral line. The upper margin is nearly straight, the soft portion, however, being elevated ; it is entirely scaleless. The spines are of moderate strength ; they increase in length from the first to the last, the length of which is one-half that of the head. The membrane between them emits a short filament behind every one. The anterior rays continue to increase in length to the sixth, which forms the highest portion of the fin, its length being four-fifths that of the head. The following rays become rapidly shorter. The *caudal* is subtruncated and covered with small scales at the base ; its length is one fifth of the total. The *anal* begins in the vertical from the second dorsal ray, and terminates very little before the dorsal ; the margin of its soft portion is rounded ; it is, like the dorsal, entirely scaleless ; the spines are stronger than those of the dorsal ; the third is the longest, its length being $2\frac{1}{2}$ in that of the head. Of the rays, the third and fourth are the longest, two-thirds the length of the head. The *pectoral* is composed of fifteen rays, pointed, rather elongate, and reaching to the second anal spine. The *ventrals* are inserted somewhat behind the pectorals, and reach to the vent ; their spine is of moderate length and strength.

The *scales* are cycloid, rather higher than wide ; one of the largest covers two-thirds of the orbit. The lateral line originates in the scapular region, and runs from hence parallel to the dorsal line ; it approaches the end of the dorsal, where it ends. The posterior part of the lateral line commences in the vertical from the third dorsal ray, there being four longitudinal series above it, and runs straight along the middle of the tail.

Both the jaws are armed with a series of *teeth*, slightly compressed at the tip, and distinctly notched ; the tips are of brown colour. A second series is separated from the first by a groove, in which the mandibular series is received. This second series is formed by very small teeth, similar to the others. The palate and the tongue are toothless. The lower pharyngeal bone is single, triangular, and armed with small cardiform teeth.

There are four gills, a slit behind the fourth. Pseudobranchiae none.

The *ground-colour* is greenish, shining silvery on the sides, and on the belly. The body is crossed by four, the tail by three darker bands ; there is another band across the neck, and a narrower one between the orbits ; a dark streak between the eye and the posterior extremity of the operculum. The vertical fins are transparent, with indistinct, dark, oblique streaks ; an ovate black spot behind the base

of the last spine. The pectorals are colourless, with blackish root; ventrals blackish.

	inches.	lines.
Total length	5	2
Height of the body	1	7
Length of the head	1	5
Diameter of the eye	0	4
Length of the last dorsal spine	0	8½
—— of the sixth dorsal ray	1	1
—— of the caudal	1	1
—— of the third anal	0	7
—— of the fourth anal ray	0	11
—— of the pectoral	1	3
—— of the ventral	0	11
—— of a large scale	0	2¾
Height of a large scale	0	3

The intestines are not in a good state of preservation; they make many convolutions; if there is a pyloric appendage, it must be a single one. The air-bladder is bifurcate anteriorly, each lobe being continued to the skull. The development of the organs of reproduction shows the maturity of the specimens.

The "belief" has been expressed that "the Algerian mammals and reptiles are entirely distinct from those of the opposite coast*." Now, in the first place, naturalists never ought to "believe," especially when it is easy to find the necessary information by personal examination or by consulting authorities on the subject. A single glance at any of the herpetological accounts of Algeria would have awakened considerable doubts in the mind of the reviewer of Mr. Bree's 'Birds of Europe;' for, as far as I am aware, every Herpetologist's opinion on the matter, *gained from facts*, has been, and is, that the main body of the reptiles all round the shores of the Mediterranean is entirely the same. So, for the information of those who are not well acquainted with the geographical distribution of reptiles, I add the following notes, which show that even of the species collected by Mr. Tristram in more southern parts of the Sahara than those which were visited by previous naturalists, not less than seven are found on the European side, namely:—

Chamaeleo vulgaris, in Sicily and Spain, to 38° lat. N.

Tarentola mauritanica, *Lacerta ocellata*, *Seps tridactylus*, in the islands and peninsulas of the Mediterranean and in the South of France, to 43° lat. N.

Gongylus ocellatus, islands of the Mediterranean (Spain?), to 42° lat. N.

Rana esculenta, Europe; Northern Asia to 60° lat. N.

Bufo viridis, Europe to Denmark and Sweden, to 60° lat. N.

Thus, by means of Mr. Tristram's collection, our knowledge has advanced one step further, as it is proved that the European Amphibio-fauna extends beyond the Atlas towards the heart of the Desert.

* In the 'Ibis,' a Magazine of General Ornithology, vol. i. pp. 93, 156, 157.

I, at least, am not able to point out any difference of the slightest importance between European, Cis-Atlantean, and Trans-Atlantean specimens in any single species. But, supposing there were persons who had the hardiness to distinguish specifically these animals, what other result would be gained for science than that of the existence of two series of species (one north, the other south of the Mediterranean), so extremely similar, that, except from knowing the locality, nobody could make them out? No peculiarity in the feature of the North African fauna would be expressed by it, and North Africa would continue to belong *zoologically*, and not merely *ornithologically*, to the Palæarctic Region. No other fact proves this so well as that of the presence of Tailed Batrachians in these countries.

If we ask for the boundary between the Faunas of the Palæarctic and Æthiopian Regions, it is like the water-shed between the systems of two rivers: tributaries of the one extend far within the reach of the other. Nevertheless, we must draw such a line, and, the reptiles collected by Mr. Tristram being identical with those north of the Atlas, it cannot be found in the tract of those mountains, but it must be transferred into the Desert itself*. Probably the Æthiopian fauna penetrates into the Desert from the South, similarly as the European from the North; and some future attempt at a general account of the fauna of the Sahara may be drawn up according to the three categories:—

1. Animals generically and specifically belonging to the Palæarctic Fauna.

2. Animals generically and specifically belonging to the Æthiopian Fauna.

3. Animals generically peculiar to the desert.

The new genus of fishes described above appears to belong to the latter category. It is remarkable from its habitat in ditches the water of which is impregnated with the salt of the desert. The fishes most closely allied to it live in the seas round the coasts of Africa, viz. *Chromis* in the Mediterranean, *Sarotherodon* and *Hemichromis* on the coast of Guinea, *Glyphisodon* in the tropical seas of the west and east. To judge from the description, we find a similar fish, though certainly different, perhaps a *Chromis*, indicated by Lacépède (Hist. Nat. Poiss. iv. p. 161), with the name of *Sparus desfontainii*. It is said to be found in the warm springs of Cafsa near Tunis, the water of which has a temperature of 30° R., and does not contain mineral ingredients. He states further that the same species is found in ordinary fresh water also at Tozzer. This would be not improbable. The other fish, *Cyprinodon dispar*, found by Mr. Tristram in the hot springs of Sidi Ohkbar, with a temperature of 80° F., and by Dr. Rüppell† in those of Tor (27° R.), lives also in ordinary fresh waters of the oases of Egypt, of Abyssinia, and Syria‡. This is a viviparous fish.

* Cfr. Wallace in 'Ibis,' 1859, p. 449.

† Rüppell, Atlas Fische, p. 66 (*Lebias dispar*).

‡ Cuv. et Val. xviii. p. 161 (*Cyprinodon lunatus* and *moseas*).

8. NOTES ON THE REPTILES AND FISHES OF THE SAHARA.
BY THE REV. H. B. TRISTRAM, F.L.S.

UROMASTIX SPINIPES, "*Ed D'Abb*," Arab.

Long since described by Freytag, "*Lacerta Libyca seu Arabica*, genus distinctiore corpore et cauda, eademque esculenta, et ob carnem delicatorem expetita."

It also attracted the notice of Leo Africanus, who gives a long and somewhat tedious account of its habits (vol. i. p. 307), mingling some Arab fables with his own observations.

It is found throughout the whole of the Algerian and Tunisian Sahara, but is most common in the south, living either in holes of the rocks, or in burrows of its own in the sand. I have seen specimens measuring 2 feet in length. Its colour during life is grass-green (of a darker hue in the young, but very bright in the adult), spotted with brown, and paler under the belly. When provoked and irritated the adult's bright hue becomes rapidly darker. It is a very inoffensive creature, and moves very slowly and awkwardly, with the gait attributed to the crocodile, and turns its head from side to side with great caution as it walks. Its tail forms its weapon of defence, and it uses it with effect on any pursuer. It seldom bites, but when it does, nothing will induce it to relinquish its grasp. It is almost impossible to force its mouth open. It never drinks. The Arabs believe that water is certain death to it.

It is frequently kept in confinement for fattening among the Beni M'zab, who consider it very good eating. I found it really very palatable when stewed, not unlike tender chicken. I kept several for some time, and one in particular, which became familiar and showed attachment to those whom it recognized. I also saw one kept in an artillery barrack in Algiers, who recognized his owner's voice, and would come to him, climb up his body, and nestle on his shoulder. It appears to be neither strictly nocturnal nor diurnal in its habits, but mine always basked in the morning sun, and retired to sleep in the shade about noon. I have often watched my special pet asleep both by day and night, with his nose and fore feet resting against the wall, his hind-feet hanging down, and the tail stiffened, supporting the body, which was nearly perpendicular to the floor.

The D'Abb has no cry, and, as far as I could observe, lives on friendly terms with individuals of the same species. The Arabs declare that it is a match for the Horned Viper (*Cerastes*), which often enters its holes, but soon has its vertebræ dislocated by the vigorous blows of the D'Abb's prickly tail.

My specimen fed generally on insects, and was an adept at catching flies, but it would also eat several plants, and among these *Pegatum harmala*, and *Tragopogon crocifolius*, which seemed its favourite vegetable.

SCINCUS OFFICINALIS, "*H'out el ber*," "Land-fish," Arab. "*Cherchiman*," "*Choromcham*," Berber, are the collective names.

The male is distinguished in Arabia as "*Zanarout*," the female as

"*Zelgaga*." The male is decidedly larger than the female, and has its shoulders and sides covered with blackish spots, while the female is of a uniform sand colour. I never observed it among rocks or elsewhere than in the sands of the Sahara, in some parts of which it literally swarms. It hibernates under ground through the winter, when it can easily be dug out of its holes. In summer it may constantly be seen basking in the sun, and attracting attention by the glittering of its bright scales. I have also frequently observed it by moonlight. When alarmed, it wriggles for a moment and disappears beneath the sand with a magical rapidity.

Its food appears to consist exclusively of beetles, ants, and other insects, and the Arabs state that it often devours even scorpions.

It is a very favourite article both of diet and medicine, and in many of the oases, as Waregla and Touat, its capture is the occupation of a considerable portion of the population. Fried fresh with *ghee*, it is by no means an unsavoury dish, as I can vouch from experience, but I cannot say as much for the paste into which it is usually made up. The Arabs skin and dry it in large quantities, then pound it very fine in a mortar, after which it is mixed with a mass of stoned dates, and compressed very tightly in skin-bags, when it keeps fresh for months, and is a not unimportant article of commerce with the Touat Caravans, and with the Chambâa of Metlili.

CHAMÆLEO VULGARIS.

Occurs generally among the Tamarisk trees of the Weds, and is more abundant in the north than in the south of the Sahara. It may often be observed hanging motionless by its tail from a topmost bough. I frequently kept them alive for some time, when they fed themselves on mosquitoes; but the cold of the Tell proved fatal, sooner or later, to all my specimens.

LACERTA OCELLATA, "*H' Ardoun and Boulién*," Arabic.

In habits and resorts like our common Lizard. I have watched it climb trees and attack the nest of *Aëdon galactodes*.

SEPS TRIDACTYLUS.

Does not occur in the sand, but only among vegetation. I never observed it take refuge in holes or under ground, but only among the roots of grass or rushes. It moves with great rapidity, twisting itself more after the fashion of a serpent than a lizard. Its bite is perfectly harmless.

TARENTOLA MAURITANICA.

Resorts chiefly to the base of the cliffs in the weds and gorges of the M'zab. Though not uncommon, it is not easy to detect, covered as it usually is with the sand and *débris* of the limestone.

HALIGENES TRISTRAMI, Günther.

This fish is found in great abundance in the salt lake near

Tuggurt, and in the deep ditch which surrounds the city. The lake and ditch abound in small weeds, round the stems of which great numbers of a species of *Melania* and *Paludina nana* (?) cluster. This lake is the only one with which I am acquainted in the Eastern Sahara (except that near Waregla) that is never dry in summer. It is intensely saline, and the whole surface of the sand, for some miles round, is covered with a delicate incrustation of salt, and glitters like a vast sheet of water in the distance. As it is considerably lower than the Mediterranean, and probably the lowest depression in the whole Sahara, may not this fish be the last lingering living relic of those forms which must have swarmed in these seas during the Tertiary epoch, and before the great and gradual elevation of Northern Africa drained this ocean into the Mediterranean by the Gulf of Cades? It seems probable that this gulf between Tunis and Tripoli formed the outlet, since on this coast, for a space of near 200 miles, there is no high land between the Mediterranean and the Desert,—merely long ranges of drifting sandholes about 300 or 400 feet high,—while between Tuggurt and Souf the level of the land is calculated to be 70 feet below that of the sea.

As Lacépède has mentioned a fish of the same family, "*Sparus desfontaini*," in the springs of Cafsa, or Gafsa, not 200 miles from Tuggurt, we may reasonably anticipate that a more persevering search than I had time to make will reveal some similar inhabitant of the Wareglan lake.

The following list of additions to the Society's Menagerie by presentation and purchase during the month of November was read:—

1 Entellus Monkey	<i>Presbytes entellus</i>	India.
30 Roach.....	<i>Leuciscus rutilus</i>	England.
5 Perch	<i>Perca fluviatilis</i>	England.
3 Bleak	<i>Leuciscus alburnus</i>	England.
2 Pike	<i>Esox lucius</i>	England.
1 Egyptian Goose.....	<i>Chenalopex ægyptiacus</i>	S. Africa.
1 Ocelot	<i>Felis pardalis</i> ?	Guiana.
1 Malbrook Monkey.....	<i>Cercopithecus cynosurus</i>	W. Africa.
1 Coral Snake	<i>Oxyrrhopus trigeminus</i>	Pernambuco.
Pectens	<i>Pecten varius</i>	Tenby.
Lucernariæ.....	<i>Lucernaria auricula</i>	Tenby.
1 Striped Hyena	<i>Hyæna striata</i>	Egypt.
1 Roe Deer	<i>Cervus capreolus</i>	England.
2 Bean Geese	<i>Anser segetum</i>	England.
2 Barnacle Geese	<i>Bernicla leucopsis</i>	England.
15 Carolina Ducks	<i>Aix sponsa</i>	N. America.
1 American Bear	<i>Ursus americanus</i>	N. America.

December 13th.

Dr. Gray, V.P., in the Chair.

The following papers were read :—

1. DESCRIPTION OF A NEW SPECIES OF SQUIRREL (*SCIURUS SIAMENSIS*) FROM SIAM, IN THE COLLECTION OF THE BRITISH MUSEUM. BY DR. J. E. GRAY, F.R.S., V.P.Z.S., PRES. ENT. SOC., ETC.

Among the animals lately sent by M. Mouhot from Siam are two small Squirrels, which differ from any that we have hitherto received from India or the neighbouring countries.

I am aware that the Indian Squirrels, and indeed Squirrels generally, are very apt to vary; and probably many more species are described than exist in nature; but I do not know any species of which the one now described can with reason be considered as a variety; the two specimens in the Museum are very uniform in their general appearance.

It may be observed that some species, both of Mammalia and Birds, are so much alike in external appearance, that, judging from their skins alone, we might be inclined to doubt whether they were more than slight varieties; yet when their habits, modes of life, food, and manners are known, they are far more distinct, as species, than animals which are very different in their external appearance, and marked with what might *a priori* be considered very striking characters.

SCIURUS SIAMENSIS, sp. nov.

Bright red-brown, grizzled with elongate black tips to the longer hairs, each of which is marked with a broad subterminal yellow band. These black hairs are more abundant, and have broad pale rings on the rump outside of the thighs, and especially on the lower part of the tail, where they nearly hide the general red colour. The terminal half of the tail bright chestnut-brown, without any black hairs or pale rings. The throat, breast, belly, lower part of sides, inner side and edge of the legs, uniform bright red-brown. Ears rounded. Whiskers black. Feet covered with short close-pressed hairs.

Hab. Siam (*M. Mouhot*).

2. DESCRIPTION OF A NEW SPECIES OF FRESHWATER TORTOISE FROM SIAM. BY DR. J. EDWARD GRAY, F.R.S., V.P.Z.S., PRES. ENT. SOC., ETC.

(Reptilia, Pl. XXI.)

The British Museum has received from M. Mouhot, with some other Reptiles, two specimens of a Freshwater Tortoise, which are

decidedly different from any I have before seen. They have somewhat the external appearance, both in shape and markings of the head, of some specimens of *Cistudo amboinensis*, but belong to the genus *Emys*, or rather *Geoclemys*, and not to *Cistudo*.

They are referable to the first division of genus which has the back of the shell three-keeled, and, like the other species of that section, come from Asia.

1. *GEOCLEMYS MACROCEPHALA*.

The shell oblong, rather depressed, entire, three-keeled, olive-brown; the keels subcontinued, nearly parallel, the middle one higher and more distinct behind; the lateral ones, near the upper edge of the shields, continued, ending abruptly on the hinder edge of the third lateral discal shield; the hinder lateral and central shield only marked with a slight convexity; the margin entire, yellow-edged. The under side yellow, with black triangular spots; the sternum flat, very indistinctly keeled on the side.

Animal blackish-olive. Head large; crown flat, covered with single smooth plate, purplish-brown, with two streaks from middle of the nose, the upper edging the crown, the other the upper part of the beak, and with two streaks from the hinder edge of the orbit, the lower short and interrupted, extended on the temple, the upper broader and continued over the ear along the side of the neck; two close streaks under the nostrils to the middle of the upper jaw, and two broad streaks, dilated behind, down the front of the lower jaw, and continued on the edge of the lower jaw behind; the nape and hinder part of the side of the lower jaw covered with large flat scales; the rest of the neck and legs covered with minute granular scales; the front of the fore-legs covered with broad band-like scales; the toes of the fore- and hind-feet rather short and thick, covered above with broad band-like scales.

Hab. Siam.

The front vertebral plate is quadrangular, the front edge wider, rounded; second, third, and fourth ventral shields six-sided, the second longer than broad, the fourth broader than long; the three hinder sides are longest, the fifth vertebral shield subquadrangular, the front sides being very narrow, and the hinder side very broad and slightly truncated.

3. DESCRIPTION OF SOME NEW GENERA OF LITHOPHYTES, OR STONY ZOOPHYTES. BY DR. JOHN EDWARD GRAY, F.R.S., F.L.S., V.P.Z.S., PRES. ENT. SOC., ETC.

The Corals were formerly divided into three genera, according to the nature of their axes; viz. *Corallium* with continuous stony, *Isis* with jointed stony, and *Gorgonia* with horny axes; but many of the corals which had stony axes were referred to the last genus.

Lamouroux, in his work on 'Flexible Corals,' divided the genus

Gorgonia into three, according to the form and disposition of the cells; and, in his edition of Solander and Ellis, added a fourth under the name of *Muricea*; but still the genus *Gorgonia* was a magazine of most heterogeneous species, some closely allied to the genera which Lamouroux had established; and it is to be observed that Lamarck did not adopt the Lamourouxian genera.

Ehrenberg added another genus to the group, under the name of *Pterogorgia*; but this is synonymous with *Gorgonia* of Lamouroux, when the other genera which he describes are separated from it; and Dana seems to have felt this to be the case when he referred so many additional species to that genus.

I have in various papers added several genera to the list; and in the 'Annals and Magazine' for this month I have given an arrangement of the various published genera in a connected series.

M. Valenciennes, in his outline of the arrangement of *Gorgoniae* in the 'Comptes Rendus,' xli. p. 14. f. 18, proposed two genera:— 1. *Gorgonella* for *Gorgonia sarmentosa*, and *Verrucella* for *Gorgonia violacea*, *G. flexuosa* and *G. furcata* of Lamarck. The specimens which I have named as *G. sarmentosa* and *G. violacea* have a horny and not a calcareous axis, and in other respects do not agree with the characters that M. Valenciennes assigns to them.

Esper's figure of *G. violacea* (Gorg. t. 12) has flat, and not produced cells, which is the essential character of the genus *Verrucella*, of which it is regarded and quoted as the type. These genera must be left for further examination. M. M.-Edwards adopts them in his 'Coralliaires,' i. p. 184.

The *Lithophytes* which have a stony axis may be divided into four groups, according to the nature of the axis and the structure of the bark, these groups being subdivided into families:—

I. *Axis continuous, not jointed; bark granular.*

Fam. 1. CORALLIADÆ.

The axis solid, calcareous, not jointed. Bark granular. Cells scattered on all sides.

1. CORALLIUM.

1. C. RUBRUM, Carolini.

Hab. Mediterranean.

2. C. SECUNDUM, Dana.

Hab. Sandwich Islands.

2. HELANIA.

Coral fan-like, dichotomously branched; branchlets subacute, ascending, divaricate; lower branches sometimes inosculating. Bark granular, hard, even. Cells produced, subcylindrical, short, rather incurved, placed in two, three, or four alternating series on the sides of the branchlets. Axis hard, continued, calcareous, greyish-brown.

1. *HELIA* SPINESCENS.

Coral rather fan-like, more or less twisted; branches, especially the lower one, conical, acute, spine-like, sometimes inosculating; upper branchlet subsecund.

Hab. Philippines (*Cuming*).

Fam. 2. ELLISELLADÆ.

The axis solid, calcareous, not jointed. Bark granular. Cells on the sides of the stem and branches separated by a lateral groove.

a. *Cell more or less elongate.*

1. ELLISELLA.

Coral tree-like, subcylindrical; branches free. Cells numerous, small, crowded.

1. *E. JUNCEA.*

2. *E. ELONGATA.*

3. *E. COCCINEA.*

4. *E. PECTINATA.*

2. SCIRPEARIA.

Coral simple or forked; cells subcylindrical, in two alternating series.

* *Coral simple.*

S. MIRABILIS.

B.M.

S. mirabilis, Cuvier, Schweig. Beob. t. 2. f. 13.

Polypus mirabilis, Linn. Mus. Adolph. t. 19. f. 4.

Funiculina cylindrica, Lamk.

Hab. West Indies.

** *Coral branched, forked.*

S. DICHOTOMA.

B.M.

Coral fan-like, in a single plane, irregularly dichotomous; cells cylindrical, elongate, truncated, in a row on each side of the branches, subalternate.

Hab. Mauritius.

b. *Cells convex or sunken.*

3. UMBRACELLA.

Coral fan-shaped; branches and branchlets inosculating, netted. Cells numerous, small, lateral.

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1. *U. UMBRACULUM*, Solander, Zooph. t. 10.
2. *U. GRANULATA*, Esper, Pflanzenth. t. 4.

4. PHENILIA.

Coral tree-like; branches short, subquadrangular, divaricating, sometimes coalescing, forming an irregular netted frond; branchlet subclavate. Bark granular; lateral groove distinct, scarcely sunken. Cells large, sunken, in two or three irregular rows on each side of the branches. Axis solid, hard, calcareous, horn-coloured.

1. PHENILIA SANGUINOLENTA.

Coral yellowish; branches flexuose, intertwined; branchlets short, clavate, diverging; cells large, dark brick-red, making the coral look as if spotted with blood.

Hab. —?

Fam. 3. SUBERGORGIADE.

Coral branched; branches compressed, dichotomous. Cells on the sides of the branches, with a sunken groove on each side of the stem; bark granular. Axis continuous, cork-like, soft, calcareous.

1. SUBERGORGIA.

Subergorgia, Gray, P. Z. S. 1857, pp. 159, 288.

1. *S. SUBEROSA*, Esper, t. 49. B.M.
 2. *S. COMPRESSA*, Gray, P. Z. S. 1857, p. 288. B.M.
- (See *Gorgonia Richardi*, Lamx. Pol. Flex. 407.)

2. SOLANDERIA.

Solanderia, Duchassaing, Rev. Zool. 1846, p. 218.

"Axis continuous, of a suberose texture, resembling the non-calci-fied joints of *Melitella*."—M.-Edw.

S. GRACILIS, Duch. *loc. cit.*

Very much branched; branchlet rounded, irregular, striated; bark tomentose or granulose.

Hab. Guadeloupe.

I have not seen this coral. The *Gorgonia suberosa* of Ellis's 'Corallines,' t. 29. f. Q & R, which has been called *Plexaura suberosa* by Lamouroux, *Briareum suberosum* by Dana, and which Ellis described as having a pale red axis "of the substance of cork," striated externally and subcylindrical, "a fleshy spongy bark, with the cells on all sides disposed in a quincunx order," would appear to be allied to the family *Annelladae*: but I have not been able to discover this coral in any collection. It would indeed appear to be intermediate

between the two families, having the corky axis of *Subergorgia* and the regularly disposed cells of the *Annelladæ*. M. Milne-Edwards (Coralliaires, i. 190) thinks that it may perhaps be a *Solanderia*.

Fam. 4. ANNELLADÆ.

Coral branched; branches cylindrical, of equal diameter. Cells equally scattered on all sides of the branches; bark granular. Axis solid, calcareous, continuous.

1. ANNELLA.

Coral netted; branchlet inosculating.

Annella reticulata, Gray, P. Z. S. 1857, p. 287.

Fam. 5. PRIMNOADÆ.

Primnoadæ, Gray, P. Z. S. 1857, p. 285.

* *Cell campanulate; scales large.*

1. PRIMNOA.

Coral tree-like, forked.

† *Coral tree-like, branched.*

1. P. LEPADIFERA.

Hab. Mediterranean.

†† *Coral simple, with simple spreading branches.*

2. P. ANTARCTICA, Valenc. Voy. Venus, t. 12. f. 2.

Hab. Falkland Islands.

** *Cells tubular, incurved; scales small.*

2. PRIMNOELLA.

Primnoella, Gray, P. Z. S. 1857, p. 286.

Coral simple. Cells numerous, in close whorls, closely pressed to the stem.

P. AUSTRALASIÆ, Gray, P. Z. S. 1849, p. 146. t. 2. f. 8, 9.

The calcareous axis, described as *Virgularia australis* by Lamarck, Hist. A. S. V. ii. 648, is, I believe, the axis of this coral, or of a very nearly allied species. Seba, Thes. iii. t. 111. f. 2, to whom Lamarck refers, properly represents these axes as attached.

Hab. Australasian Sea, Bass Strait: on oyster-shells and stones.

3. CALLOGORGIA.

Coral fan-like, pinnate. Cells in whorls.

C. VERTICILLATA.

B.M.

Gorgonia verticillata, Pallas.

Gorgonia verticillans, Linn.

Primnoa verticillans, Ehrenb.

Muricea verticillans, Dana.

Cells in close whorls of three or six.

Hab. Mediterranean.

CALLOGORGIA FLABELLA.

Gorgonia verticillans, Esper, Pflanzenth. t. 42. f. 1, 2, 3.

Primnoa flabellum, Ehrenb.

Cells in close whorls of eight or ten.

Hab. Red Sea.

CALLOGORGIA PLUMATILIS, Edw. Coralliaires, 141.

Cells small, seldom more than two in a whorl.

Hab. Isle of Bourbon.

Is this *Gorgonia pluma*, Lamk.?

CALLOGORGIA GRACILIS, Edw. Coralliaires, 141.

Cells very small; whorls far apart, and generally of four cells.

Hab. West Indies.

4. MYURA.

Coral elongate, simple. Cells elongate, incurved in two rows on each side of the stem; medial groove distinct.

MYURA SIMPLEX.

Mus. Paris.

Gorgonia myura, Lamk.

Muricea myura, Dana.

Primnoa myura, Edw. Coralliaires, i. 142. t. 132, f. 3.

Coral elongate, simple, slender.

Hab. —?

II. *Axis jointed, joints swollen, porous.*

Fam. 6. MELITEADE.

Branches from the swollen joints of the stem.

* *Cells in a series on each side of the branchlets, elongate, sub-cylindrical, rather tapering.*

1. ACABARIA.

Coral fan-like, dichotomous; branches diverging. Axis solid, calcareous.

A. DIVARICATA.

Coral fan-like; branches dichotomous, diverging, very slender; the lateral branches diverging at right angles from the stem and branches; bark thin, yellow, granular. Cells produced, subcylindrical on each side of the branches, in alternating series. Axis calcareous, red, solid, longitudinally grooved; internodes swollen, spongy.

Hab. — ?

** *Cells slightly prominent, in two or more series on the sides of the branches; branches and branchlets compressed, tapering.*

2. MELITEA.

Coral fan-like, forked; branches subparallel. Cells in two or three series on the sides of the branchlets. Axis calcareous, spongy, with numerous sinuous tubes.

MELITEA OCHRACEA, Esper, Pflanzenth. t. 4 a. t. 11. f. 1, 2.

Hab. — ?

Var. 1. Bright yellow, with red cells on side of branchlets.

Var. 2. Red, with yellow cells on sides of branchlets.

The branches very rarely inosculate. The cells are small, not prominent, in two series on each side of the branchlets, leaving the inner and outer surface nearly bare and smooth. The axes of the branchlets are rather solid and calcareous, that of the stem is porous, pierced with numerous tortuous cylindrical tubes; the branchlets are moderately short.

3. MELITELLA.

Coral fan-like, forked; branches subparallel, more or less coalescing. Cells rather produced, numerous, crowded on the two sides and one surface of the branchlets. Axis solid, calcareous.

† *Branches virgate, subparallel, rarely inosculating.*

1. MELITELLA ELONGATA.

B.M.

Orange, branches virgate, subparallel, much divided; branchlets slender, elongated, compressed, sometimes inosculating; articulation of the branchlets very long, slender, compressed.

Isis ochracea, var., Esper, Pflanzenth. t. 4 a, f. 2, 4, 5 (not 3).

Melitea ochracea, var. *lutea*, Lamk.

Hab. — ?

This coral is very like *Melitea ochracea*, and has most probably been hitherto confounded with it; but it is easily distinguished from it by the cells being much more numerous and crowded, and by the solidity of the axis.

Esper's figures somewhat represent the species, but the cells are not sufficiently crowded nor numerous in figs. 4 and 5; yet some of

them are represented in the middle of the branchlet, as well as on the side, where I have never observed them in *Melitæa ochracea*.

† *Branchlets divaricated, reticulating, inosculating.*

2. MELITELLA RETIFERA.

B.M.

Melitæa retifera, Lamk.

Isis coccinea, Esper, Pflantz. t. 10.

Isis aurantia, Esper, t. 9? Cells too prominent and conical; branches diverging.

Var. ? *Melitæa textiformis*, Lam. Pol. Flex. 465. t. 19. f. 1; Esper, t. 71. f. 5.

3. MELITELLA COCCINEA, Lamk.

B.M.

Isis coccinea, Ellis, Zooph. t. 12. f. 5.

M. Rissoi, Lamk.

4. MELITELLA ? TENELLA.

Melitæa tenella, Dana, Zooph. 683.

4. MOPSELLA.

Coral tree-like, forked; branches diverging. Cells on the sides and one surface of the branches; other surface smooth. Axis calcareous, solid, longitudinally grooved.

1. MOPSELLA DICHOTOMA.

B.M.

Mopsea dichotoma, Lamx.

Isis dichotoma, Esper, Pflantz. p. 5. t. 11. f. 4, 5.

Joint short, thick, striated.

2. MOPSELLA GRACILIS.

B.M.

Coral very slender, thread-like; joint elongate, slender, pale red; articulations only slightly swollen; branches divaricating, the first rather rounded at their base.

Hab. —?

*** *Cells not prominent, scattered equally on all sides of the branches; branches cylindrical, of a nearly uniform thickness. Axis solid.*

5. CLATHRARIA.

Coral tree-like, erect; branches few, inosculating, tortuous; branchlets, some free, blunt; bark thin, granular. Cells numerous. Axis solid; joints elongate, white, longitudinal, striated; internode red, spongy.

1. CLATHRARIA RUBRINODIS.

B.M.

Hab. —?

4. DESCRIPTION OF A NEW CONCHIFEROUS MOLLUSC OF THE GENUS PANDORA. BY ARTHUR ADAMS.

PANDORA WARDIANA, A. Adams.

P. testa maxima, solida, transversim ovata, valde inæquilaterali, postice rotundata, antice subangulata: valvula dextra concava, lineis concentricis regularibus interruptis et sulcis fuscis radiantibus subdistantibus decussata: valvula sinistra convexa, sordide alba, lineis concentricis irregularibus instructa, et sulco obliquo ab umbone usque ad sinum in marginem ventralem producto.

Hab. In littoribus Mantchuriæ.

Shell large, solid, transversely oval, very inequilateral, rounded posteriorly, somewhat angulated anteriorly. Right flat valve with regular concentric fine interrupted lines, and marked with brown, radiated, rather distant grooves. Left convex valve chalky white, with irregular concentric lines of growth, and with an oblique furrow proceeding from the beak and ending in the sinuosity at the fore part of the ventral margin.

Hab. Coast of Mantchuria, 20 fathoms; Sunday Island.

I have dedicated this fine species to Commander J. Ward, of H.M.S. 'Actæon,' to whose assistance and encouragement science will be indebted for any results that may be obtained during our cruises along the coasts of Korea, Mantchuria, and Japan.

5. SYSTEMATIC LIST OF THE SPECIES OF DOLIUM RESTRICTED. BY SYLVANUS HANLEY.

The magnitude to which the *Dolia* attain has discouraged private collectors from their acquisition, so that the amount of variation permitted to each species, and the differences of aspect between young, mature, and aged individuals, have not been so satisfactorily determined as the writer could have wished. Judging, however, from *D. variegatum*, of which fine series are present in the National and Cumingian Museums, shape would seem of less importance than colouring; yet in *D. cepa*, the colouring appears diversified, and the shape comparatively invariable. It is hoped that the following list of species may clear up the somewhat confused synonymy, and attract attention to a genus which has scarcely experienced the ordinary amount of critical investigation. *D. pomum* and *D. ringens*, which constitute the subgenus *Malea*, have not been included in our list.

DOLIUM GALEA (Linnæus).

Buccinum galea, Linn. Syst. Nat.; Gmelin, Syst. Nat. p. 3469; Bruguière, Hist. Vers. p. 244 (? vars.); Bosc, Coquilles; Dillw. Desc. Cat. p. 582, probably.

Dolium costatum magnum, Martini, iii. f. 1070.

Dolium galea, Lamarck, Anim. s. Vert.; Blainv. Dict. Sc. Nat.; Kiener, Coq. Viv. Dol. pl. 2. f. 2; Phil. Mol. Sic. i. (not var.); Hanley, Young, Conch.; Reeve, Conc. Icon. Dol. f. 1. Not of Montfort.

Dolium tenue, Menke, Synopsis, p. 143 (Young).

The typical *galea* (that indicated by the synonymy) is thin in proportion to its magnitude, of a pale russet colour, with indistinct lighter and darker zones, a whitish posterior margin to its whorls, a tawny nucleus, a pale aperture, and rounded ribs, which, although alternately larger and smaller, are not, at least in the almost mature stage, so very disproportionate.

Two other forms (perchance species) require to be noticed. The one which I designate var. *tenebrosa* is stronger, and peculiarly globose, has a dark chocolate-coloured nucleus, the smaller turns of a brownish chocolate hue, and the body-whorl livid brown; the throat dark chestnut, and the internal thickened edge of its outer lip pure white. Its ribs, moreover, are more abruptly elevated; their intervals rather broader, more square-cut, and not intersected by an interstitial costella (or raised stria) upon the lower or anterior half of the body. Mr. Cuming possesses a small but exquisite example of this shell: I have elsewhere seen an adult specimen stated to have been found in the Red Sea.

The other form alluded to (possibly the *D. tenue* of Menke) is of a smaller size (that now before me is only $3\frac{1}{8}$ inches long), has the body more elongated, and combines the broad sulci and the abruptly prominent ribs and costellæ of the last variety (?) with the pale tints of the typical *galea*; its nucleus is chestnut or fulvous, its aperture whitish, its expanded outer lip thickened internally, and toothed as in an adult *galea*. Mr. Cuming has received it as from China! It reminds one much of Martini's 'Braune geribte Tonne' (iii. f. 1071), said to come from Guinea; its colouring, however, is less intense.

DOLIUM MELANOSTOMA, Jay.

Dolium melanostoma, Jay, Catalogue, p. 124. pls. 8, 9; Philippi, Neue Conch. iii. p. 11; Reeve, Conch. Icon. Dol. f. 2.

The shell figured in Reeve's beautiful work was not perfect, but is essentially the same species as that delineated by Jay. Mr. Cuming possesses a superb example, and two specimens are said to be preserved in the Guernsey Museum.

DOLIUM ZONATUM, Green.

Buccinum olearium, Linn. Syst. Nat. probably; Wood, Index Testac. pl. 22. f. 1, possibly.

Dolium olearium, Crouch, Illust. Lam. pl. 19. f. 2 (1827).

Dolium zonatum, Green, Albany Instit. i. p. 131. pl. 4 (June 1830); Reeve, Conch. Icon. Dol. f. 12.

Dolium crenulatum, Philippi, Zeitschr. Malak. 1845. p. 148; Neue Conch. iii. Dol. pl. 1. f. 1.

Although Crouch may have rightly divined the Linnean species, the Linnean definition was too obscure to ensure certainty.

DOLIUM FASCIATUM, Martini.

Dolium fasciatum, Martini, iii. p. 406. f. 1081 ; Lamarck, An. s. Vert. ; Blainv. Dict. Sc. Nat. liv. ; Kiener, Coq. Viv. Dol. pl. 3. f. 5 ; Reeve, Conch. Icon. Dol. f. 11.

Buccinum fasciatum, Bruguière, Hist. Vers, p. 247 ; Bosc., Coquilles.

Buccinum sulcosum, Dillwyn (not Born), Desc. Cat. ii. p. 584 ; Wood, Ind. Testac. pl. 22. f. 5.

DOLIUM LATESULCATUM, Martini.

Dolium latesulcatum, Martini, Conch. Cab. iii. p. 396. f. 1072, 1082.

Dolium lactescens, Schröter, Index to Martini (1788), abridged from *D. lactescens latesulcatum*, Mart. iii. p. 390.

Buccinum dolium, in part, Bruguière, Hist. Vers, p. 246.

Buccinum dolium, var. B (as *B. allium* of Solander), Dillw. Desc. Cat. ii. p. 585.

Dolium galea, Montfort, probably.

Dolium fasciatum, var., Kiener, Coq. Viv. Dol. pl. 4. f. 6.

Dolium costatum, Menke, Synopsis ; Deshayes ed. Lam. ; Reeve, Conch. Icon. Dol. f. 8.

The more characteristic examples (Martini, f. 1072) are oval and of a pearly white ; the ribs in the young are, for the most part, obsoletely tessellated ; in a rare variety (Mus. Cuming) the shape is more round than usual, the ribs subarticulately painted with fulvous brown, and their intervals, which are adorned with a single spiral tawny line, concentrically and broadly streaked with greyish purple. The suture in this variety, which I designate *picta*, is more canalliculated, and between the first two or three of the thirteen ribs which encircle the body-whorl is (as occasionally in the form *lactescens*) an additional costella.

DOLIUM CEPA, Martini.

Bulla canaliculata, Linn. Syst. Nat. ed. 10, from types ; Mus. Ulric. (Young).

Dolium cepa, Martini, Conch. Cab. iii. p. 401. pl. 117. f. 1076, 1077.

Dolium marmoreum, Schröter, Index to Mart. and Chemn.

Cadus cepa, Bolten, for Martini, f. 1076.

Buccinum olearium, Bruguière (not Linn.), Hist. Vers, p. 243 ; Bosc, Coquilles.

Dolium olearium, Lamarck, Anim. s. Vert. ; Blainv. Dict. Sc. Nat. liv. ; Hanley, Young, Conch. ; Reeve, Conch. Icon. Dol. f. 14. Not of Crouch, Sowerby's Gen. or Reeve's Conch. Syst.

Buccinum galea, Wood, Index Testac. pl. 22. f. 2, probably.

Dolium plumatum, Green, Albany Instit. i. p. 132, probably.

The fry of this well-known species proves to be the long-lost *Bulla canaliculata* of Linnæus, but, as the identity could not possibly have been discovered without an examination of the author's cabinet, the next earliest binomial appellation has been adopted. The epithet

canaliculata would, however, have been peculiarly appropriate, as it specifies an essential and distinctive feature of the species. Although generally accepted, of late, as the *olearium* of Linnæus, it was deficient, as Bruguière remarked, in the very important character of an interstitial costella between the belts. The *Buccinum olearium* of Dillwyn seems an attempt to unite the delineated features of this shell with the Linnean definition. Kiener's figures, if designed for this species, are by no means characteristic. The engraving of *D. olearium* in the 'Encyclopédie Méthodique' (pl. 403, f. 1) does not sufficiently exhibit the canaliculated sutures; yet can scarcely be intended for the allied *deshayesii*.

Reeve has figured in his 'Iconica' a very beautiful, but unusual variety, which I take to be the *D. plumatum* of Green,—a species which has indeed been referred to *perdix*, but whose described suture harmonises far better with that of the present *Dolium*; his reference to Seba (pl. 63. f. 18, instead of pl. 68. f. 16) was clearly a misprint. Green's description of *D. olearium* reminds us more of *galea* than of *cepa*.

DOLIUM DESHAYESII, Reeve.

Dolium perdix, in part, Martini, Conch. Cab. iii. f. 1080, probably.

Dolium olearium, Sowerby, Genera Shells; Reeve, Conch. System. pl. 264, f. 1.

Dolium Deshayesii, Reeve, Conch. Icon. Dol. f. 15.

There is a painting in Knorr (Del. pt. 5. pl. 12. f. 1) which may perhaps have been intended for this scarce shell. A rather irregular malleation aids us in distinguishing it from *D. cepa*.

DOLIUM FAVANNEI, Hanley, Proc. Zool. Soc. 1859.

DOLIUM DUNKERI, Hanley, Proc. Zool. Soc. 1859.

DOLIUM VARIEGATUM, Lamarck.

Dolium variegatum, Lamarck, Anim. s. Vert.; Kiener, Coq. Viv. Dol. pl. 2. f. 3 (not 3 a); Reeve, Conch. Icon. Dol. f. 7 a. Not of Philippi.

Dolium Kieneri, Philippi, Neue Conch. iii. p. 36, for Kiener, as cited.

Lamarck appears to have described the species from a young or dwarf example of the short-spined form. In fine characteristic specimens the shape is subglobose, and the basal or anterior declination abrupt; the suture is channelled; the spire not much raised, and the throat orange. A spiral riblet runs between the ribs upon the spire, and between the posterior ones of the eighteen or twenty which encircle the body.

In the younger specimens the suture is not so deeply channelled, the belts are rounder and narrower in proportion, and more of them are spotted.

In the variety *tankervillii* (the *D. variegatum* of the Tankerville collection, now in my own possession) the spire is peculiarly depressed,

the suture deeply channelled, and the peculiarly narrow intervals of the seventeen very prominent body ribs (almost every alternate one of which is spotted) are alike devoid of costellæ; the throat is rather pale. The variety *angusta* (Reeve, Conch. Icon. Dol. f. 7 *b*) is more oval, its spire is more produced, and its suture less conspicuously channelled.

DOLIUM CHINENSE, Chemnitz.

Dolium Australe, seu Chinense, Chemn. Conch. Cab. xi. f. 1804, 1805.

Buccinum Chinense, Dillw. Desc. Cat. ii. p. 585; Wood, Index Testac. pl. 22. f. 7.

Dolium variegatum, Philippi (not Lam.), Neuer Conch. iii. p. 36. Dol. pl. 3. f. 1, 2.

Dolium Chinense, Deshayes, ed. Lam. x. p. 146; Reeve, Conch. Icon. Dol. f. 10.

Dolium Australe, Mörch, Cat. Yoldi, for the species of Chemnitz.

Dillwyn appears to have preferred the second appellation of Chemnitz, to prevent confusion with the *Buccinum australe* of Gmelin.

DOLIUM CUMINGII, Hanley.

Dolium Cumingii, Hanley, in Reeve, Conch. Icon. Dol. f. 13.

DOLIUM AMPULLACEUM, Philippi.

Dolium ampullaceum, Philippi, Zeitschr. Malak. 1845, p. 147; Neue Conch. iii. p. 11. pl. 2.

The only specimen known to me of this rare shell in England is the one I acquired from the late M. Vernède's collection.

DOLIUM MACULATUM, Lamarck.

Buccinum dolium, Linn. Syst. Nat. ed. 10, chiefly (not Mus. Ulric). Not of Bruguière or Mawe.

Dolium in costis maculatum, Martini, Conch. Cab. iii. p. 397. f. 1073, 1074.

Buccinum dolium, var. B, Born, Index Mus. Cæs.

Buccinum dolium, var. A in part, Dillw. Desc. Cat. ii. p. 584.

Cadus dolium, Bolten.

Dolium maculatum, Lamarck, Anim. s. Vert.; Blainv. Dict. Sc. Nat.; Kiener, Coq. Viv. Dol. pl. 3. f. 4; Hanley, Young, Conch.; Reeve, Conch. Icon. Dol. f. 4.

The *D. maculatum* (an abbreviation of the *D. m. papyraceum* of Martini, f. 1075), indicated in Schröter's index to Martini and Chemnitz, is the fry of some other species.

From the especial notice in the 'Systema' of the remoteness of the ribs in *B. dolium*, I regard the present shell as more peculiarly the one intended by Linnæus in his earlier publication.

DOLIUM FIMBRIATUM, Sowerby.

Buccinum dolium, Linn. Mus. Ulric. (not Syst.); Mawe, Conch. pl. 24. f. 3.

Cadus cassis, Bolten, teste Mörch (wholly undefined).

Buccinum tessellatum, Bory St. Vincent (as = *maculatum*) in Encycl. Méthod. Vers, pl. 403. f. 3.

Dolium fimbriatum, Sowerby, Genera Shells; Reeve, Conch. Syst. pl. 264. f. 2; Conch. Icon. Dol. f. 3 *b* (not 3 *a*).

Dolium Minjac, Deshayes, ed. Lam. (possibly).

Although the *Minjac* of Adanson (Seneg. pl. 7. f. 6) has been usually identified with this easily distinguished species, the account (p. 109) of its colouring, suture, &c., scarcely harmonizes with its peculiarities. The *D. Minjac* of Deshayes is said to be at least five inches long, to have a channelled suture, and fifteen ribs upon its body-whorl.

DOLIUM PERDIX, Linnæus.

Tesan, Adanson, Seneg. p. 107. pl. 7. f. 5, probably.

Buccinum perdix, Linn. Syst. Nat. chiefly; Gmel. Brug. and Dillw. in part; Mont. Test. Brit. p. 244. pl. 8. f. 5; Wood, Ind. Test. pl. 22. f. 3.

Dolium perdix, Martini, Conch. iii. f. 1079 (not 1080); Green, Alb. Instit. p. 132, probably; Kiener, Coq. Viv. Dol. pl. 5. f. 9.

Perdix reticulatus, Montfort, ii. p. 447 (execrably).

Variety. *Dolium rufum*, Blainv. Dict. Sc. Nat. liv. p. 503.

Fry. *Helix sulphurea*, Adams, Contrib. Conch.

The variety *rufa* is rufous within and without, is of a peaked oblong shape, with the turns of the spire, which is more than half the length of the aperture, more than half as high as their breadth; the suture is very oblique.

The more solid American examples, in which the ribs are narrow (Knorr, Vergn. iii. pl. 8, f. 1), pale, prominent, and irregularly tessellated by small concave-fronted brown spots (the sulci being decidedly broad), are easily distinguished from the oriental specimens which alike bear the name of *Partridge Tuns*.

Cochlea pennata, Rumphius, Thes. Cochl. pl. 27. f. C.

Buccinum perdix, Linn. Syst. Nat. in part only: Mus. Ulric.; Brug. and Dillw. in part.

Dolium perdix, Hanley, Young, Conch.; Reeve, Conch. Icon. Dol. f. 9.

I am not prepared to assert the specific distinctness of the Indian shell, however much the idea may be favoured by the surmised laws of geographical distribution; nevertheless matured individuals of the two forms can, for the most part, be easily distinguished. The latter seems more intensely rufous, with more sharply defined (and usually lunate) linear white markings, the ribs always flattened, and generally fewer, their intervals pallid, extremely shallow, and never half so broad as the ribs; the spire, which is rarely, if ever, even one third the length of the aperture, occupies a much smaller proportional area; its volutions, which are less rounded, are rarely encircled by more than six belts. The shape, moreover, is more produced than in the variegated West Indian specimens, and the body is more contracted posteriorly. The outer lip more conspicuously ascends the penult whorl; and the pillar enamel is, apparently, more copious.

Besides the *Dolia* which I have been enabled to determine, I find the following indicated in our catalogues :—

DOLIUM AMPHORA, Philippi, Neue Conch. iii. *Dolium*, p. 12 (no figure).

DOLIUM PENNATUM, Mörch, fr. Martini, Conch. f. 1078 (as a young *W. Indian perdis*).

This may prove one of the many forms of the typical *perdis*.

DOLIUM MARGINATUM, Philippi, Zeitschr. Mal. 1845, p. 147.

Dolium variegatum, var., Kiener, Viv. Dol. pl. 2. f. 3a, teste Philippi.

I know not whether to regard as the matured state of this shell (said to be only 27 lines long, and to have twelve ribs upon the body), some very beautiful specimens, which I shall proceed to describe, and for which, if not identical, as I much doubt, I would suggest the name of *D. reevii*, in honour of an indefatigable conchologist, who has delineated as an adult *D. fimbriatum* (Conch. Icon. Dol. f. 3, not 3a) a shell which reminds one greatly of my examples ; his type, unfortunately, is no longer to be described in Mr. Cuming's collection.

Testa subglobosa, antice satis abrupte declivis, vix crassiuscula, vix umbilicata (potius rimata) purpurascenti-alba, costis castaneo albidoque tessellatim pictis circumcincta. Anfractus 7 seu 8 (quorum 4 superiores superne sunt pallidi et inferne lividi) ad suturam vix minime canaliculatam subscalariformes. Costæ angustæ, distantes (quarum circiter 15 satis elevatæ et superne remotiores ultimum anfractum, et 3 seu 4 gyras duas præcedentes, cingunt), costella divisæ quæ latitudinem earum interstitiæ prope duplicant. Cingulum siphonale latum neque caudatum, nec rotundatum, sed subangulatum, remotius porcatum, inferne album. Apertura haud unice lata, longitudinem spiræ acutæ exsertæ bis certe superans. Faux livido-castanea. Labii exterioris margo intus incrassatus (simplex?). Lamella columellaris eminens nulla. Exitus umbilici angustus.

Long. $4\frac{1}{2}$, lat. $3\frac{1}{2}$ poll.

Hab.—?

Mus. Cuming.

The painting of *D. maculatum* is here combined with the general sculpture of *D. latesulcatum* ; the spots appear to be rather numerous on the body-whorl. There are as many as nine or ten raised striæ on the turns which immediately succeed the smooth nucleus.

6. ON TWO NEW SPECIES OF CINCLUS.

By JOHN GOULD, F.R.S., ETC.

I have the pleasure of bringing before the notice of the meeting two new species of *Cinclus*, for the knowledge of which science is indebted to the researches of Dr. A. Leith Adams, who collected

them in Cashmere. The first of these, which is very nearly allied to our well-known *Cinclus aquaticus*, I propose to characterize as *C. cashmeriensis*; the other, which is more nearly allied to *C. pallasi*, as *C. sordidus*.

The following are descriptions of these two birds:—

CINCLUS CASHMERIENSIS.

Crown of the head, ear-coverts, and mantle brown, passing into deeper brown on the upper part of the back and wing-coverts; lower part of the back and tail-coverts grey, with a darker central mark on each feather; tail blackish grey; wings the same colour as the tail; throat and breast white; upper part of the abdomen brown, passing into dark greyish-brown on the flanks and vent; under tail-coverts uniform dark grey; tarsi brown, lighter on the front and on the upper part of the toes.

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

Hab. Cashmere.

Remark.—As compared with adult males of the *C. aquaticus*, this bird differs in being considerably larger in size, and in wanting the rich chestnut colouring of the upper part of the abdomen; the wings exceeding in length those of its European ally by more than half an inch.

CINCLUS SORDIDUS.

Crown of the head, back of the neck, throat, and chest chocolate-brown, the throat and breast being lighter than the back of the head; back, abdomen, and tail deep brownish-black, the abdomen somewhat the darkest; wings nearly the same colour as the back; tarsi brown, lighter on the front and on the upper part of the toes.

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

Hab. Cashmere.

Remark.—If it were possible to conceive a cross between *C. aquaticus*, or *C. cashmeriensis*, and *C. pallasi*, the produce would, I should say, be a bird like the one under consideration. I do not, however, believe that any such occurrence has taken place, but that the bird characterized as *C. sordidus* is a good species. In size it is smaller than *C. aquaticus*; at least the measurements of the only example I have seen induce me to believe so.

Mr. Stewart exhibited specimens of *Corystes cassivelaunus*, and the young of *Comatula rosea*, from the Devonshire coast. The latter were attached to the cœnecium of *Salicornaria farciminoides*.

A Letter was read from Dr. Cobbold concerning the causes of the death of a young Giraffe belonging to the Society.

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ERRATA.

- Page 110, lines 14 and 15, for *gilliespii* read *gillespii*.
 Page 164, line 26, for *pandoni* read *paddoni*.
 Page 236, line 35, for *Oreoortyx* read *Oreortyx*.

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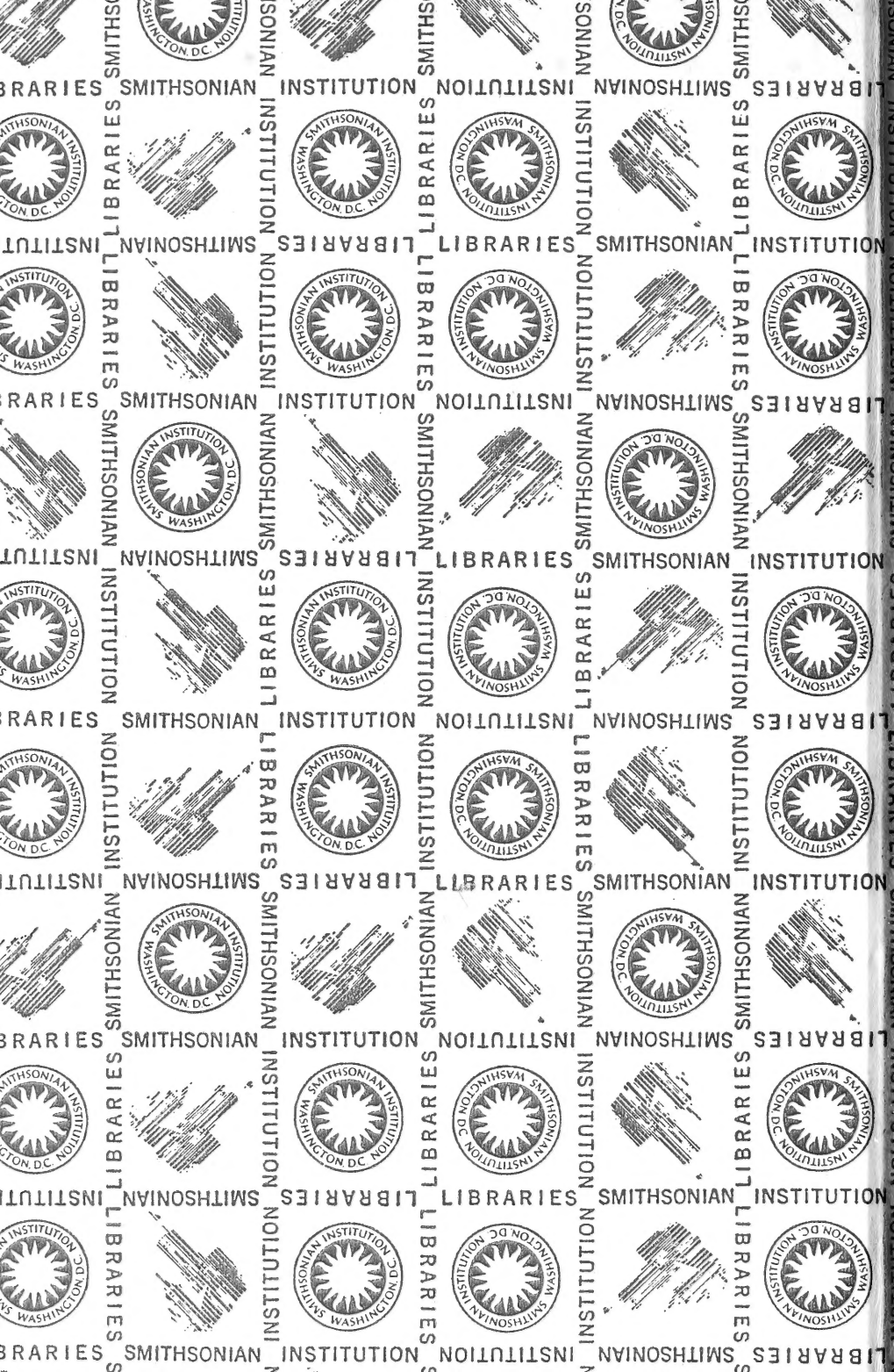
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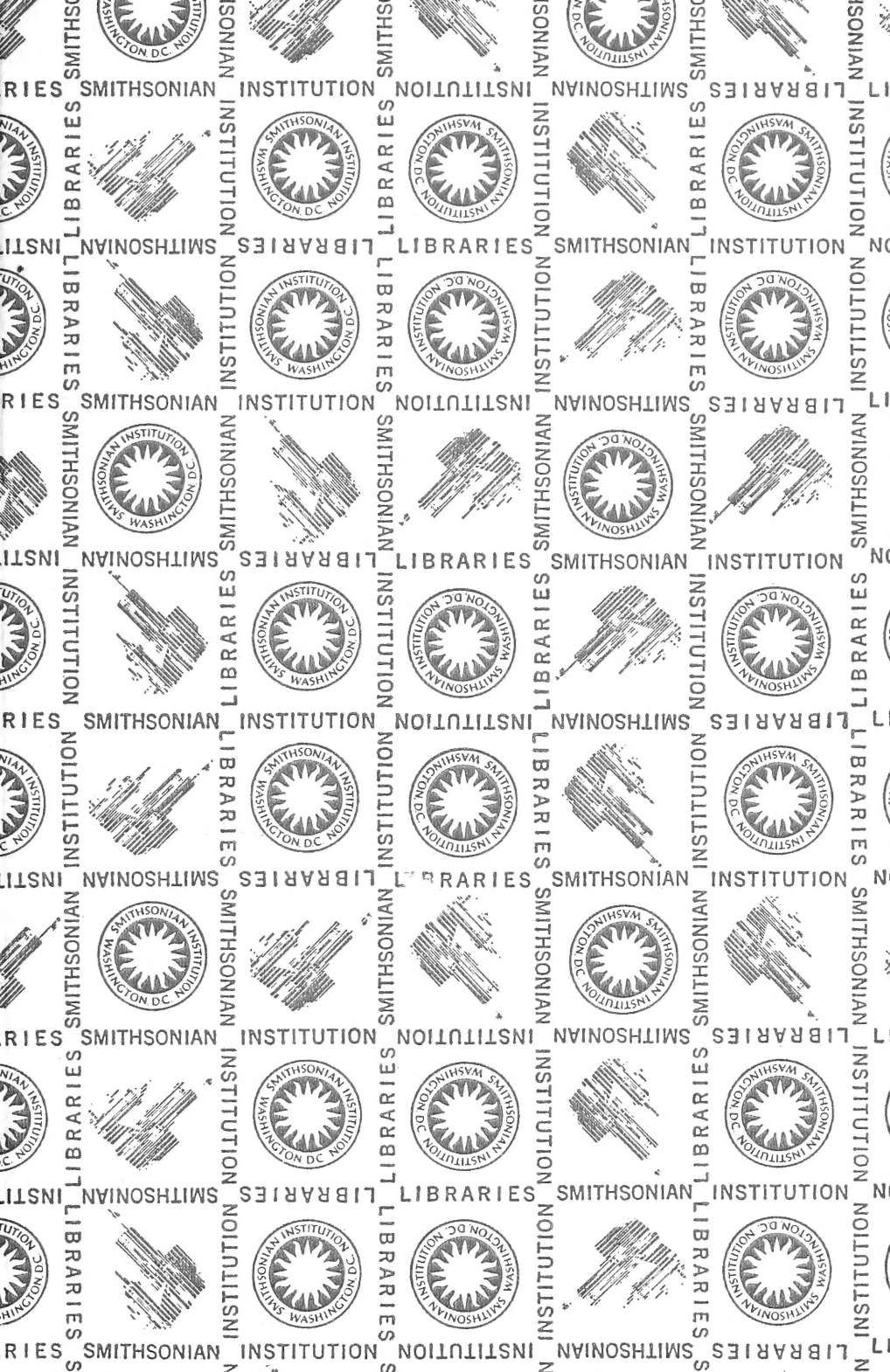
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