

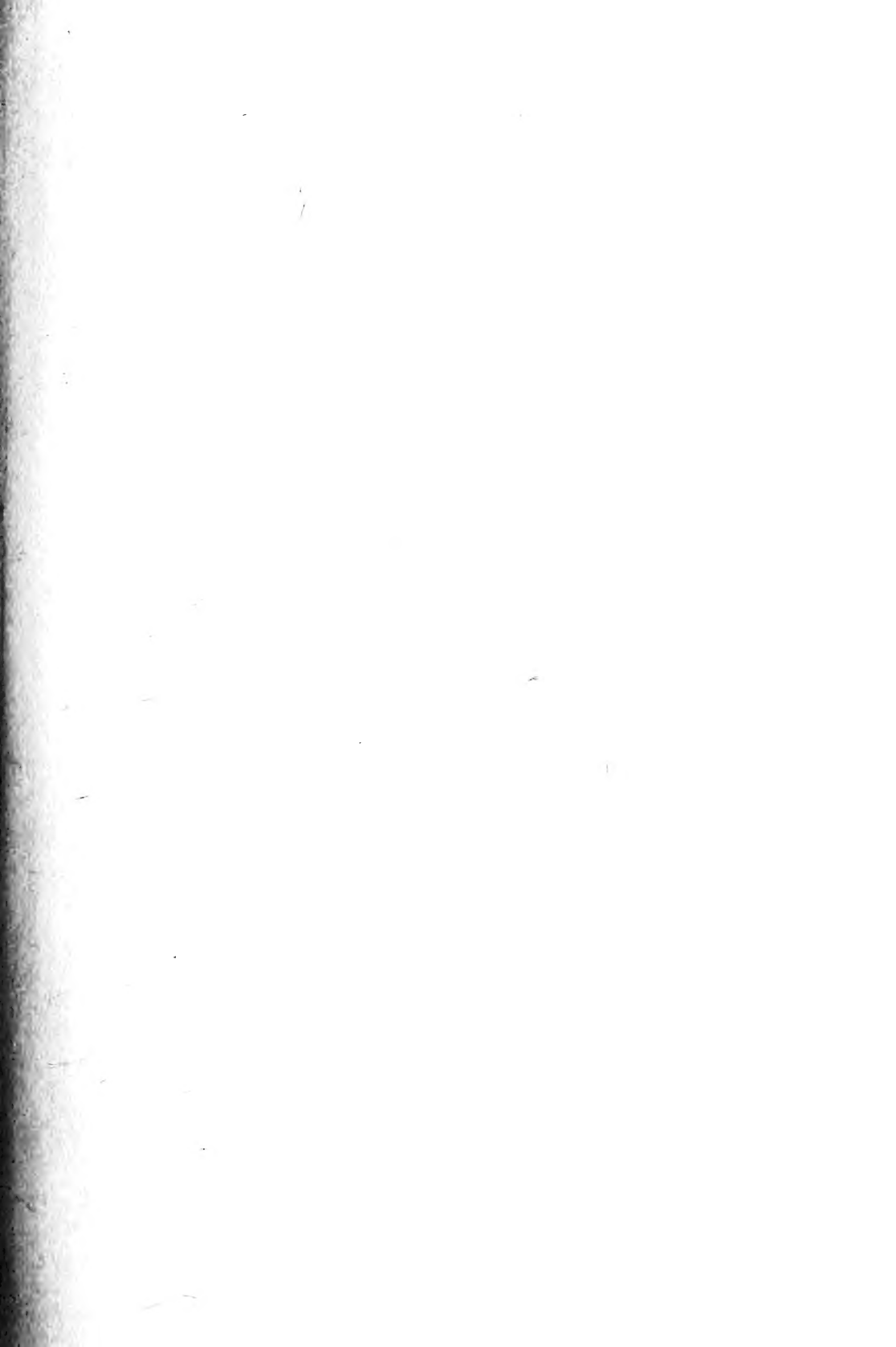


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# PROCEEDINGS

OF THE

SCIENTIFIC MEETINGS

OF THE

# ZOOLOGICAL SOCIETY

OF LONDON.

FOR THE YEAR

1877.

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PART III.

CONTAINING PAPERS READ IN

MAY AND JUNE.



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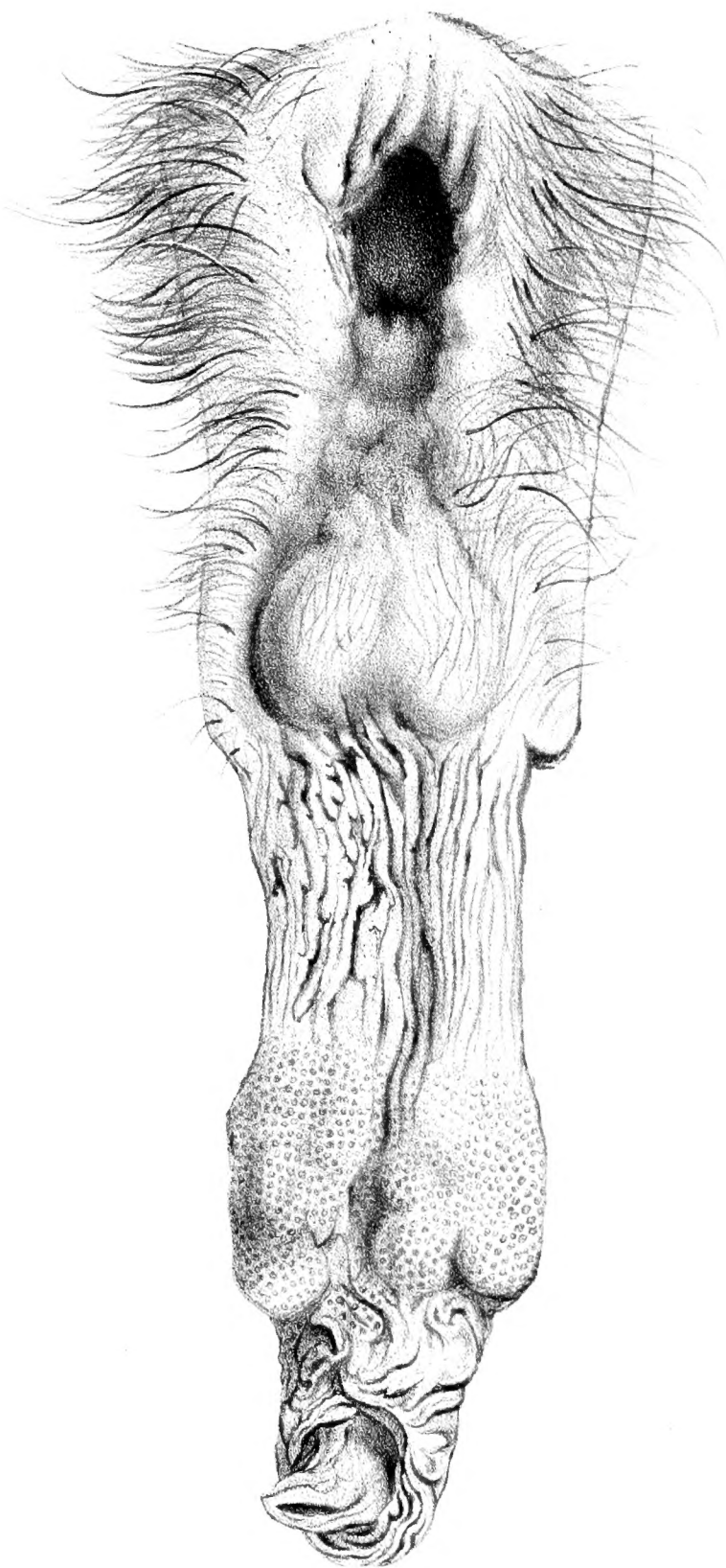
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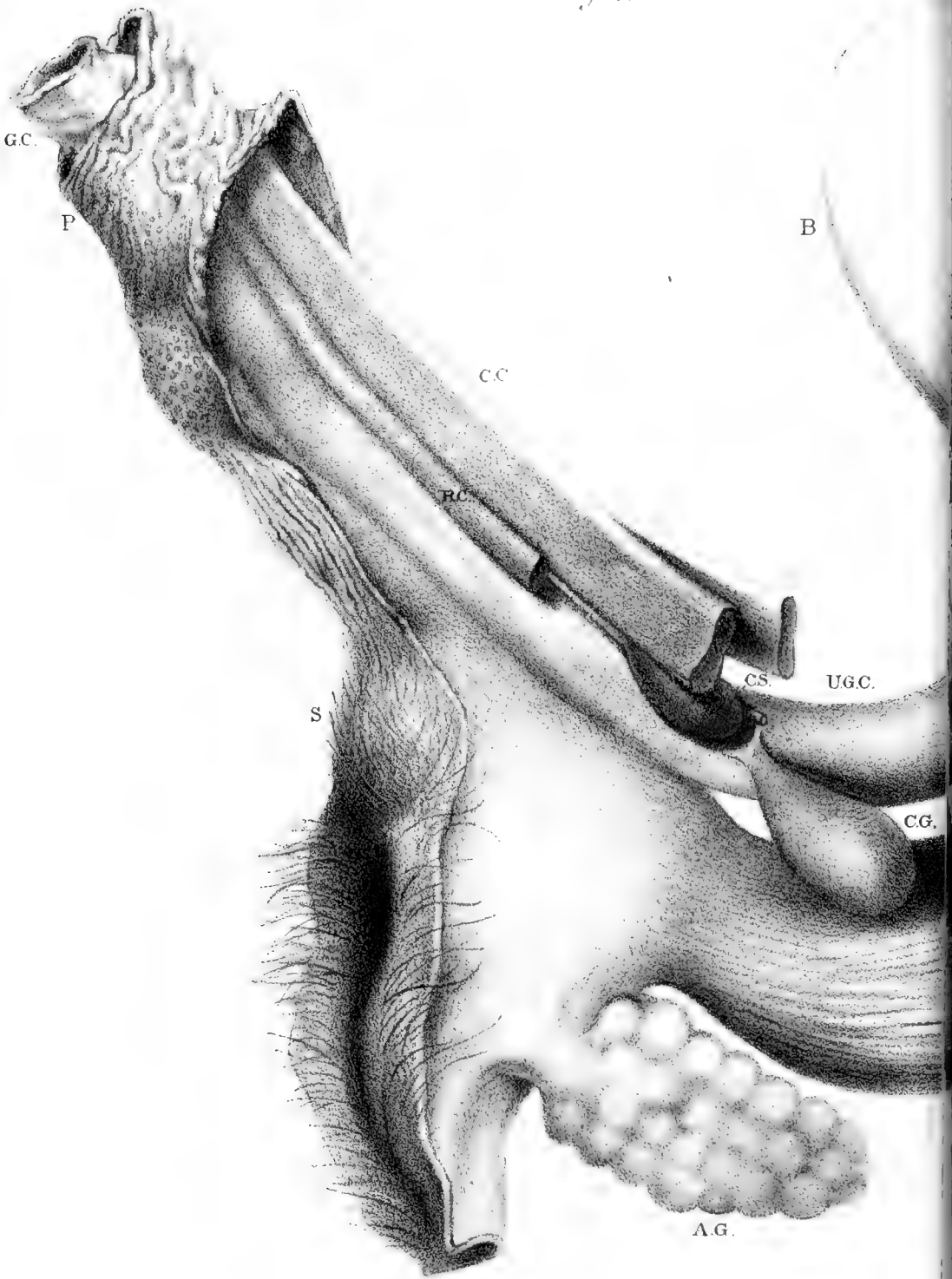
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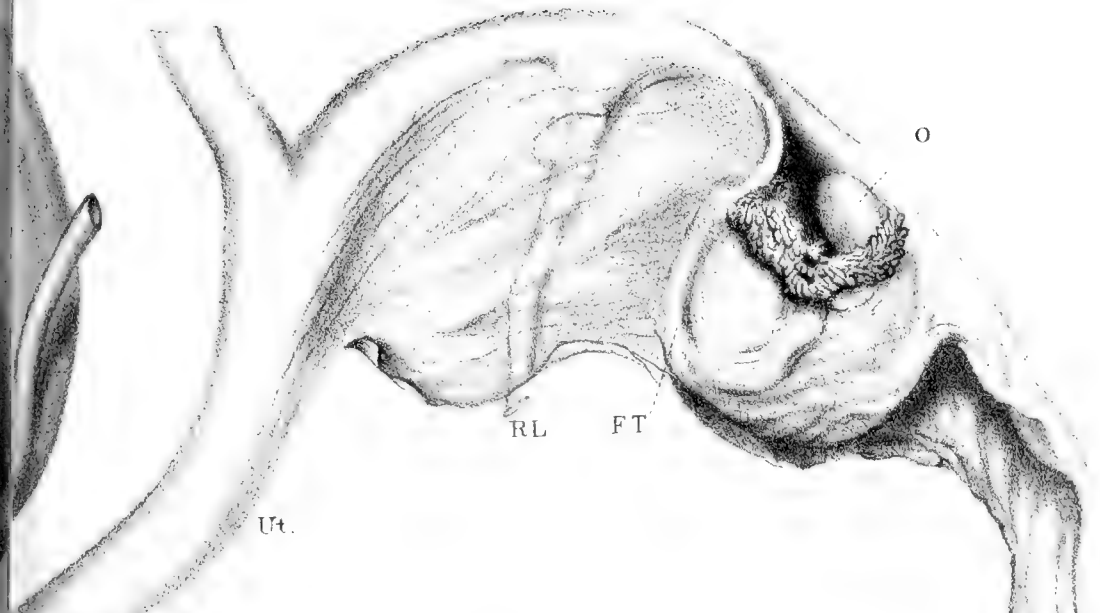
ANATOMY OF HYENA CROCUTA.



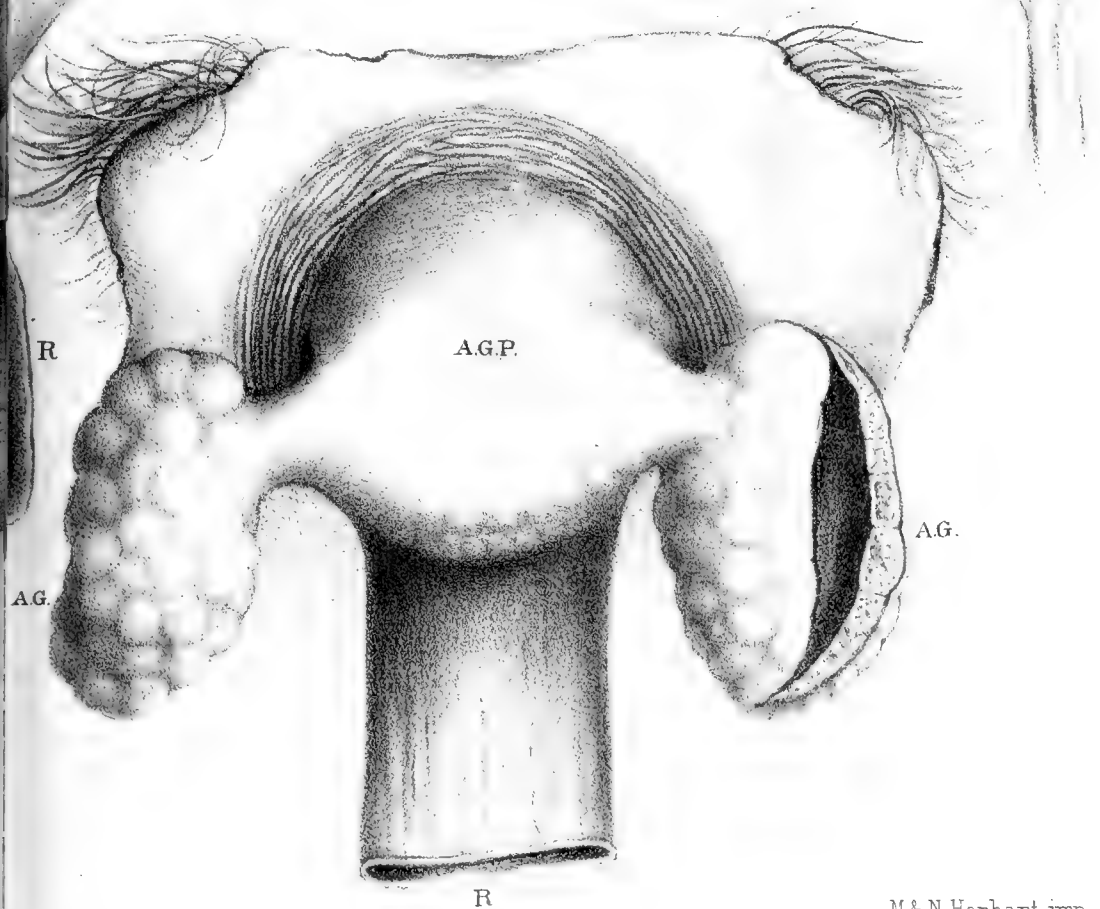
Fig. 1.







*Fig. 2.*





1. On the Female Generative Organs of *Hyæna crocuta*. By M. WATSON, M.D., Professor of Anatomy, Owens College, Manchester. Communicated by A. H. GARROD, M.A.

[Received April 11, 1877.]

(Plates XL., XLI.)

Before entering on the subject of this communication, I desire to state that to Mr. A. H. Garrod is undoubtedly due the merit of having first recognized the peculiar characteristics of the female generative organs of *Hyæna crocuta*, he having some time since examined a specimen which died in the Society's garden. The structure of these organs, however, struck him as so peculiar that he hesitated to publish the account of his dissection until such time as he should be able to verify his observations by the examination of a second specimen. Meanwhile I obtained the specimen the dissection of which furnishes the subject matter of this communication, and, feeling uncertain on account of the very unusual condition of the female organs whether they were to be regarded as normal, applied to Mr. Garrod for information. He at once in the most generous manner forwarded to me for comparison what remained of his own dissection, and, in the note which accompanied it, showed that he had clearly recognized the peculiarities in question.

#### *External parts.*

The appearance of the perineal region of the female *Hyæna crocuta* is such as to have led me in the first instance to believe the animal which I examined to be one of the opposite sex. This belief was based upon the following appearances:—(1) the absence of any well-marked vulva such as one generally sees in female Carnivora; (2) the presence of an elongated pendulous penis-like body, surrounded by a prepuce, and having a glans perforated by a single canal; and (3) the presence of two projections below the anus, which at once called to mind the appearance of the scrotum in many Carnivora. I pass to the description of these parts.

*Clitoris.*—The pendulous penis-like body, viewed in the light of the subsequent dissection, we must regard as the clitoris. It projects downwards and forwards from the level of the perineum, measures 2 inches in length and 1 inch in diameter, and consists of a central body, the glans clitoridis, which is surrounded by a thick fleshy prepuce. The colour of the glans is bluish toward the tip, where it is exposed, but flesh-coloured under cover of the prepuce. Its extremity is obliquely truncated from before backward, so that the posterior border of the glans is more prominent than the anterior. It is moreover perforated by a single canal of so small a size that one is at first sight induced to believe that he is dealing with the extremity of the male urethra, an error only corrected by an examination of the internal organs. The prepuce consists of a double

fold of thick integument which, rising from the level of the perineum, passes as far forward as the extremity of the glans, and is then reflected to the base of that body to become continuous with its cutaneous covering. It is attached by a distinct frænum to the pointed posterior angle of the glans, but is otherwise free, very loose, and rugose, and can be readily drawn out so as completely to conceal the glans of the clitoris. Under ordinary circumstances, however, it would appear that the preputial integument is thrown into circular rugæ around the clitoris, and thus leaves the extremity of the glans uncovered. The colour of the skin forming the prepuce resembles that of the glans, being bluish externally, but where it comes into contact with the glans it assumes the flesh-colour of the corresponding portion of that body.

*Labia?*—The integument of the perineum, continuous with that which forms the prepuce, is of the same bluish colour as high as the lower margin of the anus, where it changes its appearance. The whole of the skin in this region is devoid of hair and, close to the base of the clitoris, is thickly studded with numerous little depressions. These depressions equal in size the head of a pin, and are so closely placed that the intervals between them are less than the depressions themselves. The integument of the perineal surface of the prepuce is also studded at its base with these depressions, although here they are by no means so numerous as in the perineal region. They are entirely absent from the abdominal surface of the prepuce, as also from the upper part of the perineum. Immediately above (perinead) the clitoris the skin is thrown into two longitudinal folds which bound a shallow groove. These folds are by no means well marked, but correspond in position to that of the labia in other animals. Should they, as I believe they do, represent these structures in this animal, the clitoris occupies the usual position with regard to them; that is, it lies in the anterior commissure. It is to be observed, however, that there is no vaginal aperture between the folds. The integument forming them possesses the structure already described; but between their upper extremities and the margin of the anus, the skin, although devoid of hair, loses the little depressions already referred to.

*Scrotal pouches.*—The cutaneous elevations which I have so named are situated immediately below the anus, one on either side of the middle line, and remind one, forcibly in respect of position, of the scrotum in many of the Felidæ. Each is about the size of a filbert, and, unlike the rest of the perineum, is covered with delicate hair of a light brown colour. The presence of these pouches adds much to the deceptive appearance of the female, and, combined with the other peculiarities, renders the identification of the sex a matter of difficulty. These pouches when cut open are seen to be mere pouch-like elevations of the skin, and do not lodge any part of the generative apparatus. Each is filled with a little mass of subcutaneous fat.

*Anus and anal-gland pouch.*—Immediately above the scrotal pouches the surface of the skin is somewhat depressed, the margins

of the depression being covered with hair of the same colour as the surrounding parts. In this depression are situated two apertures, that of the anus, and that of the anal-gland pouch, the latter being situated between the former and the root of the tail. The lower margin of the anus is placed an inch above the scrotal pouches, the skin between them being black. The anus is separated by a transverse fold of integument from the anal-gland pouch. The skin of the latter is smooth and devoid of hair, with the exception of three small tufts, one of which springs from the middle of the upper wall of the pouch, and one from each of its inferior external angles. At the bottom of the pouch, on either side of the middle line, is a single aperture of sufficient size to admit a quill. These are the openings of the ducts of two large anal glands; and stretching across the bottom of the pouch from one of these openings to the other is a transverse line of perforations which correspond to the excretory ducts of a number of small isolated glandules to be subsequently described.

Having now described the appearances of the external parts, I pass on to the description of the

#### *Internal Organs.*

*Rectum and Anal Glands.*—The walls of the rectum are thick, being provided with a strong layer of longitudinally arranged muscular fibres. It has the usual relation to neighbouring viscera, and terminates immediately below the pouch which receives the excretory ducts of the anal glands. This pouch has a transversely oval form, is  $2\frac{1}{2}$  inches in breadth, and is depressed from the level of the perineum to the depth of  $1\frac{1}{2}$  inch. The anal glands which pour their secretion into it are two in number; but in addition to these there is a belt of isolated glandular follicles which extends across the bottom of the pouch. Each anal gland is situated above and to the outer side of the rectum, and has, when denuded of the surrounding connective tissue, a botryoidal appearance, by reason of the presence of a number of little grape-like projections on its surface. Each is roughly pyriform, and has the apex directed forward and upward, the base backward and downward. The inner side of each gland is applied to the corresponding angle of the anal pouch; and from this surface of the gland the duct is given off to open into the pouch as previously described. Each of the glands measures  $2\frac{1}{2}$  inches from base to apex, and  $1\frac{1}{2}$  inch in diameter at the base. When cut open, each is seen to consist of a thick glandular wall, enclosing a single cavity of large size which communicates by means of the opening already described with the anal-gland pouch. The cavity of the gland was filled with a thick yellowish secretion, evidently the product of the glandular walls, of the consistence of butter, and having a very offensive smell. A quantity of muscular fibres apparently continuous with those of the sphincter ani surrounds each gland, and evidently acts as a compressor. The belt of glandular follicles above referred to as extending across the bottom of the anal-gland pouch, consists of a large number of isolated glands, each about

the size of a small pea, and each provided with a single duct which perforates the fundus of the pouch by means of one of the little apertures previously described.

*Bladder and Urethra.*—The bladder is small in size, and regularly pyriform. It passes insensibly into the urethra; so that it is difficult to say where the former ends and the latter begins. It is, with the exception of the base, entirely covered with peritoneum, which forms three ligaments to the viscus. Two of these pass upward to connect it with the uterine cornua, and one downwards to attach it to the anterior abdominal wall. The ureters are provided with thick muscular walls, and enter the bladder close to the orifice of the urethra. This tube measures only  $1\frac{1}{2}$  inch in length, and passes backwards, resting against the corpus uteri to open into the urogenital canal, its orifice being separated from the os uteri by a single semilunar fold of mucous membrane.

*Ovaries.*—Each of these bodies is of an oval flattened form, having its long axis placed transversely, and its anterior and posterior surfaces somewhat flattened. Each measures rather more than half an inch in length and about a fourth of an inch in thickness. The ovary is retained in position by two stout ligaments, one of which is attached to the inner, the other to its outer extremity. The former attaches the ovary to the outer extremity of the corresponding uterine horn, and measures half an inch in length. By means of the latter, which measures 5 inches in length, the ovary is fixed to the posterior surface of the diaphragm. Each of these ligaments consists of a fibrous cord, and each is covered by peritoneum. The ovary is placed in a peritoneal pouch of size sufficient to contain a large walnut. The opening of this pouch is considerably narrowed, and in the natural position of the parts is directed upwards (towards the spine of the animal) so that ova, as they pass from the surface of the ovary must almost necessarily be caught by it. This pouch is formed by a reduplication of the broad ligament of the uterus, and appears to be, so to speak, suspended from the uterine and diaphragmatic ligaments of the ovary, hanging vertically below that organ, which is placed just within the entrance to the sac. The posterior free margin of the pouch is formed by the ovary together with its uterine and diaphragmatic ligaments, whilst its anterior margin is formed by the free edge of the peritoneal fold and, to a less extent, by the fimbriated extremity of the Fallopian tube.

*Fallopian Tube.*—In order to be explicit, I must here state that by the term Fallopian tube I understand so much of the oviduct as extends from its fimbriated extremity to the point of attachment to it of the uterine ligament of the ovary. That portion of the oviduct which extends from the attachment of this ligament to its junction with its fellow of the opposite side, I regard as constituting the horn of the uterus. The Fallopian tube, as thus defined, measures between  $2\frac{1}{2}$  and 3 inches in length, and describes a U-shaped flexure from the one extremity to the other, the concavity of the U in the natural position of the parts being directed upward. The free extremity of the Fallopian tube lies in contact with the anterior free margin of

the peritoneal ovarian pouch, and is provided with numerous elongated fimbriæ. From this extremity the tube passes downwards lying in the anterior wall of the sac as far as its floor, where it turns upward and then comes to lie in the posterior wall of the pouch, terminating by becoming continuous with the corresponding uterine horn at the point of attachment to the latter of the ovarian ligament. The tube thus accommodates within the concavity of its flexure the fundus of the ovarian pouch.

*Uterus.*—The uterus consists of a central body and two horns. Each horn measures  $3\frac{1}{2}$  inches in length, and extends from the uterine ligament of the ovary as far as the middle line, where it meets with its fellow to form the corpus uteri. In this course it is contained between the folds of the broad ligament, and increases gradually in calibre from without inwards. Midway between its commencement and termination there is attached to the horn a stout fibrous cord, which evidently represents the round ligament of the uterus. When traced backwards it is seen to enter the inguinal region; but its exact attachment in this locality I could not determine, in consequence of the organs having been removed from the body before I was aware that the generative organs of this Hyæna presented any unusual arrangement. At the point of attachment of the round ligament to the left uterine horn there was a small pedunculated hydatid.

The body of the uterus is formed by the junction of the right and left horns, and lies between the bladder and the rectum. It measures 5 inches in length from the junction of the horns to the opening of the os uteri into the urino-genital canal. That the whole of this is to be regarded as corpus uteri, and not as constituting any part of the vagina, is proved by the absence of any constriction in its interior which might correspond to an os uteri, the tubular body of the uterus remaining of the same calibre, and having the walls of uniform thickness down to its opening into the urino-genital canal. What must, therefore, be regarded as the os uteri is the constricted opening by means of which the uterus communicates with the canal common to both urinary and generative organs. At this point there is a thick semilunar fold of mucous membrane, the concavity of which is directed backwards, and its margins attached to the walls of the urino-genital canal. It is placed horizontally, having its surfaces directed upward and downward, and intervenes between the opening of the urethra above and that of the os uteri below it into the common canal. Internal to this fold is the uterus; external to it is the urino-genital canal; for, as we shall see presently, there is in this animal a complete absence of any differentiation of vagina from urethra. The mucous lining of the uterus is thrown into well-marked longitudinal rugæ.

*Urino-genital Canal.*—As already stated, the uterus and urethra open into a common canal. This, the urino-genital canal, extends from the junction of the two tubes to the extremity of the clitoris, and measures rather more than 8 inches. In this course it describes a wide curve with the convexity backward, corresponding of course to that of the perineum upon which it rests. The canal may, for the sake

of clearness in description, be divided into two parts—(a) the part extending from its commencement as far as the base of the clitoris, and (b) a part extending from base to apex of the clitoris. The first part measures  $1\frac{1}{2}$  inch in length, and possesses walls of considerable thickness, these being provided with a thick layer of circularly arranged muscular fibres. Where this portion of the common canal becomes continuous with the second portion its floor is pierced by the ducts of two large glands.

*Cowper's Glands.*—These, which appear to correspond to Cowper's glands as figured by Daubenton in the male *Hyæna striata*, lie one on either side of the common canal, the base of the gland being opposite the junction of the urinary and genital passages, whilst from its apex the duct above mentioned is given off. Each gland is pyriform, somewhat flattened, and measures  $1\frac{1}{2}$  inch in length, and  $\frac{3}{4}$  of an inch in greatest breadth. When cut into, the gland is seen to be solid, and recalls to mind the appearance of a section of salivary gland.

The second portion of the urino-genital canal extends along the under surface of the clitoris, lying along the lower border of the united corpora cavernosa of that body, to which it is attached, and finally pierces the glans clitoridis by an opening of small size, which might readily be mistaken for the termination of the male urethra. The walls of this portion of the canal are much thinner than those of its first part, and consist merely of mucous membrane, with a substratum of connective tissue. The mucous membrane of both parts of the common canal is extremely distensible, and is thrown into longitudinal rugæ, which are quite continuous at the os with those previously described in the uterus.

*Clitoris.*—The clitoris measures  $6\frac{1}{2}$  inches in length from root to tip. It is composed of two corpora cavernosa, which form the bulk of the organ. Corpora spongiosa, however, are not absent, although they are altogether subordinate in size of the corpora cavernosa. Each corpus cavernosum is a thick laterally compressed band of erectile tissue enclosed in a fibrous capsule, and, except at the root, where it is attached to the corresponding ischium and forms the crus, is in contact with its fellow of the opposite side along the whole length of the clitoris. At the extremity of the clitoris the two corpora cavernosa terminate abruptly and form the upper hard portion of the glans, the lower portion of that body being formed by the walls of the urino-genital canal.

The corpora spongiosa are two in number, but of small size. Each is pyriform, and measures about an inch in length. Each is situated below and in contact with the corresponding crus clitoridis, and has its narrow end directed forwards. This extremity terminates in a vein of considerable size, which runs forward and unites with its fellow of the opposite side. The single vessel is then continued onward, lying in contact with the lower border of the united corpora cavernosa, and above the urino-genital canal as far as the glans. Its mode of termination I could not make out; but in all probability it terminates in branches which enter the corpora cavernosa; at least, many branches were given off from it to



these structures. The two spongy bodies of opposite sides are quite distinct from one another, and do not communicate except through the vein just described; nor do they take any part in the formation of the glans clitoridis, that body being formed entirely by the corpora cavernosa and the walls of the urino-genital canal. It will also be observed that the spongy bodies are placed altogether *above* that canal, and that consequently the latter is not surrounded by the spongy structure in any part of its course. An artery of considerable size enters the bulbous extremity of each spongy body.

Two muscles are met with in the dissection of the clitoris. The one is the erector clitoridis, which is of large size and covers the crus, as well as the bulb of the corpus spongiosum, in the usual manner. The other is the retractor clitoridis. The origin of this muscle I could not determine, as the parts had been detached from the bones; but in all probability it arose either from the ischium or pubis. The muscles of opposite sides pass forward in contact with one another, and form two cord-like bands which lie along the lower borders of the corresponding cavernous bodies; and each is inserted by means of an aponeurotic structure into the corresponding corpus cavernosum immediately behind the glans. These muscles are doubtless retractors of the glans within the prepuce. A large artery, vein, and nerve run along the outer side of each cavernous body, and can be traced as far as the base of the glans. There is no bone in the clitoris.

If, now, we compare the description above given of these parts in *Hyæna crocuta* with that of the corresponding organs in other species, we find, with regard to the anal-gland pouch, that its presence has been proved by Daubenton<sup>1</sup> in the *Hyæna striata*, by Murie<sup>2</sup> in the *Hyæna brunnea* and *crocuta*, and by Prof. Flower<sup>3</sup> in the allied genus *Proteles*. With regard to *H. crocuta*, its presence has been denied by Busk<sup>4</sup>; but Dr. Murie's investigations, along with my own, now leave, I think, no doubt regarding this point. Anal glands are present in all of these animals, but differ somewhat in respect of number in different species. In *H. striata* Daubenton describes and figures *two* on each side of the anal-gland pouch. The anterior of these corresponds most closely with that which is present in *H. crocuta*, the posterior having no representative in the latter species. He further describes in *H. striata* a quantity of isolated follicles which have almost the same arrangement as the transverse belt of glandules which I have described as opening into the anal-gland pouch in *H. crocuta*. Dr. Murie describes in *H. brunnea* *three* anal glands on each side of the rectum, but makes no mention of isolated glandules in relation to the fundus of the anal pouch. Lastly, in *Proteles* *two* anal glands of large size are described by Prof. Flower, in addition to a central glandular mass covering the bottom of the anal pouch. The large glands correspond almost exactly in shape with those I have described in *H. crocuta*; and although I am in doubt, from his description, of the exact appearance of the central glandular mass, it appears to correspond closely to the belt of

<sup>1</sup> Buffon's Hist. Nat. tom. ix.

<sup>2</sup> Trans. Zool. Soc. vii. p. 503.

<sup>3</sup> Proc. Zool. Soc. 1869, p. 493.

<sup>4</sup> Quoted by Dr. Murie in his paper.

follicles above referred to. In respect therefore of the anal pouch and glands *H. crocuta* agrees more closely with *Proteles* than with any species of its own genus.

Turning now to the female organs of other species, and comparing them with those of *H. crocuta*, which have not, so far as I know, been previously described, I find that Owen<sup>1</sup> gives a description of the ovary and its containing pouch, which almost exactly corresponds to that given above. He does not, however, say to what species the description applies, merely stating that it refers to the genus *Hyæna*. Murie<sup>2</sup> figures the ovary of *H. brunnea*, but gives no description; and it is difficult to decide from the drawing as to whether the organ is contained in a pouch, similar to that found in *H. crocuta*, or the contrary. The uterus of *H. crocuta* appears to correspond accurately in form to that of *H. brunnea* as figured by Murie<sup>3</sup>, agreeing with it especially as regards the elongated form of the corpus uteri. The os uteri of *H. crocuta* is smooth and non-papillose, in which respects it agrees with Owen's<sup>4</sup> generic description. The characteristic peculiarities of the internal female generative organs of *H. crocuta* are therefore to be found in the presence of the single passage leading from the os uteri to the exterior of the body for the conveyance of both the urinary and genital products; in none of the species hitherto described does the same arrangement obtain. John Hunter<sup>5</sup> states that in *H. striata* the common vagina, by which term I understand him to refer to the urino-genital canal, is only  $1\frac{1}{2}$  inch in length, whilst the proper vagina measures 5 inches. This description agrees with Murie's figure and description of the same parts in *H. brunnea*. He describes the urethra as opening externally in the anterior angle of the slit-shaped vulva, the opening being distinct from that of the vagina. In both *H. striata* and *H. brunnea*, then, the female urethra extends from the neck of the bladder to the vulva, or, at least, close to it, leaving the urino-genital canal only about an inch in length. In *H. crocuta*, on the other hand, as we have seen, the urethra opens into the urino-genital canal close to the os uteri, and consequently we have the urino-genital canal measuring about 8 inches in length. Moreover in *H. crocuta* we have two Cowperian glands of large size opening into this canal, glands which appear to be absent in the other species of the genus; at least, they have neither been described nor figured by Hunter, Owen, or Murie.

The external parts of *H. crocuta* also differ materially from those of allied species. We have before drawn attention to the enormous size of the clitoris, and its perforation by the urino-genital canal in this animal, as well as to the absence of any trace of a vulva properly so called. In respect of each of these points, *H. crocuta* appears to differ from other species.

Hunter<sup>6</sup> says of *H. striata*:—"Below the anus opens the vagina: there are no external lips ending in a projecting point, as in many

<sup>1</sup> Anat. of Vertebrates, vol. iii. p. 701.

<sup>2</sup> Trans. Zool. Soc. vol. vii. pl. lxiii. fig. 1, o.

<sup>3</sup> Trans. Zool. Soc. vol. vii. pl. lxiii. fig. 1, v.

<sup>4</sup> Anat. of Vertebrates, vol. iii. p. 701.

<sup>5</sup> Essays and Observations, by Owen, vol. ii. p. 57.

<sup>6</sup> *Ibidem*.

other animals, but a round hole similar to an anus. Just within this is the clitoris, which points forwards like a short, blunt tongue." Murie<sup>1</sup> figures the external female organs of *H. brunnea*, and describes the "vulva as being slit-shaped,  $\frac{7}{8}$  of an inch in length, and with the urethral outlet placed in its anterior angle." He makes no mention whatever of the clitoris. Now it is impossible to doubt that, had the clitoris presented the large size in either of these species that it does in *H. crocuta*, one or both of the observers just named would have referred to it. Moreover the presence in both these of a vulva presenting the usual appearance, and particularly referred to by the anatomists who describe them, shows that in this respect also *H. crocuta* differs much from its congeners. The perforation of the clitoris by the urino-genital canal is an arrangement which, so far as I am aware, does not occur in any other animal. It is not by any means exceptional that the female *urethra* should groove or even perforate the clitoris; but the fact that the excretory canal which is common to both the urinary and genital organs should do so is, I believe, extremely uncommon. Owen<sup>2</sup> says that, with the exception of the monotremes, "in all mammals both urine and semen are carried out by the urethral canal in the male; and in some Insectivora and Quadrumana the clitoris in the female is similarly traversed by a canal, *which here, however, is exclusively for the urine.* The vaginal orifice intervenes between the prominent and perforate clitoris and the anus."

The arrangement of the female organs in *H. crocuta* is such as to give them a great resemblance to those of the males in other species. Leuckart<sup>3</sup> figures the passages of the male *H. striata*, and shows that in connexion with the floor of the prostatic portion of the urethra there is a small flask-shaped uterus masculinus. Now, if we suppose this uterus masculinus enlarged to the size of the uterus, above described, of the female *H. crocuta*, we shall, in the absence of a prostate gland, have an almost identical arrangement of the excretory passages of both sexes, an agreement which is confirmed by the position and large size of the Cowperian glands in both. I have not had an opportunity of examining the male organs of *H. crocuta*; but, from Prof. Flower's remarks<sup>4</sup> as to the form of the penis in that animal, I am inclined to think that it closely resembles the clitoris of the opposite sex; and an examination of Dr. Murie's drawing of the external parts of a young male *H. crocuta* confirms this opinion. Add to which that, as I have already stated at the commencement of this paper, the resemblance of the external parts in general in both sexes is so close that it is difficult, if not impossible, to distinguish them, and we have, I think, an explanation of the notion entertained by the ancients regarding these animals—namely, that they were hermaphrodites. As showing how easily even those who are most familiar with these creatures may be misled, I may mention that the keepers of the

<sup>1</sup> Trans. Zool. Soc. vol. vii. p. 504. fig. 1.

<sup>2</sup> Anat. of Vertebrates, vol. iii. p. 609.

<sup>3</sup> Cyclopæd. of Anat. vol. iv. Art. "Vesicula prostatica."

<sup>4</sup> Proc. Zool. Soc. 1869, p. 493.

animal examined by me were both of opinion that it was a male, but acknowledged that they had very great difficulty at any time in deciding as to the sex in this species. The theory of the ancients regarding their sexual peculiarities, moreover, obtains in a popular form at the present day, as I have it on the authority of a gentleman who resided for some time in South Africa that the Dutch hunters in that region are still of the same opinion. For my own part, I see no reason to doubt that, just as under many popular ideas there lies an element of truth, so beneath the extraordinary belief regarding the sexual relations of these animals a physiological fact may be concealed. There *may* be some truth in the assertion by the South-African hunters, and which I give on the authority of the gentleman above referred to, that two individuals of the same sex have been seen to couple. There appears to me to be nothing in the arrangement of the parts to prevent two females in indulging in what to both may afford sexual gratification. It is not impossible that an organ of the size of the clitoris in these animals, almost entirely composed of erectile tissue, and richly supplied with blood, may afford the means of sexual gratification to two individuals of the same sex, especially during the period of rut. It is a matter of daily observation that among animals during the period of heat the mere contact of individuals of the *same* sex affords pleasure; and if this contact, by reason of the anatomical arrangement of the parts, be permitted to be more complete, as is apparently the case in *H. crocuta*, I see no reason to doubt that occurrences of this kind, taken in conjunction with the difficulty of distinguishing the sexes, may have led to the foundation of the hermaphroditic theory with reference to these animals.

It would not be uninteresting, in connexion with the arrangement of the urino-genital canal perforating, as it does, the clitoris, to know somewhat regarding the condition and size of the young at birth. The canal itself is dilatable enough; but the opening at the extremity of the glans scarcely appears sufficiently roomy to allow of the passage of young of such size as, judging from those of other animals at the same period, those of *H. crocuta* must be. The mode of coupling of these animals also is worthy of observation, as, from what has been stated, it will be seen that the arrangement of the parts is not such as to facilitate this act.

The form and size of the cæcum, and mode of branching of the aorta, in *H. crocuta* are exactly the same as has been described by Daubenton in *H. striata*, and by Murie in *H. brunnea*.

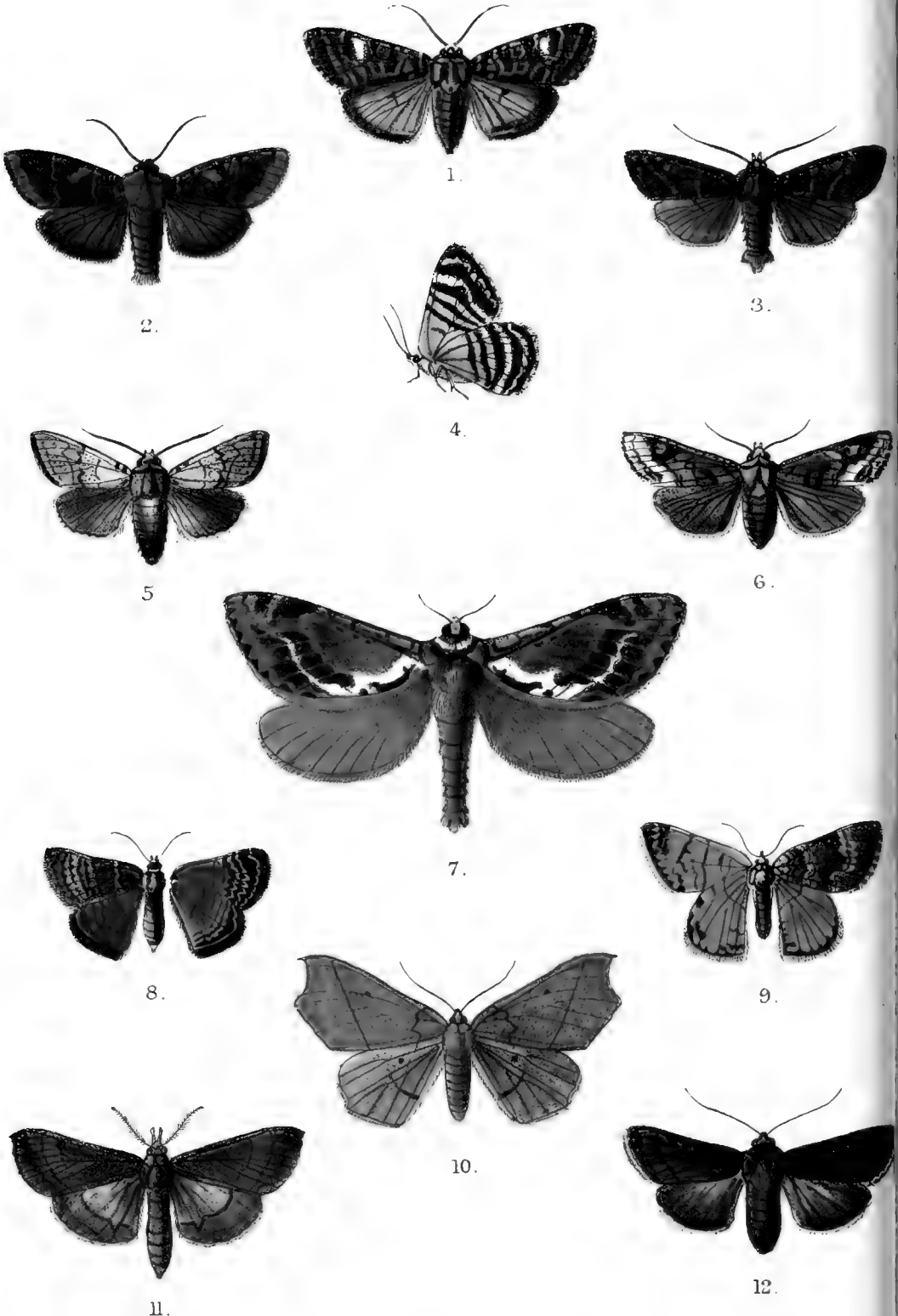
In conclusion, I have to state that my best thanks are due to my friend Dr. Alfred Young for the very excellent drawings which accompany this paper.

#### EXPLANATION OF PLATES XL. & XLI.

##### PLATE XL.

View of the female perineum and clitoris of *Hyæna crocuta*. From above downwards are seen the orifice of the anus, as well as of the anal-gland pouch; below this is the pair of elevations referred to under









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the name of "scrotal projections" in the paper. Below these is the bare perineal integument with a median groove which *may* represent the vulva. Lowest of all is the clitoris, surrounded by its prepuce, and perforated at the extremity of the glans by the urino-genital canal.

## PLATE XLI.

Fig. 1. Female generative organs and extremity of rectum of *Hyæna crocuta*. G.C. Glans clitoridis perforated at its extremity by the urino-genital canal. P. Prepuce surrounding the glans clitoridis. C.C. Corpora cavernosa clitoridis, separating posteriorly to form the crura. R.C. Retractor clitoridis muscle. C.S. Corpus spongiosum clitoridis; a small artery is seen entering its base. CG. Cowper's gland, opening into UGC, urino-genital canal, which is seen to extend forward from the junction of the urethra and uterus to the extremity of the clitoris, lying underneath the corpora cavernosa. UR. Urethra. B. Bladder. UT. Uterus, formed by the junction of the two cornua. R.L. Round ligament of uterus. F.T. Fallopian tube, terminating in a fimbriated extremity. O. Ovary, lying in its peritoneal pouch. R. Rectum. A.G. Anal gland of left side, opening into the anal-gland pouch, which, in this position of the parts, is seen. S. Scrotal projection, seen from the side.

Fig. 2. Posterior extremity of rectum and anal glands, seen from above. R. Rectum. A.G.P. Anal-gland pouch, which communicates with A.G., A.G., the anal glands.

Between the anal glands of opposite sides a belt of glandular follicles is seen to cover the fundus of the pouch.

## 2. On two Collections of Heterocerous Lepidoptera from New Zealand, with descriptions of new Genera and Species<sup>1</sup>. By ARTHUR G. BUTLER, F.L.S., F.Z.S.

(Received 11th April, 1877.)

(Plates XLII. & XLIII.)

In my list of the "Lepidoptera of New Zealand," published in the Insect portion of the 'Voyage of the Erebus and Terror,' I was unable, from the small attention which up to that time I had paid to the Heterocera, to determine critically the correct genera to which many of Walker's species were referable; I had, moreover, little time at my disposal to go through the whole collection with Guénée's descriptions; and therefore I was compelled merely to introduce them into their places, in the belief that this author had made strenuous efforts to determine the species described by Walker. That this belief was (to all appearance) unsupported by fact will, I think, be made sufficiently clear in the following synonymic revision of the two small collections recently brought to England by Dr. Hector and Mr. J. D. Enys; I can only discover two or three instances in which species here enumerated have been identified, and in the case of *Nitocris comma* incorrectly.

M. Guénée says, "I am able to recognize some of them; but the

<sup>1</sup> The types of new species have been presented to the collection of the British Museum.

greater part of those sent to me seem new. It may be that the locality, where Mr. Fereday collects is different from those which Messrs. Bolton, Colenso, and Sinclair visited, or that I have not been able to recognize many of them, from the too often little-precise descriptions by Mr. Walker." It is possible that, as I constantly have Mr. Walker's types to compare with his descriptions, it may be easier for me to determine those which we do not possess than it is for a foreigner; but I can scarcely comprehend M. Guénée failing to recognize so many as he has done, if he really tried to identify them.

Mr. F. Moore has very kindly assisted me in the determination of some of the more obscure genera, chiefly of Noctuites and Geometrites, to which groups I have as yet been able to devote but little time.

#### SPHINGIDÆ.

##### 1. PROTOPARCE DISTANS.

*Sphinx convolvuli*, var. *distans*, Butler, Zool. Ereb. and Terror, Ins. p. 30 (1874).

Hawk's Bay, North Island. In colls. Dr. Hector and J. D. Enys, Esq.

#### ÆGERIIDÆ.

##### 2. ÆGERIA TIPULIFORMIS.

*Sphinx tipuliformis*, Linnæus, Faun. Suec. p. 289, n. 1096.

In colls. Dr. Hector and J. D. Enys, Esq.

#### NYCTEMERIDÆ.

##### 3. SECUSIO ANNULATA.

*Leptosoma annulatum*, Boisduval, Voy. de l'Astrolabe, pl. v. fig 9 (1853).

In colls. Dr. Hector and J. D. Enys, Esq.

This species certainly agrees better with Walker's genus *Secusio* than with *Nyctemera*, to which hitherto it has been referred.

#### HEPIALIDÆ.

##### 4. CHARAGIA VIRESCENS.

*Hepialus virescens*, Doubleday, Dieff. N. Zeal. ii. App. p. 284, n. 114 (1843).

North Island. In colls. Dr. Hector and J. D. Enys, Esq.

One of Dr. Hector's examples is of a sandy ochraceous colour; but in all probability this coloration is not natural.

Felder's *Charagia fischeri* is the *C. rubroviridans* of Walker.

##### 5. CHARAGIA HECTORI, n. sp.

Size, form, and general coloration of *C. rubroviridans*, but the primaries covered all over with transverse interrupted ferruginous-bordered whitish bands. Thorax and primaries sap-green, the latter crossed by about five macular transverse bands, but ill-defined on

the basal half of the wing; secondaries and abdomen above salmon-colour; primaries below with the basal area, excepting on costa, salmon-colour, the transverse markings only visible through the wing, secondaries varied with sap-green. Expanse of wings 6 inches 2 lines.

North Island. From Dr. Hector's collection.

6. *PORINA ENYSII*, n. sp. (Plate XLII. fig. 7.)

Primaries above smoky brown, varied with testaceous, black, and silvery white; costal area and basal third of wing whitish, mottled with brown and black; internal area white, interrupted upon the margin and towards the base by a claviform longitudinal black streak, followed by a small rounded black spot; discal area crossed by a broad brown band which terminates below in a black inverted cone, and is bounded externally by a connected transverse arched series of blackish spots; immediately beyond the black spots there is an irregular transverse whitish area (quite white at inner margin) which encloses a second, and submarginal, series of blackish spots; outer border, fringe, and veins testaceous; secondaries testaceous, with darker veins and fringe; thorax smoky brown; head testaceous; collar dark brown in front, very hairy, the hairs on the posterior border white at the tips; abdomen testaceous: wings below sordid testaceous, veins dusky, costa of primaries with two brown spots just beyond the middle; body sordid testaceous below, the pectus dusky in front. Expanse of wings 2 inches 7 lines.

North Island. From the collection of Mr. J. D. Enys.

*Porina Enysii* is most nearly allied to the *P. mairi* of Dr. Buller, but is very distinct; unfortunately the type is somewhat rubbed, so that it is possible that there may be markings upon the centre of the basal area of the primaries which I have failed to detect; the broad discal band and the submarginal series of reniform blackish spots, however, will at once serve to distinguish the species from all previously known forms.

7. *PORINA CERVINATA*.

*Elhamma cervinata*, Walker, Lep. Het. Suppl. ii. p. 595.

South Island. In colls. Dr. Hector and J. D. Enys, Esq.

PSYCHIDÆ.

8. *PSYCHE UNICOLOR*, n. sp.

Uniformly grey, the primaries of a slightly more brownish tint than the secondaries, and with a blackish costal edge; the secondaries subhyaline: body clothed with long woolly hair. Expanse of wings 1 inch.

South Island. From the coll. of J. D. Enys, Esq.

The case of *P. unicolor* is fusiform, truncated and open at the apex, through which (after the exclusion of the moth) the dark mahogany-brown pupa-skin projects; it is composed of short pieces of grass-stalks placed longitudinally, the largest being at the base, the smallest (mixed with small chips and silk) at the apex. Found on fences, gate-posts, rails, &c.

A second form of case occurs in Mr. Enys's collection; larger, longer, fusiform, of a woolly texture, grey in colouring, with a tendency to darker zones at unequal distances. It is found chiefly on willows, sometimes on *Cupressus*. Unfortunately the moth does not accompany it in sufficiently good condition for description; it is a species of *Clania*. Having discovered the type of *Morova subfasciata* of Walker, I find it to be a large example of *Cacæcia ? gallicolens*; the type of the latter description is a dwarfed and extremely dark specimen. Until I have examined really good examples of this species I should not like to hazard another guess at its affinities; but it certainly does not belong to the *Tortricidæ*.

#### NOCTUITES.

*Declana floccosa* of Walker should, I think, be placed among the Geometrites next to the genus *Ligia*; it is congeneric with the *Chlenias verrucosa* of Felder, which is not a true *Chlenias*. The form of the wings, slender abdomen, and long antennæ, seem to distinguish it from *Cnethocampa* and allies.

#### LEUCANIIDÆ.

##### 9. LEUCANIA PROPRIA.

*Leucania propria*, Walker, Lep. Het. ix. p. 111.

In coll. Dr. Hector.

##### 10. LEUCANIA SEMIVITTATA.

*Leucania semivittata*, Walker, Lep. Het. Suppl. ii. p. 628 (1865).

In colls. Dr. Hector and J. D. Enys, Esq.

##### 11. NONAGRIA UNICA.

*Leucania unica*, Walker, Lep. Het. ix. p. 112 (1856).

*Nonagria juncicolor*, Guénée, Ent. Mo. Mag. v. p. 2 (1868).

♂. In colls. Dr. Hector and J. D. Enys, Esq.

After carefully comparing Guénée's description with Walker's type, and with the examples brought to England by Dr. Hector and Mr. Enys, I am perfectly satisfied that the two descriptions represent the same species. Walker's type, which is a female, has not the blackish-grey under surface to the primaries; nor have specimens obtained by Dr. Hector; but in two of Mr. Enys's examples this character is well marked. The dots on the primaries and the darker thorax, upon which M. Guénée lays some stress, are both characteristic of Walker's type, although less strongly indicated than in most individuals of the species.

*Amphitape crassitibia* of Felder is *Ipana leptomera* of Walker.

##### 12. ALYSIA NULLIFERA.

*Agrotis nullifera*, Walker, Lep. Het. xi. p. 742 (1857).

*Alysia specifica*, Guénée, Ent. Mo. Mag. v. p. 3 (1868).

In colls. Dr. Hector and J. D. Enys, Esq.

This species appears to me to approach most nearly to *Nonagria*.

## APAMIDÆ.

## 13. HELIOPHOBUS DISJUNGENS.

*Heliophobus disjungens*, Walker, Lep. Het. xv. p. 1681 (1858).

*Hadena nervata*, Guénée, Ent. Mo. Mag. v. p. 40 (1868).

In colls. Dr. Hector and J. D. Enys, Esq.

The type is much rubbed; but a fresh example obtained by Dr. Hector seems to me to agree better with *Heliophobus* than with *Hadena*.

## NOCTUIDÆ.

## 14. NITOCRIS COMMA.

*Mamestra comma*, Walker, Lep. Het. ix. p. 239 (1856).

In colls. Dr. Hector and J. D. Enys, Esq.

## 15. NITOCRIS PLUSIATA.

*Hadena plusiata*, Walker, Lep. Het. Suppl. iii. p. 742 (1865).

*Nitocris bicomma*, Guénée, Ent. Mo. Mag. v. p. 4 (1868).

In colls. Dr. Hector and J. D. Enys, Esq.

I have no doubt of the correct synonymy of this species.

## 16. AGROTIS SUFFUSA.

*Noctua suffusa*, Denis, Wien. Verz. p. 80. n. 4 (1775).

In colls. Dr. Hector and J. D. Enys, Esq.

## 17. AGROTIS ? MODERATA.

*Agrotis ? moderata*, Walker, Lep. Het. Suppl. ii. p. 705 (1865).

In colls. Dr. Hector and J. D. Enys, Esq.

## 18. AGROTIS CÆRULEA.

*Agrotis (Spælotis) cærulea*, Guénée, Ent. Mo. Mag. v. p. 38 (1868).

A fragment in coll. J. D. Enys, Esq.

## 19. AGROTIS MITIS, n. sp. (Plate XLII. fig. 5.)

Allied to *A. ashworthii*; primaries silvery grey, the usual spots and markings barely indicated by dark grey scales; a transverse, central, well-defined, elbowed, dark grey line from costa to inner margin; two ill-defined discal lines, the outer one most distinct and formed of small dark grey sagittate spots; a submarginal series of black dots bordered with dark grey externally; fringe with a broad but indistinct central grey band; costa spotted with blackish; secondaries pale shining greyish brown, with a dusky lunulate submarginal line; fringe whitish; thorax silvery grey, head rather dusky; collar with a slender posterior black marginal line; abdomen pale greyish brown: wings below shining greyish silver, primaries with the discoidal and interno-discoidal areas and the veins suffused with smoky brown, a submarginal series of small conical black spots, extreme margin yellowish, fringe greyish; secondaries with a well-

defined disco-cellular dark grey spot, a lunulated submarginal blackish line, extreme margin yellowish, fringe white; pectus and legs whitish; venter testaceous, clothed laterally and anally with grey hair. Expanse of wings 1 inch 4 lines.

South Island. Coll. J. D. Enys, Esq.

A very well-marked and pleasing species.

#### 20. *AGROTIS ADMIRATIONIS*?

*Agrotis admirationis*, Guénée, Ent. Mo. Mag. v. p. 38 (1868).

Colls. Dr. Hector and J. D. Enys, Esq.

#### 21. *GRAPHIPHORA TARTAREA*, n. sp. (Plate XLII. fig. 2.)

♂. Primaries shining purplish brown; outer border broadly bronzy, bounded within by a slender sinuated irregular submarginal pale line, which ends towards the costa in an oblique black litura; costa crossed, particularly in the centre, by black spots; two central pale lines, diverging towards costa (the inner one irregularly inarched, the outer one angulated and excavated), enclosing several transverse black spots, one of which indicates the hind margin of the reniform spot; the latter bounded externally by the outer transverse elbowed line, and followed immediately by a black spot; fringe with slender basal and central pale undulated lines; secondaries bronzy brown, fringe with slender basal pale line; head, collar, and shoulders grey; collar brown-edged; thorax reddish; abdomen smoky brown, anus testaceous; wings below shining grey, with a continuous blackish discal line; costal and external areas paler, irrorated with brown; fringe sordid ochraceous with slender basal pale line; body below grey, tarsi blackish; anal valves fringed with sandy yellow. Expanse of wings 1 inch 7 lines.

Colls. Dr. Hector and J. D. Enys, Esq.

Allied to *G. rhomboidea*.

#### 22. *APAMEA VITIOSA*, n. sp. (Plate XLII. fig. 3.)

Nearly allied to *A. oculea*; primaries purplish or red-brown, with the markings more or less defined; the renal stigma and the four transverse lines generally yellowish, the whole of the usual markings always indicated by blackish lines; outer margin crenated, black; fringe with a whitish basal crenated line; secondaries pale shining brown, outer margin crenulated, black; fringe with a whitish basal crenulated line: body corresponding with the wings in colour; wings below grey in dark examples, whitish, tinted with red, in pale examples, with the discal area of primaries and the veins grey; an irregular transverse blackish line, common to all the wings; a black spot on the discocellulars, and a marginal series of small blackish spots between the veins; body below purplish in dark varieties, reddish in pale varieties, tarsi above banded with black. Expanse of wings 1 inch 5 lines.

South Island. Colls. Dr. Hector and J. D. Enys, Esq.

This species has varieties parallel to those of the European *A. oculea*.

## 23. EUMICHTIS SISTENS.

*Eumichtis sistens*, Guénée, Ent. Mo. Mag. v. p. 39 (1868).

Coll. Dr. Hector.

## HADENIDÆ.

## 24. HADENA MUTANS.

*Hadena mutans*, Walker, Lep. Het. xi. p. 602 (1857).

Coll. Dr. Hector.

## 25. HADENA LIGNIFUSCA.

*Hadena lignifusca*, Walker, Lep. Het. xi. p. 603 (1857).

*Euplexia insignis* (part), Walker, Lep. Het. Suppl. iii. p. 724 (1865).

Coll. Dr. Hector.

Possibly a variety of the preceding species.

## 26. HADENA DEBILIS, n. sp. (Plate XLII. fig. 6.)

Same general markings as in the two preceding; primaries silvery pale grey, crossed by a broad central (almost Y-shaped) pale brownish band, bounded by two brown lines, the outer line lunulated; the ordinary spots greyish, whitish-edged, between them a dark greyish area; a submarginal yellowish white lunulated line, relieved by blackish scales, and surrounded by a sandy-yellowish suffusion; a marginal series of blackish lunules; secondaries shining pale brown, with a marginal dusky line; thorax pale grey, collar and tegulæ with marginal black line; body whity-brown: wings below shining white; primaries with the discoidal and interno-discoidal areas greyish; secondaries irrorated with grey, a well-defined dark grey discocellular lunule; marginal markings as above; body below whitish. Expanse of wings 1 inch 5 lines.

North Island? Colls. Dr. Hector and J. D. Enys, Esq.

It is possible that this may be an extreme variation of *H. mutans*; but I think not; I have seen several examples all alike.

## 27. HADENA LIGNANA.

*Hadena lignana*, Walker, Lep. Het. xi. p. 758 (1857).

♀. Coll. Dr. Hector.

The type is a male.

## 28. HADENA INSIGNIS.

*Euplexia insignis* (part), Walker, Lep. Het. Suppl. iii. p. 724 (1865).

*Xylina turbida*, Walker, l. c. p. 754 (1865).

♂. Coll. J. D. Enys, Esq.

The *Xylina vexata* of Walker is closely allied to this species, but seems to be distinct.

## METERANA, n. gen.

Allied to *Erana*, but with rather longer palpi, broader thorax, the abdomen with lateral and dorsal tufts of hair-scales, the antennæ of

the male not pectinated, but each article bearing short pencils of hair; the wings slightly broader, the median veins of primaries emitted more regularly, the discoidal cell of secondaries much longer, the subcostal and radial branches emitted from a very short foot-stalk, and the second and third median branches (without a foot-stalk) from the inferior extremity of the cell. Type *M. pictula*.

29. *METERANA PICTULA*. (Plate XLII. fig. 1.)

*Dianthecia pictula*, White, in Taylor's 'New Zealand and its Inhabitants,' pl. i. fig. 3 (1855).

*Hadena pictula*, Walker, Lep. Het. xi. p. 601 (1857).

North and South Islands. ♀. Coll. J. D. Enys, Esq.

The female has the primaries less strongly marked with yellow than the male, the renal stigma being also white; the secondaries are rose-pink, with the discocellular, three dots on the median branches, and a broad outer border dusky; a yellowish spot is discernible near the anal angle upon the border.

30. *ERANA PLENA*.

*Erana plena*, Walker, Lep. Het. Suppl. iii. p. 744 (1865).

Colls. Dr. Hector and J. D. Enys, Esq.

XYLINIDÆ.

31. *AUCHMIS COMPOSITA*.

*Auchmis composita*, Guénée, Gen. Léop. Noct. iii. p. 114 (1852).

Colls. Dr. Hector and J. D. Enys, Esq.

Felder has figured this species under the name of *Mamestra maori*.

32. *XYLOCAMPA CUCULLINA* ?

*Xylocampa cucullina*, Guénée, Ent. Mo. Mag. v. p. 40 (1868).

Coll. J. D. Enys, Esq.

33. *XYLOCAMPA INCEPTURA*.

*Xylina inceptura*, Walker, Lep. Het. xv. p. 1736 (1858).

*Xylina* ? *deceptura*, Walker, l. c. p. 1737 (1858).

Colls. Dr. Hector and J. D. Enys, Esq.

34. *XYLINA USTISTRIGA*.

*Xylina ustistriga*, Walker, Lep. Het. xi. p. 630 (1857).

Colls. Dr. Hector and J. D. Enys, Esq.

35. *XYLINA LIGNISECTA* ?

*Xylina lignisecta*, Walker, Lep. Het. xi. p. 631 (1857).

Coll. Dr. Hector.

A single example in poor condition.

36. *XYLOPHASIA STIPATA*.

*Xylina stipata*, Walker, Lep. Het. Suppl. iii. p. 753 (1865).

Colls. Dr. Hector and J. D. Enys, Esq.



This species certainly belongs to the genus *Xylophasia*.  
*Xylina provida* and *X. canescens* of Walker are synonyms.

## AMPHIPYRIDÆ.

## 37. BITYLA ATRISTRIGA.

*Xylina atristriga*, Walker, Lep. Het. Suppl. iii. p. 756 (1865).  
 ♀. Coll. Dr. Hector. ♂. Coll. J. D. Enys, Esq.

## 38. BITYLA DEFIGURATA.

*Xylina defigurata*, Walker, Lep. Het. Suppl. iii. p. 756 (1865).  
*Bityla thoracica*, Walker, l. c. p. 869 (1865).  
 Coll. J. D. Enys, Esq.

## 39. BITYLA SERICEA, n. sp. (Plate XLII. fig. 12.)

Primaries shining greyish brown, crossed by two widely separated and slightly diverging dusky lines, the inner one in the shape of a } , the outer one composed of small lunules with whitish exterior margins; outer margin undulated, fringe silky whitish; secondaries pale brown, fringe sandy whitish; thorax greyish brown, collar slightly darker; abdomen?: primaries below pale grey, costa and fringe whitish; secondaries whitish, with a submarginal indistinct grey band, and the outer border of the same tint, fringe whitish; pectus sandy yellowish, dusky in front; legs sandy yellowish, banded with black. Expanse of wings 1 inch 6 lines.

South Island. Coll. J. D. Enys, Esq.

One imperfect example. It is allied to *B. defigurata*.

## HELIOTHIDÆ.

## 40. HELIOTHIS CONFERTA.

*Heliothis conferta*, Walker, Lep. Het. xi. p. 690. n. 21 (1857).  
 Coll. Dr. Hector.

## EUCLIDIIDÆ.

## 41. EUCLIDIA HECTORI, n. sp. (Plate XLII. fig. 4.)

Primaries very like those of the New-Zealand *Fidonia*, shining grey, irrorated with white, with a central irregular broad band, edged on each side with dark brown; a broad brown outer border, through the centre of which runs a pale lunulated line; costa crossed by oblique brown dashes; fringe brown, spotted externally with white; secondaries with the basal two thirds whity-brown, crossed by three nearly straight parallel brown bands; apical third brown, crossed by a slender irregularly undulated whity-brown line; fringe brown, tipped with white; body grey: wings below sordid white, with a broad black outer border, crossed by a sinuous macular white streak; primaries with a transverse dash near the base, and three bands (the outermost elbowed) across the central area, black; secondaries greyish at base, crossed by four parallel black bands; body below sandy whitish. Expanse of wings 1 inch 5 lines.

High-mountain form. Colls. Dr. Hector and J. D. Enys, Esq.

Found at between 4000 and 5000 feet. Very difficult to catch.

## PYRALITES.

## HYPENIDÆ.

## 42. RHAPSA SCOTOSIALIS.

*Rhapsa scotosialis*, Walker, Lep. Het. Suppl. iv. p. 1150 (1865).  
Colls. Dr. Hector and J. D. Enys, Esq.

## HERMINIIDÆ.

## 43. HERMINIA LILACINA, n. sp. (Plate XLII. fig. 11.)

Primaries olive-brown, shot with lilac and irrorated with black, a minute annular marking at the base; a transverse discal series of dots, and a submarginal undulated line, black; a rounded orange black-edged spot in the centre of the cell; the spot on the discocellulars ("reniform" of Guénée) B-shaped, orange, black-edged; secondaries sandy whitish; external area and a well-defined transverse discal line dusky; margins of all the wings with a slender brown line dotted with black, the fringe grey, with a basal yellow line; body corresponding in colour with the wings: primaries below grey, the costal and external areas pale testaceous; secondaries whitish testaceous, irrorated with brown; all the wings with a discal transverse streak, and a submarginal series of spots brown; fringe as above. Expanse of wings 1 inch 7-lines.

South Island. Coll. Dr. Hector.

## 44. DARABA PARONALIS.

*Scopula? paronalis*, Walker, Lep. Het. xviii. p. 797 (1859).  
Colls. Dr. Hector and J. D. Enys, Esq.

## 45. SCOPULA FLAVIDALIS.

*Margaritia flavidalis*, Doubleday, Dieff. N. Zeal. App. p. 288 (1843).

Colls. Dr. Hector and J. D. Enys, Esq.

*S. quadralis* and *S. dipsasalis* appear to be varieties of this species, they agree with it in marking. *Botys otagalus* of Felder seems to be an allied but distinct species.

## 46. MECYNA ORNITHOPTERALIS.

*Mecyna ornithopteralis*, Guénée, Sp. Gen. Léop., Delt. et Pyral. p. 411 (1854).

Colls. Dr. Hector and J. D. Enys, Esq.

A very variable species; the *Botys maorialis* of Felder may be a form of it; it is certainly congeneric.

## SCOPARIIDÆ.

## 47. SCOPARIA DIPHThERALIS.

*Scoparia diptheralis*, Walker, Lep. Het. Suppl. iv. p. 1503 (1865).  
South Island. Coll. J. D. Enys, Esq.

## 48. SCOPARIA SUBMARGINALIS.

*Hypochalcia submarginalis*, Walker, Lep. Het. xxvii. p. 48 (1863).  
*Scoparia feredayi*, Knaggs, Ent. Mo. Mag. iv. p. 80 (1867).

Colls. Dr. Hector and J. D. Enys, Esq.

## 49. SCOPARIA RAKAIENSIS.

*Scoparia rakaiensis*, Knaggs, Ent. Mo. Mag. iv. p. 80 (1867).

South Island. Coll. J. D. Enys, Esq.

The *Scoparia ejuncida* of Knaggs is *Hypochalcia indistinctalis* of Walker.

## GEOMETRITES.

## ENNOMIDÆ.

## 50. POLYGONIA FORTINATA.

*Polygonia fortinata*, Guénée, Ent. Mo. Mag. v. p. 41 (1868).

*Cautoloma? ziczac*, Felder, Reise der Nov. Lep. v. pl. cxxxii. 4.

North and South Islands. Coll. J. D. Enys, Esq.

The *Selenia gallaria* of Walker is a nearly allied species of the same genus.

## 51. GONODONTIS FELIX, n. sp. (Plate XLII. fig. 10.)

Primaries golden fawn-colour, sparsely irrorated with grey, crossed near the base by a zigzag line which runs inwards at the costa, and beyond the middle of the wing by a nearly straight oblique line, both purplish brown; the outer line bordered externally by a slender line of pinky whitish; a black spot at the end of the cell; fringe orange, white-tipped; secondaries pale pinky brownish; the disk crossed by an irregular grey line; a grey spot at the end of the cell; fringe orange, tipped with white; head and thorax golden fawn-colour: wings below pale reddish clay-colour; outer border paler, with zigzag internal edge; a discal black-dotted transverse line, zigzag on the secondaries; a black spot at the end of each discoidal cell; costa of primaries dotted alternately with ferruginous and white; pectus reddish clay-colour. Expanse of wings 1 inch 10 lines.

South Island. Coll. J. D. Enys, Esq.

Allied to *G. nelsonaria* of Felder. Dr. Staudinger possesses a smaller and less strongly marked example of the same species, probably its male; in this specimen the pale external border is wanting on the under surface. "It varies much in depth of colour" (*Enys*).

## 52. SESTRA OBTRUNCATA.

*Cidaria? obtruncata*, Walker, Lep. Het. xxv. p. 1421 (1862).

*Teras punctilineana*, Walker, l. c. Suppl. v. p. 1780 (1866).

Coll. J. D. Enys, Esq.

Judging from an example in Dr. Staudinger's possession, I suspect that this is only a variety of *Sestra flexata*, described by Walker as a *Cidaria*, but identical with his *S. fusiplagiata*.

53. *SESTRA OBTUSARIA.*

*Lozogramma obtusaria*, Walker, Lep. Het. xxiii. p. 985 (1861).

Coll. J. D. Enys, Esq.

This is closely allied to (if not identical with) *S. humeraria* of Walker, described with a query as a *Macaria*. The genus *Sestra* seems to be most nearly allied to *Epione*.

## BOARMIIDÆ.

54. *BOARMIA DEJECTARIA.*

*Boarmia dejectaria*, Walker, Lep. Het. xxi. p. 394 (1860).

*Boarmia exprompta*, Walker, l. c. p. 395 (1860).

*Trepheusia patularia*, Walker, l. c. p. 422 (1860).

*Gnophos pannularia*, Guénée, Ent. Mo. Mag. v. p. 42 (1868).

*Scotopteryx maoriata*, Felder, Reise der Nov. Lep. v. pl. cxxvi. fig. 4.

*Hemerophila sulpitiata*, Felder, l. c. fig. 7.

*H. caprimulgata*, Felder, l. c. fig. 12.

Colls. Dr. Hector and J. D. Enys, Esq.

*Boarmia dejectaria* is one of the commonest and most variable of the New-Zealand moths; there is therefore some excuse for the multiplication of specific names associated with it; but the positions assigned to these supposed species show deplorable carelessness as to structural characters.

55. *BOARMIA ATTRACTA.*

*Boarmia attracta*, Walker, Lep. Het. xxi. p. 394 (1860).

North Island. Coll. J. D. Enys.

As I have shown in my 'Lepidoptera of New Zealand,' Mr. Walker described this form three times under two different genera. I strongly suspect it to be an extreme variety of the preceding species. The *Tephrosia scriptaria* of Walker is identical with his *Scotosia stigmaticata*.

## ACIDALIIDÆ.

56. *ASTHENA SUBPURPUREATA.*

*Asthenia subpurpureata*, Walker, Lep. Het. xxvi. p. 1588 (1862).

*Acidalia tukuata*, Felder, Reise der Nov. Lep. v. pl. cxxviii. f. 5.

Colls. Dr. Hector and J. D. Enys, Esq.

57. *ASTHENA PULCHRARIA.*

*Acidalia pulchraria*, Doubleday, Dieff. N. Zeal. App. p. 286 (1843).

*Asthenia mullata*, Guénée, Ent. Mo. Mag. v. p. 42 (1868).

Colls. Dr. Hector and J. D. Enys, Esq.

58. *ACIDALIA RUBRARIA.*

*Acidalia? rubraria*, Doubleday, Dieff. N. Zeal. App. p. 286 (1843).

*Fidonia? acidaliaria*, Walker, Lep. Het. xxiv. p. 1037 (1862).

Colls. Dr. Hector and J. D. Enys, Esq.

## 59. ACIDALIA SCHISTARIA.

*Acidalia schistaria*, Walker, Lep. Het. xxiv. p. 782 (1861).  
Coll. Dr. Hector.

## 60. ACIDALIA UNDOSATA.

*Cidaria undosata*, Felder, Reise der Nov. Lep. v. pl. cxxviii.  
fig. 2.

Colls. Dr. Hector and J. D. Enys, Esq.

## 61. ACIDALIA PRÆFECTATA.

*Acidalia præfectata*, Walker, Lep. Het. xxiv. p. 781 (1861).  
*Acidalia subtentaria*, Walker, l. c. xxvi. p. 1610 (1862).  
*Acidaliu absconditaria*, Walker, l. c. p. 1611 (1862).

Colls. Dr. Hector and J. D. Enys, Esq.

Now that I have placed the types of Walker's three descriptions in one drawer, I find them to be slight variations of one and the same species.

## FIDONIDÆ.

## 62. PANAGRA SCISSARIA.

*Panagra scissaria*, Guénée, Ent. Mo. Mag. v. p. 43 (1868).

Coll. J. D. Enys, Esq.

This species bears a strong general resemblance to Walker's genus *Samana*; the latter should, perhaps, be placed near it. *Panagra ephyrraria* is congeneric with *Gargaphia muriferata*. I discovered that Walker had placed the two together, but without moving the label of the former from its original position. It seems to have been a common practice with this naturalist, when he supposed two of his species to be identical, to put the specimens under one name, leaving the labels undisturbed. This practice has given me inconceivable trouble, and has wasted much valuable time.

## 63. FIDONIA BREPHOSATA.

*Fidonia? brephosata*, Walker, Lep. Het. xxiv. p. 1037 (1862).

Coll. J. D. Enys, Esq.

## 64. FIDONIA CATOCALARIA.

*Larentia catocalaria*, Guénée, Ent. Mo. Mag. v. p. 26 (1868).

Colls. Dr. Hector and J. D. Enys, Esq.

I believe this to be a slight variety of the preceding species, and to be identical with *Fidonia brephos* of Felder.

## 65. FIDONIA ENYSII, n. sp. (Plate XLII. fig. 9.)

Primaries above pale grey, crossed by sandy yellowish, white, and dark grey bars and lines, some of which form an irregular darker central band; outer border broadly dark grey, bounded internally by a lunulated sandy stripe and intersected by a pale line; fringe alternately pale brown and whitish; secondaries bright orange; abdominal area speckled with blackish; a subbasal transverse black

line; outer border dentated, black; fringe alternately brown and whitish; body grey: wings below bright ochreous, crossed by several black lines, much as in the preceding species; outer border black, intersected by a crenated yellow stripe, which in the secondaries unites with the ground-colour at the apex and in the second median interspace; pectus white, venter creamy whitish. Expanse of wings 1 inch 4 lines.

Three examples. Coll. J. D. Enys, Esq.

A mountain form, found at from 3000 to 5000 feet.

66. *FIDONIA ANCEPS*, n. sp. (Plate XLIII. fig. 3.)

Allied to the preceding species, but paler; the secondaries above straw-yellow, dusky at the base, crossed by three parallel central dark grey bands; also with a confused zigzag submarginal band of the same colour. Expanse of wings 1 inch 3 lines.

Two examples. Coll. J. D. Enys, Esq.

Also a mountain species.

67. *FIDONIA FEROX*, n. sp. (Plate XLII. fig. 8.)

Primaries dark shining grey, crossed by numerous darker undulated and lunular lines; two of these form a central band, relieved on each side by a tint of bronzy brown; outer border broadly tinted with bronzy brown, and bounded within by a double lunulated line; fringe long and grey; secondaries fiery orange, greyish at base, crossed from the basal third by five black lines, the first and last thickest, the first two straight, the two next lunulated and angulated, the fifth lunulated and arched, submarginal; margin black; fringe long and brown, grey at the tips; body greyish brown, abdomen annulated with whitish: wings below golden orange; external half crossed by lunulated black and silvery white lines; body below white. Expanse of wings 1 inch 2 lines.

Coll. J. D. Enys, Esq.

The prettiest of all the orange-winged species. Found at from 3000 to 5000 feet elevation.

68. *FIDONIA?* *ABROGATA*.

*Aspilates abrogata*, Walker, Lep. Het. xxiv. p. 1075 (1862).

*Fidonia? servularia*, Guénee, Ent. Mo. Mag. v. p. 43 (1868).

Colls. Dr. Hector and J. D. Enys, Esq.

I believe this to be a species of *Acidalia*; it certainly has very little in common with *Fidonia*, and does not at all agree with *Aspilates*.

69. *FIDONIA?* *CATAPYRRHA*, n. sp. (Plate XLIII. fig. 2.)

♂, ♀. Primaries above whitish, clouded and banded with brown; the principal markings are an angulated transverse subbasal dark brown band; two central bands forming a band, its inner edge subangulated, its outer edge very irregular, projecting within the median interspaces; an interrupted submarginal brown streak; a brown apical spot, and five oval marginal red spots enclosing black

dots at their interior extremities; fringe alternately brown and white; secondaries ochre-yellow, with a central angulated bifid band, an angulated submarginal streak, and the outer border composed of dark grey scales; a marginal series of black dots; fringe grey; body brown; abdomen banded with white: primaries below stramineous; an angulated postmedian band, bifid above the median nervure, a dot at end of cell, an irregular transverse tapering subapical streak, and the centre of the outer border black-brown; a subapical spot, and the apical border pale ferruginous; a spot on the costa, and an irregular apical submarginal streak, white; fringe alternately brown and white; secondaries brick-red; a central longitudinal cuneiform streak proceeding from the base to near the outer margin, and the abdominal border, white; a spot close to the base, a central angulated transverse band, a claviform submarginal streak, and a spot on the outer margin, black; fringe grey; body below whitish. Expanse of wings  $8\frac{1}{2}$  lines.

Colls. Dr. Hector and J. D. Enys, Esq.

70. *ASPILATES INSIGNIS*, n. sp. (Plate XLIII. fig. 1.)

♂. Primaries cupreous-brown, the base, costal area, and centre of internal area irrorated with grey; a submedian longitudinal streak from base of inner margin to just beyond the end of discoidal cell, and a transverse straight discal band, white; fringe pale grey; secondaries sandy yellow, the base and outer border finely dusted with pale grey; fringe whitish; body grey; anal tuft testaceous; wings below sandy yellow, fringe whity-brown, white internally; pectus whitish, venter testaceous. Expanse of wings 1 inch 4 lines.

3000 to 4000 feet elevation. Colls. Dr. Hector and J. D. Enys, Esq.

In one example obtained by Mr. Enys the longitudinal white streak of primaries joins the discal white band, and the coloration is altogether deeper than in the type. Mr. Enys took one specimen at 6000 feet.

71. *DASYURIS PERORNATA*.

*Fidonia perornata*, Walker, Lep. Het. xxvi. p. 1672 (1862).

Coll. J. D. Enys, Esq.

72. *DASYURIS PARTHENIATA*.

*Dasyuris partheniata*, Guénée, Ent. Mo. Mag. v. p. 93 (1868).

Colls. Dr. Hector and J. D. Enys, Esq.

Allied to *Camptogramma correlata* of Walker.

73. *DASYURIS REHATA*.

*Cidaria rehata*, Felder, Reise der Nov. Lep. v. pl. cxxxi. fig. 6.

Coll. Dr. Hector.

This species varies much in the outline of the central band of primaries. I have not seen it with the falcate form of wing represented in Felder's figure.

## HYBERNIIDÆ.

## 74. HYBERNIA INDOCILISARIA.

*Zermizinga indocilisaria*, Walker, Lep. Het. xxvi. p. 1530 (1862).  
*Hybernia boreophilaria*, Guénée, Ent. Mo. Mag. v. p. 61 (1868).  
 ♂, ♀. Coll. Dr. Hector.

## LARENTIIDÆ.

## 75. LARENTIA PRODUCTATA.

*Larentia productata*, Walker, Lep. Het. xxiv. p. 1197 (1862).  
 Coll. J. D. Enys, Esq.  
*Larentia quadristrigata* is synonymous with *L. interclusa*.

## 76. LARENTIA SEMISIGNATA.

*Larentia semisignata*, Walker, Lep. Het. xxiv. p. 1200 (1862).  
*Cidaria dissociata*, Walker, Lep. Het. xxvi. p. 1734 (1862).  
*Cidaria semilisata*, Walker, l. c. p. 1735 (1862).  
*Larentia corcularia*, Guénée, Ent. Mo. Mag. v. p. 61 (1868).  
 Colls. Dr. Hector and J. D. Enys, Esq.

I here insert two puzzling genera:—

## PSEUDOCOREMIA, n. gen.

Aspect of *Larentia productata*; antennæ as in *Boarmia*. Palpi short, projecting a short distance in front of the eyes. Posterior margins of the segments of abdomen more or less tufted laterally. Wings broad; primaries rounded at apex; discocellulars transverse, regular; first median branch emitted at some distance from the second and third, the latter emitted close together at the end of the cell. Discocellular of secondaries angulated; second and third median branches emitted nearer together than the first and second. Type *P. fragosata*.

This genus is probably allied to *Boarmia*, but has the general coloration of *Larentia productata*, and the abdomen very long—according to Mr. Enys, sometimes as long as that of *Tatosoma*.

## 77. PSEUDOCOREMIA FRAGOSATA.

*Selidosema? fragosata*, Felder, Reise der Nov. Lep. v. pl. cxxxi. fig. 29.

South Island. Coll. J. D. Enys, Esq.

*Selidosema* of Hübner agrees with *Tephrosia*.

## 78. PSEUDOCOREMIA INDISTINCTA, n. sp. (Plate XLIII. fig. 8.)

Primaries whitish, tinted with stramineous and mottled with brown; base spotted with dark brown; an angulated squamose brown fascia limiting the basal area; the costal area beyond the middle banded with brown; a submarginal series of large spots and the outer border brown; two series of short longitudinal black lituræ on the latter between the veins; secondaries stramineous, with indications of two squamose ferruginous bands, one across the



cell, the other submarginal; a marginal series of minute black dots; thorax pale brown; head dark brown; abdomen stramineous: underside stramineous; primaries with the discoidal cell, base, and a squamose apical patch brown. Expanse of wings 1 inch 3 lines.

South Island. Coll. Dr. Hector.

#### CACOPSODOS, n. gen.

Agreeing in general appearance and in its hairy palpi with *Psodos*, but differing entirely in the structure of the antennæ, the latter presenting to the naked eye the appearance of those of *Coremia* ♀, but having in reality only the inner margin pectinated, the outer margin being quite simple. Type *C. niger*.

#### 79. CACOPSODOS NIGER, n. sp. (Plate XLIII. fig. 4.)

Greyish black, speckled with white scales; primaries crossed by a broad dentated central black band; below shining dark grey, with a continuous paler discal line; pectus black. Expanse of wings 11 lines.

South Island. Coll. J. D. Enys, Esq.

This species is somewhat like *Panagra explanata*, *disputata*, and *esignata*, but differs in its hairy palpi.

#### 80. HELASTIA INVEXATA.

*Larentia invexata*, Walker, Lep. Het. xxiv. p. 1199 (1862).

*Cidaria adonata*?, Felder, Reise der Nov. Lep. v. pl. cxxxi. fig. 31.

Colls. Dr. Hector and J. D. Enys, Esq.

#### 81. HELASTIA INDICATARIA.

*Eupithecia indicataria*, Walker, Lep. Het. xxvi. p. 1708 (1862).

Coll. Dr. Hector.

#### 82. HELASTIA BILINEOLATA.

*Eupithecia bilineolata*, Walker, Lep. Het. xxiv. p. 1246 (1862).

*Eupithecia cidariaria*?, Guénée, Ent. Mo. Mag. v. p. 62 (1868).

Coll. J. D. Enys, Esq.

Possibly an extreme form of the preceding species. The three here placed under *Helastia* differ from the males of *Eupithecia* in their prominently pectinated antennæ; the following also seems to agree with them in structure:—

#### 83. HELASTIA MUSCOSATA.

*Eupithecia? muscosata*, Walker, Lep. Het. xxiv. p. 1246 (1862).

Colls. Dr. Hector and J. D. Enys, Esq.

I think it not improbable that the *Coremia inamænaria* of Guénée is this species; but the description is not sufficiently precise to enable me to determine it satisfactorily. Felder's figure of *Cidaria aquosata* may also be intended for this species.

## 84. COREMIA ROSEARIA.

*Cidaria rosearia*, Doubleday, Dieff. N. Zeal. App. p. 285 (1843).

*Coremia pastinaria*, Guénée, Ent. Mo. Mag. v. p. 64 (1868).

Colls. Dr. Hector and J. D. Enys, Esq.

As I do not possess Guénée's type (of *C. subidaria*) from Australia to compare with Doubleday's from New Zealand, I cannot be absolutely certain that they are identical, although they have long been considered so. M. Guénée says, "Elle varie extrêmement," which is the case with Doubleday's species; the latter also comes both from Australia and New Zealand.

## 85. COREMIA ARDULARIA.

*Coremia ardularia*, Guénée, Ent. Mo. Mag. v. p. 63 (1868).

Colls. Dr. Hector and J. D. Enys, Esq.

## 86. CAMPTOGRAMMA SUBOCHRARIA.

*Aspilates? subochraria*, Doubleday, Dieff. N. Zeal. App. p. 285 (1843).

Var. *Camptogramma fuscinata*, Guénée, Ent. Mo. Mag. v. p. 92 (1868).

Colls. Dr. Hector and J. D. Enys, Esq.

The brown form named by Guénée is a common and slight variety of the species, not differing in any thing but tint and varying in intensity.

## 87. CAMPTOGRAMMA STINARIA.

*Camptogramma stinaria*, Guénée, Ent. Mo. Mag. v. p. 92 (1868).

Colls. Dr. Hector and J. D. Enys, Esq.

A well-marked and pretty little species.

## 88. PHIBALAPTERYX GOBIATA.

*Cidaria (Phibalapteryx) gobiata*, Felder, Reise der Nov. Lep. v. pl. cxxxi. fig. 2.

Colls. Dr. Hector and J. D. Enys, Esq.

## 89. PHIBALAPTERYX VERRICULATA.

*Cidaria verriculata*, Felder, Reise der Nov. Lep. v. pl. cxxxi. fig. 20.

On cabbage-trees near the sea. Colls. Dr. Hector and J. D. Enys, Esq.

*Phibalapteryx parvulata* of Walker is identical with *Scotosia denotata*; and *Scotosia humeraria* is probably a worn example of the same. *Scotosia panagrata* is a *Hyperythra*. It varies in so remarkable a manner that, had I not seen intermediates between the extreme forms, it would have been impossible to associate them together. The type is brown, the primaries rather darker than the secondaries, showing traces of darker transverse lines, and having a 3-shaped white line on the discocellulars; the extreme variation has no white line, but both primaries and secondaries are spotted with bright ochraceous as follows:—primaries with a short subbasal

transverse macular fascia, a similar abbreviated subapical fascia, and and a spot on inner margin near external angle; secondaries with a transverse subapical abbreviated fascia and a spot at anal angle. The genus *Hyperythra* belongs to the Ennomidæ.

90. *CIDARIA CLARATA*.

*Larentia clarata*, Walker, Lep. Het. xxiv. p. 1197 (1862).

*Cidaria pyramaria*, Guénée, Ent. Mo. Mag. v. p. 93 (1868).

Colls. Dr. Hector and J. D. Enys, Esq.

91. *CIDARIA BEATA*, n. sp. (Plate XLIII. fig. 6.)

Above very similar in pattern to the preceding species, but much smaller, and the primaries with all the markings olive-green instead of bronzy brown; the secondaries white instead of yellow, with a pale pinky brown outer border; thorax olive-green; abdomen testaceous: primaries below with the basal area, to the extremity of the dentated central band of the upper surface, madder-brown; costa testaceous, tinted with olivaceous, and crossed by ferruginous bars; disk whity-brown; apex and outer border shining testaceous, almost golden; a submarginal series of white dots; fringe silvery white, black-spotted; secondaries pale testaceous, increasing in intensity to the outer border, which is golden, crossed by parallel crenate olivaceous lines, three of which form a central band, relieved externally by white lunules; disk crossed by paler olivaceous lines, followed by a submarginal series of white lunules; body below testaceous. Expanse of wings 1 inch.

South Island. Coll. J. D. Enys, Esq.

A very distinct and pretty little species.

92. *CIDARIA SEMIFISSATA*.

*Coremia semifissata*, Walker, Lep. Het. xxv. p. 1320 (1862).

*Cidaria delicatulata*, Guénée, Ent. Mo. Mag. v. p. 94 (1868).

Colls. Dr. Hector and J. D. Enys, Esq.

M. Guénée's description of *Coremia ypsilonaria* would almost do for some examples of this species; but he can hardly have described it twice under distinct genera.

93. *CIDARIA SIMILATA*.

*Cidaria similata*, Walker, Lep. Het. xxv. p. 1413 (1862).

Colls. Dr. Hector and J. D. Enys, Esq.

94. *CIDARIA MEGASPILATA*.

*Larentia megaspilata*, Walker, Lep. Het. xxiv. p. 1198 (1862).

*Cidaria assata*, Felder, Reise der Nov. Lep. v. pl. cxxxi. fig. 4.

Colls. Dr. Hector and J. D. Enys, Esq.

95. *CIDARIA CONGREGATA*.

*Cidaria congregata*, Walker, Lep. Het. xxv. p. 1415 (1862).

*Cidaria monoliata*, Felder, Reise der Nov. Lep. v. pl. cxxxii. fig. 8.

Coll. Dr. Hector.

96. *CIDARIA INCLARATA.*

*Cidaria inclarata*, Walker, Lep. Het. xxv. p. 1411 (1862).  
Colls. Dr. Hector and J. D. Enys, Esq.

97. *CIDARIA PLAGIFURCATA.*

*Cidaria plagifurcata*, Walker, Lep. Het. xxv. p. 1416 (1862).  
Coll. Dr. Hector.

*Cidaria inopiata* of Felder appears to be a slight variety of *C. perductata* of Walker; and *C. timarata* is a poor figure of *C. similata*.

98. *TATOSOMA LESTEVATA.*

*Cidaria lestevata*, Walker, Lep. Het. xxv. p. 1416 (1862).  
*Sauris ranata*, Felder, Reise der Nov. Lep. v. pl. cxxxii. fig. 11.  
Coll. J. D. Enys, Esq.

99. *ELVIA GLAUCATA.*

*Elvia glaucata*, Walker, Lep. Het. xxv. p. 1431 (1862).  
Coll. J. D. Enys, Esq.  
Felder's figures of this species are too brightly coloured.

## LIGIDÆ.

100. *DECLANA FLOCCOSA.*

*Declana floccosa*, Walker, Lep. Het. xv. p. 1649 (1858).  
Colls. Dr. Hector and J. D. Enys, Esq.  
Walker's *Argua scabra* is an allied species, if not a variety.

101. *DECLANA FEREDAYI*, n. sp. (Plate XLIII. fig. 5.)

Primaries shining pinky grey, crossed by innumerable short black lines; two widely separated irregularly zigzag central black lines, indicating a broad central band, which is relieved on each side by ferruginous; external area (commencing in an oblique line from the apex) silvery; a regularly zigzag marginal line; fringe greyish brown; secondaries pale grey; margin and fringe as in primaries; thorax dark grey, varied with ferruginous; abdomen pale grey; wings and body below pale grey; primaries with the costa whitish, spotted with dark grey; fringe and margin as above. Expanse of wings 1 inch 6 lines.

Christchurch. Coll. J. D. Enys, Esq.  
A common species round Christchurch.

## CRAMBITES.

## GALLERIDÆ.

102. *APHOMIA STRIGOSA*, n. sp. (Plate XLIII. fig. 10.)

Primaries shining whity-brown; crossed beyond the middle by an arched deeply dentated slender black line, bounded externally by whitish; a white submedian streak, from the base to the origin of the first median branch, bounded below and at its extremity by a

hooked black streak; a whitish ill-defined streak through the end of the cell, upon which there is a minute black discocellular dot; secondaries pale whity-brown, slightly darker at the apex; body coloured like the opposite wings, anal tuft yellow: wings below shining pale whity-brown, sandy yellowish on the costal areas; body below whitish. Expanse of wings 1 inch 3 lines.

South Island. Coll. Dr. Hector.

Were it not for the black and white longitudinal streaks below the discoidal cell of primaries, this species would not be at all unlike the European form. It is common in grass.

#### PHYCIDÆ.

##### 103. HYPOCHALCIA CORRUPTA, n. sp. (Plate XLIII. fig. 9.)

Pale brown; primaries with the costal half irrorated with whitish; base, centre of disk, and two terminal patches (the smaller one nearest to apex) bronzy, speckled with black; fringe of all the wings pale grey, very long; thorax brown, abdomen paler brown: wings below whity-brown, the primaries rather darker than the secondaries; fringe silky-whitish; body below whitish. Expanse of wings 9 lines.

South Island. Colls. Dr. Hector and J. D. Enys, Esq.  
Common in grass.

##### 104. GADIRA ACERELLA.

*Gadira acerella*, Walker, Lep. Het. Suppl. v. p. 1742 (1866).

*Botys mahanga*, Felder, Reise der Nov. Lep. v. pl. cxxxvii. fig. 27.

Colls. Dr. Hector and J. D. Enys, Esq.  
Not common.

#### CRAMBIDÆ.

##### 105. CRAMBUS FLEXUOSELLUS.

*Crambus flexuosellus*, Doubleday, Dieff. N. Zeal. App. p. 289 (1843); Felder, Reise der Nov. Lep. v. pl. cxxxvii. fig. 32.

Coll. Dr. Hector.

The commonest *Crambus* in New Zealand.

##### 106. CRAMBUS VAPIDUS, n. sp.

Primaries above testaceous, with a longitudinal whitish streak tapering to both ends, from the base through the discoidal cell to the outer margin, bounded towards the base below and in the centre above by blackish lines; apical margin whitish: four black dots terminating the nervures at the centre of outer margin; fringe shining whitish; secondaries shining whitish; head and thorax white; palpi externally, and tegulæ, pale pinky brown; abdomen testaceous: wings below paler than above; primaries without markings; body below whitish. Expanse of wings 11 lines.

South Island. Coll. Dr. Hector.

## 107. CRAMBUS TRANSCISSALIS.

*Crambus transcissalis*, Walker, Lep. Het. xxvii. p. 178 (1863).

Coll. Dr. Hector.

This species appears to be rare; I have only seen two examples.

## 108. CRAMBUS RAMOSELLUS.

*Crambus ramosellus*, Doubleday, Dieff. N. Zeal. App. p. 288 (1843).

Var. ? *Crambus rangona*, Felder, Reise der Nov. Lep. v. pl. cxxxvii. fig. 25.

Coll. J. D. Enys, Esq.

Walker confounded with this species two New-Zealand examples of the Australian *Crambus lativittalis*.

## 109. CRAMBUS TRIVIRGATUS.

*Crambus trivirgatus*, Felder, Reise der Nov. Lep. v. pl. cxxxvii. fig. 29.

South Island. Coll. J. D. Enys, Esq.

Apparently a rare species.

## 110. CRAMBUS VULGARIS, n. sp. (Plate XLIII. fig. 7.)

Primaries above pale reddish brown, more or less irrorated with whitish on the costal area; a longitudinal discoidal white streak from the base, upon which are two dark brown spots, the inner one smaller and squamose, the outer one cuneiform and sharply defined; a white subapical dentated abbreviated transverse band sometimes joining and always approaching at its extremity an oblique streak, which proceeds from the apex; the inner edge of the subapical band sometimes outlined in black; five black dots on the outer margin; fringe reddish brown externally, white internally, with a central blackish line; secondaries stramineous, sometimes tinted with reddish; fringe white; body reddish brown, the thorax darker than the abdomen: wings below stramineous; the costal area of primaries brownish; body below whitish. Expanse of wings 1 inch.

South Island. Colls. Dr. Hector and J. D. Enys, Esq.

Evidently a common species, allied to *C. tuhualis* of Felder, but said to be local.

## 111. CHILO SIMPLEX, n. sp. (Plate XLIII. fig. 12.)

Primaries above silky testaceous, the costa and fringe silvery whitish; a central longitudinal silvery white streak from base to centre of outer margin, this band is bounded on each side by deep longitudinal folds, which in certain lights look like black lines; secondaries white, slightly tinted with buff towards the outer margin; head and greater part of thorax testaceous, metathorax white; abdomen whitish: wings below pale silky testaceous, the primaries darker than the secondaries; pectus testaceous, venter white. Expanse of wings 1 inch 3 lines.

South Island. Colls. Dr. Hector and J. D. Enys, Esq.

I have taken the description from an example previously in the

Museum collection from Auckland, and which Walker had confounded with *Crambus vitellus* of Doubleday.

112. *CHILO LEUCANIALIS*, n. sp.

Primaries above silky testaceous, the internal area from the median vein downwards more or less suffused with pale bronze-brown, which is deepest immediately below the median vein; a longitudinal white streak above the median vein; the veins beyond the discoidal cell bronze-brown, their interspaces whitish; secondaries silvery white, slightly testaceous towards outer margin; body creamy white; tegulæ and upper surface of two anterior pairs of legs brown; primaries below testaceous; secondaries white, with a faint yellowish tint; body below white. Expanse of wings 1 inch 1 line.

South Island. Colls. Dr. Hector and J. D. Enys, Esq.

The colouring is not unlike that of *Leucania*.

113. *EROMENE AURISCRIPTELLA*.

*Eromene auriscriptella*, Walker, Lep. Het. xxx. p. 976 (1864).

*Crambus gracilis*, Felder, Reise der Nov. Lep. v. pl. cxxxvii. fig. 26.

Coll. Dr. Hector.

114. *EROMENE METALLIFERA*, n. sp. (Plate XLIII. fig. 11.)

Allied to the preceding species, but differing as follows:— Primaries rather brighter in colour, the central transverse lines only half as wide apart; the silver discocellular spot less curved, and edged with brown; a series of longitudinal discal silver lines between the veins; secondaries white instead of brown. Expanse of wings 8 lines.

Coll. Dr. Hector.

This is a very beautiful little species.

115. *SAMANA ACUTATA*, n. sp.

Primaries pale straw yellow; an oblique interno-basal litura, a dot at the end of the cell, and a discal transverse line terminating in an acute <-shaped angle, piceous; the discal line diffused externally; a marginal series of black dots; secondaries white, with the fringe creamy; a marginal series of black dots; thorax pale straw yellow, abdomen white; primaries below pale testaceous, whitish on internal area; markings (excepting the marginal dots, which are united by a slender brown line) only visible through the wing; secondaries white, the costal area tinted with testaceous, and sparsely irrorated with brown; a small black dot at the end of cell; a marginal series of black dots; fringe creamy; body below pale straw yellow. Expanse of wings 1 inch 2 lines.

Sea-level, South Island. Coll. J. D. Enys, Esq.

In my opinion, this genus would be better placed amongst the *Pyrales*.

116. *ADENA XANTHIALIS*.

*Adena xanthialis*, Walker, Lep. Het. xxvii. p. 168 (1863).

Coll. J. D. Enys, Esq.

This genus certainly has no business among the *Crambites*; it should be placed among the *Hypenidæ*.

## TORTRICITES.

## TORTRICIDÆ.

117. *TERAS ÆNEA*, n. sp.

Primaries with the central area brassy, gradually merging into cupreous towards the borders, which are silky brown; secondaries brown, subcostal area yellowish, costal area pale stramineous; body above dark brown: wings below shining brassy yellow, the primaries becoming greyish brown at the borders, the secondaries becoming golden towards the outer margin; body below creamy whitish. Expanse of wings 1 inch.

Mountain form. Coll. J. D. Enys, Esq.

Found at 3000 to 4000 feet elevation.

118. *TERAS FLAVESCENS*, n. sp.

Primaries straw-yellow, very indistinctly reticulated with deeper lines of the same colour; a spot at the extremity of the costal nervure, a second less distinct at the end of the second subcostal branch, and the apical half of the fringe, tawny; secondaries white, tinted with stramineous towards costa; thorax ochraceous; abdomen (probably white): primaries below whitish, with the basi-costal area and apex ochraceous, crossed by orange reticulations; apical fringe tawny; secondaries pale stramineous, reticulated with orange; pectus silvery white, legs ochraceous. Expanse of wings 1 inch 4 lines.

South Island. Coll. Dr. Hector.

This species seems to me to belong to the *T. boscana* group.

Several genera are confounded by Walker under *Teras*; his *T. oblongana* and *T. inaptana* are probably also variations of one species; and I believe his *T. servana*, *T. priscana*, and *T. contractana* to be synonymous; but the specimens are in poor condition, which renders their accurate determination difficult.

119. *CACOËCIA VILIS*, n. sp. (Plate XLIII. fig. 15.)

Allied to *C. herana* of Felder. Primaries above shining sordid testaceous; subbasal area, base of inner margin, and external border silvery grey; a **V**-shaped basi-subcostal marking, an oblique bracket-shaped line from the cell to the inner margin, and two or three dots near the outer margin black-brown; a semicircular costal brown patch, a diffused brownish patch bounded within by the bracket-shaped line; secondaries white, the apical and abdominal areas feebly tinted with testaceous; head white, thorax brown: primaries below reddish, markings indistinct; secondaries sordid white, reticu-



lated with grey, the costal and apical areas reddish. Expanse of wings 8 lines.

Coll. J. D. Enys, Esq.

Dr. Hector also possesses a faded example of this species.

120. CACOËCIA TAIPANA.

*Tortrix taipana*, Felder, Reise der Nov. Lep. v. pl. cxxxvii. fig. 46.

Coll. Dr. Hector.

Felder's figure is a little too decided, judging from Dr. Hector's example. The two preceding species belong to the same group with *C. costana*.

121. CACOËCIA INANA, n. sp. (Plate XLIII. fig. 13.)

Primaries above pale clay-brown, irrorated with grey, costa indistinctly spotted with grey; secondaries silky white, reticulated with grey; thorax clay-brown; abdomen whitish: wings below white, reticulated with dark grey, costal borders tinted with testaceous; body below sordid white, venter with lateral black dots. Expanse of wings 1 inch  $3\frac{1}{2}$  lines.

Coll. Dr. Hector.

Mr. Enys has an example of a species somewhat resembling *Rhacodia rureana* of Felder. It may be a *Cacoëcia*; but as it has lost its palpi, I cannot venture to describe it.

122. HETEROGNOMON EXCESSANA.

*Teras excessana*, Walker, Lep. Het. xxviii. p. 303 (1863).

Colls. Dr. Hector and J. D. Enys, Esq.

123. (SCIAPHILA) SPOLIATANA??

*Sciaphila spoliatana*, Walker, Lep. Het. xxviii. p. 356 (1863).

Coll. Dr. Hector.

The single example is much rubbed, and injured by mites; it may have nothing to do with Walker's species: several of Walker's types have the wings closed, and thus are not easily recognized.

124. ZELOTHERSES? ROBUSTA, n. sp. (Plate XLIII. fig. 17.)

♂ ♀. Primaries sordid white, acute; a broad oblique patch beginning just within the base of the discoidal cell and terminating in a point near to the centre of inner margin, a slender subcostal dash near the base, five spots on the apical half of costa, a squamose patch across the median veins, and the terminations of the nervures black-brown; secondaries greyish, particularly towards the outer margin; body sordid white: primaries below grey, the costal margin white, crossed by greyish spots towards apex; secondaries paler grey, the costa white; body below white. Expanse of wings  $4\frac{1}{2}$  lines.

Coll. Dr. Hector.

A curious little species, found on the Canterbury plains amongst scrubby bushes.

125. *STEGANOPTYCHA?* *NEGLIGENS*, n. sp. (Plate XLIII. fig. 18.)

Primaries sordid white, clouded with yellow; a broad oblique subbasal blackish band, not reaching the costal margin; a broad slightly angulated oblique central band, yellowish irrorated with grey above the median vein, becoming reddish-brown below it; the apical half of costal margin and the outer margin spotted with ferruginous, fringe grey; secondaries brown, costal area white; head white, collar and shoulders yellow, tegulæ whitish; thorax and abdomen brown: primaries below pale brown, costal and external borders alternately white and brown; secondaries white, the veins, abdominal area, and a streak through the cell brown, fringe brown crossed by a central pale line; body below white. Expanse of wings  $4\frac{1}{2}$  lines.

Canterbury plains. Coll. J. D. Enys, Esq.

Seems allied to *S. dealbana*; but the primaries are slightly narrower.

## CHOREUTIDÆ.

126. *OROSANA ATRA*, n. sp.

Shining purplish brown; primaries with a spot close to the base, a zigzag transverse subbasal line, a spot at the end of the cell, and a sigmoidal discal line from costa to inner margin black; a dot beyond the cell, and two subapical marginal dots, creamy whitish; collar below clothed with white hairs. Expanse of wings  $4\frac{1}{2}$  lines.

Canterbury plains. Coll. J. D. Enys, Esq.

The darkest known species of this little Australian genus.

## TINEITES.

## TINEIDÆ.

127. *TINEA RECTELLA*.

*Tinea rectella*, Walker, Lep. Het. xxviii. p. 482 (1863).

Colls. Dr. Hector and J. D. Enys, Esq.

128. *TINEA PALÆSTRICA*, n. sp.

Primaries with the basal third dark brown, remainder of the wing sandy whitish; a large round spot beyond the cell, encircled by a complete series of smaller spots, all grey; beyond this a longitudinal streak of grey, bounded on each side by two black dots; fringe, excepting at external angle, brownish; secondaries shining sandy whitish; head snow-white, tufted; thorax brown, a yellow spot on the centre of the prothorax; abdomen testaceous; wings below shining testaceous; body rather darker testaceous. Expanse of wings 8 lines.

Coll. Dr. Hector.

Closely allied to the European *T. tapetzella*.

## PLUTELLIDÆ.

129. *CEROSTOMA FULGURATELLA*.

*Cerostoma fulguratella*, Walker, Lep. Het. xxviii. p. 548 (1863).

Coll. J. D. Enys, Esq.

## GELECHIIDÆ.

The New-Zealand species referred to *Gelechia* by Mr. Walker are (as Mr. McLachlan has pointed out to me) none of them members of that genus. The following should be referred to *Æcophora*—*Gelechia innotella*, *intactella*, *monospilella*, *flavidella*, *collitella*, *convulsella*, and *contextella*.

*Gelechia subditella* is identical with the European *Endrosis fenestrella*.

130. *ÆCOPHORA PSEUDOSPRETELLA*.

*Æcophora pseudospretella*, Stainton, Cat. 14, I. B. 162 (1854).

Colls. Dr. Hector and J. D. Enys, Esq.

A common European species.

131. *ÆCOPHORA SORDIDA*, n. sp.

Primaries pale shining brown; a small arched marking just beyond the end of the cell, the outer border, and fringe grey; secondaries silvery white; body testaceous: wings below silvery white, primaries slightly brownish; pectus (apparently) silvery white; legs and venter pale testaceous. Expanse of wings 10 lines.

Colls. Dr. Hector and J. D. Enys, Esq.

Allied to the preceding species.

132. *ÆCOPHORA GRISEATA*, n. sp.

Wings and body above shining grey; primaries irrorated with brown, crossed by two widely separated indistinct oblique brown lines, the inner one angulated at the median nervure, the outer one, which is discal, deeply excavated in the middle; a spot of the same colour at the end of the cell; secondaries with a feeble brassy tinge: primaries below shining brown, fringe grey; secondaries sordid white, speckled with brown; body below pale brown; legs white internally. Expanse of wings 7 lines.

Colls. Dr. Hector and J. D. Enys, Esq.

133. *ÆCOPHORA PARCA*, n. sp.

Primaries pale shining straw-yellow, fringe white; secondaries silvery white; thorax yellow, abdomen white: primaries below shining whity-brown; secondaries silvery white; body below white. Expanse of wings 8 lines.

Colls. Dr. Hector and J. D. Enys, Esq.

Allied to *Æ. apertella*.

*Psecadia teras* of Felder is *Æcophora picarella* of Walker.

134. *TACHYPTILIA ATYCHIOIDES*, n. sp. (Plate XLIII. fig. 14.)

Primaries above purplish brown; discoidal cell white, crossed by a large central subquadrate black spot, terminated by a smaller black spot; a small white spot beyond the cell, and a discal arched white line; apex bronzy brown; fringe brown, whitish towards apex; secondaries coppery brown, two sordid whitish longitudinal streaks, one within the cell, the other on interno-median area; costa

and fringe white, the latter brownish at anal angle; body above dark brown, collar and prothorax varied with ochraceous; hind margins of tegulæ fringed with whitish; abdomen with whitish hind margins to the segments: primaries below bronzy-brown, pale towards the base, crossed towards apex by a series of ill-defined whitish dots, fringe greyish; secondaries sordid white, shining, clouded (excepting at apex and outer border) with grey; body below pearly whitish; tibiæ and tarsi of legs above banded with black. Expanse of wings, ♂ 7 lines, ♀ 9 lines.

Colls. Dr. Hector and J. D. Enys, Esq.

A puzzling little species, with the general coloration of *Atychia*.

135. *CRYPTOLECHIA CARNIFEX*, n. sp.

Primaries flesh-colour, costal margin blood red, the same colour also extending for a short distance down the fringe, which is throughout rather darker than the body of the wing; secondaries white, slightly tinted with flesh-colour at the borders; thorax flesh-coloured; palpi and femora and tibiæ of anterior legs carmine: wings below nearly as above, excepting that the secondaries show three or four apical marginal dark grey spots; body below white. Expanse of wings 11 lines.

Coll. J. D. Enys, Esq.

*C. carnifex* is allied to Walker's *Depressaria moderatella* from Tasmania.

136. *CRYPTOLECHIA RUFOPARSA*, n. sp.

Primaries straw-yellow, clouded with flesh-colour and regularly dotted with indistinct reddish spots; secondaries silvery white; thorax straw yellow; abdomen pale testaceous (possibly white in fresh examples): wings below silvery white; primaries with the costa and fringe yellow; anterior tibiæ carmine; anterior femora flesh-colour; body below white. Expanse of wings 10 lines.

Coll. J. D. Enys, Esq.

137. *CRYPTOLECHIA GALACTINA*.

*Cryptolechia galactina*, Felder, Reise der Nov. Lep. v. pl. cxl. fig. 34.

Coll. J. D. Enys, Esq.

A pure white species.

GRACILARIIDÆ.

138. *GRACILARIA LINEARIS*, n. sp. (Plate XLIII. fig. 16.)

Primaries clay-brown, crossed by oblique series of blackish dots, in certain lights uniform lilacine brownish, shining; secondaries white, fringes at apex slightly tinted with testaceous: thorax coloured like the primaries, abdomen testaceous: wings below silvery whitish, primaries slightly brownish in tint: body below white. Expanse of wings 5 lines.

Coll. Dr. Hector.

Allied to *G. arenosella*.

139. *PLATYPTILUS REPLETALIS.*

*Platyptilus repletalis*, Walker, Lep. Het. xxx. p. 931 (1864).  
Coll. J. D. Enys, Esq.

140. *ACIPTILUS MONOSPILALIS.*

*Aciptilus monospilalis*, Walker, Lep. Het. xxx. p. 950 (1864).  
Coll. J. D. Enys, Esq.  
I believe *A. patruelis* of Felder to be this species overcoloured.

## EXPLANATION OF THE PLATES.

## PLATE XLII.

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| <p>Fig. 1. <i>Meterana pictula</i> ♀, p. 386.<br/>2. <i>Graphiphora tartaræa</i> ♂, p. 384.<br/>3. <i>Apamea vitiosa</i> ♂, p. 384.<br/>4. <i>Euclidia hectori</i> ♀, p. 387.<br/>5. <i>Agrotis mitis</i> ♂, p. 383.<br/>6. <i>Hadena debilis</i> ♀, p. 385.</p> | <p>Fig. 7. <i>Porina enysii</i> ♂, p. 381.<br/>8. <i>Fidonia ferox</i> ♀, p. 392.<br/>9. — <i>enysii</i> ♀, p. 391.<br/>10. <i>Gonodontis felix</i> ♀, p. 389.<br/>11. <i>Hermينيا lilacina</i> ♂, p. 388.<br/>12. <i>Bityla sericea</i> ♀, p. 387.</p> |
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## PLATE XLIII.

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| <p>Fig. 1. <i>Aspilates insignis</i> ♂, p. 393.<br/>2. <i>Fidonia catapyrrha</i>, p. 392.<br/>3. — <i>anceps</i>, p. 392.<br/>4. <i>Cacopsodos niger</i>, p. 395.<br/>5. <i>Declana Feredayi</i>, p. 398.<br/>6. <i>Cidaria beata</i>, p. 397.<br/>7. <i>Crambus vulgaris</i> (enlarged), p. 400.<br/>8. <i>Pseudocoremia indistincta</i>, p. 394.<br/>9. <i>Hypochalcia corrupta</i> (enlarged), p. 399.<br/>10. <i>Aphomia strigosa</i>, p. 398.<br/>11. <i>Eromene metallifera</i> (enlarged), p. 401.</p> | <p>Fig. 12. <i>Chilo simplex</i>, p. 400.<br/>13. <i>Cacoëcia inana</i> (enlarged), p. 403.<br/>14. <i>Tachyptilia atychioides</i> (enlarged), p. 405.<br/>15. <i>Cacoëcia vilis</i> (enlarged), p. 402.<br/>16. <i>Gracilaria linearis</i> (enlarged), p. 406.<br/>17. <i>Zelotheres? robusta</i> (enlarged), p. 403.<br/>18. <i>Steganoptycha? negligens</i> (enlarged), p. 404.</p> |
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3. On a small Collection of Birds from the Marquesas Islands. By OTTO FINSCH, Ph.D., C.M.Z.S., Director of the Bremen Museum.

[Received April 12, 1877.]

Through the Museum Godeffroy, at Hamburg, I have received a small collection of birds in alcohol, made by Mr. A. Garrett, the well-known naturalist of that Museum, during a visit to the Marquesas Islands. As our knowledge of the Marquesas birds is still very limited, I think it will be of interest to report on this collection, the more so as it contains, with the exception of four species (*Coriphilus smaragdinus*, *Eudynamis taitianus*, *Serresius galeatus*, and *Phlegænas rubescens*), examples of all the land-birds known to inhabit this group, which

number altogether 10 species. One of these, a Kingfisher, although known already to Forster, proves to belong to an unnamed species. A closer exploration of the group will probably bring to light further species, peculiar to the different islands, such as, under similar circumstances, the excellent researches of Mr. Layard have recently made known to us in the Feejee group.

### 1. COLLOCALIA CINEREA (Gm.).

*Herse Forsteri*, Hartl.

*C. vanicorensis*, part., Finsch & Hartl. Orn. Central-Polyn. p. 47.

One specimen, agreeing generally with the description communicated to me by Dr. von Pelzeln from a Tahitian specimen in the Vienna Museum (*vide* Journ. d. Museum Godeffroy, Heft xii. 1876, p. 25); but the coloration is as dark as in *C. vanicorensis*; the rump is not pale, as in *C. spodiopygia*, but uniform with the remaining upper parts; the single feathers show very narrow light lateral margins; but these are hidden.

The specimen seems, therefore, to be identical with the Tahitian species first mentioned from this locality by Forster, and agrees exactly in its larger size, by which it may be distinguished from the other species inhabiting the Pacific.

### 2. HALCYON GODEFFROYI, sp. nov.

*Alcedo collaris*, var. ii., Forst. Descr. Anim. 1844, p. 163.

*Todirhamphus*, sp., Hartl. Journ. f. Orn. 1834, p. 170.

*Adult.* Head, neck, mantle, and whole under surface, including the under wing-coverts, white; shoulders, lower back, quills, and tail cobalt-blue; inner webs of wings smoky black, margined with white; from the lores through the eye and temporal region a narrow black band encircling the nape; basal half of bill black, lower mandible pale horn-colour; feet black.

There are three specimens which agree perfectly with the description above given. The white middle portion of the mantle is faintly stained with rusty.

*Young.* Frontal margin, extending as a narrow supercilium to above the eye white; remainder of head obscure marine-blue (on the crown appear three new pure white feathers); lores and a broad band around the nape dull black, the same as the hind neck and upper portion of the mantle; on the hinder mantle some white feathers, washed with pale rusty; under surface white, with dark edgings to the feathers of the sides of the crop; smaller upper wing-coverts with narrow whitish tips.

	Long tot.		al.		caud.			culm.	latit.	rostr.
	in.	li.	in.	li.	in.	li.	in.	li.	a basi.	lin.
<i>H. godeffroyi</i>	8 $\frac{1}{4}$	3	7-3	8	2	6-2	7	15-16	7-7 $\frac{1}{2}$	
<i>H. albicilla</i>	...	4	7		3			24	7 $\frac{1}{2}$	

The Kingfisher of the Marquesas has not come under examination since the time of Forster, who described the bird correctly as a

variety of his *Alcedo collaris*, from the Island of St. Christina. This island is the "Tahuata" of the new maps, a small island separated by the Bordelaise Straits from Hiwaoa, the chief eastern island of the Marquesas group. As this supposed variety of Forster's has remained unnamed since his time, I take a pleasure in bestowing on it the name of Mr. Johann Cesar Godeffroy, who has contributed through his travels so much to a better knowledge of the Polynesian Islands.

*H. godeffroyi* is a true miniature of *H. albicilla*, Less., from New Guinea and the Eastern Moluccas, but may be distinguished, besides its inferior size, by the white of the hind neck running down to the middle part of the mantle. In this respect it differs also, even in its young state, from *H. tuta*, the occurrence of which on the Marquesas rests merely on the labels of the Leiden and Dresden Museums, and has not been verified by any traveller.

3. TATARE LONGIROSTRIS (Gm.); Finsch & Hartl. Ornith. Central-Polyn. p. 66.

Three specimens, agreeing perfectly with examples from the Society Islands (Eimeo and Huahine).

4. MONARCHA NIGRA (Sparrm.); Finsch & Hartl. Ornith. Central-Polyn. p. 90.

An extensive series of 12 specimens, representing all the stages of plumage which were formerly considered to belong to different species.

Four specimens in a uniform black dress are, no doubt, in full plumage.

Four specimens are in the rusty plumage (*Muscicapa lutea*, Gm.), and are apparently young birds:—

Upper parts dark rusty brown, quills and tail darker; the remiges margined externally rusty; lores, sides of head and neck, and the whole under surface light rufous, paling to rufous white on the middle of breast and vent; anal region nearly white. Bill yellowish, the culmen greyish. The protracted yellow angle of the mouth gives these birds the appearance of young ones.

Five specimens show transitions in plumage from white to black, and from rusty to black; all these birds are moulting:—

Head, chin, throat and quills black, the remaining parts white, but varied with black feathers on the shoulders and mantle; tail in one nearly uniform white, in others irregularly tipped with black, in one the outmost feather rusty; primaries margined externally more or less with white, in one specimen with rusty.

Specimens changing from rusty to black:—

Black; wing-coverts margined with rusty, as are also some of the primaries; shoulders dark rusty-brown, like the tail; two middle tail-feathers black; lower breast and abdomen pale rufous, flanks dark rufous; under tail-coverts black.

In another specimen, agreeing otherwise with the foregoing, the under tail-coverts are dark rusty, and the black of the head is mixed with dark brown feathers.

The size differs a good deal, as well as the form of the bill, which in some examples appears more flat and enlarged, in others more slender, differences, however, not to be expressed by measurements.

Long. alæ.		caudæ.		culm.	tars.	
in. li.	in. li.	in. li.	in. li.	li.	li.	
3	5-3	7	2	7-2	11	6 -6½ 11½ (black form).
3	4-3	6	2	9		5¼-5¾ (black and white form).
3	1-3	2	2	7		5½-6 (rufous form).

*M. nigra* has been found likewise on the Friendly and Society Islands; Dr. Graeffe, however, did not meet with this species on the Tonga Islands (*vide* Finsch, Journ. f. Orn. 1870, p. 119).

5. *PTILINOPUS DUPETITTHOUARSI* (Neboux); Finsch & Hartl. Ornith. Central-Polyn. p. 129.

Old and young birds of this peculiar species; the latter show already the whitish sincipital mark so characteristic of this species.

Bill horn-green; eye-ring bright red; feet pale red.

6. *PTILINOPUS MERCIERI* (Des Murs); Finsch & Hartl. Ornith. Central-Polyn. p. 128.

Two specimens.

This very rare fruit-pigeon, which I have now had the pleasure of examining for the first time, is a very remarkable species, distinguished at once by the extent of dark purple red on the head, which occupies not only the forehead and vertex, but also the lores, extending thence in a large patch to the base of the lower mandible. From above the eye the red cap is surrounded by a broad circle of bright yellow; the chin and throat are yellowish; breast and remaining under surface, inclusive of the lower tail-coverts, of a uniform dark yellow.

Bill horn-green; eye-ring red; feet dirty purplish.

Long. alæ.		caudæ.		culm.	tars.
in.	lin.	in.	lin.	lin.	lin.
5	1	3		5	10

It is very interesting to find in one and the same group of small islands two such very different species of *Ptilinopus*.

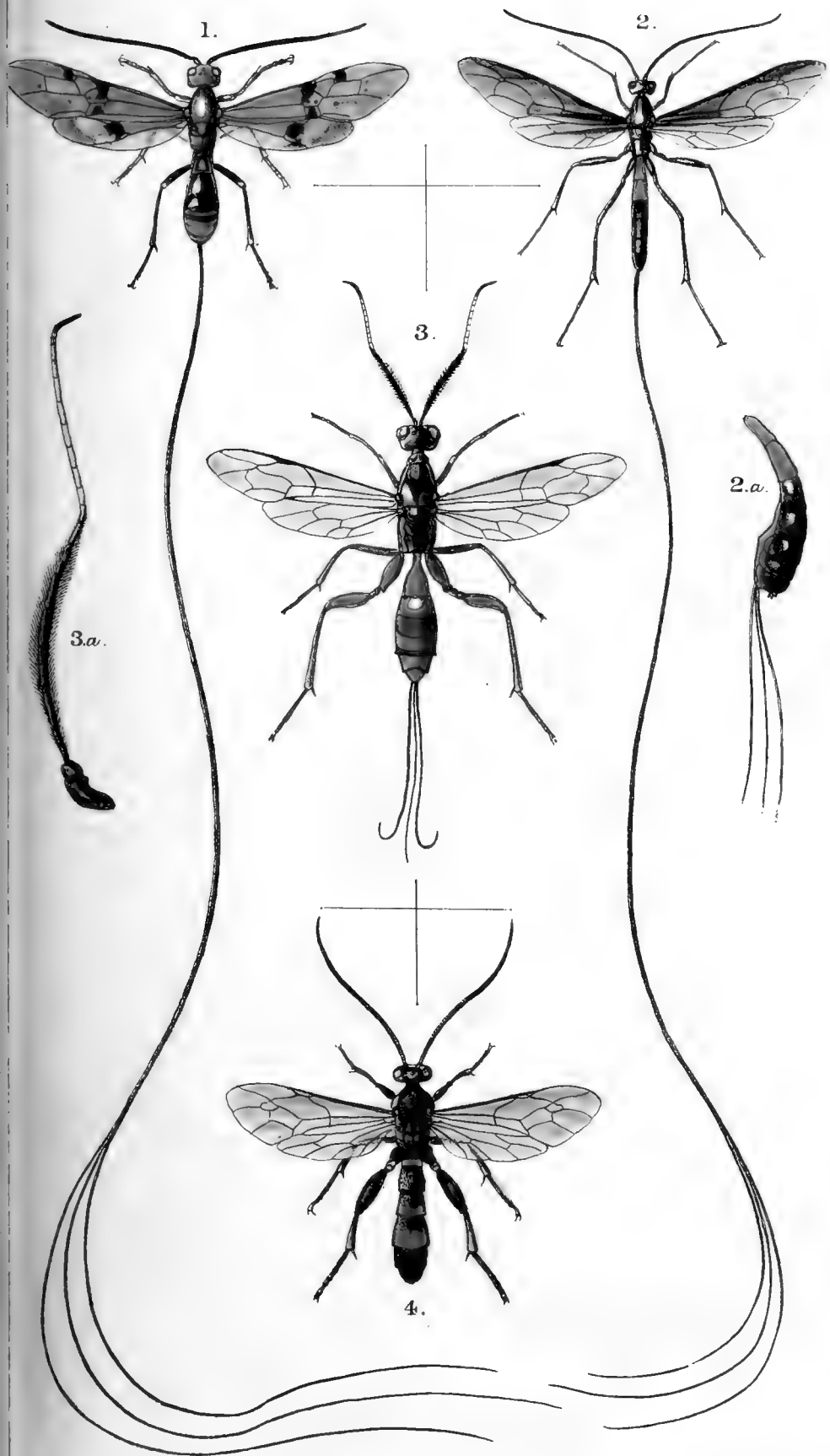
4. Descriptions of four new Species of Ichneumonidæ in the Collection of the British Museum. By FREDERICK SMITH.

[Received April 13, 1877.]

(Plate XLIV.)

Of the Ichneumons which I now describe three are probably the most remarkable species to be found in the entire family. Two of them I cannot assign to any genus yet established; a new one has





NEW SPECIES OF ICHNEUMONIDÆ.

Mintern Bros imp.



consequently been formed for the reception of each. *Perissocerus plumicornis* is remarkable in having its antennæ plumose more than half their length. The genus is undoubtedly closely allied to *Xylo-nomus*; but its extraordinary antennæ, elbowed at the joint where the pubescence terminates, appear sufficiently to warrant its generic separation. *Dolichomitus longicauda* is allied to the genera *Ephialtes* and *Rhyssa*; but its falcate and compressed abdomen removes it from the former genus, and the incised and tuberculate segments sufficiently distinguish it from the latter. The new species of *Bracon* is remarkable in having an ovipositor over nine times the length of its body, being the most remarkable instance known of the elongation of that instrument. The new species of *Metopius* is the only one known to me from China, or indeed from that part of the world, including India and the islands adjacent.

*METOPÍUS SINENSIS.* (Plate XLIV. fig. 4.)

Black, strongly punctured, with the apical margins of the first, third, and fourth segments yellow. Head—the front yellow as high as the insertion of the antennæ; a narrow yellow line runs up a little way close to the eyes, and an angular shape is produced between the antennæ; a large ovate black macula in the middle of the front; the flagellum of the antennæ fulvous beneath. Thorax—above the puncturing is strong and confluent; the scutellum quadrate, and produced over the postscutellum and base of the metathorax; the lateral margins sharply elevated, and produced posteriorly into stout compressed teeth; the wings slightly fulvo-hyaline, the nervures rufo-fuscous, the stigma pale ferruginous; the tibiæ, tarsi, and posterior trochanters more or less obscurely ferruginous; the anterior femora ferruginous in front; the posterior femora incrassate. Abdomen with confluent punctures, the second and base of the third rugose; the yellow fascia on the basal segment subinterrupted; that on the third broader, and deeply emarginate in the middle; on the fourth segment the band is very broad, and occupies more than half the segment; the fifth and sixth segments have a purple tint.

The male differs in being rather smaller, and in being more variegated with yellow; the face is entirely yellow, as well as the scape and the antennæ in front; on the sides of the thorax are two longitudinal and one vertical yellow stripe; the anterior and intermediate legs are yellow, the femora of the former being more or less black behind; the femora of the latter are black in the middle, and the posterior pair yellow at their base and apex; the tips of the spines on the scutellum are also yellow.

*Hab.* Shanghai.

Collected by Mr. R. Fortune.

Genus *DOLICHOMITUS*, Smith.

Antennæ setaceous; the scape truncate laterally; the flagellum multiarticulate, the joints gradually decreasing in length from the basal one; the head transverse. The anterior wings with an elon-

gate marginal cell and three submarginal ones, the first submarginal elongate, broad at the base, and narrow towards the apex; the second submarginal minute, subtriangular, and with a short petiole; the third submarginal elongate, narrow, and extending to the apex of the wing; the anterior tarsi twice the length of the tibiæ; the posterior tarsi only a little longer than the tibiæ; the claws of the tarsi bifid; the pulvillus small. Abdomen curved, narrowed at the base, and slightly compressed; the two basal segments of equal length, the three following of equal length and a little shorter than the basal one; the two apical segments shorter than the fifth; the ovipositor nearly seven times the length of the insect.

*DOLICHOMITUS LONGICAUDA.* (Plate XLIV. figs. 2 and 2 a.)

Black and shining, with the base of the abdomen yellow; wings smoky. The face finely punctured, slightly convex; a minute yellow spot, in some examples, at the lateral angles of the face, close to the base of the mandibles; the anterior margin of the clypeus broadly but slightly emarginate. Thorax—the metathorax nearly flat and oblique; wings fuscous, with a purple iridescence, the anterior margin of fore wings dark brown; the anterior tibiæ more or less ferruginous within, occasionally black. The two basal segments of the abdomen above, and all beneath, bright yellow; the sheaths of the ovipositor black, the latter ferruginous. Length 9–11 lines; of the ovipositor  $3\frac{1}{2}$ – $6\frac{1}{2}$  inches.

*Hab.* Bogota, Columbia.

GENUS *PERISSOCERUS*, Smith.

Head subglobose; antennæ 22-jointed, joints 3rd to 7th densely pubescent, at the apex of the seventh joint the antennæ are elbowed, as is also the terminal joint. Thorax oblong; the metathorax oblong-quadrate, divided into six compartments above by two longitudinal and one transverse carina; wings with one elongate marginal cell and two submarginal ones; the posterior legs rather stout, elongate, the femora somewhat swollen; the claws of the tarsi simple and very small; the first joint of the tarsi longer than the rest united. Abdomen with a short petiole, depressed beyond the first segment, the second and third tuberculate at the base; the ovipositor nearly as long as the head and thorax.

*PERISSOCERUS PLUMICORNIS.* (Plate XLIV. figs. 3 and 3 a.)

Head and thorax black and shining; the abdomen bright ferruginous. The head subglobose; the antennæ black to the apex of the seventh joint and densely clothed with short black pubescence; the eighth joint to the fourteenth white, with the apical joints black. The mesothorax with two deep sutures, each emanating from the middle of the margin of the scutellum, and diverging forwards to the sides, and dividing the disk into three parts, which are convex, and covered with curved striæ; wings hyaline, stigma and nervures black; the coxæ, trochanters, and femora ferruginous; the tibiæ

and tarsi yellow. Abdomen ferruginous and shining; the ovipositor obscurely ferruginous, with the sheaths black and pubescent.

*Hab.* Amazon valley.

Collected by Mr. Henry Walter Bates.

**BRACON PENETRATOR.** (Plate XLIV. fig. 1.)

Rufous, with the antennæ, three basal segments of the abdomen above, the posterior legs, and the sheaths of the ovipositor black; wings flavo-hyaline, each having four black spots; the head, thorax, legs, and the apex of the abdomen pubescent. The head smooth and shining; the face with long thin fulvous pubescence; the anterior margin of the clypeus narrowly, and the tips of the mandibles, black; a small circular cavity on the vertex between the eyes, in which the ocelli are placed, black. Thorax smooth, shining, and impunctate; the wings have a pale fuscous band on their apical margins; two blackish-brown spots at the anterior margin of the fore wings, the first somewhat oblong-quadrate, covering the apex of the externō-median and the base of the second discoidal cell; the second spot is quadrate and occupies the base of the marginal cell and the apex of the stigma; a third spot, irregular in shape, is placed in the first discoidal cell; a fourth, larger, ovate spot is situated in the middle of the posterior wings; the anterior wings have also three minute paler spots, one in the second discoidal cell, a second beneath the second submarginal, and a third in the second submarginal cell; the articulations of the joints of the posterior legs are more or less rufo-piceous. Abdomen—the lateral margins of the basal segment are deeply longitudinally sulcate; the middle of the segment rufo-piceous; the lateral raised margins of the two basal segments are reddish-yellow; the basal margin of the fourth segment narrowly black; the apical margins of the third and fourth segments and the fifth and following segments rufous. Length of the body 9 lines, of the ovipositor 7 inches. (The figure is slightly enlarged.)

*Hab.* Yokohama (Japan).

Collected by Mr. Jonas.

EXPLANATION OF PLATE XLIV.

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| Fig. 1. <i>Bracon penetrator</i> ♀, p. 413.  |  | Fig. 3. <i>Perissocerus plumicornis</i> ♀, p. 412. |
| 2. <i>Dolichomitus longicauda</i> ♀, p. 412. |  | 3 a. Antenna of <i>Perissocerus</i> , magnified.   |
| 2 a. Abdomen of <i>Dolichomitus</i> .        |  | 4. <i>Metopius sinensis</i> ♀, p. 411.             |
|  |  |  |

5. Notes on the Anatomy and Systematic Position of the Genera *Thinocorus* and *Attagis*. By A. H. GARROD, M.A., F.R.S., Prosector to the Society.

[Received April 17, 1877.]

Through the kindness of Mr. Edward Gerrard I have become possessed of an adult specimen of *Thinocorus rumicivorus*, and of a

nestling of *Attagis gayi*, in spirit, from Chili; and I take the present opportunity of bringing before this Society my notes on their structure. Of the former of these species Mr. Eyton has fully described the visceral anatomy and the osteology in the 'Zoology of the Voyage of the "Beagle"'<sup>1</sup>; and in his 'Osteologia Avium'<sup>2</sup> will be found an account of the skeleton, together with a figure of the sternum, of the latter. By Mr. Eyton, in his account of *Thinocorus*, these birds are referred to the order Gallinæ; but in his more recent work they are included with *Chionis*, to constitute the Chionididæ, which are by him placed after the Otidæ (comprising the Otinæ and Tinaminæ), and before the Charadriidæ, as families of his order Littores. By Mr. G. R. Gray, in his 'Hand-list of Birds,' they are separated from the Chionididæ, between which and the Glareolidæ they stand as a division of the Grallæ. This is much the same position as that in which they are located by Messrs. Sclater and Salvin in their 'Nomenclator Avium Neotropicalium.' Nitzsch, as Burmeister tells us, was disposed to place them in his group of the Alectorides, along with *Chauna*, *Otis*, *Cariama*, *Psophia*, and *Grus*; whilst Wagler placed them with the Pteroclidæ; but Burmeister himself is of opinion that "this remarkable bird (*Thinocorus rumicivorus*), which Wagler very improperly compares with the Sand-Grouse (*Pterocles*), is in every particular an aberrant Scolopacine form, related to *Glareola* in exactly the same way as *Chionis* to *Hæmatopus*, or *Dromas* to *Recurvirostra*"<sup>3</sup>.

As far as pterylography goes, not much of importance with reference to the position of the Thinocorinæ can be learnt. In that they possess a tufted oil-gland they differ from the Pteroclidæ and Columbæ, in both of which families it is nude. On the whole the pterylosis is typically Limicoline.

With reference to the alimentary canal, the tongue is simple and triangular, occupying most of the space between the rami of the mandible. The œsophagus is not large, but develops a capacious and well-defined globose crop, situated just above the furcula. The gizzard is muscular, not large, and it possesses simple tritulating pads like those in the majority of non-carnivorous birds.

In the specimens of both *Thinocorus* and *Attagis* under consideration the intestines are 12·5 inches in length; but it must be remembered that the *Attagis* is a nestling. The colic cæca in the *Thinocorus* are 2·25 and 2·5 inches long; in the *Attagis* they are both 3 inches.

Myologically, the ambiens muscle is present, although slender. Both the femoro-caudal and its accessory head exist, of equal breadth. The semitendinosus, together with the accessory semitendinosus are of average size, whilst the semimembranosus is peculiarly slender. The myological formula, therefore, in conformity with the nomenclature adopted in my paper "On the Muscular System of Birds," in the Society's 'Proceedings' for 1874 (p. 111), is A B, X Y.

The vastus externus covers the biceps cruris; and in the foot the

<sup>1</sup> Part iii. p. 155.

<sup>2</sup> P. 177, and plate xxi. fig. 3.

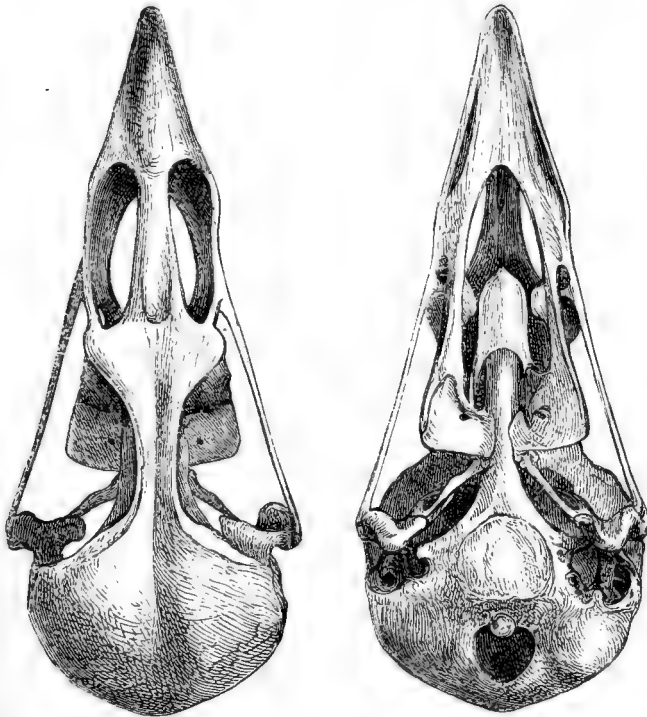
<sup>3</sup> Nitzsch's 'Pterylography,' Royal Society's translation, p. 139.

deep plantar tendons are arranged as in *Apteryx* and many other birds in which the hallux is small, the flexor longus hallucis blending with the flexor digitorum profundus, at the same time that a slender slip is sent off from the inner side of the conjoined tendon to the hallux<sup>1</sup>.

In the patagium of the wing a slender muscular fasciculus runs from the biceps to a little above the middle of the tendon of the tensor patagii longus—the tendon of the tensor patagii brevis being in two parts, of which the outer is the broader and stronger. Where this latter joins the extensor carpi radialis longus a fan-shaped fibrous expansion is sent off to the middle long patagial tendon, as in the *Limicolæ* generally.

The obturator internus muscle is very small and oval in shape.

Both the right and left carotid arteries are developed in the two genera, which agree exactly in their myology.



Skull of *Attagis gayi*.

The lower larynx is simple, a slender muscle on each side running to the fourth bronchial half-ring, which, like the three above it, is deeper than the other bronchial half-rings, and more like a split tracheal ring.

Osteologically the *Thinocorinæ* present many features of interest. In his more recent communication "On *Ægithognathous* Birds"

<sup>1</sup> *Vide* P. Z. S. 1875, p. 341.

(part ii., read before this Society in February 1876, and not yet published), Prof. Parker has fully described and beautifully figured the skull of *Thinocorus rumicivorus*, and has drawn special attention to the spuriously Ægithognathous nature of the palate, with its peculiarly broad vomer, rounded in front, and there intimately connected with the nasal cartilages in a manner which much resembles the arrangement in Passerine birds. In the accompanying figure (p. 415) the palate of *Attagis gayi* is represented from a specimen most kindly lent me by Mr. T. C. Eyton, the sternum of which is that referred to above as figured in the 'Osteologia Avium.'

By comparing it with Mr. Parker's figure of *Thinocorus rumicivorus*, the almost exact identity of the two is rendered certain. In the same memoir Mr. Parker also directs attention to the nature of the anterior osseous nares, which, as he remarks, are much the same as in the Turnicidæ. Both these genera agree with the birds termed Schizorhinal by me in a previous paper<sup>1</sup>, resembling the Limicolæ, Pteroclidæ, Columbæ, and their allies in this respect—although, on account of the shortness of the face, as in the Pteroclidæ, their schizorhinal nature is not quite so conspicuous as in such genera as *Grus*, *Ibis*, and *Scolopax*. The superior aspect of the skull of *Attagis gayi* is also represented *suprà* (p. 415).

In more than one peculiarity the skulls of *Thinocorus* and of *Attagis* differ from those of *Turnix* and *Hemipodius*<sup>2</sup>. The maxillo-palatines, instead of being slender throughout and simply squared off at their free ends, which are situated considerably nearer the middle line than are the inner margins of the palatine bones at the parts which they oppose, are broad, short, and swollen apically, where they scarcely project beyond the median borders of the palatines. The Turnicidæ also possess an extensive articulation between the middle of each pterygoid bone and the basisphenoid rostrum—no traces even of processes for such an articulation being present in the Thinocorinæ, in which latter subfamily also the supraorbital glands, although not largely developed, leave a small crescentic depression on the superior surface of the upper margin of the bony orbit, not present in the former group.

Continuing the comparison with the Turnicidæ, it may be mentioned that in them the left carotid artery is alone developed (in *Hemipodius tachydromus* and *Turnix lepurana* at least), whilst the accessory femoro-caudal muscle, as well as the slip to the patagium from the biceps of the arm, are wanting, at the same time that the obturator internus is large and fan-shaped, not oval and small<sup>3</sup>. The colic cæca, also, never exceed  $1\frac{1}{2}$  inch in length, in which, as well as all the above-mentioned characters, they differ from the Thinocorinæ.

That *Turnix* and *Thinocorus* are not intimately related may be

<sup>1</sup> P. Z. S. 1873, p. 33 *et seqq.*

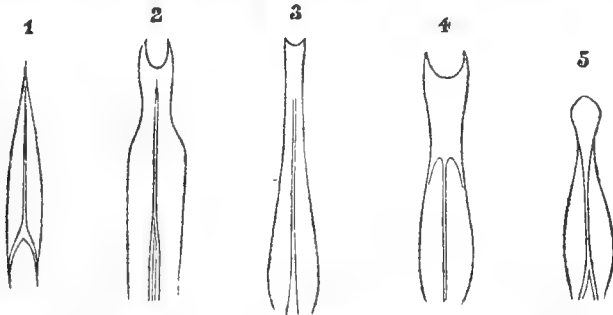
<sup>2</sup> For most instructive figures and descriptions of the skulls of *Turnix* and *Hemipodius* see Prof. Parker's paper "On Ægithognathous Birds," part i., Trans. Zool. Soc. vol. ix. pl. liv. and p. 294.

<sup>3</sup> Vide P. Z. S. 1876, p. 195.



therefore considered certain, notwithstanding the partial resemblance of their vomers.

Next with reference to *Chionis*. By De Blainville this genus has been located close to *Hæmatopus*<sup>1</sup>; and his view has been accepted, to a greater or less extent, by many. Nevertheless, although these birds are both strictly schizorhinal, their skulls give indications of a very different affinity. *Hæmatopus* possesses supraoccipital foramina, as well as pterygoid articulations with the basisphenoid, together with a bifid vomer, as represented in fig. 2. The similarly formed vomer is extraordinarily broad in *Recurvirostra avocetta*, which is shown in



Anterior extremity of vomer in:—1. *Sterna hirundo*; 2. *Hæmatopus ostralegus*; 3. *Numenius arquatus*; 4. *Recurvirostra avocetta*; 5. *Chionis alba*.

fig. 4, agreeing with the restricted *Limicolæ*; whilst in *Chionis* the vomer is blunt (fig. 5), and the basisphenoid rostrum, as well as the pterygoids, are entirely free as far as articulating facets are concerned. In the Bulletin of the United States National Museum<sup>2</sup> Dr. E. Coues and Mr. Kidder, after a most careful study of the whole anatomy of the genus, *Chionis minor* especially, remark, "We find in *Chionis* a connecting link, closing the narrow gap between the plovers and gulls of the present day. In our opinion this group represents the survivors of an ancestral type from which both gulls and plovers have descended"<sup>3</sup>. A separate division, termed Chionomorphæ, is established for them, comparable with the Geranomorphæ and the Cecomorphæ of Prof. Huxley<sup>4</sup>. My dissections of both *C. alba* and *C. minor* are quite in favour of this Larine affinity. That the genus deserves to be located in a separate division, however, as Dr. Coues suggests, I cannot agree. The Cecomorphæ of Prof. Huxley include the Laridæ, Procellariidæ, Colymbidæ, and Alcidæ; and it is now known that neither the Procellariidæ nor Colymbidæ come near the Laridæ and Alcidæ, which two last-named families are related one to the other most intimately, and differ from one another to almost exactly the same amount as the Chionididæ do from either. I should place the Chionididæ, the Laridæ, and Alcidæ

<sup>1</sup> Annales des Sciences Naturelles, vi. 1836, p. 97.

<sup>2</sup> No. 3, p. 85, Washington, 1876.

<sup>4</sup> P. Z. S. 1867, p. 457.

<sup>3</sup> L. c. p. 114.

in sequence as members of the Limicolæ<sup>1</sup>; and such being the case, their intimate affinities with the Thinocorinæ scarcely need further notice. The bifid vomer of *Numenius arquatus*, as shown in fig. 3, p. 417, closely resembles that of most of the Limicolæ proper. The vomer is always sharp-pointed in the Larinæ, as in *Sterna hirundo* (fig. 1, p. 417), with which *Chionis* generally agrees.

In *Cursorius* and *Glareola* the vomer is not expanded laterally. In them, however, there is an absence of pterygoid facets for articulation with the basisphenoid rostrum, together with a general resemblance between their palates and those of the Thinocorinæ. In their myology these genera do not differ in any essential points from *Thinocorus* and *Attagis*; and it is with these that I cannot help thinking that *Thinocorus* and *Attagis* are most allied. Not in any of these genera are the pair of supraoccipital foramina to be found, which are present in nearly all the Charadriidæ and the Gruidæ.

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May 15, 1877.

Prof. A. Newton, F.R.S., V..P, in the Chair.

The following report on the additions to the Society's Menagerie during the month of April 1877 was read by the Secretary:—

The total number of registered additions to the Society's Menagerie during the month of April 1877 was 74, of which 28 were by presentation, 16 by purchase, 5 by exchange, 8 by birth, and 17 were received on deposit. The total number of departures during the same period by death and removals was 105.

The most noticeable additions during the month were:—

1. A Ceylon Fish-Owl (*Ketupa ceylonensis*), from Ceylon, presented April 4th by Capt. H. B. Turner. This fine Owl is new to our published list, and has not been represented in the Gardens for many years, though I believe we formerly had a living example of it.

2. A female Bohor Antelope (*Cervicapra bohor*), transmitted by the Sultan of Zanzibar, along with other animals, to the Prince of Wales, and deposited by His Royal Highness in the Gardens on April 24th. This Antelope is new to the Society's collection.

3. A Pygmy Marmoset (*Hapale pygmæa*), purchased April 27th, and stated to have been obtained at Pebas, on the Upper Amazons. No previous living example of this beautiful little Marmoset has, so far as I am aware, reached Europe alive. The iris is of a clear reddish brown.

<sup>1</sup> Vide P. Z. S. 1874, p. 123. I may here mention that Dr. Coes's account, in the above-quoted paper, of the myology of *Chionis minor* is incomplete as far as the varying muscles are concerned; and I may add that in both species the ambiens muscle is of fair size, the external vastus covers the biceps cruris, the femoro-caudal with its accessories and the semitendinosus with its accessories are well developed. The internal obturator is oval; and there is a slip from the biceps humeri to the patagium. There are two carotid arteries, and intestinal cæca 5 inches long in *C. alba*, 6 inches in *C. minor*.

Spix obtained his specimen at Tabatinga; Mr. E. Bartlett got a single example on the Huallaga<sup>1</sup>; and Castelnau and Deville brought home a series<sup>2</sup> from the Upper Amazons, but do not give the exact locality.

4. Two specimens of the rare Yellow-throated Parrot, *Caica xanthomera* (G. R. Gray), which arrived along with the Pygmy Marmoset, also quite new to the collection.

Mr. Sclater made some remarks on the progress and condition of the Zoological Gardens of Rotterdam, Amsterdam, Antwerp, Brussels, and Ghent, which he had lately visited.

In Rotterdam he had seen a pair of the West-African Jackal described and figured in the Society's 'Proceedings' (1870, p. 279, pl. xxiii.) as *Canis lateralis*, and a fine specimen of *Casuarium uniappendiculatus*.

At Amsterdam Mr. Sclater had found the young male Hippopotamus, born on the 3rd of August, 1876, in excellent health and condition, and another young one expected shortly. Two examples, nearly adult, of *Casuarium uniappendiculatus* were in the collection, one of which Mr. Westerman has consented to part with to this Society.

At Antwerp M. Vekemans was busy on the construction of a new Lion-house, about 230 ft. long by 65 ft.—that is, of about the same dimensions as the Society's newly-constructed building.

A communication was read from Dr. G. S. Brady, C.M.Z.S., containing a memoir on the Fossil Ostracoda of the Antwerp Crag. This paper will be published in the Society's 'Transactions.'

The following papers were read:—

1. Notice of the Capture of *Coregonus oxyrhynchus* in Lincolnshire. By FRANCIS DAY, F.Z.S.

[Received May 7, 1877.]

Amongst a consignment of fresh fish received on April 17th, this year, at Cheltenham, from Lincolnshire, I observed a *Coregonus*<sup>3</sup>, along with some Smelts (*Osmerus eperlanus*). So far as I am aware, *Coregonus oxyrhynchus* has not been previously recorded as either a visitor to or resident along the coasts of Great Britain or Ireland.

The genus *Coregonus* has been divided into those forms having

- (a) The lower jaw the longer,
- (b) The upper jaw the longer.

Amongst those comprising this latter division, a soft prolongation of the snout may be present or absent.

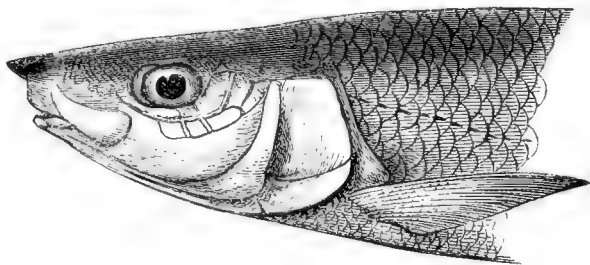
<sup>1</sup> See P. Z. S. 1871, p. 220.

<sup>2</sup> See Casteln. and Dev., Exp. de l'Am. d. S. Mamm. p. 20\*, pl. v. figs. 1 & 2.

<sup>3</sup> The fishmonger assured me that there was a second example, which I did not see.

The British species have been restricted to three (or perhaps four), in none of which has the snout a soft conical prolongation.

The *C. oxyrhynchus* belongs to the subdivision in which a soft conical prolongation of the snout is present.



*Coregonus oxyrhynchus*.

The specimen I obtained is about 7 inches in length, and may be briefly described as follows:—

B. ix, D. 14, P. 15, V. 6, A. 15, L. l. 80, L. tr.  $\frac{8}{12}$ .

Length of head 5, of caudal fin  $5\frac{1}{2}$ , height of body 6 in the total length. Eyes, diameter  $4\frac{1}{2}$  in the length of the head,  $1\frac{1}{2}$  diameter from the end of snout, and  $1\frac{1}{4}$  apart. Teeth absent from the jaws. Fins, pectoral as long as the head excluding the snout. Scales,  $7\frac{1}{2}$  rows between the lateral line and base of the ventral fin.

As this fish is found along the coasts and entering the fresh waters of Holland, Germany, and Denmark, it is remarkable that it has not been recorded from the east coast of England, as stragglers are probably of no rare occurrence.

## 2. Notes on the Species of the Genus *Batrachostomus* inhabiting the Indian Region. By ARTHUR, Marquis of TWEEDDALE, F.R.S.

[Received May 15, 1877.]

(Plates XLV.—XLIX.)

The rarity in our collections of examples representing the different members of the genus *Batrachostomus* in all their various states of plumage, the want of field-collectors' notes to elucidate the few that do exist, the variability and intricacy of the markings by which they are characterized, and consequent difficulty, more especially in the males (?), of conveying by mere description, and even by coloured drawings, an adequate conception of their distinctive external characters, have combined to retard our knowledge of the genus.

The group was unknown to the older zoologists; and Dr. Hors-



J. Smith del.

BATRACHOSTOLIUS AFFINIS ♀.

H. G. S. 1897.

$\frac{3}{4}$





J. Smit del.

H. G. Rees sculp.

34

BATRACHUS M. P. COENIDUCES L.







PLATE 100

THE JOURNAL OF THE ENTOMOLOGICAL SOCIETY OF AMERICA

1910





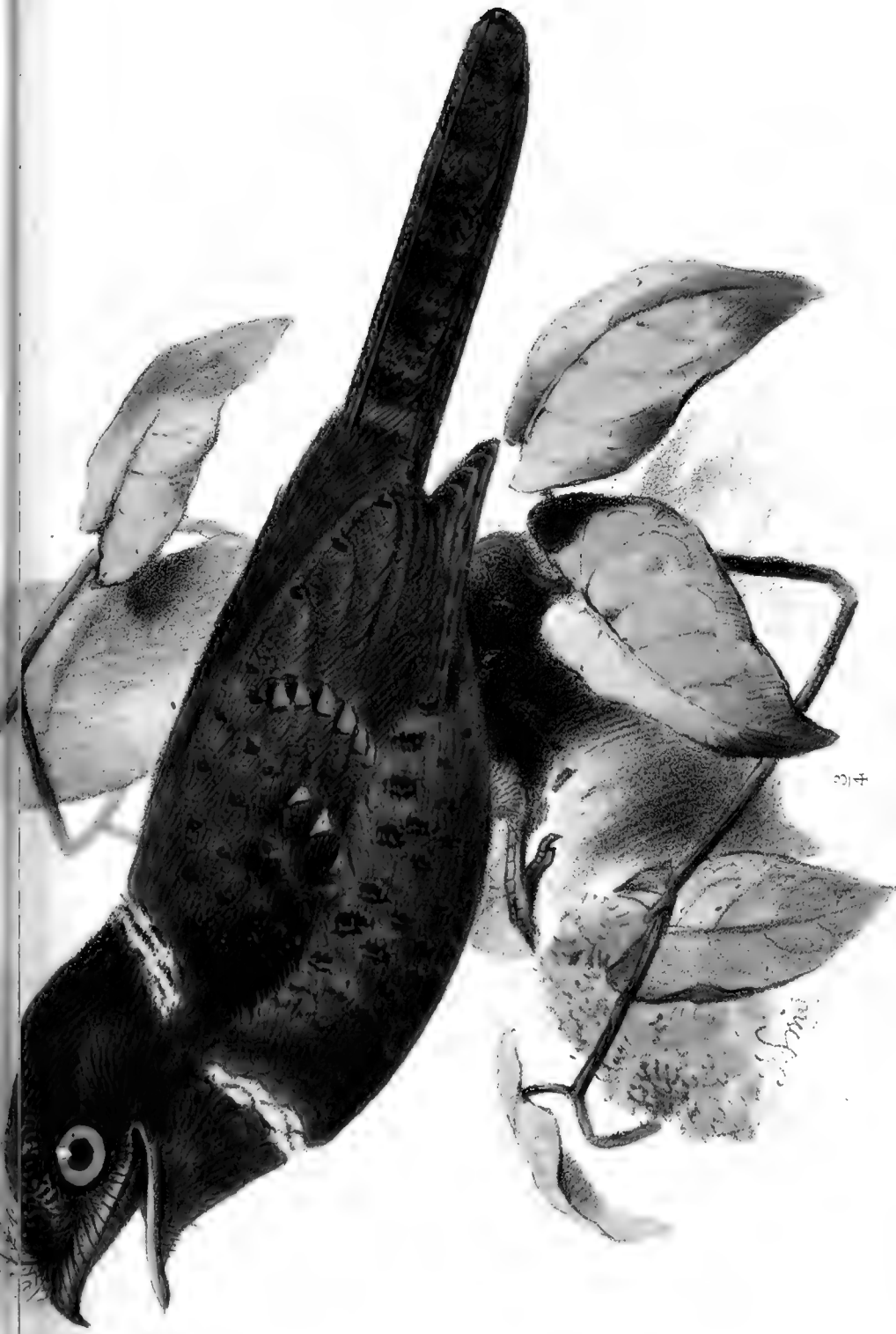
Smt lith.

3  
4

Hanhart imp

EUTROPIS MONILIGER.





J. Smit del.

BATRACHOSTOMUS MONILIGER, ♀

Harkent 307



field was the first naturalist who described (1820), and afterwards figured, one of its members, an inhabitant of Java—*B. javensis*. Temminck soon afterwards (1823) described and figured another species from Bencoolen, in Sumatra, obtained by Messrs. Diard and Duvaucel, probably under the auspices of Sir Stamford Raffles; and a few years later (1830) Vigors made known the giant form of Sumatra, *B. auritus*, sent to England among the collections of Sir Stamford. In 1837 Mr. Gould added a fourth species, *B. stellatus*, describing it as inhabiting Java. Dr. Jerdon, in his Second Supplement to his 'Catalogue of the Birds of Southern India' (1845), announced the discovery by Capt. Roberts of a representative of the genus in Peninsular India, which, however, he never saw, and which up to this date remains unidentified. Not many years elapsed before Blyth (1847) published an account of a sixth species, obtained at Malacca by Mr. Frith, *B. affinis*; and two years later he received from Darjeeling the fragments of two nestlings, which he identified as belonging to this species (*l. c.*). In Ceylon, Layard discovered and so added another species to the list (which may or may not be the same as the South-Indian form)—a species described by Blyth (1849) under Layard's title of *B. moniliger*. The whole of these six or seven species were in rufous or rufous-brown plumage; but in 1850 Bonaparte (*l. i. c.*) made known the fact that each sex in one species at least (*B. javensis*) wore a plumage peculiar to itself—a statement reiterated in wider terms and confirmed by Prof. Schlegel (*l. i. c.*) four years later. This important fact did not deter Mr. G. R. Gray from describing in 1857 a bird in grey and brown mottled plumage obtained the year before by Mr. Hodgson's collectors at an elevation of some 3000 or 4000 feet behind Darjeeling, as belonging not only to a new species but to a distinct genus—*Otothrix hodgsoni*.

From the year 1849 until the date of the visit of the 'Challenger' Expedition to the Philippines, the efforts of naturalists, while considerably increasing and correcting our knowledge of the geographical distribution of the *Batrachostomi*, had not made known any new species. Mr. Blyth had already announced the occurrence of *B. auritus* in Malacca; and Mr. Low has discovered it in Borneo. Mr. Motley obtained *B. cornutus* at Banjarmassing, in Borneo; and the Marchese Doria found it at Sarawak. Tickell has figured and described *B. affinis* from Burma; and Lieut. Wardlaw Ramsay discovered the same species in the plumage of *Otothrix hodgsoni* on the Karen-nee hills in that country. The range of *B. stellatus* has been made to include Malacca by Mr. Blyth's researches, and extended to Borneo (Sarawak) by Marchese G. Doria. Mr. Bourdillon has quite recently discovered in Travancore examples of a species of the genus which, while confirming Dr. Jerdon's statement that one of its members occurred in Southern India, may prove to be a distinct form. And, lastly, the Philippine island Mindanao has been added to the area of the genus (as restricted), by the discovery there made by the naturalists of the 'Challenger' Expedition of a large species. Examples of the genus, so far as at present recorded, therefore present themselves in Ceylon, Southern India (Wynaad, Travancore),

the vicinity of Darjeeling, Tung-goo and Karen-nee in Burma, Malacca, Sumatra, Borneo, Java, and Mindanao.

It was an *à priori* and a natural inference of many ornithologists that the bright-plumaged birds of the genus *Batrachostomus* must be males, and the grey dull-coloured birds either females or immature examples, or else that they belonged to totally distinct species; for the *Batrachostomi* exhibit two very distinct phases of plumage—the bright rufous or rufous bay (when adult), and the speckled, spotted, and striated grey and brown and rufous brown dress. So very different an aspect do individuals falling under either one or other of these two phases assume, that it was long before some authors suspected that they in fact belonged to the same species, though to the opposite sexes. This conclusion cannot even now be considered as placed beyond doubt (for the Frogmouths may be dimorphic); and it is therefore proposed to state and examine the evidence on which it rests. Bonaparte (Consp. i. p. 57. no. 2) seems to have been the first writer who announced that in the case of *B. javensis* the sexes differed; for he remarks (*l. c.*):—“*Mas et fem. inter se colore differunt uti Scops asio differt a Sc. nævia auctorum.*” But his simile leads to the inference that he thought the rufous birds were males and the grey females. A few years later Prof. Schlegel (*J. f. Orn.* 1856, p. 460) propounded the general and more definite axiom that in all the Indian species of the genus *Podargus* (*Batrachostomus*) the males are grey, the females rust-coloured. At that time the Leyden Museum possessed examples of two Asiatic species, identified by the Professor as *B. parvulus* (*ex* Borneo and Malacca) and *B. cornutus* (*ex* Java, Sumatra, and Borneo); and to these species must Professor Schlegel’s dictum be restricted, doubtless founded on numerous examples with the sexes determined by the Dutch collectors. Of *B. parvulus* (= *B. affinis*, Blyth), *ex* Malacca and Borneo or Sumatra, I have not met with an example, in either grey or rufous plumage, of which the sexes had been determined by a competent collector. Yet, if *B. affinis*, Blyth, is but a slightly smaller form of *B. castaneus*, Hume (of which there is little doubt), and consequently the rufous phase of *Otothrix hodgsoni*, then there is some confirmatory evidence of Prof. Schlegel’s opinion that the grey birds belong to the male sex. Examples of *B. cornutus*, *ex* Sumatra and Borneo, in both plumages, with the sexes determined, fortunately exist in England, and bear out the Professor’s conclusions. In the British Museum is preserved an example, *ex* Sumatra, in grey plumage, and marked as being of a male by its collector, Mr. Wallace. Count Salvadori (*l. c.*) describes a freckled rufous individual from Sarawak; and the sex, as ascertained by the collector, is stated to be female. Two pairs of this species, collected in Banjarmassing by Motley, were examined by Mr. Sclater; and he observed (*P. Z. S.* 1863, p. 212) that “the sexes are very different in colouring, the male being minutely freckled with brown and black, and the female bright rufous. Horsfield’s figure represents the female.” As regards the remaining Asiatic species there is also some evidence on this point. A bright rufous example



of *B. moniliger*, Layard, collected in Ceylon, by Mr. S. Chapman (*mus. nostr.*) is marked "sex, female." A grey-brown speckled bird of the same species, obtained at Ratnapura, in Ceylon, is marked ♂ by the collector, Mr. H. Nevil (*mus. nostr.*). Of two individuals belonging to the genus recently obtained in Travancore by Mr. Bourdillon, and referred by Mr. Hume (*l. c.*) to *B. moniliger*, Layard, one, in rufous plumage, said by Mr. Hume to agree with the description of the Ceylon type, is marked female by the collector; the other, in grey-and-brown freckled and mottled plumage, is marked a male. A single specimen of a new species from Mindanao, discovered by the naturalists of the 'Challenger' Expedition, is in rufous-brown striated plumage; and the sex is stated on the label to be female. Lieut. Wardlaw Ramsay ascertained the sex of a *Batrachostomus* obtained by him on the Karen hills (5000 ft. elevation) to be male; and this individual is in grey-and-brown mottled plumage, hardly distinguishable from the type of *Otothrix hodgsoni* and from grey-and-brown mottled examples of *B. affinis*, *ex* Malacca. Of *B. stellatus* (= *B. stictopterus*, Cab.) I have never seen examples in grey plumage. It is a common bird in Malaccan collections; and I have examined a great number of individuals. It has two phases of plumage—bright rufous or rufous bay, and dark brown and rufous brown. Younger birds possess either of these hues, but have the upper plumage striated. Count Salvadori's Latin description, taken from three Sarawak individuals (one of which is labelled as being a male), applies to the rufous-brown phase of dress; for he says, "*Supra rufo-brunneus.*" We might infer, therefore, that the bright rufous dress belongs here again to the female; but controverting this conclusion is a Bornean example in bright rufous plumage, collected by Mr. Everett (*mus. nostr.*), on the label of which the sex is marked male. Of ten examples of the large *B. auritus*, *ex* Malacca (*mus. nostr.*), five are in a rufous-coloured dress, and the other five are strongly tinged with grey above and below. I cannot discover that the sexes corresponding to these two phases of plumage have ever been determined by collectors; but Mr. Gould (*l. c.*) conjectured, some thirty-four years ago, that the rufous bird was the male, and the greyer bird was either the female or the young—a conjecture requiring confirmatory proof. With the exception of the male symbol on Mr. Everett's Bornean rufous example of *B. stellatus*, the little reliable evidence on record favours Professor Schlegel's generalization. It must not be omitted to notice that Mr. Hume (*Str. F.* ii. p. 349) has distinctly stated that "Mr. Hodgson's bird" (the type of *Otothrix hodgsoni*) "was certainly an adult female, by dissection;" but we are left without any evidence (besides Mr. Hume's statement) that this assertion is well founded; there is nothing on the label of the type specimen relating to the sex. Judging from the following more recent observation of Mr. Hume (*op. cit.* iv. p. 378)—"It is true that when I formerly wrote, I thought it (relying on what Hodgson recorded) probable that *hodgsoni* was the female, and *castaneus* the male,"—it would appear that Mr. Hodgson had recorded that he had *ascertained* by *dissection* that

the bird on which Gray founded his *Otothrix hodgsoni* was a female. If this be so, the conclusion that the females of this species are always rufous, and the males grey, is very much shaken; and it is most desirable that Mr. Hodgson's own words should be made known; for the accuracy of zoological facts stated by Mr. Hodgson may be said to be more than "probable." Of the specimens of *B. crinitus*, ex Gilolo and Batchian, with sex determined, the females are in rufous plumage or rufous brown (*B. psilopterus*). The females of other Papuan forms of *Podargus* appear also to be rufous, such as *P. ocellatus*. It may be added that the white markings on the nuchal, gular, and pectoral plumes and on the scapulars and wing-coverts (where they occur) are very similar in adult birds of either sex, *B. moniliger* in part excepted.

There is no evidence that the young, even nestlings, of both sexes wear plumage of the same colour. On the contrary, from the little that has been published on the subject, the young of the species known have grey or rufous predominating from the first.

Of the two nestlings from Darjeeling identified by Blyth as belonging to *B. affinis*, one is described as being "mainly of a light chestnut hue, with nearly obsolete barred markings, and throwing out deeper chestnut or light-bay feathers on the crown and shoulder of the wing; while the other is profusely mottled throughout with black on a pale ground, but faintly tinged with chestnut" (J. A. S. B. 1849, p. 806). The nestling obtained along with the adult of *Otothrix hodgsoni* (Mus. Brit.) is in pale rufous barred plumage. A nestling of the Travancore bird discovered by Mr. Bourdillon is described by Mr. Hume as a "little rufous brown ball" (Str. F. iv. p. 380).

If it comes to be established that the adult females wear the rufous dress, and the adult males the more sombre grey and brown plumage, we shall have the fact that the females of the species belonging to the genus *Batrachostomus* are far more brightly coloured, and therefore more conspicuous than the males. The white ornamental plumes, the erect, frontal, half-developed, crest-like feathers, the true occipital crests, and the long hair-like auriculars are equally prominent in adults of both sexes, species by species, the white scapulars in the *B.-auritus* group excepted. But the fact will remain that the bright colouring belongs to the females. It is a coincidence, though perhaps nothing more, that all seven were first made known from rufous examples.

The genus *Batrachostomus* was formed by Mr. Gould (Icones Av. ii. p. 13) for the reception of *P. auritus*, Vigors. Captain Hay three years later (J. A. S. B. 1841, p. 573) also proposed to make the same species the type of a genus which he called *Bombycistomus*. It is difficult to detect any external characters sufficiently definite to warrant the removal of *B. auritus*, or any of the other Asiatic *Batrachostomi*, from the older genus *Podargus*. Mr. G. R. Gray (P. Z. S. 1859, p. 101) created a separate genus under the title *Otothrix*, mainly relying on the long hairy auriculars, for the reception of the species obtained near Darjeeling by Mr. Hodgson. All

the external generic characters given by Mr. G. R. Gray for *Otothrix* belong to every other Asiatic species of *Batrachostomus* in a greater or lesser degree; and it seems unnecessary to retain the title. That of *Batrachostomus* I only hesitate to surrender because I have not had an opportunity of sufficiently studying all the species of *Podargus* as restricted. *B. crinitus*, if any species, perhaps deserves generic separation, on account of its long naked tarsus and weak bill.

The following diagnostic table may perhaps assist the identification of the species known to inhabit the Indian region.

Females, adult uniform rufous, young rufous much striated with brown. Males with mottled, freckled, spotted, striated, grey, brown, tawny, and rufous-brown plumage, or uniform brown upper plumage. A white or else tawny-white nuchal collar in adults of both sexes.

- A. ♀. Wing-coverts unspotted with white.  
Gular collar, pectoral and scapulary plumes white.
- ♂. Wing-coverts with white or tawny white terminal spots or bands.
 

1. ♀. Major; white extending to centre of throat; gape 1.38	}	<i>B. cornutus</i> .
♂. " " "		
Sumatra, Borneo.		
2. ♀. Minor; white extending to centre of throat; gape 1.12	}	<i>B. javensis</i> .
♂. Undescribed . . . . .		
Java.		
3. ♀. White throat, plumes con- fined to the gular collar; gape 1.12 . . . . .	}	<i>B. affinis</i> .
♂. White extending to centre of throat; gape 1.12 . . . . .		
Malacca, Burma, Darjeeling.		
4. ♀. " Rufous; " " " " " "	}	<i>B. stellatus</i> .
♂. Brown or dark rufous-brown above; gape 1.31 . . . . .		

- |   |   |                             |
|---|---|-----------------------------|
| <p>5. ♀. Major ; scapulars with large terminal black spots, tipped white ; white gular and pectoral plumes rudimentary ; feathers of the head mostly tipped fulvous ; gape 2·25 .....</p> <p>♂. Above and below tinged grey ; scapulars tawny grey, finely striated with brown ; gape 2·25 .....</p> <p>Sumatra, Malacca, Borneo.</p> | } | <p><i>B. auritus.</i></p>   |
| <p>6. ♀. Minor ; scapulars without black and white terminal spots ; gape 1·37 .....</p> <p>♂. Unknown .....</p> <p>Mindanao.</p>  | } | <p><i>B. sp. nov.</i></p>   |
| <p>7. ♀. Scapulars with a minute terminal black dot, tipped white ; gape 1·25 .....</p> <p>♂. Scapulars white and rufous white, minutely striated with brown ; gape 1·25..</p> <p>Ceylon.</p>   | } | <p><i>B. moniliger.</i></p> |

Females, at least in some species, seem to betray immaturity by having their rufous plumage traversed by dark irregular striæ and by the white markings of the adult being ill-defined and not pure in colour ; males by having the white nuchal and gular collar-plumes indistinct, undeveloped, and sullied by tawny. Some importance has been attached to the fact that in occasional examples of the genus the maxilla is found to overlap the mandibula. But this appearance seems to be owing to the imperfect preparation of the skin.

BATRACHOSTOMUS AFFINIS. (Plate XLV.)

- Podargus stellatus*, Gould, Blyth, J. A. S. B. 1845, p. 209.
- Batrachostomus affinis*, Blyth, J. A. S. B. 1847, p. 1180, "Malacca ;" Blyth, *op. cit.* 1849, p. 806, juv. ; *t. c.* p. 807, adult.
- Podargus affinis*, Blyth, Cat. Calc. Mus. p. 81. n. 405 (1849).
- Batrachostomus parvulus* (Temm.), Bp. Consp. Av. i. p. 57 (1850), ♀.
- Podargus parvulus*, Schlegel, J. für O. 1856, p. 460, "Borneo, Malacca ;" Handleiding d. Dierk. i. p. 224, "Borneo, Malacca" (1857).
- Otothrix hodgsoni*, G. R. Gray, P. Z. S. 1859, p. 101, t. clii. (♀?).
- Otothrix hodgsoni*, G. R. Gray, Jerdon, B. India, i. p. 190 (1862).
- Podargus javanensis*, Horsf., Tickell, Indian Ornithology, vii. p. 8, *nec* Horsf.
- Batrachostomus moniliger*, Blyth, Tickell, *op. cit.* t. 1, "near Toung-ngoo, Burma," *nec* Blyth.

*Batrachostomus castaneus*, Hume, St. F. ii. p. 349 (1874), "neighbourhood of Darjeeling" (♀?); *op. cit.* 1876, p. 376.

*Batrachostomus hodgsoni* (G. R. Gray), Walden, J. A. S. B. 1875, pt. ii. ex. no. p. 83. no. 162, "Karen-nee, at 6000 feet," ♂.

*Batrachostomus affinis*, Blyth, Walden, *t. c.* p. 84.

*Batrachostomus affinis*, Blyth, Walden, Ibis, 1876, p. 355.

*B. castaneus*, Hume, Blanford, Ibis, 1877, p. 251.

*Hab.* Malacca, Burma, Darjeeling, Borneo (?), Sumatra (?)

*B. parvulus* is stated by Professor Schlegel (*Handleid. l. c.*) to inhabit Borneo and Malacca; but at page 479, index to the plates, no. 15, it is given as from Sumatra also. The bird represented, however, seems to belong to *B. stellatus*. An example of a young *Batrachostomus* (rufous plumage) is contained in the British Museum, and labelled "Sumatra," which may belong to *B. affinis*, as it corresponds well with the young example *ex* Malacca (*mus. nostr.*) below described. But the young bird in rufous plumage is exceedingly difficult to distinguish from the young bird of *B. cornutus* when the latter has not arrived at dimensions equal to or greater than *B. affinis* adult; and its resemblance to *B. javensis* will be probably found to be still closer.

Of the specific identity of *B. affinis* with *Otothrix hodgsoni* there is some concurrence of testimony. Fragments of two specimens from Darjeeling were enumerated by Blyth (Cat. Calc. Mus. no. 405, B, C) under *B. affinis*, but stated to be "of a nearly allied but distinct species." This opinion Blyth subsequently modified the same year; for in his "Supplemental note to the Catalogue" (J. A. S. B. 1849, p. 806. no. 405) he remarked, "In a collection made at Darjeeling we found the heads, wings, and tails of two specimens of what we now consider to be the young of this species" (*B. affinis*). Lieutenant Wardlaw Ramsay's example of *Otothrix hodgsoni* was obtained in the vicinity of the district from which Colonel Tickell received an example of *B. affinis* in rufous plumage. Malaccan examples of *B. affinis* in the dress of *Otothrix hodgsoni* occur as frequently as the rufous bird; and Mr. Hume (*l. c.*) has described a specimen of his *B. castaneus*, *ex* Darjeeling, in a plumage that agrees with that of *O. hodgsoni*. Mr. Hume almost admits that *B. castaneus* represents a phase or a sex of *O. hodgsoni*. Both Jerdon and Blyth in later years strongly suspected that *O. hodgsoni* represented a phase of *B. affinis*. In the dimensions of the wings and tail the birds at the northern limit of the range (Sikim) exceed those at the southern (Malacca), while the width of gape remains constant.

No. 1, ♀ (?) adult, *ex* Malacca (*mus. nostr.*) (Pl. XLV.). Head, elongated occipital crest-plumes, back, uropygium, upper tail-coverts, scapulars, minor and major wing-coverts, exposed upper surface of secondaries, and tertiaries, throat, sides of neck, breast, abdomen, ventral region, and flanks pure bright rufous; chin, forehead, and supercilium tawny rufous. The elongated auriculars tawny rufous and tipped blackish brown. The abdomen and exposed surface of secondaries and tertiaries of a somewhat paler shade than the back. Throat-plumes with a white open transverse V-mark towards the tips,

which are bright rufous ; above the white mark a narrow dark brown line which separates the white of the V-mark from the white bases of the lateral webs, these forming a narrow white margin to the shaft, which is white ; below the white V-mark another dark brown separating line, remainder of the webs grey or greyish brown : with each feather the extent and outline of the white markings slightly varies ; but taken together a white irregular demicollar is formed, which is partly concealed by the rufous tips of its constituent feathers. Springing from below this collar and from the sides of the upper breast are many elongated bright rufous plumes, bearing a pure white ocellum about the middle of each. These ocelli are separated from the rufous colour of each feather by a narrow but distinct dark brown encircling line. Below these breast-feathers is another series traversing the lower breast and upper abdomen ornamented in a similar manner ; but the spots are larger, and elongated rather than round, and on each side of the shaft above the drop the webs at their base are white ; the white spots on the lower abdominal feathers are fewer in number, smaller in size, and more irregular in form. As on the throat, all these white markings are much concealed by the overlapping of the rufous tips and margins. Some of the scapulars have a long bold white centre, separated from the rufous by a narrow dark brown line. On the shorter scapulars the white mark is small ; and on the longer scapulars the white only occupies the outer half of the feather. Several of the nuchal feathers are traversed by a pure white band, which is bounded above and below by a narrow dark brown line, the tips of the feathers being rufous. The unexposed inner webs of all the quills are uniform brown above, paler underneath. The outer webs of the primaries are pale rufous, with a few narrow transverse brown marks. Excepting the first and second primaries the pale rufous colour of the outer webs continues round the tips of the quills onto the inner webs, slightly increasing in extent with each quill. Underneath, the outer webs are also pale rufous, the brown marks hardly showing through. The shafts above are rufous brown, below pale rufous or yellowish rufous. The ground-colour of the rectrices is a dull rufous, of a somewhat darker hue than that of the tertiaries. They are traversed at almost equal intervals by a series of some seven or eight obscure ill-defined darker rufous or brownish-rufous bands, margined above and below by a narrow irregular zigzag darker brown line. On the outer rectrices these dark lines are broader, and the interspaces are darker brown. The basal half of the inner webs of the rectrices (middle pair excepted) is cut into with white or tawny white. The short outermost pair have a white or tawny spot on both webs and another higher up. The second outer pair have two tawny white marks on the outer web. Under surface of rectrices pallid rufous, the dark bands showing through. Under tail-coverts yellowish white, some tipped and otherwise marked with rufous. Thigh-coverts tawny. Axillaries grey tipped with rufous. Under wing-coverts mixed grey, rufous, and tawny white. The stiff elongated narial and frontal bristles are tawny rufous tipped black. The bill is massive and typical.

1st quill a little more than two-thirds the length of the 2nd, which is  $\frac{3}{8}$  of an inch shorter than the 3rd; the 4th exceeds the 3rd by about  $\frac{1}{8}$  and is slightly shorter than the 5th, which is longest. The tarsus is naked behind, but feathered anteriorly for about a quarter of its length. The three middle pairs of rectrices are about equal in length; the fourth pair are somewhat shorter; the fifth pair are about half the length; and the outer pair are almost rudimentary. Wing 4.62, tail 4.75, tarsus 0.43, middle toe 0.50, bill from forehead 0.88, width of gape 1.12.

No. 2, ♀ (?) not quite adult (?). Colonel Tickell (*l. c.*) described and figured a species of *Batrachostomus* from near Toung-ngoo, in Burma, which belongs to *B. affinis*. It is in rufous plumage, the feathers of the head, upper back, and scapulars being vermiculated transversely with black. No mention is made of a white nuchal band; nor is such a character indicated in the plate. Still this character might be easily overlooked in some skins; and Tickell described from a dried specimen. The description is of sufficient importance to be published, and is as follows:—"Iris sepia<sup>1</sup>. Bill fleshy horn. Legs horn. Head, upper back, and scapulars bright umber, shaded ferruginous on back and mingled with greyish on scapulars, the whole vermiculated crossways, black. Outer webs of two or three longest scapulars white, bordered with black. Tertiaries clouded brown, ferruginous and grey, with black vermiculations. Wing-coverts rusty vinous, broadly vermiculated black. Secondaries and primaries, outer webs chesnut-rusty, with broken narrow bars of black. Inner webs sepia. Tips of primaries pale and mottled. Tail cinnamon-brown, shaded grey marginally and vermiculated black, and crossed with five paler bars (not joining the shafts), subterminal series (*sic*). The bars are edged black and obscurely vermiculated. All underparts from bill vinous rusty, with a group of white black-margined patches on throat, and another across bottom of breast, below which the colour is paler and broken with rusty and dusky irregular bars; this extends to lower tail-coverts. Lower back and upper tail-coverts as back. A pale tawny supercilium. Lining of wings whitish. Length 9 inches. Wing  $4-\frac{3}{4}$ . Tail  $4\frac{5}{8}$ , of which beyond body  $2\frac{1}{2}$ . Bill  $\frac{5}{8}$ . Tarsus  $\frac{9}{16}$ . Middle toe  $\frac{5}{8}$ ."

This description refers to the rufous phase, when the upper plumage is traversed and vermiculated by narrow brown lines, while otherwise the bird exhibits the adult markings.

No. 3, ♀ (?) young, ex Malacca (*mus. nostr.*). Chin and upper throat tawny white; rest of throat tawny rufous, feathers tipped brighter rufous and with distinct indications of white ocelli. Upper breast the same. Lower breast-feathers tawny white, with rufous margins (somewhat as in *B. stellatus*, ♀ adult). No traces of the pure white drops on the lower pectoral plumes. Abdomen, ventral region, and under tail-coverts sordid white, with traces of pallid rufous. Frontal band and supercilium tawny rufous. Crown and occipital crest-plumes as in adult. White nuchal collar distinctly indicated,

<sup>1</sup> The colour of the iris must have been stated to, and not observed by, Colonel Tickell.

the white of the band not being pure. Back and uropygium dark rufous, traversed by narrow black irregular lines. Upper tail-coverts pale rufous, striated with black or brown. A few scapulars showing indications of the white markings of the adult. The rufous part of all the the quills with distinct, transverse, irregular black lines. Rectrices as in adult; but the paler rufous intervals are round, and do not touch the shafts. Sides of the neck creamy white. No lengthened auriculars. Wing 4.50, tail 4.12, bill from forehead 0.81, width of gape 0.88.

The example here described seems to be of a nestling female passing over to the intermediate finely striated phase. It is full of blood-feathers. An example, *ex* Sumatra (*Mus. Brit.*) is in similar plumage.

No. 4, ♂ (?) adult, Malacca (*mus. nostr.*). General aspect grey, greyish white, greyish rufous, rufous brown, with a white nuchal collar, white-marked scapulars, white throat and pectoral plumes. Frontal plumes tawny at their insertion, tipped and marked with brown, a bold buff supercilium, edged above with a series of buff feathers with brown tips and freckles. Crown-feathers greyish, with dark brown tips and small tawny-white marks on the margins of the webs of some. Lengthened auriculars tawny white the greater part of their length, freckled with brown, and tipped dark brown. Occipital crest like the crown-feathers, but tinged with rufous at their extremities, forming with the upper nape-feathers an obscure rufous-tinged collar. A conspicuous nuchal collar formed by a series of feathers which, pale rufous tawny grey at their insertion, are, lower down, traversed by a narrow brown zigzag line, then by a narrow band of pure tawny rufous, which is separated by a second irregular brown transverse line from a broad pure white band, which, in its turn, is bounded by a black terminal border to the feather, in some freckled with tawny. Interscapulars grey, with a rufous tinge, minutely freckled with brown, some with black, terminal small spots. Back the same, but less rufous, and with fewer black terminal dots. Upper tail-coverts rufous, with tawny dots and brown freckles. Some scapulars pure white, with a black terminal spot and a narrow margin (in parts) of black; near insertion a few zigzag pale brown markings. Several other scapulars with inner webs grey, freckled with brown, outer webs being pure white, narrowly bordered with dark brown, and having terminal black spots. Other scapulars pure white traversed sparsely with fine irregular greyish brown lines. Minor and major wing-coverts brown, with rusty margins and having a mottled rusty and brown aspect. Many of the major coverts with pure white terminal spots. White and tawny minute terminal spots on many of the other wing-coverts. Tertiaries brown, minutely freckled with pale grey wavy fine lines, tinged with tawny rufous in places. Some with white or greyish white terminal spots. Primaries with the inner webs pale brown; outer brown, marked with rusty and indented with white or tawny white. Tips of primaries (1st and 2nd excepted) mottled with tawny rust-colour. Axillaries grey, tipped pure white. Under wing-coverts creamy white, mingled here and there with brown.



Chin and throat-feathers white at their roots, with tawny tips, the produced hair-like shafts being brown, and narrow brown lines crossing some of the feathers. On the centre of the throat and reaching to the breast a patch of white feathers, each with a subterminal, irregular, brown, narrow transverse line, and in some, higher up the feather, a second V-shaped line. The white throat-plumes bordering the upper breast with a broader dark-brown or black terminal band. Separating the group of white throat-plumes from the upper breast is a series of brown feathers freckled with rusty, and all with more or less white along the basal half of the shaft. These are followed by a series of pectoral pure white plumes with either black terminal margins or black margins freckled with pale rusty. Many are traversed with two irregular brown narrow lines. These pectoral plumes are succeeded by pure white abdominal feathers, traversed by two narrow V-shaped pale-brown or tawny-brown lines, the terminal margins being white or fulvous. The flank-feathers have much the same character. The ventral feathers and under tail-coverts are white, some of the latter traversed with dilute brown markings. Rectrices pale grey, tinged tawny and profusely freckled with transverse, minute, irregular lines. Six or seven pale irregularly circumscribed quasi-bands cross the rectrices, but without quite touching the shafts. These bands are minutely dotted with pale brown, and margined above and below with a distinct brown line. Penultimate outer pair broadly indented on both webs with pure white. Shafts above pale ruddy brown, below tawny white. Rectrices below appear pale greyish brown, banded with pallid tawny. Rectrices tipped brown. The long narial bristles are black. The bill is as in the rufous bird. Upper fourth of anterior side of the tarsus is feathered. Wing 4.62, tail 5, tarsus 0.5, middle toe 0.62, bill from forehead 1, width of gape 1.12.

No. 5, ♂ (?) adult, ex Malacca (*mus. nostr.*). This example closely resembles the one above described, but has the plumage of the head of a darker brown. The whole back with a more decided dark rufous tinge. The pale caudal bands more regular in outline and running right across the feathers, and the darker and broader interspaces more rufous brown. Wing 4.75, tail 5, bill from forehead 0.9, width of gape 1.18.

No. 6, ♂ (?) not quite adult (?), ex Malacca (*mus. nostr.*). In general tone of colour this example closely resembles No. 4. The auricular plumes are fully developed, and the bill is that of an adult; but the white nuchal collar is only indicated by a few feathers, and might be overlooked. The scapulars exhibit white all over or only on the outer webs; the white on the throat-plumes is more irregularly distributed, while the pure white small spots on the major wing-coverts are more abundant. The rectrices resemble those of No. 2. Wing 4.5, tail 4.62, bill from forehead 0.9, width of gape 1.16.

An example (*mus. nostr.*) marked East Africa (!) only differs from the foregoing by all the quills being indented on their outer webs with pure rufous without any white.

No. 7, ♂ (*vide* Wardlaw Ramsay) ex Karennee, at 6000 feet eleva-

tion (specimen referred to under the title of *Otothrix hodgsoni*, in Blyth's *B. Burma, l. c.*). This example has the general aspect of the three last described. The back has the rufous tinge of No. 5; but the white-banded nuchal feathers are not more apparent than in No. 6. The scapulars are coloured and marked as in the others; but on one or two of the tectrices, near the end, on either web, is a pure white spot. The white and the tawny rufous pectoral feathers are, here and there, tipped with a darker brown. The tail-feathers are marked as in examples 5 and 6; but the general tone is a shade more rufous or rusty. The markings on the quills are somewhat more rufous than in either of the Malaccan birds. On the whole it is impossible to discern any character which differentiates this example from the other three, more decided than the small differences that distinguish each of the three Malaccan individuals from one another. Some of the dimensions, however, are greater. Wing 5.0, tail 5.5, tarsus 0.62, middle toe 0.75, bill from forehead 0.93, width of gape 1.12. The graduation of the quills and rectrices is as in the others, and the tarsus as much, but not more feathered. The bill is as powerful. The iris is stated by Lieutenant W. Ramsay to be marbled buff, bill light madder, legs the same tinged with violet. The auricular plumes are not more developed than in Malaccan examples.

♂ No. 8, (?), neighbourhood of Darjeeling. Type of *Otothrix hodgsoni*, G. R. Gray. The whole of the feathers of the head are much darker brown than in the foregoing; each plume has a pair of fulvous subterminal spots, one on the outer margin of either web. These fulvous markings are very regular. Scapulars are all white or only so on the outer webs, some with broad black subterminal bands. Nuchal collar-plumes fulvous near the shaft, each terminated with a broad brown or black fringe, above which a broad white band, bounded by a narrow brown line. Dorsal plumage mixed rufous, brown, and black. Ground-colour of the caudal bands warm rufous and pale grey alternating, and all traversed with brown zigzag lines. The rufous bands are about double the breadth of the grey. The gular collar-plumes are white along the shaft; a brown transverse line, then a broad white band followed by a narrow brown terminal band fringed with fulvous. The most part of the pectoral and abdominal feathers are white with black subterminal triangular drops tipped white. Two outer pairs of rectrices indented with pure white on outer margin. Wing coverts brown with rufous marginal markings; greater coverts tipped with white drops. Wing 5.1, tail 5.3, gape 1.1. Tarsus covered anteriorly a quarter of its length.

No. 9, nestling. (Hodgson, *Mus. Brit.*). Above pale rufous, each feather with a subterminal straight brown transverse narrow band. White scapulars indicated. Below white, with a pale tawny brown transverse band on each feather. Gape 0.7.

BATRACHOSTOMUS CORNUTUS. (Plate XLVI.).

*Podargus cornutus*, Temm. Pl. Col. 159, "Bencoolen, Sumatra" (July 26, 1823).

*Batrachostomus javensis* (Horsf.), Sclater, P. Z. S. 1863, p. 211, "Banjarmassing, Borneo."

*Batrachostomus javanensis* (Horsf.), Salvadori, Ucc. Borneo, p. 112, ♀, "Sarawak" (1874); Walden, J. A. S. B. 1875, pt. ii. extra no. p. 84, "ex Sumatra."

*Hab.* Sumatra, Borneo.

Doria, according to Salvadori, *l. c.*, notes the iris of the female, ex Sarawak, as being light yellow (giallo chiaro).

In the British Museum is preserved an example of *B. cornutus*, in rufous plumage, from Banjarmassing, identical with an example obtained by Mr. Buxton in South-east Sumatra. The national collection also possesses examples from Sumatra, from Banjarmassing, and from Labuan, in grey spotted and striated plumage, which vary but slightly from one another. *Podargus cornutus* is the title substituted by Temminck for that of *P. javensis*, Horsf., in the belief that the Javan and Sumatran species were identical, on account of Horsfield's designation giving too restricted an idea of the geographical distribution of the species. The bird figured and described by Temminck (*l. c.*), however, is not in the absolute grey or mottled plumage of the male bird, but rather in the darker rufous-brown phase of the female, when the upper plumage is marked with fine narrow irregular transversal black markings. Dr. Jerdon (*l. c.*) treated *P. cornutus*, as figured in Shaw's General Zoology (xiii. pt. 2, p. 92, t. 41), as belonging to a species distinct from *B. javanensis*, Horsf. Shaw's engraving was copied from Temminck's plate (*l. c.*).

No. 1, ♀ (?) adult (?) ex Lampong district, S. E. Sumatra (*mus. nostr.*). General colour pale clear rufous, somewhat paler than in *B. affinis* ♀ adult, the description of which species will more or less apply to this kind in almost every respect but size. But the wings and tail are of a pale rufous-buff rather than rufous. The throat-feathers are nearly all white, and are without any transverse brown lines. Below they are bordered with a brown line, and then fringed with rufous. Many more of the pectoral feathers have white centres; and these are all more elongated than round on the upper breast. Most of the flank-feathers are largely centred with white, which does not seem to be the case in *B. affinis*, ex Malacca. The white markings, from being more numerous and larger, are much more conspicuous on the under surface than in *B. affinis*; and they reach to the vent. The greater wing-coverts are also faintly tipped with pale abescent dots. The elongated auricular plumes are rufous to the tips and not brown. Wing 5.50, tail 5.37, tarsus 0.68, middle toe 0.75, bill from forehead 1.12, width of gape 1.38. A few feathers on the anterior surface of tarsus.

No. 2, ♀ (?) adult, ex Banjarmassing (*Mus. Brit.*) closely resembles the Lampong female (?), but has the gular plumes differently marked. They are white on both sides of the shaft; an irregular transverse brown line crosses the feathers when the down ceases, followed by a white or fulvous white band, which is bordered below by a brown transverse line, below which is a broad white band finally margined

with brown. A few feathers on the tarsi. Wing 5·30, width of gape 1·30. Other dimensions as in Lampong example.

No. 3, ♀ (?) young, an immature example of *B. cornutus* in rufous dress, ex Banjarmassing, in the British Museum, is almost entirely of a pale isabelline-rufous, freckled with dark irregular transverse zigzag lines. Here and there, especially on the head, the uniform rufous feathers of the older stage have come in, and also a few of the white scapular, nuchal, and pectoral plumes. The mandibles are weak, evidently not full-grown; but the width of the gape is equal to that of *B. affinis* when adult, and the wing is longer than in that species, otherwise it would be difficult to determine to which species it belongs. Wings 5·10, tail 4·60, width of gape 1·10.

No. 4, ♂ (?) adult (?), ex Banjarmassing (Motley, *mus. nostr.*). (Pl. XLVI.) Were it not for the larger dimensions, a more massive bill, and a wider gape, it would be most difficult to distinguish this bird from males of *B. affinis* as above described. I am unable to state any feature of its plumage whereby it can be distinguished, other than its having a broad nuchal collar consisting of several tiers of plumes, fulvous-brown at their insertion, crossed by an obsolete brown line, then a fulvous band, followed by a parallel brown line, then a white band, bounded by a third brown line, then another white band edged on either side with a fulvous terminal fringe and tipped with a black drop. The upper plumes of the series want some of these details which characterize the lowest tier of feathers. The ground-colour of the rectrices is perhaps more rufous brown than pale grey, tinged with tawny as in *B. affinis*. Wing 5·25, tail 5·0, tarsus 0·65, middle toe 0·75, bill from forehead 1·12, width of gape 1·38. Tarsus naked. This and the following are the two males referred to by Mr. Sclater (*l. c.*).

No. 5, ♂ (?) adult, ex Banjarmassing (Motley, *Mus. Brit.*). Wing 5·20, gape 1·40, other dimensions as above; and the plumage offers no points of difference. Tarsus naked.

No. 6, ♂ (?) adult, ex Labuan (Lowe, *Mus. Brit.*). In this example there is scarcely a trace of rufous colouring. The colours of the plumage are brown, black, grey, and white. The colour of the rectrices is a pale grey, the dark transverse bands being formed by the greater number and density of the brown zigzag lines and markings. These bands are not all more or less parallel to one another, but narrow almost to a point inwards to the shaft. Wing 5·40, gape 1·35, Tarsus naked.

No. 7, ♂ adult, ex Sumatra (Wallace, *Mus. Brit.*). Has the general aspect of the Bornean examples and of those of *B. affinis* ♂. The wing-coverts are brown with rufous markings. The white nuchal collar-plumes are tipped with large black triangular drops. Pectoral plumes (other than the white) rufous lineated with brown. The caudal bands have alternately a grey ground and a rufous ground strangely contrasting, both traversed (but not unequally) with numerous zigzag brown lines. These bands are parallel. Wing 5·20, gape 1·35. Tarsus naked.

## BATRACHOSTOMUS JAVENSIS.

*Podargus javensis*, Horsf. Tr. L. S. xiv. p. 141, "Java," (1820).

*Podargus javanensis*, Horsf. Zool. Res. Java (1830)<sup>1</sup>.

*Batrachostomus javanensis*, Horsf., G. R. Gray, Gen. Birds, i. p. 45 (1846).

*Batrachostomus javensis*, Horsf., Blyth, J. A. S. B. 1847, p. 1680, partim.

*Podargus javanensis*, Horsf., Blyth, Cat. Calc. Mus. p. 81. no. 404, "ex Java," ♂ (1849); *conf.* Jerd. B. Ind. i. p. 190, sub *Otothrix hodgsoni*.

*Batrachostomus javanensis*, Horsf., Bp. Consp. i. p. 57 (1850) partim.

*Batrachostomus javensis*, Horsf., Moore, Cat. E.I. C. Mus. i. p. 112, "Java" (1854), type.

*Podargus javanensis*, vel *cornutus*, Schlegel, Handleid. d. Dierkunde, i. p. 224, "Java, Sumatra, Borneo" (1857), partim.

*Batrachostomus javanensis*, Bp., Bernstein, J. für O. 1860, p. 428, "Java."

*Batrachostomus javanensis*, Horsf., Walden, J. A. S. B. 1875, pt. ex. no. p. 84, "ex Java."

*Hab.* Java.

Bernstein (*l. c.*), who gives an account of the nesting of the Java bird, states that the iris is pure sulphur-yellow. Careful examinations of an authentic Javan example in rufous plumage (*mus. nostr.*), though lacking all the rectrices, has led me to doubt the specific identity of typical *B. javensis* with Sumatran and Bornean individuals. The bill, on comparison, is less massive, and the gape narrower. The dimension of the wing and tarsus are less. Horsfield's type specimen still exists, but in a deplorable condition, in the India Museum at South Kensington. With the exception of one or two broken rectrices and a few scattered plumes, the whole of the webs have been destroyed by the moth. Yet enough of the type remains to show that the width of the gape, the form of the bill, and the dimensions of the wing and tarsus agree with my authentic Javan example; and I feel therefore justified in separating the Sumatran and Bornean species from that inhabiting Java. Still they are but representative forms of one another, and along with *B. affinis* constitute a small characteristic group.

♀ (?) not in quite perfect plumage (?), ex Java (*mus. nostr.*). Bright rufous or chestnut. Lengthened auriculars brown for the greater part of their length. Frontal long imperfect plumes brown, almost black. A yellow, chestnut-tinged supercilium. Feathers before the eye pale rufous-yellow at base, with a transverse rufous or else brown line near the tips, which are bright rufous. A series of nuchal plumes pale rufous white, then an irregular transverse rufous brown narrow bar, followed by a broad white band, ter-

<sup>1</sup> This is the date on the titlepage of the complete work; but it is evident, from Temminck's remarks (Pl. Col. 159, sub *P. cornutus*), that the part, no. 2, in which the plate appeared must have been published in the year 1823, or earlier.

minated with rufous-brown. Shorter scapulars white-centred towards the end, the white being separated from the rufous edging by a brown mark. Longer scapulars with all the outer webs and a small part of the inner, near the shaft, white, which colour is more or less enclosed by a brown or rufous-brown irregular line, edged with rufous, inner webs rufous. Chin tawny rufous. A patch of feathers commencing at the middle of the throat, and expanding lower down the throat, pure white and rufous-white, each feather being traversed by an ill-defined narrow pale-brown line; a brown subterminal line fringed with rufous. Many of the concealed pectoral feathers marked in a similar manner, but without the transverse narrow line. Longer pectoral plumes whity brown, edged with a rufous fringe. Back and abdominal feathers paler rufous, centred with white, and with an outer white terminal double or single spot, or with outer webs only white. Ventral region pale tawny-rufous. Quills rufous-brown, outer webs pale rufous, with faint brown marking. Wing-coverts uniform chestnut-colour. Under wing-coverts pale rufous faintly barred with brown. Wing 4.85, tarsus 0.50, middle toes 0.68, bill from forehead 0.87, width of gape 1.12.

The tarsus is not feathered much below the knee; otherwise the structure is normal. In Horsfield's type the dimensions are, wing 5.75, tarsus 0.50, width of gape 1.12, bill from forehead 0.87.

The male has not been described, nor have I succeeded in meeting with an example; but if Prince Buonaparte had authentic Javan individuals before him, we may infer from the passage above quoted (*l. c.*) that it possesses the grey and brown mottled plumage of *B. cornutus* and *B. affinis*. Indeed, if the specimen in the Calcutta Museum, described by Dr. Jerdon (*l. c.*) really came from Java, there can be no doubt on the point. Dr. Jerdon even states that this specimen was "barely (if indeed at all) distinguishable from *Otothrix hodgsoni*." It may even be doubted whether *B. affinis* can be considered distinct from *B. javensis*; but there appears to be a discrepancy in the dimensions, and the white on the throat in *B. affinis* seems to be restricted to the gular collar.

#### BATRACHOSTOMUS STELLATUS. (Plate XLVII.)

*Podargus stellatus*, Gould, P. Z. S. 1837, p. 43, "Java" (?).

*Batrachostomus javensis* (Horsf.), Blyth, J. A. S. B. 1847, p. 1181, partim, nec Horsf.

*Podargus javanensis*, Horsf., Blyth, Cat. Calc. Mus. p. 81, no. 404 partim, "Avis juv. ex Malacca," nec Horsf. (1848).

*Batrachostomus javanensis* (Horsf.), Blyth, J. A. S. B. 1849, p. 807, nec Horsf.

*Podargus parvulus*, T., Schlegel, Handleid. d. Dierkunde, Atlas, t. ii. f. 15, "Sumatra" (1857).

*Batrachostomus stictopterus*, Cab. Mus. Hein. i. pt. ii. p. 124. no. 370, "Malacca," ♂ (1859-60).

*Batrachostomus stellatus* (Gould), Moore, Cat. E. I. C. Mus. i. p. 388, "Malacca" (1854); Sclater, P. Z. S. 1863, p. 212, "ex Malacca;" Salvadori, Ucc. Borneo, p. 113, "Sarawak," ♂ (1874).

*Batrachostomus javanensis* (Horsf.), Walden, J. A. S. B. 1875, pt. ii. ex. no. p. 84, partim, "ex Malacca, Borneo," nec Horsf., ♀.

*Batrachostomus stictopterus*, Cab. Walden, *l. c.* "ex Malacca, Borneo," ♂.

*Batrachostomus affinis*, Blyth, Hume, Str. F. 1876, p. 376, nec Blyth; Blandford, Ibis, 1877, p. 251, nec Blyth.

*Hab.* Malacca, Borneo, Sumatra, Java (?).

Mr. Everett has noted on the label of a rufous bird from Bedi, Borneo (*mus. nostr.*), and marked a male, that the iris is "light yellow," the feet ochre, and the bill pale brown. Doria (*Salvad. l. c.*) gives the colour of the iris of a Sarawak example as being light yellow (*giallo chiaro*).

The British Museum possesses a single specimen of this species in brown plumage, which is labelled "Sumatra." Its occurrence in that island is probable; but the correctness of the locality on the label is not beyond question; the skin is of the characteristic Malaccan make. The figure given by Professor Schlegel (*l. c.*) of *P. parvulus* undoubtedly represents *B. stictopterus*. It is stated to have been taken from an old male from Sumatra. The wing-coverts are spotted; and there are no white throat- or breast-markings.

The type of *P. stellatus*, Gould (Pl. XLVII.), now in my collection, is marked "Java" on the label. In the original description the length of the wing is stated to be four inches, whereas in the type specimen it is five. Beyond the word "Java" on the label, there is nothing to confirm its Javan origin. It has, however, no appearance of being a Malaccan trade-skin. Mr. Gould informs me that the prominent white spots on the major coverts suggested to him the specific designation of *stellatus*. The description of *B. stictopterus*, Cab., was taken from a Malaccan individual in the rufous-brown phase of plumage.

Without having the advantage of the observations of field collectors to assist us, it is difficult to select from a large series of this species any one example as illustrative of the adult bird. When compared with fully-plumaged rufous adults of the other species, the absence of their finished white markings and the decided coloration on the under plumage lead to the inference that *B. stellatus*, as it always seems to come to us from Malacca and Borneo, represents an intermediate stage of plumage. For long it was considered by several Indian writers, myself among the number, to be the young stage of *B. javanensis*, the pallid rufous-margined lower pectoral and abdominal feathers being very similar to what we find in *B. affinis* juv. Assuming that birds with the caudal bands complete, the chin and throat uniform rufous, and the back unfreckled are the most adult, I will describe the following example:—

♀ (?) adult (?), ex Malacca. General aspect above bright rufous. Frontal plumes tawny rufous, also supercilium. Crown, occipital crest-plumes, auriculars, cheeks, back, wing-coverts, and uropygium rich deep chestnut. A series of nuchal plumes grey at the insertion, lower down slightly tinged with rufous, then a narrow transverse blackish line, followed by a broader pure white band edged with

black, and then, in some, a rufous tip. A black-edged white nuchal collar is thus formed. The minor wing-coverts are unspotted; but at the tips of the greater coverts are to be found a large white spot, mostly occupying the outer web and bordered above by a dark brown line. In some this dark line surrounds the inner margin of the white spot. Some of the scapulars have the greater part of both webs of the lower half white; others have only the outer webs white. These white marks are all more or less edged with brown. The primaries and secondaries have their inner webs uniform brown, the outer webs being pale rufous with irregular rufous-brown marks at intervals, adjoining the shaft; the exposed part of the tertiaries is more or less uniform rufous. The upper tail-coverts are rufous, with one or two pairs of tawny-rufous spots on transverse bars. Rectrices dull rufous, stippled with a few minute brown dots, and traversed by five or six narrow tawny-rufous bands, each being margined above and below with a narrow brown line. Terminal narrow fringe of rectrices dark brown, in some surrounded by a rufous edging; in the laterals the pale bands on the inner webs are mostly almost white. Under surface of rectrices as above, but all tints much paler. Chin and throat dingy rufous, some of the throat-feathers and most of the upper pectoral having pallid tawny centres, most conspicuous on the breast, crossed by a pale brown line and fringed with bright rufous. This combination imparts a scale-like appearance to the breast, but has a slight resemblance to the pure white breast and throat-banding in *B. affinis* ♀. The lower pectoral feathers are of the same character, but, being much larger, more of the pallid tawny hue is exposed. The abdominal and flank-plumes are of the same pallid hue, but are scarcely fringed with bright rufous. The ventral region and under tail-coverts same as abdomen, but with still less rufous edgings. The narial bristles are tawny rufous, darker towards the tips. Under wing-coverts almost vinous tawny, varied with rufous or brown; axillaries white. Wing 5·0, tail 5·25, tarsus 0·50, middle toe 0·63, bill from forehead 1·12, width of gape 1·31.

In some examples the nuchal collar-plumes have two transverse brown bars above the white. The white portion and, indeed, the whole of the markings also occur tinged with rufo-fulvous.

Mr. Gould's type specimen scarcely differs from the above description. Its rufous plumage is of a deeper bay tone; the caudal bands do not touch the shaft, and they are rufous, and not tawny-rufous. This phase is to be found in Malaccan and Bornean examples. In less-mature (?) examples the dorsal plumage, the scapulars, the major coverts, and tertiaries are finely striated with black, with occasional more definite black lines.

♂ (?) adult (?), ex Malacca. In Malaccan collections examples are as frequently present in which the rufous or rufous-bay colouring is replaced by a dark brown tint, sometimes with a rufous tinge, the markings being similar to those of the rufous birds. The caudal bands or spots are sometimes of a rufous tint. These brown birds sometimes occur with the dorsal plumage finely striated with black



and mottled with dark rufous. Wing 5·0, tail 5·25, width of gape 1·31.

A Bornean (Bedi) example marked ♂ by Mr. Everett (*mus. nostr.*) is in the rufous-bay plumage, and is not distinguishable from Malaccan individuals (*mus. nostr.*). If the sex was correctly ascertained, it would appear that both sexes wear similar plumage. Wing 4·90, tail 5·0, width of gape 1·37.

In *B. stellatus* the auricular plumes are much less developed than in any of the other species. The front of the tarsus for about a quarter of its length is feathered. The bill is large and massive, and the gradation of the remiges and rectrices is normal.

#### BATRACHOSTOMUS AURITUS.

*Podargus auritus*, Vigers (Griffith), Tr. Cuv. An. Kingd. ii. p. 114, t. (1829); Vigers, App. Mem. Sir S. Raffles, p. 652, "Sumatra" (1830).

*Batrachostomus auritus* (Vigers), Gould, Ic. Av. pt. ii. p. 13, t. 7 (1838); Sharpe, P. Z. S. 1875, p. 99.

*Bombycistomus fullertonii*, Hay, J. A. S. B. 1841, p. 573, woodcut, "Sumatra,"

*Podargus*, sp. —, Blyth, J. A. S. B. 1842, p. 106, "Malacca."

*Podargus fullertoni*, Hay (?), Blyth, t. c. p. 798, "Malacca."

*Hab.* Sumatra, Malacca, Borneo.

The Malaccan bird has still to be compared with the typical Sumatran form. I have compared the Bornean example with the Malaccan, and can discern no distinction.

The species is too well known to require description.

The tarsus is well feathered anteriorly in both sexes for more than half its length.

#### BATRACHOSTOMUS, sp. n.

An example in rufous-brown mottled and striated plumage of an undescribed species of *Batrachostomus* was obtained in Mindanao by the 'Challenger' expedition. It is labelled a female, and will be described in my forthcoming report on the Philippine birds collected by the expedition. The tarsus is feathered anteriorly for a quarter of its length.

#### BATRACHOSTOMUS MONILIGER. (Plates XLVIII., XLIX.)

*Batrachostomus moniliger*, Layard, Blyth, J. A. S. B. 1849, p. 806, ♀, "Ceylon."

? *Podargus javanensis*, Horsf. Jerdon, Madr. J. L. Sc. nec Horsf.

? *Batrachostomus moniliger*, Blyth, Jerdon, B. India, i. p. 189, "Southern India" (1862).

*Batrachostomus moniliger*, Blyth, Holdsworth, P. Z. S. 1872, p. 420, "Ceylon."

*Batrachostomus punctatus*, Hume, Str. F. 1874, p. 354, ♂ ? "Ceylon;" *op. cit.* 1876, p. 377.

*Batrachostomus moniliger*, Layard, Walden, J. A. S. B. 1875, pt. ii. ex. no. p. 84.

*Batrachostomus punctatus*, Hume, Blanford, Ibis, 1877, p. 251, ex Ceylon.

? *Batrachostomus moniliger*, Layard, Hume, Str. F. iv. p. 376, "Travancore;" Blanford, *t. c.* 252.

*Hab.* Ceylon, Travancore.

Judging from Mr. Hume's detailed description (*l. c.*) of the specimen of a male obtained by Mr. Bourdillon in Travancore, the range of the Ceylon bird may be safely extended to that district of India. The iris of one of Mr. Bourdillon's specimens is stated to have been bright yellow.

No. 1, ♀, almost adult (?). (Pl. XLIX). Rattabown<sup>1</sup> or Kattabown, Ceylon (*mus. nostr.*). Bright rufous; of the same shade on the head and wing-coverts as *B. affinis* ♀, but elsewhere paler. Some stray rufous-brown feathers on the head and shoulders. Recurved frontal plumes tawny rufous. Feathers in front of the eyes tawny rufous, with a distinct brown subterminal transverse line or band and a narrow tawny-rufous terminal fringe. Behind these and passing over the eyes some longer feathers, black-tipped, with outer webs pale tawny-white, inner webs rufous, thus forming a pale supercilium. Long auriculars tipped brown. Four rows of nuchal feathers rufous, with a broad white subterminal band confined between a narrow irregular rufous-brown line above and below, the terminal fringe being rufous. In some of the nuchal plumes the markings are better-defined than in others, where they become obsolete. The whole presents the appearance of an irregularly formed white collar. Lesser wing-coverts unspotted, greater with bold, ovoid, larger or smaller white spots at their tips, mostly situated on the outer webs, and circumscribed more or less above and on their inner margins by a brown line. The scapulars are pure rufous, tipped by a minute white or fulvous spot, margined above with dark brown or black. The tertiaries are pale rufous, much freckled with brown, and having still minuter terminal spots of the same character as those on the scapulars. The primaries and secondaries have their inner webs brown and their outer pale rufous, the brown of the inner webs running through at intervals and forming narrow irregular bars. Many of the quills have minute terminal white spots; and all but the first have their tips clouded or freckled with rufous. The axillaries are rufous brown. Under wing-coverts pale rufous, with some grey and sandy white feathers. The chin is tawny rufous; the upper throat bright rufous, with no concealed white-marked plumes. Surrounding the lower throat a series of rufous plumes, broadly tipped with pure white, which is separated from the rufous above by a narrow irregular brown line; below, the white marks are faintly fringed with pale tawny. This white necklace is followed by the pure rufous of the upper breast, among which are no concealed white-marked feathers. Lower breast-feathers of the same rufous, but

<sup>1</sup> The writing on the label is most difficult to decipher.

more or less broadly tipped with white ; an irregular narrow brown line separating the white from the rufous. This lower pectoral white band descends to the flanks. Abdominal feathers and under tail-coverts pale dingy rufous, mostly tipped with subdued whitish spots, surmounted by a narrow irregular brown line. The middle rectrices are pale rufous, much freckled with pale brown zig-zag lines and traversed by seven or eight obscurely defined dark brown bands ; slight indications of white on the margins of the webs ; laterals with the white indentations well marked, all tipped with a narrow white or rufous-white fringe, and a small subterminal black mark. Frontal bristles tawny-rufous and black-tipped. Wing 4·50, tail 4·50, tarsus 3·50, middle toe 0·63, bill from front 0·80, width of gape 1·25.

The bill is massive ; the gradation of remiges and rectrices normal ; the upper fourth of the exterior part of the tarsus is feathered.

No. 2, ♀ (?). Ceylon (*mus. nostr.*). General colour deep chestnut-bay or rufous-brown. This example differs by its deep tone of rufous from the last, which, while of a general bright chestnut, possesses a few feathers on the head and shoulders and all the axillaries of the deep shade of rufous found in this example. In both the distribution of the white markings is the same ; but in the present one the white bars and the terminal rufous-brown fringes of the nuchal collar-plumes are more pronounced. The minute black and white terminal dots on the scapulars and tertiaries are less pronounced ; there are fewer and less distinct brown markings on the rufous outer webs of the quills. The rectrices scarcely differ ; but the under tail-coverts are more distinctly spotted. The feathers before the eye are darker, although also banded by a black line. Wing 4·50, tail 4·40, tarsus 0·60, middle toe 0·65, bill from forehead 0·81, width of gape 1·25. Structure as in No. 1.

No. 3, ♂ (*vide* Mr. H. Nevill), immature (?). Ratnapura, Ceylon (*mus. nostr.*). General aspect greyish brown, much mixed with rufous-brown. Chin and throat dingy pallid rusty ; on the lower throat pure rufous feathers, with a broad white terminal band separated from the rusty colour by an irregular dark-brown line ; no rufous or brown terminal fringe. Breast uniform rusty, with a few feathers on the sides, but not on the middle, broadly tipped with white and traversed with a zigzag brown separating line. Abdomen and flanks pallid fulvous-rusty, each feather for more than half of its terminal length greyish white, freckled with a number of minute irregular transverse brown lines ; many tipped with minute whitish spots. Ventral feathers pallid fulvous-rusty, and only tipped with vermiculations ; others and the under tail-coverts almost uniform fulvous-rusty, with pallid terminal spots and subterminal brown marks. Frontal feathers grey at insertion, freckled with brown, then rusty fulvous, with a subterminal black spot and a terminal minute rusty mark. Feathers of the head brown, with similar terminal marks. Superciliary plumes mostly rusty fulvous or buff on outer webs and brown on inner, with a black terminal dot, giving the supercilium a uniform buff appearance. Elongated auriculars rusty-tawny at base, freckled with brown, and pure brown at the

tips. Nape with a distinct rufous tinge; a few feathers on each side broadly terminated with white, which is margined above by a narrow brown line; a few feathers on the middle of the nape slightly tipped with pure white, some with fulvous. A rudimentary uncompleted nuchal collar is thus formed. Back and uropygium rufous-brown like the nape, marked with cloudy brown striations and a few black terminal dots. Upper tail-coverts rufous brown, with pale lateral subdued small spots or quasi-bands. Scapulars greyish white, much marked with irregular pale-brown striæ, tipped pale rufous, with a small terminal black spot almost encircling a minute rufous point. The lower scapulars are thus marked on the outer webs only, the inner being rufous, clouded with brown. Wing-coverts rufous brown. The major and secondary coverts purer rufous and tipped with bold round or ovoid white marks, some tawny, surrounded above and on their inner margins with black. Many of the greater coverts are traversed by brown zigzag lines; and the white tips are irregularly formed and incomplete. The quills are brown, the outer webs being indented with pale rufo-fulvous. The tertiaries brown, mottled with grey and rufous-grey, which resolves itself into more or less definite bands on the sides of the webs. Middle rectrices rufous-brown, with eight or nine pale fulvous-grey narrow transverse bands much dotted with brown; laterals brighter rufous. Under wing-coverts pale sordid fulvous grey. Wing 4.68, tail 4.50, tarsus 0.50, middle toe 0.75, bill from forehead 0.90, width of gape 1.20. Structure as in foregoing.

No. 4, ♂ (?) adult, Ceylon (*mus. nostr.*). (Pl. XLVIII.) General aspect above brown. Group of feathers before the eye pale rusty, with a dark brown subterminal bar; a narrow frontal band similarly marked. Superciliary plumes pale rusty white, mostly on the outer webs, freckled with brown on the inner and traversed with a subterminal dark brown irregular line. Feathers of the head brown, with minute fulvous terminal and marginal dots and subterminal black spots, all obsoletely freckled with fulvous, and many mixed with grey. Occipital crest-plumes without any fulvous dots. Elongated auriculars tawny, much striated with brown, and tipped almost black. Shorter auriculars tawny, with pale shafts. Nuchal plumes marked like occipital crest, but with a more tawny-rufous ground and with a subterminal white band confined between an upper and a terminal dark brown transverse line. A well-defined nuchal collar is thus formed of two or three rows of plumes. Interscapulars and back marked and coloured like the occipital crest. Uropygial plumes rusty, irregularly vermiculated with dark brown, some terminal markings being black. Upper tail-coverts the same, but with obsolete pale rusty lateral ocelli. Rectrices pale rusty fulvous, mixed with grey throughout, much vermiculated by fine irregular brown lines and with some seven or eight darker rufous transverse bands, separated from the paler by dark brown, almost black, irregular lines, these being broader and bolder than the fine vermiculations. Laterals with a brighter tawny rufous ground-colour. External short pair pale tawny-rufous, with pure white marginal spots. Undersurface of the rectrices pale ful-

vous or rusty brown, the black intermediate narrow bands showing through. Wing-coverts rufous brown, traversed with distinct dark-brown irregular lines. Some of the minor coverts with rusty-fulvous terminal spots. Many of the other wing-coverts with large ovoid pure white terminal spots, with a dark brown margin above and on their inner margins. Shorter scapulars with the inner webs fulvous or rusty, crossed by dark brown lines or narrow bars. Outer webs pale greyish white, crossed by fine zigzag brown lines and black terminal dots. Some of the longer the same, but with ill-defined white ocelli on their outer margins. Other long scapulars alike on both webs, pale rufous, much vermiculated with pale greyish-brown and with broad intervening incomplete bands of white or greyish-white. Quills dark brown, which runs at broad intervals through the pale rufous of the outer webs. Tips of the quills mottled with pale rufous. Tertiaries pale rufous or tawny-rufous, much striated with fine irregular brown lines; a bolder dark brown subterminal mark. Inner tertiaries obsoletely marked with four or five pale greyish white bands. Chin and throat rusty, with brown transverse lines. Some of the lateral feathers with a dark brown or black subterminal spot. Lower throat-plumes with terminal large pure white drops, margined above with a narrow dark brown line, thus forming a white necklace. Upper pectoral plumes like those of the chin and throat, but with subterminal dark brown marks and some admixture of grey in the ground-colour, some faintly tipped with greyish white, others with fulvous. Lower pectoral plumes pale fulvous-grey, with transverse dingy brown irregular lines, and broadly tipped with pure white, faintly edged with brown. Lower down these white-tipped plumes have a much more white than fulvous ground at the base. Abdominal feathers fulvous, terminated with white, and transversely striated with pale greyish brown. Ventral region and under tail-coverts fulvous-rusty, with obscure white terminal spots and subdued subterminal brown marks. Under wing-coverts the same. Axillaries dingy fulvous-grey, tipped almost white. Frontal rigid plumes and bristles black. Wing 4.75, tail 4.75, tarsus 0.50, middle toe 0.70, bill from forehead 0.90, width of gape 1.20.

Structure normal. Tarsus feathered anteriorly for a quarter of its length.

No. 5, ♂ (?), ex Malabar? (*Mus. Brit.*). This specimen is labelled Madras; but its mode of preparation is what we find in all west-coast trade skins. None of my Ceylon examples resemble it excepting in the white collars, scapulars, and pectoral plumes; and these last are not so prominent as in *B. moniliger* ♂, ex Ceylon.

General coloration mixed grey, fulvous, black, and white; only traces of pale rufous. Frontal plumes tawny at base, much vermiculated with brown and with black subterminal spots or bands. Feathers of the head and occipital crest pale ashy brown, many with black subterminal spots, and all tipped with very pale fulvous; equally pale fulvous spots on either web; others so marked and coloured, but without the black spots. Feathers comprising the nuchal collar tawny at base, with a few fine transverse irregular pale

brown striæ, succeeded by a broader brown mark and then a broad white band, tipped with black and margined with fulvous. Elongated auriculars tawny at base, traversed by numerous irregular fine pale brown lines and tipped dark brown. Space before the eye buff. A supercilium composed of buff feathers unstriated on outer webs, but lineated with brown on inner. Ear-coverts almost unmarked, pale ferruginous-buff. Shorter scapulars pure white, with several transverse zigzag brown lines, a black tip with a faint fulvous terminal dot. Inner webs of longer scapulars with a grey (not a white) ground; the inner web of others tawny-rufous, all lineated transversely with brown. Innermost tertiaries pale grey, with numerous transverse pale brown irregular lines and a terminal black mark. Back like the head. Uropygium brown, with fulvous transverse marks; no terminal black spots. Upper tail-coverts tawny-rufous, with a dark brown subterminal mark and a pallid tawny terminal dot. Ground-colour of middle pair of rectrices rufo-fulvous, much mottled with brown, towards apex grey, marked with brown and black. No distinct banding. Next pairs with bands more defined. Short outer pair pale ferruginous, with brown markings. Chin and throat pale fulvous, with fine transverse brown lines; some with broader brown subterminal marks and terminal almost white marks. A gular collar formed by broad pure white terminal bands to the lower throat-plumes, surmounted by a narrow brown intersecting line. The pectoral feathers, below this collar, pale brown, lineated as on the throat, and with faint albescent tips. Lower pectoral plumes pale fulvous, with broad white terminal halves much striated with dark brown. Abdominal plumes of the same character, but less striated and the white confined to the tips, bounded above by a brown line. Under tail-coverts pure pale rusty buff, with a subterminal pale brown line. Quills brown, much indented on outer webs with pallid tawny rufous, shading into almost pure white. Some of the inner primaries much mottled at apex, with grey or tawny rufous ground. Under wing-coverts pure tawny-rufous. Wing-coverts dark brown, traversed and tipped with rufous. Great stiff narial plumes black, with tawny specks at base. Wing 4·90, tail 3·50, tarsus 0·60, middle toe without nail 0·60, bill from forehead 0·80, gape 1·30.

This bird may represent a phase of Mr. Bourdillon's Travancore species, which is possibly distinct from the true *B. moniliger*.

#### EXPLANATION OF THE PLATES.

##### PLATE XLV.

*Batrachostomus affinis* ♀, No. 1, p. 427, from a skin from Malacca. *Mus. nostr.*

##### PLATE XLVI.

*B. cornutus* ♂, No. 4, p. 434, from a skin collected by A. R. Wallace at Banjarmassing. *Mus. nostr.*

##### PLATE XLVII.

*B. stellatus* ♀, p. 437, from Mr. Gould's typical specimen. *Mus. nostr.*

## PLATE XLVIII.

*B. moniliger* ♂, No. 4, p. 442, from a skin from Ceylon. *Mus. nostr.*

## PLATE XLIX.

*B. moniliger* ♀, No. 1, 440, from a skin collected at Rattabown, Ceylon. *Mus. nostr.*

### 3. On an undescribed Shrew from Central America By EDWARD R. ALSTON, F.L.S., F.Z.S., &c.

[Received April 26, 1877.]

Among the Central-American Mammals in the British Museum are two shrews from Guatemala which were named but not described by the late Dr. Gray as *Corsira temlyas*<sup>1</sup>, and are labelled and catalogued in the Museum as *C. teculyas*. A comparison with the other American *Soricidæ* convinces me that they represent an undescribed species; and Dr. Elliott Coues, who is at present at work on the American Insectivora, and to whom I have sent a short description of them, is of the same opinion. Dr. Günther, with his usual courtesy, has had the skull extracted from one of the specimens; so that I am able to describe the dentition of the species, which proves to belong to the restricted genus (or subgenus) *Sorex*, characterized by the possession of thirty-two teeth in all. In describing these I have accepted the views of Dr. E. Brandt as to the homologies of the teeth in this family<sup>2</sup>.

As neither of Gray's names has any claim to adoption, and as both are barbarous, I propose to call this Shrew

*SOREX VERÆ-PACIS*, sp. n.

*Corsira temlyas*, J. E. Gray, P. Z. S. 1843, p. 79 (sine descr.).

*C. teculyas* ejusd. MS.

Ears moderate, thickly clothed with rather long fur. Tail rather long, clad with short closely pressed hairs which conceal the scales.

Colour nearly uniform dark dusky brown, hardly lighter beneath, feet and tail dusky. Fur short and close, dark slate-colour at the base, tipped with dark brown.

Approximate measurements from the mounted type specimens:—

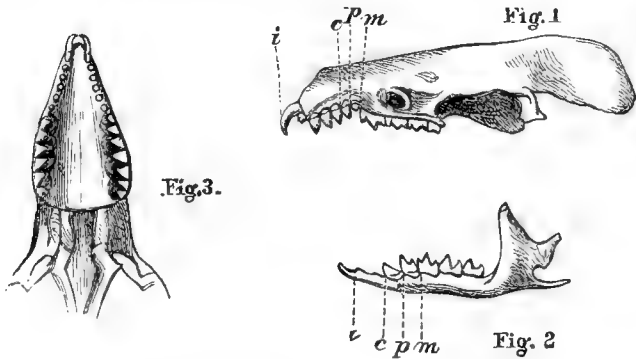
	inches.	inches.
Length of head and body	3·45	3·35
"    tail	2·05	2·00
"    hind foot	·53	·50

Teeth white, tipped with brown. First upper incisor stout, falcate, with a well-marked internal cusp; second to fourth simple, gradually diminishing in size, canine slightly smaller than fourth incisor. Premolar very small, hardly higher than the cingulum of the first molar.

<sup>1</sup> P. Z. S. 1843, p. 79.

<sup>2</sup> "Izsljedovaniya o zubnoi sistemye kutor i zemleroeck," St. Petersburg, 1865 (cf. Zool. Rec. 1866, pp. 24-27); "Untersuchungen über das Gebiss der Spitzmäuse," Bull. Soc. Imp. Nat. Moscou, vol. xli. (2de p.) pp. 76-95, pls. i.-vi., vol. xlvi. (2de pt.) pp. 1-79.

Molars with the usual W pattern towards the outer edge and broad low inner portion, which in the second and third rises into a distinct cusp.



Skull and dentition of *Sorex verae-pacis*.

The lower incisor is long and stout, with one well-marked and one nearly obsolete internal cusp. The canine is small and simple; and the premolar and molars have each one inner and two outer cusps.

*Hab.* Coban (Vera Paz), Guatemala (*Brit. Mus.*).

I may here observe that the Shrew named *Corsira tropicalis* by Gray, at the same time as the above, seems to be the same as that subsequently described as *Sorex micrurus* by Mr. Tomes<sup>1</sup>. Dr. Coues informs me that it proves to belong to the division of *Blarina*, which have thirty-two teeth; but whether it is distinct from some of the described North-American species remains to be ascertained.

These Central-American Shrews are interesting as showing how far the Insectivora have penetrated into the Neotropical Region, their further advance having doubtless been checked by the competition of the smaller Edentates and Marsupials.

As all the Guatemalan Mammals named without description by Gray in the Society's 'Proceedings' for 1843 (p. 79) have now been determined, I add a list with their synonyms:—

1. *Heteromys desmarestianus* = *H. desmarestianus*, Gray, P. Z. S. 1868, p. 204.
2. *Corsira tropicalis* = *Blarina micrura* (Tomes): *cf. supra*.
3. *Corsira temlyas* = *Sorex verae-pacis*, Alston: *cf. supra*.
4. *Saccophorus guochil* = *Geomys hispidus*, Leconte: *cf. Coues*, Proc. Acad. Philad. 1875, p. 133.
5. *Mus tazamaca* = *Ochetodon mexicana* (De Sauss.): *cf. Alston*, P. Z. S. 1876, p. 756.
6. *Mus teguina* = *Hesperomys teguina*, Alston, P. Z. S. 1876, p. 755.

<sup>1</sup> P. Z. S. 1861, p. 279.



4. Notes on the Anatomy of Passerine Birds.—Part II. By  
A. H. GARROD, M.A., F.R.S., Prosector to the Society.

[Received April 30, 1877.]

In my former communication on the anatomy of the Passeres<sup>1</sup> I adopted a definition of the group in which was included the important character made known by C. J. Sundevall in 1831, and expressed in the 1872 edition of his valuable ‘*Methodi naturalis Avium dispendendarum Tentamen*’ in the following words:—“*Hallux . . . . per se mobilis. Musculus enim flexor hallucis longus articulum ejus ultimum flectens, a flexore digitorum communi perfecte solutus. (In avibus reliquis, omnibus, tendo hujus musculi cum tendinibus alterius conjungitur. Hallux igitur simul cum reliquis digitis semper flectitur.)*” *Upupa epops*, agreeing with the Passeres in this respect, is by the author included with them. As mentioned in my paper on the deep plantar tendons of birds<sup>2</sup>, I have so frequently been able to verify this statement of the Swedish naturalist, that I felt justified in making the fact part of my definition of the group. Recently, however, from skins which have been placed at my disposal by Mr. Salvin, I have found reason for overthrowing the character, because in the Eurylæmidæ there is a strong vinculum which joins the two muscles exactly in the same manner as in many of the non-passerine families.

*Eurylæmus ochromelas*, *Cymbirhynchus macrorhynchus*, and *Calypotomena viridis* are the species which I have examined (more than one specimen of each); and in all of them there is a narrow but strong vinculum, situated just above the metatarso-phalangeal articulations, and running from the tendon of the *flexor hallucis longus* downwards to the tendon of the *flexor digitorum profundus*. No other passerine bird which I have dissected possesses this vinculum, not even *Rupicola crocea*, which has been thought by some to be intimately related to the Eurylæminæ. Such being the case, either Sundevall’s character no longer holds, or the Eurylæmidæ are not Passeres.

In his invaluable memoir on the voice-organs of Passerine birds<sup>3</sup>, a translation of which, by my friend Mr. F. J. Bell, will shortly be published at Oxford (by the Clarendon Press), J. Müller was so overcome by the flood of facts which he had discovered, that he remarks “It is, then, now thoroughly proved that the singing birds cannot be separated, as an order, from the rest of the Passeres (of Cuvier). There is only a large division of *Insesores* or Passerines which must also include the *Scansores*. This order of *Insesores* will contain birds with the most varied supply of vocal muscles, as well as birds which do not possess these muscles, every intermediate condition being found.” The fact that an important generalization, such as that of Sundevall above considered, breaks

<sup>1</sup> P. Z. S. 1876, p. 508.

<sup>2</sup> P. Z. S. 1875, p. 348.

<sup>3</sup> Abh. k. Akademie d. Wiss. zu Berlin, 1847.

down in the case of *Eurylæmus* would have further confirmed Müller in his views, and makes the question as to the ordinal importance of the Passerine group one of vital ornithological interest.

My subclass Anomalognatæ<sup>1</sup> very closely corresponds with the Müllerian "Insessores," which comprises the Cuvierian order so termed, together with the Scansores. At the present time its importance would be considered supraordinal by all; and it is not customary now to divide that large division into three sections, 1. *Oscines*, 2. *Tracheophonæ*, 3. *Picarii*, as was done, though not with any great feeling of certainty, by the able German biologist. We include the *Oscines* and *Tracheophonæ*, together with the "Ampelidæ and Tyrannidæ," in the order PASSERES. Why do we do so? For many reasons.

First, because, since the promulgation of the theory of natural selection by Mr. Darwin, the doctrine of evolution has obtained a hold upon biologists. This doctrine makes us look upon the classification of animals and plants in a different aspect to that in which the biologists of thirty years ago and more were wont to do. We do not expect to find all intermediate links between any two allied forms of life. Groups have become differentiated from their parent stocks, and when once independent have gone on developing in their special lines, without admixture with any other types. When the ancestral Passeres were first developed they possessed the potentiality for the production of all the peculiarities of their offspring; and the peculiarities which made them Passerine must form the fundamental basis for a definition of the group. The determination of what these fundamental characters happened to be can be only made at the present time (as far as soft parts are concerned, at least) by a correlation of the non-varying details. No Passerine bird being otherwise, they probably had (1) the hallux alone of all the toes directed backwards, (2) short, simple colic cæca, (3) a nude oil-gland, together with the special pterylosis of the group, (4) only one carotid artery, the left, (5) a sternum with a single notch on each side of the carina, together with a bifurcate manubrium, (6) a truncated vomer with the anterior angles of which the nasal cartilages joined, (7) a peculiar insertion to the *tensor patagii brevis* muscle of the wing.

As in all but the *Eurylaimidæ*, the deep flexor tendon of the hallux is free from that to the other digits of the foot, at the same time that the *Eurylaimidæ* agree with by far the majority of the class Aves in this respect (whilst in the characterizing features above stated they are completely Passerine), it is evident that the ancestral type which forms the basis of our definition, lived at a period prior to the loss of the vinculum between the pedal deep flexor tendons, because the probability that the vinculum may have reappeared in them in a condition identical with that in other birds is infinitely small. This view is confirmed by the nature of the syrinx, as far as we are acquainted with it, J. Müller not having been able to detect any intrinsic muscles in *Corydon sumatranus*<sup>2</sup>, the only species he had the

<sup>1</sup> P. Z. S. 1874, p. 111.

<sup>2</sup> *Loc. cit.* p. 32.

opportunity of examining. And the length of the first primary among the remiges tells the same tale.

The order Passeres falls, therefore, into two sections to start with :—those with the hallux not free, the Eurylaimidæ; and those with the hallux independently movable. This latter suborder may be again divided up in the manner suggested in Part I. of this communication<sup>1</sup>. I much regret that, not having been able, as yet, to obtain any of the Eurylaimidæ in spirit, I have not had an opportunity of making out the arrangement of the *tensor patagii brevis* muscle at its insertion. From skins, however, I have been able to procure the skulls, with the palates uninjured, of *Eurylæmus ochromelas*, *Cymbirhynchus macrorhynchus*, and *Calyptomena viridis*. The first and last of these are figured here (figs. 1 & 2), *Cymbirhynchus* agreeing very closely with *Eurylæmus*. The truly Passerine

Fig. 1.

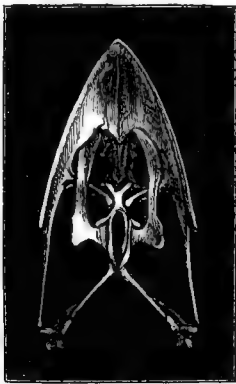
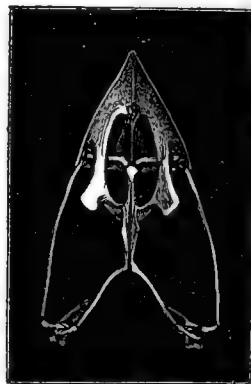


Fig. 2.

Fig. 1. Palatal view of skull of *Eurylæmus ochromelas*.Fig. 2. Palatal view of skull of *Calyptomena viridis*.

nature of the vomer at its anterior end, with the alinasal cartilages ossified in connexion with them, is undoubted; at the same time the more than usually transverse and lengthy maxillo-palatines with their unexpanded knobbed ends are worthy of notice. *Calyptomena* is seen to resemble the other genera in this latter point, though the vomer is much narrower throughout. The feeble development of the postero-external or "transpalatine" portions of the palatine bones, as termed by Mr. Parker, is to be seen in both the genera.

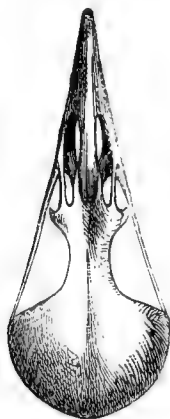
Turning to a different subject, I desire to direct attention to a peculiarity in the skulls of some of the Dendrocolaptidæ among the Tracheophone Passeres, which has, in my opinion, some significance in the arrangement of the genera of that family.

From an examination of *Furnarius rufus*, *Leptasthenura ægithaloides*, *Synallaxis frontalis*, *Sclerurus caudacutus*, and *Phleocryptes melanops*, I find that these birds present features in the conformation of their nasal bones not present in *Conopophaga aurita*, *Dendro-*

<sup>1</sup> P. Z. S. 1876, p. 518.

*colaptes albicollis*, *Picolaptes affinis*, *Thamnophilus murinus*, *Thamnophilus doliatus*, *Thamnomanes glaucus*, *Grallaria guatemalensis*, *Hylactes megapodius*, *Pteroptochus albicollis*, or any other Passerine bird with which I am acquainted. They are, in fact, schizorhinal, like the Charadriiformes; in other words, the osseous external nares are in the form of triangular openings, the apical angle of each of the triangles being situated between the inner and outer process of the nasal bone of the corresponding side<sup>1</sup>. Figure 3 gives a view of the

Fig. 3.



Superior surface of skull of *Furnarius rufus*, to show the schizorhinal form.

upper surface of the skull of *Furnarius rufus*. It has been my habit to group all the birds possessing the schizorhinal skull in a single major division, including the restricted Limicolæ, the Gruidæ, Laridæ, Alcidæ, and the Columbidae; but the independent development of an identical disposition in the small division of the Passerine birds above mentioned weakens the importance of the character to a certain extent, although it is not at all necessary to assume that it overthrows its significance. Collateral evidence, from visceral and other details, compels me still to think that those schizorhinal birds which possess the ambiens muscle—or are, in other words, homalognatous<sup>2</sup>—must be retained in one great order, the Charadriiformes, until some important structural differences are discovered which necessitate their being otherwise arranged. The schizorhinal disposition is most certainly one which is a secondary development upon the normal holorhinal nares; and that it has been independently arrived at in two non-related orders of the class is proof that it results from most simple causes, because the probability that the same complex conformation should appear *de novo* varies inversely as the complexity: the greater the elaborateness the less the chance that it, in all its detail, comes into existence more than once. A still more simple variation is found in the number of the carotid arteries, the normal two being reduced to the left only in certain members of

<sup>1</sup> Vide P. Z. S. 1873, p. 33.

<sup>2</sup> Vide P. Z. S. 1874, p. 116.

almost every order—in *Rhea* and the Megapodes among the Galliformes, in *Arctica alle* and *Turnix* among the Charadriiformes, in *Sula fusca* and *Plotus anhinga* among the Ciconiiformes, &c. The disappearance here and there of the ambiens muscle and of the femoro-caudal, as well as of the colic cæca, all come under the same category, as simple operations which lose their significance in the determination of affinity in proportion to the frequency of their appearance, or to the facility with which they are induced, as I would assume.

The figure of the superior surface of the skull of *Furnarius rufus* (p. 450), when compared with those of Charadriiform birds in my paper above quoted<sup>1</sup>, will show the resemblance between the two, as far as the point under discussion is concerned.

In questions of doubtful affinity among the birds under consideration, this character proves to be of service. For example, the genus *Margarornis* is differently placed by leading ornithologists—by some along with the Sclerurinae on account of the shortness of its outer toe, by others with the Dendrocolaptinae because of the stiffness of its tail-feathers. From the skull, an example of which I have had the opportunity of removing from a skin of *Megarornis perlata*, through the kindness of Mr. Salvin, I feel no doubt that it is *not* Dendrocolaptine, because the nasal bones agree exactly with those of *Furnarius rufus* and the other schizorhinal Passeres above mentioned.

I may also mention that in these schizorhinal tracheophone Passeres, as also in their allies the Pteroptochidæ, the maxillo-pala-

Fig. 4.



Palatal view of skull of *Pteroptochus albicollis*.

tine plates of the maxillary bones, instead of terminating by blunt uncurved tips, as in the non-oscine (mesomyodian<sup>2</sup>) Passeres generally, including *Dendrocolaptes*, *Thamnophilus*, and their nearest allies, are slender and curved backwards as in the Oscines. A study of the superb plates in Mr. Parker's Memoir on Ægithognathous Birds<sup>3</sup> will illustrate this point, which an inspection of other skulls

<sup>1</sup> P. Z. S. 1873, p. 34.

<sup>2</sup> P. Z. S. 1876.

<sup>3</sup> Trans. Zool. Soc. vol. ix. p. 289, pl. lvi. figs. 8-10, lvii. figs. 8-10, et lix. figs. 1-3 & 6-8.

still further verifies. Figure 4 (p. 451) shows this formation in the palate of *Pteroptochus albicollis*.

These facts, when correlated, suggest a slight modification of the arrangement of the Tracheophonæ as based upon the nature of the tarsal scutellation and the structure of the tails. In their valuable 'Nomenclator Avium Neotropicalium,' Messrs. Sclater and Salvin divide the suborder thus:—

Suborder TRACHEOPHONÆ.

Fam. 1. *Dendrocolaptidæ*.

Subfam. 1. Furnariinæ.

Subfam. 2. Sclerurinae.

Subfam. 3. Synallaxinæ.

Subfam. 4. Philydorinae.

Subfam. 5. Dendrocolaptinae.

Fam. 2. *Formicariidæ*.

Fam. 3. *Pteroptochidæ*.

To me it would appear that the following arrangement better represents their mutual alliances:—

Suborder TRACHEOPHONÆ.

Fam. 1. *Furnariidæ*.

Subfam. 1. Furnariinæ.

Subfam. 2. Sclerurinae.

Subfam. 3. Synallaxinæ.

Subfam. 4. Philydorinae.

Fam. 2. *Pteroptochidæ*.

Fam. 3. *Dendrocolaptidæ*.

Fam. 4. *Conopophagidæ*.

Fam. 5. *Formicariidæ*.

5. On the past and present Geographical Distribution of the Larger Mammals of South Africa<sup>1</sup>. By T. E. BUCKLEY, B.A., F.Z.S.

[Received April 30, 1877.]

Since my last communication to the Society on the Geographical Distribution of South-African Mammals (P. Z. S. 1876, p. 277), I have again visited South Africa, and have gathered some further information on the subject; and the following are the additions and corrections I wish to make to my former paper.

Professor Newton, a short time ago, kindly showed me a letter he had received from Mr. E. L. Layard, in which Mr. Layard criticised

<sup>1</sup> Continued from P. Z. S. 1876, p. 277.

some of my statements, and made a number of additions to the localities for certain species in the Cape colony. These I have incorporated into my paper *verbatim*, with his name attached to the extracts, except in instances when I had gathered the same information for myself; in such cases I did not think it necessary to do this.

*ELEPHAS AFRICANUS* (the Elephant), *l. c.* p. 280.

Besides the Knysna, the Elephant is still found in some of the other large forests of the eastern provinces of the Cape colony, one of the spots being the Addo bush, near Port Elizabeth. My informant told me that their spoor was frequently seen while the railway was being made, but that the animals apparently disliked to cross the line itself. In the Amatonga country, in a spot south of Delagoa Bay and east of the Bombo hills, there is a small herd preserved by the chief Nosingili; I am told, however, that they are for the most part tuskless and very fierce, which, I believe, is generally the case when they are without those appendages: from here they sometimes cross the Bombo, and wander, in summer, through the plains underneath these hills to places where the "Umganu" tree is common, to feed on its fruit, which is about the size of a plum, and of which the Elephants are extremely fond.

In 1875 an Elephant was killed in Umsila's country, north of Delagoa Bay, with tusks weighing 150 lb. each, which, I believe, is the largest pair ever known.

*EQUUS QUAGGA* (the Quagga), *l. c.* p. 281.

Mr. Layard, in his letter, makes the following remark on my statement as to the extinction of this the true Quagga:—"He is, I think, wrong. We had a young Quagga (true) in the S.A. Museum; and I several times saw skins for sale in Cape Town, mutilated and unfit for mounting. I forget the locality whence they came, but think it was somewhere from the S.W. Chapman and Andersson both spoke to me of it; but I have not my books to refer to."

In the Table at the end of my former paper, p. 291, there is a misprint relating to this animal, "the extensive plains north of the Vaal river;" *south* should be substituted for *north*.

*EQUUS MONTANUS* (the Zebra), *l. c.* p. 282.

Mr. Layard gives another locality for this species. He says, "It was not extinct in 1868, to my personal knowledge. It existed in small troops in the Hottentot Holland mountains near Fransch Hock, not far from Cape Town. I know, in 1864, it was in the Swartbergen, between George and the Beaufort Karroo; I hunted it there along with the Kudu, though unsuccessfully. Buckley, in P.Z.S. 1876, p. 282, says, 'It was still said to occur in the Hottentot Holland mountains.' I heard of it on the mountains to the eastward, Zuurberg &c."

*CEPHALOPHUS GRIMMIA* (the Duiker) *l. c.* p. 283.

I was not aware, until Sir Victor Brooke informed me, that there

was more than one species of Duiker; so that the remarks in my former paper can only refer to the eastern variety. Mr. Layard seems to consider that there is another species still, besides the eastern form and that of the Cape colony, which comes from Ovampoland. He thus characterizes them:—"The Eastern form is grey, with a rufous dash between the horns and down the front and nose; the Western form is all grey, and a different grey from the Eastern; the colonial one is rufous (chestnut), with a dark, almost black, dash down the face, and a tuft of twisted hair between the horns. I am not sure that the others have this." In both my specimens, however, from Matabililand the tuft of twisted hair between the horns exists.

*ÆPYCEROS MELAMPUS* (the Pallah), *l. c.* p. 283.

The Pallah was at one time pretty common in suitable places in the north of Natal; and even yet, I am informed, a small herd of from eight to a dozen individuals exists on the Mooi river, near its junction with the Tuglea, where they are now preserved.

*STREPSICEROS KUDU* (the Koodoo), *l. c.* p. 284.

Concerning the existence of the Koodoo in the Cape colony, Mr. Layard says:—"In 1864 the Koodoo was an undoubted inhabitant of the Swartbergen before noted, to my personal knowledge; also I heard of it in the forests of Zitzikama, Fish river, and other forests to the eastward. Buckley seems to doubt its still being in the colony."

In the 'Cape Monthly Magazine' for November 1875, Gough and the northern part of Bushmanland in the Cape colony are given as localities for this species.

*ALCELAPHUS CAAMA* (the Hartebeest), *l. c.* p. 285.

The same gentleman who showed me the Gemsbock's head, told me that a few Hartebeests were to be found in the same place as the Oryx; and, if I remember rightly, he had brought with him a pair of their horns from that locality. Mr. Layard says that the Hartebeest still lingered in the Beaufort Karoo, between Nelspoort and the Zwartberg in 1864. In Natal I saw a fine herd of these Antelopes, close to Pietermaritzburg, in September of last year, also a small herd of eight or nine on the Biggareberg.

*ALCELAPHUS LICHTENSTEINI*?, *l. c.* p. 286.

This species of Hartebeest is found along the coast, commencing about 24° S. lat., and goes along to the mouth of the Limpopo. It is again found far inland at Shesheke, a town on the north side of the Zambesi, and a little west (about forty miles) of where the Chobi and Zambesi join. A friend of mine who had just come down from that place kindly presented me with two pairs of horns, male and female. On showing them to a Mr. Du Bois, with whom I was just about to start on a hunting-expedition, he at once recognized them as the horns of a Hartebeest he had seen some distance north



of Delagoa Bay, and called them by the native name of "Nondo." Speke and Grant found them common in Central Africa, in several localities; they are apparently local, as they have not been observed at the Victoria Falls of the Zambesi. The horns of this species are a good deal smaller than those of *A. caama*, and are very much flattened at the base.

In the 'Cape Monthly Magazine' for November 1875, this species of Hartebeest is apparently mentioned under the name of Maak Hartebeest, and the coast district between the Limpopo and Zambesi is given as one of its habitats.

CONNOCHETES GNU (the Common Gnu), *l. c.* p. 286.

According to the November number of the 'Cape Monthly Magazine,' a small herd of this animal is preserved on one of the large farms in Victoria, West division, in the Cape colony.

In the Table at the end of my former paper, p. 272, under this heading, "south" must be substituted for "north;" and the same mistake occurs also lower down, under the heading *Hippotragus equinus*.

ORYX CAPENSIS (the Gemsbock), *l. c.* p. 289.

Mr. Layard corrects a statement of mine, to the effect that the Gemsbock is found at Cape L'Agulhaz; this it appears is not so, as he himself knows the country about there well, and has hunted all over it.

While at Cape Town I met with a gentleman who had just returned from Little Namaqua Land, where he had been successful enough to shoot a male Oryx; and he kindly showed me its head. This is now probably the only place in the Cape colony where this species exists. I have been told, too, that the Oryx is found in the north-eastern part of the Transvaal, and sparingly north of Delagoa Bay. The Hon. W. H. Drummond, in his book on the Large Game of South and South-east Africa, mentions the Gemsbock as occurring a little to the north of the Sutu river, in Amaswazi Land; this would be a little north of 27° south latitude, and 32° east longitude.

BUBALUS CAFFER (Cape Buffalo), *l. c.* p. 289.

While I was at the Cape, waiting for the steamer to take me onto Natal, I heard of a man who was going down to the Knysna to try and shoot Buffalo there; and in Mr. Layard's letter, he says that the Buffalo "was certainly still found in the Knysna and all the great forests of the eastern provinces up to the date of my leaving the Cape in 1870."

In Natal, besides the herd mentioned in my paper, I have since been informed that a few are still supposed to exist on the range of hills between Natal and Moschesh's country, where the Umkomazi and the Umzinkulu rivers rise: this is one of the wildest and least-known parts of that colony.

In the 'Cape Monthly Magazine' for November 1874, a writer on Antelopes states that "a remnant still roams through the Tzitzikama forest."

Mr. Du Bois, with whom I was hunting last season in the Amaswazi country, and who knows that part of Africa perhaps better than any other man, informs me that a variety of the Buffalo, smaller and with a red tinge on its skin, used to exist along the Bomba hills; and in fact I saw such a skin brought in for sale by one of the natives. The Hon. W. H. Drummond, in his book on the Large Game of South-eastern Africa, says, p. 33, "A herd of Buffalo, or, more correctly speaking, several herds, that exist in a district known as the Umbeka, on the north-east of Zululand, are famed as having a tinge of red in their colour, and as being smaller and more dangerous than any others."

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June 5, 1877.

Prof. W. H. Flower, F.R.S., V.P., in the Chair.

The following papers were read:—

1. Description of five new Species of Sponges discovered by A. B. Meyer on the Philippine Islands and New Guinea. By the late J. S. BOWERBANK, F.R.S., F.Z.S.<sup>1</sup>

[Received May 14, 1876.]

1. *OPHLITOSPONGIA MEYERI*, sp. nov.

Sponge fistulous; pedicel short and stout. Surface very rugged and tuberculous. Oscula numerous, dispersed within the cloacal cavity. Pores inconspicuous. Dermal membrane spiculous; tension-spicula acute, dispersed or subfasciculate, large and stout, same size as those of the skeleton; retentive spicula bidentate equianchorate, very minute and slender, denticuli long, apices obtuse, few in number, dispersed. Skeleton: Fibre rigid, stout and abundantly spiculous; rete irregular and open; spicula acute, and a few acerate, stout and rather long; fibres profusely armed with stout attenuato-acuate basally and apically spined internal defensive spicula, projected at nearly right angles and in all directions from the fibres. Interstitial membranes spiculous; spicula same as those of the dermal membrane. Gemmules membranous, spherical or oval, black and opaque.

<sup>1</sup> Communicated to the Secretary by Dr. A. B. Meyer, with the subjoined remarks:—

"The enclosed paper of the late Dr. Bowerbank on five new sponges from the Philippines and New Guinea was finished June 1876, and was intended by the author for the 'Proceedings' of the Zoological Society. He sent the paper over to me for inspection; and I returned it, after having added a few notes. He then became ill and died, without having been able to forward the paper to your address. Dr. Bowerbank's family now return the paper to me, and I forward it to you with the hope that the Society may accept it."

Colour, in the dried state, nut-brown.

*Hab.* Kordo, Island of Mysore, Geelvinks Bay, New Guinea  
(*Dr. A. B. Meyer*).

Examined in the dried state.

Type in the Dresden Museum.

*Dr. Meyer* observes :—“ In life, of the gayest green, red, and yellow colours, which fade away very quickly.

The form of this sponge is that of a single long fistulous body which has apparently been attached to the side of a mass of calcareous matter by a short stout pedicel, and has then curved upwards to about eight inches in height. Its external diameter rather exceeds two inches ; and its internal one averages one and a half inch. Externally it is very rugged and prominently tuberculous, while its inner surface is smooth and even, with numerous dispersed oscula for discharging their effete streams into the large cloacal cavity, which exceeds seven inches in depth.

The oscula within the great cloacal cavity are numerous, and appear to be equally distributed throughout the whole of its length ; they rarely exceed a line in diameter.

The external surface of the sponge abounds in porous cavities or depressions ; but the true inhalant pores of the dermal membrane that lines them are inconspicuous, and I did not detect a single open one on any part of the dermal membrane when mounted in Canada balsam. The dermal membrane is abundantly spiculous. The tension-spicula are acuate, stout and long, and as large as those of the skeleton ; they are dispersed or subfasciculated ; occasionally, but rarely, a few of the attenuato-acuate internal defensive spicula occur among them ; but I could not detect any acerate spicula. The bidentate equianchorate retentive spicula are very slender and minute, their denticuli are long and obtusely terminated ; they vary greatly in size, the smallest ones frequently not exceeding half the size of the larger ones. The largest I found measured  $\frac{1}{1500}$  inch in length ; of the smaller ones, one measured  $\frac{1}{2727}$  inch, and another  $\frac{1}{3000}$  inch in length. The fibre of the dermal rete is not so abundantly spiculous as that of the skeleton. The latter frequently assumes quite the appearance of a *Desmacidon* from the abundance of its spicula.

The skeleton-spicula are of two forms, acuate and acerate, the latter form being of rather rare occurrence ; both forms are rather variable in length : they are very numerous and closely packed in the fibres ; their average length is  $\frac{1}{187}$  inch.

The internal defensive spicula are based on the surface of the skeleton-fibre, from which they are projected at various angles. Their bases and the distal halves of their shafts are abundantly spinous, the proximal half of the shaft being frequently destitute of spines ; these organs are well developed and are all acutely conical. The internal defensive spicula are very numerous, and they form a most effective defence against any minute Annelids that might attempt to enter the skeleton structures of the sponge. Their average length is  $\frac{1}{300}$  inch.

The interstitial membranes closely resemble the dermal one, but

they are not so abundantly furnished with tension-spicula, while the retentive ones are the same in form and about the same in number. These organs are not very readily detected *in situ* while immersed in the sarcode; and from the delicacy of their structure they require a microscopical power of at least  $\frac{1}{1000}$  linear to render them distinctly to the eye.

The gemmules of the sponge are rather numerous on the interstitial membranes, and on the inner surface of the dermal one. They are smooth, spherical or slightly oval, and opaque and black, whether viewed by direct day-light, or, when mounted in Canada balsam, by transmitted light. They vary to some extent in size: the smallest of them measured  $\frac{1}{3000}$  inch in diameter, the largest  $\frac{1}{1360}$  inch; but the average of several measured was  $\frac{1}{1500}$  inch in diameter.

## 2. ISODICTYA ASPERA, sp. nov.

Sponge sessile, multifistulous, fistulæ branching irregularly and usually confluent; parietes thick; surface very rough and irregular. Oscula within the fistulæ. Pores inconspicuous. Dermal membrane spiculous, reticulated; rete irregular, uni- or bispiculous; spicula acute, same size as those of the skeleton. Skeleton: Rete irregular, diffused; primary fibres multispiculous, secondary fibres irregularly disposed; acute, stout and rather long. Gemmules membranous, abundant, more or less congregated, spherical, semi-transparent, dark amber-colour.

Colour. In the dried state, dark brown.

*Hab.* Abu, Philippine Islands (*Dr. A. B. Meyer*).

Examined in the dried state.

Type in the Dresden Museum.

This sponge rather exceeds six inches in height, and is of about the same average diameter.

The fistulæ radiate in all directions from the massive basal attachment, and immediately separate more or less into short stout branches which most frequently become confluent groups. This character of the fistulæ is very unusual, and is very characteristic of the species. The surfaces of the fistulæ are exceedingly rough and rugged; and their substance is very brittle in the dried state. Their distal terminations are open to the full extent of their internal diameters; and their margins are thin. The oscula on the smooth inner surfaces of these organs are distinctly visible by the aid of a lens of about two inches focus.

Portions of the dermal membrane, when mounted in Canada balsam; and viewed with a linear power of about 100, exhibit its reticular structure in a very satisfactory manner; the rete is rather irregular, but very distinctly exhibited; it is most frequently unispiculous; but occasionally two or, rarely, three spicula are combined in some parts of it. The spicula are nearly equal in size and of one form only, rather long and stout acute. In a portion of the dermal membrane thus examined, there were a considerable number of groups of gemmules, each group consisting of numerous closely

packed specimens, very uniform in their colour and degree of semi-transparency. These organs varied in diameter from  $\frac{1}{5000}$  to  $\frac{1}{1500}$  inch. Some of these groups of gemmules consisted almost entirely of the larger forms, while in others they were nearly all of the smaller description. They require a linear power of about 300 to render them distinctly to the eye. I have never before seen a similar congregating of the gemmules in any sponge that I have examined.

The general structure of the skeleton is very irregular, the rete in some parts being composed of many more spicula than in others. The spicula of which it is constructed are of the same form and size as those of the dermis. The gemmules were also dispersed singly around the rete to which they were attached; and in size and general character they were in perfect accordance with those grouped on the inner surface of the dermal membrane.

This sponge is the only specimen I have seen of the species; and although its structural characters are exceedingly simple, its external ones are so remarkable, that it cannot well be confounded with any other known species of *Isodictya*.

#### POLYFIBROSPONGIA, genus novum.

Skeleton kerato-fibrous. Fibres solid, cylindrical, aspiculous. Rete symmetrical. Skeleton-lines polyfibrous; primary lines of the skeleton radiating from the base of the sponge to the distal margin; secondary lines disposed at nearly right angles to the primary ones.

Although nearly allied in many respects to the genus *Spongionella*, there is an important difference in the structural arrangement of the skeleton-fibres of this sponge as compared with those of the type forms of *Spongionella pulchella*, which distinctly separates them. In the latter genus the skeleton-structures, both primary and secondary, are composed of single fibres; the primary ones radiating from the base of the sponge, and the secondary fibres being disposed at right angles to the primary ones. This mode of skeleton-structure prevails also in the sponge from the Philippine Islands; but instead of single fibres thus disposed, we find continuous fasciculi, each composed of numerous slender fibres in both the primary and secondary portions of the skeleton-structures. Thus, although the individual fibres of the sponge are very nearly the same as in *Spongionella*, the congregation of the fibres in large diffuse fasciculi constitute an important generic difference; and I therefore propose to make this peculiar mode of skeleton-structure the type of a distinct genus, to be designated as above.

#### 3. POLYFIBROSPONGIA FLABELLIFERA, sp. nov.

Sponge fan-shaped, pedicel very short, parietes very thin, surface smooth and even. Oscula and pores inconspicuous. Dermal membrane aspiculous, but abundantly supplied with adherent extraneous matters. Skeleton: Primary lines composed of a loosely constructed polyfibrous cord of slender anastomosing keratose fibres; secondary lines constructed the same as those of the primary series;

both series abundantly laden with externally adherent particles of extraneous matters.

Colour. In the dried state, light ochreous yellow.

*Hab.* Geelvink Bay, New Guinea (*Dr. A. B. Meyer*).

Examined in the dried state.

Type in the Dresden Museum.

Dr. Meyer observes, "in life brown."

The form of this sponge is that of a contorted fan six inches high by eight and a quarter inches broad. It is based on a short massive pedicel. The thickness of the general expansion of the sponge does not at any part exceed one twelfth of an inch; and the general construction of the skeleton is visible to the unassisted eye. It has lost a great part of its dermal membrane; but considerable portions of it still remain. It is destitute of any spicula usually characteristic of dermal tissues; but it is abundantly supplied by adhesion with adventitious spicula of other sponges and of grains of sand and other such matters. The oscula are scarcely distinguishable; they appear to consist of minute orifices rarely exceeding the size of one of the areas of the skeleton-rete, and they are very irregularly distributed over the inner or concave surface of the contorted sponge. I could not detect any pores in a portion of the dermis mounted in Canada balsam.

The loosely constructed polyfibrous lines of the skeleton are very singular in their structure. They consist of numerous minute fibres, running nearly parallel to each other, and anastomosing at irregular intervals by short connecting fibres at nearly right angles to each other. Neither the primary nor the secondary lines ever appear to be in any degree twisted. The primary lines, on an average, measured  $\frac{1}{94}$  inch in diameter, and the minute fibres of which they are composed varied from  $\frac{1}{2143}$  to  $\frac{1}{1394}$  inch in diameter.

The interior of the sponge appears to be as abundantly supplied with adherent grains of sand and other adventitious substances as the dermal membrane is; but none of such substances were embedded in the keratose fibres of the sponge as in the genera *Halispongia* or *Dysidea*.

#### 4. HALISPONGIA STELLIFERA, sp. nov.

4. Sponge cup-shaped, compressed, parietes thin, pedicel short. Surface even and smooth. Oscula small, slightly raised on low tumid elevations, few in number. Dermal membrane pellucid, aspiculous, but abundantly supplied with adherent extraneous matters. Pores disposed in areas containing from one to two or three of them, each surrounded by numerous minute radiating fibres anastomosing near the pore, but diverging separately towards their distal terminations. Skeleton: Primary lines radiating in nearly parallel lines from the base to the distal margin; secondary lines anastomosing irregularly with the primary ones. Primary and secondary lines both polyfibrous; fibres solid, cylindrical, frequently anastomosing irregularly. Gemmules minute, spherical, dark and opaque.

Colour. In the dried state, grey ochreous yellow.

*Hab.* Geelvinks Bay, New Guinea (*Dr. A. B. Meyer*).

Examined in the dried state.

Type in the Dresden Museum.

*Dr. Meyer* observes, "in life brown."

The form of this sponge is that of a closely compressed cup with a considerable complication of parietes on one side; and it does not appear as if it had been more expanded when in the living condition. It is one foot in height and the same at its greatest expansion, and the pedicel is short and stout. When covered by the dermal membrane, the surface both within and without the cup is smooth and even. Near the base of the sponge there are a few oscular orifices slightly elevated on tumid masses; but these organs are inconspicuous on the more fully expanded parts of the sponge. When a portion of the dermal membrane, mounted in Canada balsam, was examined by transmitted light with a power of 200 linear, the porous areas seen were large and well defined; they contain usually one, but occasionally two or three pores, each of which is surrounded by a beautifully regular and very extensive series of apparently minute corrugated radiating lines; some of these pores are open, while others are completely closed. With a higher power this apparent corrugation is seen to consist of minute slender transparent fibres which freely anastomose with each other in the immediate neighbourhood of the pores; but subsequently they diverge freely to a very considerable distance from the pore without anastomosing with each other.

The skeleton is decidedly that of a *Halispongia*. The primary or radial fibres are amply supplied with the usual central lines of embedded grains of sand and other extraneous substances, and more especially so at the surfaces of the sponge. A few adventitious spicula of various sizes and forms are entangled amid the skeleton-fibres, to which also numerous dark opaque spherical gemmules are attached, varying in diameter from  $\frac{1}{1000}$  to  $\frac{1}{1875}$  inch in diameter.

The most striking specific characters in this species of sponge are undoubtedly those of the dermal membrane; and it must be observed that they are very difficult to find without the aid of mounting portions of the dermis in Canada balsam; and from the extreme delicacy of the radial lines surrounding the pores, powers of from 200 to 500 linear are required to render them distinctly to the eye of the observer.

##### 5. HYALONEMA ANOMALUM, sp. nov.

Sponge expansively cup-shaped, sessile (?) Surface smooth. Oscula on the inner or exhalant surface, simple, large and numerous. Pores dispersed, inconspicuous. Dermal system expansible; connecting spicula expando-quaternate; radii and shaft attenuating, large and strong. Dermal membrane aspiculous (?). Skeleton: Cup compressed (?), fasciculated, fasciculi loosely compacted; spicula cylindrical, with clavate or thyriform terminations incipiently

spinous, very long and slender, and often flexuous, intermingled with single spicula of the same form and size irregularly dispersed. Interstitial spicula varying from cruciform to rectangularly sexradiate, radii cylindrical, incipiently spinous, numerous. Retentive spicula minute sexradiate stellate, radii bi- or trifurcate, attenuated, immersed in the sarcode, very numerous.

Colour, in the dried state, very pale grey.

*Hab.* Cebu (*Dr. A. B. Meyer*).

Examined in the dried state.

Type in the Dresden Museum.

If one adopts the rule that I have followed in all my previous descriptions of sponges, that the structure and mode of arrangement of the materials composing the skeletons of the Spongiadæ are the legitimate source of their generic characters, this sponge is decidedly a *Hyalonema*, but without the so-called glass rope. This organ in *Hyalonema* is not really a portion of the essential skeleton, but is rather an appendage thereto, and is apparently of the nature of a cloacal organ. Entertaining these views, I have, in accordance with them, referred the sponge in course of description to the genus *Hyalonema*; and from its discrepant structure I have given to it the specific name of *H. anomalum*. The interstitial spicula of both species also agree in being cruciform, with spinous cylindrical radii; and in each their forms are more or less variable in the number of the radii, and in both they are numerously dispersed amid the interstitial structures.

This sponge is  $3\frac{1}{2}$  inches in height and 2 inches in width at its distal extremity. In its present state it is somewhat compressed. It has no part of its basal attachment remaining; and it was in this condition apparently when taken from the sea; and from the very small remains of sarcode amid the skeleton-structures it was most probably at that time a dead specimen. What remains of the sarcode of the interstitial membranes is nearly translucent, and occurs in detached masses, each of which is crowded with the minute sexradiate stellate retentive spicula.

The dermal system is furnished with numerous large expando-quadernate connecting spicula, the radial shaft being attenuated. Their mode of arrangement is similar in design to those of *Alcyoncellum speciosum* and *Rossella philippensis*; but their disposition does not appear to be so regular as in either of those species.

The dermal membrane has been nearly all destroyed. A few small portions, in a tolerably good state of preservation, were found on parts of the margin of the cup; and these were spiculous. I found also a small piece of the external dermal membrane *in situ* in a tolerably good state of preservation; and on this there were a few large simple porous orifices irregularly dispersed. This portion of the membrane appeared to be rather abundantly supplied with very minute attenuato-acuate defensive spicula; and intermixed with them a few sexradiate stellate retentive ones were dispersed. The membrane is very thin and delicate in its structure, and it was coated



with sarcode, which appeared to be in a partially decomposed condition.

The skeleton-structure, like that of the spongy base of *Hyalonema mirabile*, is composed of irregularly dispersed fasciculi of long spicula; but the fasciculi are less compact in their structure, and amid them there are numerous single spicula as irregularly dispersed as the fasciculi are. The form of the skeleton-spicula in the sponge in course of description is very long, slender, cylindrical, with incipiently spinous clavate terminations; and intermixed with them there are a few very large and stout acute ones. The best view of the skeleton-structure is to be seen in portions of the sponge from the inner surface of the cup. At this surface the dermal membrane appears to be aspiculous; but immediately beneath it, in the portion examined, there were numerous groups of sexradiate stellate retentive and defensive spicula, densely packed in detached masses of sarcode. This congregation of spicula in separate masses is probably due to the partial decomposition of a uniform stratum of sarcode in the living sponge in which these minute organs abounded. The sexradiate stellate spicula are exceedingly slender, and average  $\frac{1}{1000}$  inch in extreme expansion. They appear to vary considerably in the number of their furcating spicula—some radii being trifurcate, while others are bifurcate; and very few have the full number of the furcating radii.

The interstitial spaces of the skeleton are abundantly supplied with cruciform spicula with cylindrical incipiently spinous radii. The normal form of these spicula is evidently rectangulated sexradiate. The greater number of them are cruciform; but a considerable number have the fifth ray, or basal portion of the shaft; and a few of them are completely sexradiate. There is a very great difference in size between the two sets of spicula—those appropriated to the dermal system with attenuated radii, and the smaller and much more abundant ones of the interstitial spaces with cylindrical radii, the expansion of the radii of the dermal ones averaging  $\frac{1}{23}$  inch, while those of the interstitial spaces seldom exceed  $\frac{1}{128}$  inch in the expansion of the cruciform radii.

The minute attenuato-acuate spicula, which are numerous dispersed on the interstitial membranes, average about  $\frac{1}{2000}$  inch in length; and it appears probable that they are really the radiating spicula broken off from the very numerous sexradiate stellate spicula that are crowded together in such great numbers in the interstitial masses of sarcode. The skeleton-spicula are many of them flexuous; their average length is  $\frac{1}{23}$  inch, while the diameter of a fully developed one measured only  $\frac{1}{8000}$  inch.

The loosely arranged fasciculi of the skeleton-structures of this sponge seem to closely ally it to the spongy base of *Hyalonema mirabile*; while the physiological structure of its expansile dermal system with its quaternate connecting spicula, and, to a considerable extent, its anatomical structure, are in perfect harmony with the corresponding parts of the genera *Alcyoncellum*, *Rossella* and *Geodia*; and the minute rectangulated sexradiate stellate forms of retentive

and defensive spicula are common to several species of *Geodia*, *Farrea*, and to *Alcyoncellum* as well as to this sponge.

If the term hexactinellid, as used by some writers, be adopted as designating the series of sponges which contain the various forms of rectangular sexradiate spicula, it will embrace a number of genera and species widely differing in the important distinctive characters of their skeletons, upon which the most important characters of their classification must ultimately be founded.

June 8th, 1876.

## 2. Remarks on the exact Localities of some Birds from the Islands of the South Pacific. By E. L. LAYARD, F.Z.S.

[Received May 14, 1877.]

In speaking of "the geographical distribution of the Fruit-pigeons in the numerous islands of the Pacific" (P. Z. S. 1874, p. 94), Dr. Finsch has, I think, committed an error which it will be as well to point out. I have only just obtained my back numbers of the 'Proceedings,' or would have alluded to the matter at an earlier date. Late though it is, I know Dr. Finsch will thank me for assisting him with local knowledge to propagate the truth, an end at which I am sure we both aim.

Dr. Finsch says, "*Ptilinopus fasciatus*, Peale, is found on the Feejees, Navigators', and the small island of Uea of the Wallis group." I think, as regards the Navigators' Islands, he is certainly mistaken. The *Ptilinopus* found there is certainly distinct, whatever it is. I have not *original* descriptions to which to refer; but my idea is (taken from Finsch and Hartlaub's own work, and from the plate in the Mus. Godeffroy) that it is *P. apicalis*, Bp. In one of my late communications to this Society (see P. Z. S. 1876, p. 495) I have pointed out the differences, which are constant. The bird which I call *P. apicalis* is never found on Fiji, nor is the Fijian bird which I call *P. fasciatus* ever found in the Navigators'. Tonga has its own species, which I call *P. porphyraceus*; and it, again, is found, or a *very near approach* to it, on Fotuna Island. *P. fasciatus* is found on Viti Levu, Mang-o, and Wakaia Islands.

I must now point out another error into which my friend Dr. Finsch has fallen. He says, "the beautiful *Chrysæna victor*, Gould, is confined to Taviumi<sup>1</sup>, one of the smallest islands of the Feejee group." So far from Taviumi being one of the "smallest," it is actually one of the *four largest* islands of the group; and *C. victor* is *not* "confined" to it, but distributed all over the large island of Vanua Levu, and the islands of Rambi, Lanthala, and Kamea. I may add, however, to Dr. Finsch's remarks, that my new *Chrysæna* (*C. viridis*) is, so far as yet known, confined to the island of Kandavu.

<sup>1</sup> I spell this as Dr. Finsch has done. Unlucky island! how naturalists have misnamed it! Both in the 'Proceedings' and in 'The Ibis' it has been spelt half a dozen different ways; but the correct way is TAVIUNI.—E. L. L.

I see also Dr. Finsch alludes, in the 'Ornithologie der Viti-, Samoa- und Tonga-Inseln,' to *Myiagra castaneiventris* being found in Samoa. Will he kindly inform us on what authority he does this? as neither Mr. Whitmee, Mr. Krauss (Messrs. Godeffroy's collector there), nor myself could ever find it there, and we all doubt its existence on the group. Will Dr. Finsch, who writes as if he had specimens before him from the Navigators', tell us who procured them, when, and where? My impression is that some Fijian specimens have been accidentally mixed by the collector with *M. albiventris*, the only *Myiagra* we have ever found in Samoa.

### 3. Note on two African Cuckoos of the Genus *Coccytes*.

By E. L. LAYARD, C.M.G., F.Z.S., &c. &c., H.B.M.  
Consul in New Caledonia.

[Received May 22, 1877.]

In Mr. R. B. Sharpe's paper on the Cuculidæ of the Ethiopian Region (P. Z. S. 1873, p. 599), in commenting on *Coccytes jacobinus*, Bodd., and *C. serratus*, Sparrm., he much underrates the "testimony" I have given that they are distinct species, and not ♂ and ♀ of one. My "testimony" is not simply "that they are not equally common in the parts of South Africa they inhabit;" and I should regret very much that it should be thought that my "testimony" as to the sexual differences of species described by me either in the 'Birds of South Africa,' or elsewhere, were based on no surer foundation than the numbers found in certain places.

Mr. Sharpe will find that, under the head of *Oxylophus edolius* (*C. serratus*, Sparrm.), I have distinctly alluded to the males and females, without giving any special description of the female, which was my custom when she (to my knowledge, *always obtained by dissection*) differed in any way from the male; and under that of *O. melanoleucus*, I state that Le Vaillant *mistook* this species for the female of the preceding. Nothing, I think, can be plainer and stronger "testimony" than this.

I can now add a little information which will appear in the second edition of the 'Birds of South Africa,' which Mr. Sharpe is bringing out. Mr. H. Bowker writes, "This is another cuckoo which I cannot quite make out from your description [he sent both species], but think it is *O. melanoleucus*, very common in Albany district, and appears early in October. It lays its egg in the nest of the 'Black Swallow-tail Spreo' (*Edolius musicus*?), and also in that of the Woodpecker, and looks after its young to see that the foster-parents are attentive to them. I once watched a Woodpecker's nest; and when the nurses brought food to the nest, they were always accompanied by one of these birds, who, after the Woodpeckers left, always looked in to see if all was right, and then sat near until the return of the Woodpeckers, when the same thing

was repeated. On examining the nest I found four fine young Cuckoos."

Of *O. edolius* he writes, "calls frequently during the night, particularly about 9 or 10 o'clock. I have found their eggs and young in the nests of the Small Butcher-bird (*Lanius silens*?)."

This is also pretty good testimony of the distinctness of the two species.

4. On a Collection of Lepidoptera from Cape York and the South-east Coast of New Guinea. By ARTHUR G. BUTLER, F.L.S., F.Z.S., &c.

[Received May 15, 1877.]

In the 'Annals and Magazine of Natural History' for last year I published an account of the first collection of Lepidoptera sent home by the Rev. J. S. Macfarlane; it contained thirty-nine species, of which six were described as new to science.

The present collection contains fifty species; but one of them is too much rubbed for specific determination. The new species are nine in number, five of them being Butterflies and four Moths, as follows:—

- Euplœa occulta*. New Guinea.  
*Tenaris onesimus*. New Guinea.  
*Lycœna conformis*. Cape York.  
*Terias sana*. Cape York.  
*Papilio macfarlanei*. New Guinea.  
*Charocampa celata*. Cape York.  
*Euchromia æmulina*. Cape York.  
*Hydata spectabilis*. Cape York.  
*Cryptophasa russata*. Cape York.

Of species previously recorded, the most striking is a female of the rare and handsome "*Euplœa*" *mesocala* of Vollenhoven.

In the arrangement of the species I shall follow my previous list (Ann. & Mag. Nat. Hist. S. 4, vol. xviii. pp. 122-128), and that on Lepidoptera from Port Moresby (*l. c.* pp. 240-249).

## RHOPALOCERA.

### Family NYMPHALIDÆ.

#### Subfamily DANAINÆ, Bates.

#### Genus DANAIS, Latreille.

##### 1. DANAIS ARCHIPPUS.

*Papilio archippus*, Fabricius, Ent. Syst. iii. 1, p. 49 (1793).

Several examples.

Cape York.

## 2. DAN AIS AFFINIS.

*Papilio affinis*, Fabricius, Syst. Ent. p. 511 (1775).

Common.

Cape York.

## 3. DAN AIS HAMATA.

*Euplœa hamata*, Macleay, King's Surv. Austr. ii. p. 451 (1827).

Several examples.

Cape York.

## Genus EUPLŒA, Fabricius.

## 4. EUPLŒA ANGASII.

*Euplœa angasii*, Felder, Reise der Nov., Lep. ii. p. 343 ("1865").

One specimen.

Cape York.

## 5. EUPLŒA MŒSTA.

*Euplœa mæsta*, Butler, P. Z. S. p. 284, fig. 3 (1866).

♂, ♀. Several examples.

New Guinea.

This is the first occasion on which I have seen the female.

## 6. EUPLŒA OCCULTA, n. sp.

♂. Primaries blue-black, becoming brown upon the outer border; secondaries with the anterior half of the wings, excepting the costal area, which is whitish, dull black, bounded behind by dark castaneous brown, which shades off into pale brown at the anal area; the anal area crossed by four indistinct paler spots, forming an abbreviated discal series: body above black; wings below altogether paler, the borders being broadly brown; primaries with a white dot near the base of second median interspace; secondaries with two white spots at the base, one in the cell, and four in an oblique series just beyond it, the latter slightly lilacine in tint: pectus black, white-spotted, venter greyish, anal segments with central longitudinal white spots. Expanse of wings 3 inches 7 lines.

One specimen.

New Guinea.

At first sight *E. occulta* might be mistaken for a large example of *E. mæsta*; but the absence of the two characteristic sericeous streaks on the primaries at once distinguishes it. It is in fact more nearly allied to *E. æthiops*; but its deeper coloration, broader wings, the paler anal area of secondaries crossed by still paler spots, and the absence of many of the spots on its under surface prove its distinctness.

## Genus CALLIPLŒA, Butler.

## 7. CALLIPLŒA MESOCALA.

*Euplœa mesocala*, Vollenhoven, Tijd. voor Ent. 1873, p. 244, pl. xi. figs. 1, 2.

♀.

New Guinea.

Originally described from examples obtained at Waigiou: Mr. Macfarlane's example is unfortunately a good deal rubbed, as though it had struggled in the net.

## Subfamily SATYRINÆ, Bates.

## Genus MYCALESIS, Hübner.

## 8. MYCALESIS FLAGRANS.

*Mycalesis flagrans*, Butler, Ann. & Mag. Nat. Hist. S. 4, vol. xviii. p. 243. n. 11 (1876).

Two examples.

New Guinea.

## Genus YPTHIMA, Hübner.

## 9. YPTHIMA ARCTOUS.

*Papilio arctous*, Fabricius, Syst. Ent. p. 489. n. 202 (1775).

Several specimens.

Cape York.

## Subfamily MORPHINÆ, Butler.

## Genus TENARIS, Hübner.

## 10. TENARIS ONESIMUS, n. sp.

♀. Primaries smoky brown, the apex and costa being darkest; a broad white patch enclosed between the subcostal and second median veins, and just impinging upon the end of the discoidal cell; secondaries white, tinted with ochraceous towards the base; the costa and a broad outer border smoky brown; thorax dark brown, whitish behind, palpi with black upper margin, otherwise ochreous; abdomen ochreous: primaries below as above; secondaries white, the veins, base, costa, and apical half of outer margin smoky brown; two large black ocelli, pupillated with white, adorned internally with a slender greyish crescent, with broad ochreous iris and narrow brown zone, one of them apical, the other upon the first median interspace, near the outer margin; pectus dark brown, venter ochreous. Expanse of wings 4 inches 7 lines.

One specimen.

New Guinea.

## Subfamily NYMPHALINÆ, Bates.

## Genus DOLESCHALLIA, Felder.

## 11. DOLESCHALLIA AUSTRALIS.

*Doleschallia australis*, Felder, Reise der Nov. Lep. iii. pl. 51. figs. 1, 2 (1867).

One example.

Cape York.

## Genus NEPTIS, Fabricius.

## 12. NEPTIS MORTIFACIES.

*Neptis mortifacies*, Butler, Trans. Ent. Soc. 1875, p. 5.

Several females.

Cape York.

## 13. NEPTIS LATIFASCIATA.

*Neptis latifasciata*, Butler, Trans. Ent. Soc. 1875, p. 4.

One male.

Cape York.

Genus *DIADEMA*, Boisduval.14. *DIADEMA VELLEDA*.

*Papilio vellea*, Cramer, Pap. Exot. pl. 349. figs. C, D (1782).

A series of both sexes. ? New Guinea.

In the present consignment there are no specimens of the true *Diadema alimena*; I am therefore strongly inclined to believe that *D. vellea* is a good species confined to Southern New Guinea, and that the example previously noted (Ann. & Mag. ser. 4, vol. xviii. p. 124) was taken there, and not at Cape York: the habitat is not indicated.

Genus *CETHOSIA*, Fabricius.15. *CETHOSIA IMPERIALIS*.

*Cethosia imperialis*, Butler, Ann. & Mag. Nat. Hist. S. 4, vol. xviii. p. 124. n. 15 (1876).

One example. Cape York.

Genus *JUNONIA*, Hübner.16. *JUNONIA ALBICINCTA*.

*Junonia albicincta*, Butler, Trans. Ent. Soc. 1875, p. 5.

One dwarfed example. Cape York.

Genus *MESSARAS*, Doubleday.17. *MESSARAS TURNERI*.

*Messaras turneri*, Butler, Ann. & Mag. Nat. Hist. S. 4, vol. xviii. p. 244. n. 17 (1876).

One dwarfed example. New Guinea.

Family *LYCÆNIDÆ*.Subfamily *LYCÆNINÆ*, Butler.Genus *LYCÆNA*, Fabricius.18. *LYCÆNA CONFORMIS*, n. sp.

Above brown distinctly shot with violet, excepting the costal and external borders, which are rather broadly olive-brown, fringe rather paler; body blackish: wings below sordid whitish; outer margin bordered by a slender black line; discocellulars and a submarginal series of spots, behind which is a series of lunules, brown; primaries with a dot in the cell, a second subcostal, and an arched discal series of six spots, black; secondaries with an irregular series of spots (encircling the discocellular litura from a short distance) formed of two lines, the first crossing the cell, the second forming an arc across the disk, all black; the whole of the spots on the under surface margined with pure white; body below white. Expanse of wings 10 lines.

One example. Cape York.

Allied to *L. lysizone*.

## Genus DANIS, Fabricius.

## 19. DANIS TAYGETUS.

*Lycæna taygetus*, Felder, Reise der Nov. Lep. ii. p. 321, pl. 33. figs. 19-21 ("1865").

One imperfect example.

Cape York.

## Family PAPILIONIDÆ.

## Subfamily PICRINÆ, Bates.

## Genus DELIAS, Hübner.

## 20. DELIAS INFERNA.

*Delias inferna*, Butler, Lep. Exot. p. 63, pl. 24. fig. 6 (1871).

One shattered female.

Cape York.

## Genus TERIAS, Swainson.

## 21. TERIAS HECABE.

*Papilio hecabe*, Linnæus, Mus. Lud. Ulr. p. 249 (1764).

Several examples.

Cape York.

## 22. TERIAS ZORAIDE.

*Terias zoraide*, Felder, Reise der Nov. Lep. ii. p. 213. n. 229 ("1865").

Several examples.

Cape York.

## 23. TERIAS SANA, n. sp.

Sulphur-yellow; primaries above with the base slightly dusted with black scales; costal border (excepting at base), apical area, outer border to the first median branch and the margin beyond it dark brown; the border runs a short distance up each of the median branches, giving its internal edge a subsinuated appearance; secondaries with a black-brown border, beginning rather narrow at apex, and rapidly tapering off to a fine line, which terminates at the first median branch: body above black, below yellow; under surface of wings unspotted. Expanse of wings 1 inch 3 lines.

Two specimens.

Cape York.

Most nearly allied to *T. venata* from India, but smaller, with narrower outer border, and unspotted under surface.

## Genus BELENOIS, Hübner.

## 24. BELENOIS NABIS.

*Pieris nabis*, Lucas, Rev. Zool. p. 326 (1852).

Two examples.

Cape York.

## Subfamily PAPILIONINÆ, Bates.

## Genus ORNITHOPTERA, Boisduval.

## 25. ORNITHOPTERA PRONOMUS.

*Papilio pronomus*, G. R. Gray, Cat. p. 2, pl. 1. figs. 1 & 2 (1852).

Seventy specimens of both sexes.

Cape York.



## Genus PAPILIO, Linnæus.

## 26. PAPILIO ADRASTUS.

*Papilio adrastus*, Felder, Reise der Nov. Lep. i. p. 110, pl. 16. figs. a, b (1865).

Several of both sexes.

New Guinea.

## 27. PAPILIO PANDION.

*Papilio pandion*, Wallace, Trans. Linn. Soc. xxv. p. 56. n. 72 (1865).

One female (like *P. onesimus*, but smaller).

New Guinea.

This female appears to be modified in imitation of *Tenaris*.

## 28. PAPILIO POLYDORUS.

*Papilio polydorus*, Linnæus, Syst. i. 2, p. 746 (1767).

Forty-eight specimens, of both sexes.

Cape York.

## 29. PAPILIO CHOREDON.

*Papilio choredon*, Felder, Verh. zool.-bot. Ges. xiv. p. 306 (1864).

One example.

Cape York.

## 30. PAPILIO MACFARLANEI, n. sp.

Wings above black, spotted and banded with green, according to the general pattern of *P. agamemnon*, but the central series of spots enlarged so as to form a broad tapering macular band on the primaries, and a wedge-shaped band (white on costal area) on the secondaries; the submarginal spots and the discal spots of secondaries smaller than in *P. agamemnon*: primaries below differing in the same way as above, but the secondaries with very different basal area, more nearly resembling that of *P. telephus*, pale green with a broad brown belt parallel to the abdominal margin, and a short tapering streak (from the costa to the subcostal nervure) interrupted upon the costal nervure by a scarlet spot, and terminating in a smaller scarlet spot; a few scarlet scales near the base of the interspace enclosed by the subcostal branches, and a scarlet spot above the black anal spot; no trace of the conspicuous white costal spot invariably found in *P. agamemnon*, or of the scarlet-edged black spot which precedes it. Expanse of wings 3 inches 9 lines.

Two specimens (rather worn).

New Guinea.

Intermediate in character between *P. wallacei* and the succeeding species. We have a *Papilio* scarcely differing from it, from Ternate.

## 31. PAPILIO ÆGISTUS.

*Papilio ægistus*, Linnæus, Syst. Nat. i. 2, p. 754. n. 48 (1766).

Two shattered examples.

New Guinea.

## 32. PAPILIO INDICATUS.

*Papilio indicatus*, Butler, Ann. & Mag. Nat. Hist. ser. 4, vol. xviii. p. 248. n. 29 (1876).

Several worn specimens.

New Guinea.

## Genus EURYCUS, Boisduval.

## 33. EURYCUS CRESSIDA.

*Papilio cressida*, Fabricius, Syst. Ent. p. 448 (1775).

Several specimens of both sexes.

Cape York.

## 34. EURYCUS TROILUS.

♂ *Eurycus troilus*, Butler, Ann. & Mag. Nat. Hist. ser. 4, vol. xviii. p. 247. n. 27 (1876).

Two or three worn specimens.

New Guinea.

The female chiefly differs from that sex of *E. cressida* in its more rounded wings and less-defined markings.

## HETEROCERA.

## Family SPHINGIDÆ.

## Subfamily CHÆROCAMPINÆ, Butler.

## Genus CHÆROCAMPA, Duponchel.

## 35. CHÆROCAMPA CELATA, n. sp.

♂ Primaries above pale sandy brownish, clouded with pale brownish, olivaceous at the base and across the end of the cell to inner margin; the whole wing, but especially the external area, sprinkled with black and grey scales; an ill-defined greyish elbowed line crossing the wing at the basal fourth, a second greyish line crossing the wing obliquely from apical third of costa to middle of inner margin; traces of two parallel lines beyond the latter, followed immediately by a strongly defined dark brown line from the apex to the inner margin: secondaries buff-coloured, the costal area silky testaceous; a broad dull-black belt almost covering the basal half of the wing: body above pale pinky brownish, becoming gradually olivaceous towards the head; the head and thorax with well-defined pinky white borders. Wings below sandy ochraceous, sprinkled with greenish-grey scales, and crossed by two parallel greenish-grey oblique streaks, the outer one less defined than the inner; body below pinky whitish or pale flesh-coloured, the hinder part of the pectus being palest. Expanse of wings 3 inches 4 lines.

One example.

Cape York.

Most nearly allied to *C. bistrigata*.

## Family AGARISTIDÆ.

## Genus AGARISTA, Leach.

## 36. AGARISTA NEPTIOIDES.

*Agarista neptioides*, Butler, Ann. & Mag. Nat. Hist. xv. p. 138 (1875).

A single male.

Cape York.

## Family ZYGENIDÆ.

## Subfamily EUCHROMINÆ, Butler.

## Genus EUCHROMIA, Hübner.

## 37. EUCHROMIA IRUS.

*Sphinx irus*, Cramer, Pap. Exot. iv. p. 150, pl. 368. fig. A (1782).

Several examples.

Cape York.

## 38. EUCHROMIA ÆMULINA, n. sp.

Wings above black; primaries with two metallic green spots at the base; a spot near the base, a bifid spot across the median vein, an elongated subcostal spot beyond the cell, and a bifid spot across the second median branch hyaline white: secondaries with the costa brown; a trifid basal spot and a large trifid spot beyond the cell hyaline white: body dark brown; shoulders, front of collar, and meta-thorax ochreous; hind margins of abdominal segments ochraceous in front, carmine towards the anus; vertex of head white; hinder part of shoulders, collar, inner margins of tegulæ, hind margin of meta-thorax, and three spots on the basal segments of the abdomen opaline, varying from silvery white to green or blue; anterior coxæ white; venter carmine with a central series of black spots; anus testaceous and black. Expanse of wings 1 inch 7 lines.

One specimen.

Cape York.

This beautiful species comes nearer to *E. aruica* of Walker than to any other described form. The pattern of the wings is quite like *Syntomis*.

## Subfamily SYNTOMINÆ, Butler.

## Genus SYNTOMIS, Ochseneimer.

## 39. SYNTOMIS MARSDENI.

*Syntomis marsdeni*, Moore, Proc. Zool. Soc. 1859, pl. 60. fig. 3.

Two specimens.

Cape York.

This is another instance of the same Lepidopterous insect occurring in Java and Australia.

## Family ARCTIIDÆ.

## Genus AREAS, Walker.

## 40. AREAS PUNCTIPENNIS.

*Areas punctipennis*, Butler, Ann. & Mag. Nat. Hist. ser. 4, vol. xviii. p. 126. p. 30 (1876).

One example.

Cape York.

## Family LITHOSIIDÆ.

## Genus THEMISCYRA, Walker.

## 41. THEMISCYRA MACTATA.

*Mieza mactata*, Felder, Reise der Nov. Lep. v. pl. cxxxix. fig. 44 (1876).

*Themiscyra varicosa*, Butler, Ann. & Mag. Nat. Hist. ser. 4, vol. xviii. p. 126. n. 31 (1876).

One example.

Cape York.

My description was published a week or two too late to secure priority.

Genus ARGINA, Hübner.

42. ARGINA CRIBRARIA.

*Phalæna cribraria*, Clerck, Icones, pl. 54. fig. 4 (1764).

One example.

Cape York.

This species seems to be common all over the Old World with the exception of Europe.

Family HYPSIDÆ.

Genus HYPSEA, Hübner.

43. HYPSEA DAMA.

*Noctua dama*, Fabricius, Sp. Ins. ii. p. 216 (1781).

One example.

Cape York.

Genus DAMALIS, Hübner.

44. DAMALIS ALCIPHON.

*Phalæna alciphron*, Cramer, Pap. Exot. ii. pl. 133. fig. F (1779).

One example.

Cape York.

Family CHALCOSIIDÆ.

Genus HELEONA, Swainson.

45. HELEONA FENESTRATA?

*Heleona fenestrata*, Swainson, Zool. Ill. pl. 116 (1832-33).

One specimen.

Cape York.

The single specimen sent has the primaries so much rubbed that I cannot be certain that it is the true *H. fenestrata*; but if not, it is a nearly allied species.

Family URANIIDÆ.

Genus NYCTALEMON, Dalman.

46. NYCTALEMON PATROCLUS.

*Papilio patroclus*, Linnæus, Mus. Lud. Ulr. p. 204 (1764).

One shattered female.

New Guinea.

Family MACARIIDÆ.

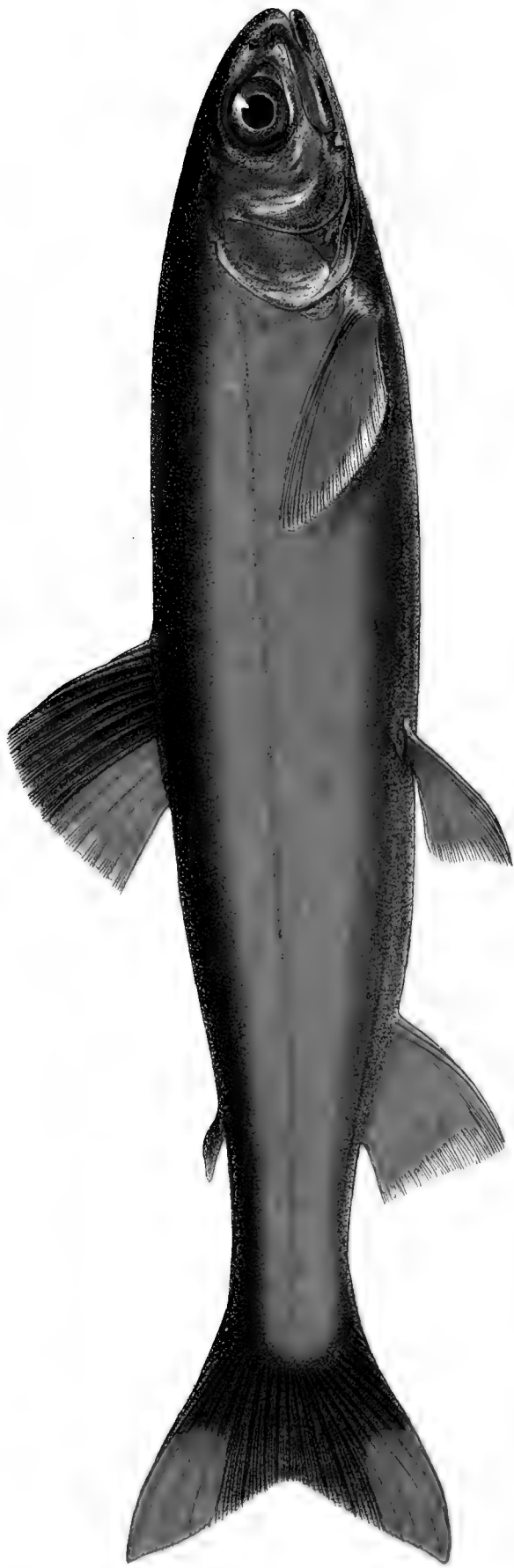
Genus HYDATA, Walker<sup>1</sup>.

47. HYDATA SPECTABILIS, n. sp.

Wings hyaline white; above with a broad pale brown or sordid cream-coloured outer border: primaries strongly falcated, sinuated

<sup>1</sup> A genus agreeing in venation with *Macaria*, but with transparent wings, the secondaries not angulated or caudated, but sinuated.





below the apex; base brownish or sordid cream-coloured, bounded externally by an oblique brown line; a second elbowed line, its upper portion represented by the discocellulars, the lower by a streak to the inner margin; outer border (excepting at apex) greyish brown; three brown costal spots, the one nearest the base indistinct: secondaries creamy towards the base; body creamy whitish. Wings below with blackish discocellular spots; outer border of primaries, excepting at apex, and inner edge of border of secondaries covered with dense confluent red-brown striations; secondaries with a black costal spot; body white. Expanse of wings 1 inch 8 lines.

One example.

Cape York.

Family GELECHIIDÆ.

Genus CRYPTOPHASA, Lewin.

48. CRYPTOPHASA RUSSATA, n. sp.

Primaries shining ferruginous; the costal border snow-white; the base, outer border, outer half of inner border, and a streak from the outer border through the discocellulars to the centre of the discoidal cell slaty greyish: secondaries pale ferruginous: head, collar, and base of antennæ snow-white; thorax ferruginous; prothorax whitish in front; abdomen pale ferruginous. Under-surface pale shining ferruginous. Expanse of wings 1 inch 4 lines.

One specimen.

Cape York.

Allied to *C. rubescens*, but smaller, of a more elegant form, and differently coloured.

Genus CRYPTOLECHIA, Zeller.

49. CRYPTOLECHIA NIVELLA?

*Cryptolechia nivella*, Walker, Lep. Het. xxix. p. 751 (1864).

One specimen.

Cape York.

5. Report on a Collection of Fishes made by Mr. C. Hart during the late Arctic Expedition. By DR. ALBERT GÜNTHER, F.R.S., Keeper of the Department of Zoology, British Museum.

[Received May 22, 1877.]

(Plate L.)

Some months after the Report on Capt. Feilden's collection of Fishes<sup>1</sup> had been prepared, the British Museum received specimens collected by Mr. C. Hart, Naturalist on board of H.M.S. 'Discovery.' He obtained eight species within the Arctic Circle, three

<sup>1</sup> Proc. Zool. Soc. 1877, p. 293.

of which were not contained in Capt. Feilden's collection, as will be seen from the following list :—

I. *Marine Species, collected in Franklin-Pierce Bay, August 11, 1875.*

1. ICELUS HAMATUS, Kröy.

2. TRIGLOPS PINGELII, Reinh.

No specimens of this fish were previously in the national collection. It appears to be much scarcer than the preceding. Externally the ventral fin appears to be composed of three rays; but on dissection four long rays and one rudimentary one are found.

3. CYCLOPTERUS SPINOSUS, adult<sup>1</sup>.

Ova contained in the same bottle as these specimens are of the size of large hemp-seed.

4. LIPARIS FABRICII, Kröy.

5. GYMNELIS VIRIDIS, Fabr.

6. GADUS FABRICII, Rich.

II. *Freshwater Species obtained from Lakes in Discovery Bay.*

1. SALMO ALIPES, Rich.

Of this species two examples were obtained, about 15 inches long; it is a well-marked species of Charr, characterized by the deep radiating and concentric striation of the gill-covers. The typical specimens were obtained in Boothia Felix; so that this Charr has an unusually wide range. Colour silvery, with scarcely any pinkish tinge. Cæc. pyl. 41.

2. SALMO NARESII, n. sp.

The body much elongate, its greatest depth being one fifth, or even one sixth, of the total length, without caudal. The length of the head is one fourth or two ninths of the same length, and nearly one half of the distance between the snout and the vertical from the origin of the dorsal fin. The snout is obtuse, the forehead flat; and the maxillary extends in the male to the vertical from the hind margin of the orbit, but in the female it is somewhat shorter. Teeth

<sup>1</sup> *Cyclopterus lumpus* we did not receive either from Capt. Feilden or Mr. Hart. It does not seem to extend so far northwards as *C. spinosus*. Mr. Horner, the Naturalist of the 'Pandora,' to whom we are indebted for several valuable additions to our series of Arctic animals, collected very young examples in lat. 64° 53' and long. 53° 20' W. attached to *Fucus vesicula*. He remarks that these little fishes are very similar in form and colour to the air-vessels of that plant.







very small, those of the vomer limited to the anterior extremity of the bone, a band of villiform teeth along the middle of the hyoid. Præoperculum with the angle much rounded, and without a distinct lower limb; suboperculum more than twice as long as deep. The gill-cover shows scarcely a trace of the radiating and concentric striæ by which *Salmo nitidus* is characterized. Pectoral shorter than, or equal in length to, the head without snout; and at least one half or more than one half of the distance of its root from the ventral. Ventral fins terminating at a considerable distance from the vent. D. 13; the largest ray scarcely longer than the distance of the eye from the end of the operculum. A. 11. Caudal deeply excised, its middle rays not quite half as long as the outer ones. Scales minute. Branchiostegals 11.

Pyloric appendages 42. Vertebræ 65.

Upper parts light greenish olive, passing into the silvery coloration of the sides. Lower part of a deep reddish-pink colour. Sides with very small red spots. Dorsal and upper part of the caudal of the colour of the back. Paired fins and anal and lower part of caudal deep red, with yellowish white margins.

Several specimens were obtained in a freshwater lake near to the winter-quarters of the 'Discovery,' in a depth of from 10-15 fathoms.

This is a small species, the largest example measuring 10 inches, all the others, males and females, being only 8 inches long. Yet the sexual organs were fully developed, and the ova ready for exclusion.

By associating the name of Sir George Nares with one of the novelties brought home by the Arctic Expedition, I pay only a small tribute of the esteem in which all zoologists hold the leader of the 'Challenger' and Arctic Expeditions.

ô. Review of the *Ibidinæ*, or Subfamily of the Ibises. By  
D. G. ELLIOT, F.R.S.E., F.L.S., &c. &c.

[Received May 22, 1877.]

(Plate LI.)

The materials by means of which the present paper has been written are contained in the Museum of Paris and in the collections of Messrs. Salvin and Godman, and Captain G. E. Shelley.

The collection of the Paris Museum is very rich in these birds, and contains several of the types of older writers, as Cuvier &c.; and I have to acknowledge my indebtedness to Prof. A. Milne-Edwards and M. Oustalet for the facility afforded me in making my investigations. In the following paper I have given the literature of the subfamily, classification, genera, and geographical distribution, together with the synonymy for each species as I have been able to determine it.

I commence with the literature of the family :—

1766. LINNÆUS, 'Systema Naturæ.'

Seven species are given by this author, some of which do not belong to the present group, and all but one are included in the genus *Tantalus*. The valid species are *T. falcinellus* (= *Falcinellus igneus*), *T. rubra* (= *Eudocimus ruber*), *T. albus* (= *E. albus*) and *Scolopax guarana* (= *F. guarana*), probably the young of the glossy *Ibis* with a white forehead. Species 4.

1783. BODDAERT, 'Table des Planches Enluminées.'

Three species of *Ibis* are apparently named for the first time, viz. *Lophotibis cristata* as *Tantalus cristatus*, *Theristicus caudatus* as *Scolopax caudatus*, and *Geronticus calvus* as *Tantalus calvus*. Species 7.

1788. GMELIN, 'Systema Naturæ.'

Twenty-one species are given under the genus *Tantalus*, of which the following are valid—*T. igneus*, *calvus*, *cristatus*, *ruber*, *albus*, *cayanensis* (described for the first time), and *melanopsis* (= *caudatus*, Bodd.). The remainder are either synonymous with previously described species, or do not belong to this subfamily. Species 8.

1790. LATHAM, 'Index Ornithologicus.'

Twenty-three species are recorded, mainly those in the list given by Gmelin. The following are described for the first time: *Tantalus melanocephalus*, *T. hagedash*, and *T. æthiopicus*. Species 11.

1817. VIEILLOT, 'Nouveau Dictionnaire d'Histoire Naturelle.'

Twenty species are here given, all included in the genus *Ibis*, one, however, not belonging to this group, viz. *Ibis nandapoa* (= *Mycteria americana*, Lath.). Only one species is described as new, viz. *Ibis cærulescens*. Species 12.

1820–1839. TEMMINCK, 'Planches Coloriées.'

Five species are here given, and four described, two of which are valid. They are *Ibis leucon* (= *T. melanocephalus*, Lath.), *Ibis papillosa*, *Ibis nippon*, *Tantalus chalconotus* (= *S. guarana*, Linn.), and *Ibis plumbea* (= *Ibis cærulescens*, Vieill.) Species 14.

1823. LICHTENSTEIN, 'Verzeichniss der Doubletten des zoolog. Museum zu Berlin.'

The *Curucáu afeytado* of Azara is named *Ibis infuscata*; no description is added. Species 15.

1823. VIEILLOT, 'Encyclopédie Méthodique.'

*Tantalus hagedash*, Lath., is described as *Ibis chalconotus*; and as *Hagedash* has been employed as a generic term (*Hagedashia*), Vieillot's specific name is retained.

1825. SPIX, 'Avium species novæ' &c.

*Cercibis oxycerca* is described as *Ibis oxycerca*. Species 16.

## 1829. WAGLER, 'Isis.'

Several species of this group of birds are mentioned in the 'Isis' of this year, some of which are described as new; but none are valid. The species named are *Ibis guarauna*, *I. macei* (= *I. melanocephalus*, Lath.), *I. papillata* (= *I. papillosa*, Temm.), *I. calva*, and *I. gonocephala* (= *Tantalus* = *I. calvus*, Bodd.).

## 1832. WAGLER, 'Isis.'

Several genera for these birds are proposed, as follows, and a list given of their species:—*Ibis*, Cuv., *ex parte*, to contain *I. religiosa* (= *Tantalus æthiopicus*, Lath.), *I. macei* (= *T. melanocephala*, Lath.), and *I. molucca*, Cuv. (= *T. æthiopicus*, Lath.); *Tantalides* has *T. falcinellus* (= *Falcinellus igneus*), and *T. guarauna*; *Theristicus* possesses *T. melanopis* (= *Scolopax caudatus*, Bodd.); *Geronticus* with *G. calvus* and *I. papillata* (= *I. papillosa*, Temm.); *Harpiprion* has *Ibis cayennensis*, *I. dentirostris* (= *T. cayanensis*, Gmel.), and *I. plumbea* (= *I. carulescens*, Vieill.); *Eudocimus* contains *Ibis rubra*, *I. alba*, and *I. longirostris*, Wagl. (= *T. albus*, Linn.); *Cercibis* to have *I. oxycerca*, Spix; *Phimosus* represented by *I. infuscata*, Lich., and *I. nudifrons*, Spix. (= *I. infuscata*, Licht.).

## 1835. RÜPPELL, 'Fauna Abyssinica.'

*Bostrychia carunculata* described and figured as *Ibis carunculata*. Species 17.

## 1835. JAMESON, 'Edinburgh New Philosophical Journal.'

*Carphibis spinicollis* described as *Ibis spinicollis*. Species 18.

## 1837. DU BUS, 'Bulletin de l'Académie de Bruxelles.'

*Lampribis olivacea* described as *Ibis olivacea*. Species 19.

## 1844–1849. G. R. GRAY, 'Genera of Birds.'

In this valuable publication, the Ibises are placed in the family Ardeidæ, and compose its fifth subfamily. Three genera are con-signed to it, viz.:—*Tantalus*, properly belonging to the Ciconiidae; *Ibis*, with five species, only three of which are valid according to the present writer's views; and *Geronticus*, with eighteen species, fourteen of which are good. The various genera proposed by other authors are merged in *Geronticus*, which is not admissible, as the species of this group represent many distinct genera worthy of recognition.

## 1845. RÜPPELL, 'Systematische Uebersicht der Vögel Nord-Ost-Afrika's.'

*Comatibis comata*, described as *Ibis (Geronticus) comata*. Species 20.

## 1857. BONAPARTE, 'Conspectus Generum Avium.'

The Ibises here form the subfamilies Ibinæ and Eudociminæ of the Tantalidae; and sixteen genera are employed. *Ibis* contains five species, three of which are good, *I. bernieri*, of Madagascar, being separated from *I. æthiopica*: *Nipponia*, and *Carphibis*, each with one valid species. In the division Geronticeæ we have *Bostrychia*,

*Hagedashia*, *Comatibis*, *Geronticus*, *Inocotis*, and *Lophotibis*, all possessing one species each, excepting the second named, which has two. The division *Phimosæ* has *Molybdophanes*, *Theristicus*, *Harpiprion*, *Cercibis*, and *Phimosus*, each with one species, save the second, which has two, only one of which is valid. The second subfamily, *Eudociminæ*, contains *Eudocimus*, with three species, two only of which are valid, and *Falcinellus* with six, one of which alone is good. Constituting two subfamilies for this group of birds is practically unnecessary; and several of the so-called species are founded upon immature specimens. The genera employed, however, are apparently required, unless all these birds should be retained under one genus, which does not seem to be advisable in view of the many and important differences exhibited by the various species. Species 21.

1870. SWINHOE, 'Proceedings of the Zoological Society of London.'  
*Ibis melanocephala* described as *Ibis propinqua*.

1874. RIDGWAY, 'American Naturalist.'  
*Falcinellus thalassinus* described as *Ibis thalassina*. Species 22.

1875. HUME, 'Stray Feathers.'  
*Grptocephalus davisoni* described as *Geronticus davisoni*.  
Species 23.

1876. ALLEN, 'Bulletin of the Museum of Comparative Anatomy of Cambridge.'  
*Falcinellus ridgwayi* described. Species 24.

1877. OUSTALET, 'Bulletin de la Société Philomatique de Paris.'  
*Thaumatibis gigantea* described as *Ibis gigantea*, and *Grptocephalus davisoni* described as *Ibis davisoni*. Species 25.

#### CLASSIFICATION.

The birds composing the groups treated of in this paper are intermediate between the *Tantali* on the one hand and the *Numenii* on the other. They are removed from the Herons by several important characters, such as the possession of a small, muscular stomach, very long and slender intestine, and small cæca, in contradistinction to the large membranous stomach, very long and slender intestine, and absence of cæca of the Herons. With the Spoon-bills they are very closely allied, these last being "Ibises with the bill flattened and expanded towards the extremity." These two groups, then, *Ibis* and *Platalea*, I consider as forming two subfamilies of one family, for which, in consideration of the former being much the larger and more important in regard to the number of its species, I adopt the term *Ibididæ*, the subfamilies being called respectively *Ibidinæ* and *Plataleinæ*. To the first of these divisions this paper is restricted. Numerous genera have been instituted for the reception of the various species; and I have adopted a considerable proportion of them. Either all the species must be

kept in one genus, or else a number of genera must be recognized ; for there is very great variation among the members of the subfamily in the extent and mode of distribution of the bare skin upon the head, face, and neck, as well as in the shape and presence of the scutella upon the tarsi. Of the twenty-two genera proposed at different periods by successive writers, as given below, I have retained nineteen, which seem to be sufficient to include all the species known to ornithologists at the present day. I commence my arrangements of these birds with the genus *Ibis*, formed by Savigny for the sacred Ibis of the ancients (*Tantalus aethiopicus*, Lath.). This genus contains three species, conspicuous for having the head and neck entirely denuded of feathers. This is succeeded by *Thaumatibis*, instituted for the extraordinary bird having a body in form and size like a *Tantalus*, but with the head and feet of an *Ibis*,—to be followed by *Graptoccephalus*, with its single species, having a curiously coloured head and neck, and a skull similar in shape to its gigantic predecessor. There is now a gap, and the genus I place next seems to be as well fitted in here as anywhere ; for, as in all other groups of birds, there are also missing links among the Ibidinæ, that we are not able to supply, the species which would have fitted the gap having probably long since become extinct. *Carchibis* therefore comes here, with its single species, having the head and throat bare, the neck only partially so. *Inocotis* succeeds, containing the curious bird with the back of the head covered with scarlet papillæ ; and this is followed by *Comatibis* with one species. *Geronticus* is next, with one species ; after which is *Phimosus*, also with one species, having top and sides of head and throat nude ; followed by *Nipponia*, with the bare space like the other, but not continuing onto the throat. All the species thus far have the head mostly denuded of feathers, and form a kind of group by themselves, separated, in a measure, from the other members of the Ibidinæ, which have the top of the head covered with feathers. Of this second section, *Cercibis* is first, with one species, followed by *Theristicus*, with also only one member ; after which comes *Lophotibis*, formed for the beautiful bird from Madagascar ; and this is followed by *Hagedashia* with only one species. We now reach *Bostrychia* with its single species, remarkable for the lengthened wattle pendent from the throat ; and this is succeeded by *Harpiprion* with only one member, which is followed by *Molybdophanes* with but a single species. *Falcinellus* comes next, with four species, the largest number that any of the genera contain, succeeded by *Lampribis* with its single species, distinguished from the members of the previous genus by the bare skin including and extending considerably behind the eye, and reaching all round the base of the bill, and from the next genus by having a feathered throat. The last is *Eudocimus* with two species, the well-known white and red Ibis.

#### GENERA.

Many genera have been proposed for the different species contained in this paper, more, perhaps, than are strictly required. Some

writers have preferred to employ them as subgeneric divisions, while others, ignoring them entirely, have placed all the birds in this subfamily under one genus, *Ibis*. From a careful examination of the subject it appears to me that either the latter view must be adopted, and but one genus recognized, or else quite a number must be employed, as the species certainly vary greatly among themselves, and by such characters as are usually deemed generic. Considering that more than one generic form is clearly to be perceived among these birds, I have referred the different species to those in which it seemed they should properly be retained. Some authors have taken the genus *Ibis*, as defined by Moehring, with *Tantalus ruber*, Linn., as the type. Moehring, however, does not come within the number of those writers who are accepted as authorities either for genera or species; and therefore *Ibis*, as referred by him, cannot in any way be taken into consideration. Lacépède was the first to define the genus *Ibis* after the time of Linnæus (the starting-point of ornithological nomenclature); but he unfortunately did not designate any type for his genus; so it cannot be accepted. The next author who proposed a generic division for these birds was Bechstein, who, in 1803, gave the term *Falcinellus* to the *Tantalus falcinellus* of Linnæus; and in 1810 Savigny defined the genus *Ibis* with *Tantalus æthiopicus*, Lath., the sacred Ibis of the ancients, as his type. It will thus be seen that *Ibis* cannot in any way be used for the American species of this subfamily, as has been generally the practice.

In the following enumeration of the terms that have been proposed, I commence with Bechstein, and bring the list down to the present day, giving with each genus the species employed as its type:—

	Type.
(1803) <i>Falcinellus</i> , Bechst., Gem. Nat. (nec Vieill.) .....	<i>Tantalus falcinellus</i> , Linn.
(1810) <i>Ibis</i> , Savigny, Système des Oiseaux de l'Égypte et de la Syrie, p. 392 .....	<i>Tantalus æthiopicus</i> , Lath.
(1832) <i>Tantalides</i> , Wagler, Isis (nec Reich.) ...	<i>Tantalus falcinellus</i> , Linn.
(1832) <i>Theristicus</i> , Wagl. ibid. ....	<i>Scolopax caudatus</i> , Bodd.
(1832) <i>Geronticus</i> , Wagl. ibid. ....	<i>Tantalus calvus</i> , Bodd.
(1832) <i>Harpiprion</i> , Wagl. ibid. ....	<i>Tantaluscayennensis</i> , Gmel.
(1832) <i>Eudocimus</i> , Wagl. ibid. ....	<i>Tantalus ruber</i> , Linn.
(1832) <i>Cercibis</i> , Wagl. ibid. ....	<i>Ibis oxycerca</i> , Spix.
(1832) <i>Phimosus</i> , Wagl. ibid. ....	<i>Ibis infuscata</i> , Licht.
(1842) <i>Threskiornis</i> , G. R. Gray, App. List Gen. Birds, p. 13 .....	<i>Tantalus æthiopicus</i> , Lath.
(1851) <i>Comatibis</i> , Reichenb. Novitiæ, Synop. Avium, pl. 291. figs. 2383, 2384.....	<i>Ibis comata</i> , Rüpp.
(1851) <i>Nipponia</i> , Reichb. ibid. pl. 141. fig. 538	<i>Ibis nippon</i> , Temm.
(1851) <i>Molybdophanes</i> , Reichb. ibid. pl. 139 fig. 524 .....	<i>Ibis cærulescens</i> , Vieill.
(1851) <i>Lophotibis</i> , Reichb. ibid. pl. 83. fig. 637	<i>Tantalus cristatus</i> , Bodd.
(1851) <i>Inocotis</i> , Reichb. ibid. pl. 140. fig. 533 ...	<i>Ibis papillosa</i> , Temm.
(1851) <i>Carpibis</i> , Reichb. ibid. pl. 82. figs. 1009, 1010 .....	<i>Ibis spinicollis</i> , James.
(1851) <i>Guara</i> , Reichb. ibid. pl. 139. figs. 525–527	<i>Tantalus ruber</i> , Linn.
(1851) <i>Leucibis</i> , Reichb. ibid. pl. 141. fig. 526, pl. 361. figs. 2825, 2826, pl. 292. fig. 2385	<i>Tantalus albus</i> , Linn.
(1851) <i>Bostrychia</i> , Reichb. ibid. pl. 83. fig. 1011	<i>Ibis carunculata</i> , Rüpp.
(1857) <i>Hagedashia</i> , Bon. Consp. Gen. Av. ....	<i>Tantalus hagedash</i> , Lath.



- (1877) *Graptocephalus*, Elliot, gen. nov. .... *Geronticus davisoni*, Hume.  
 (1877) *Thaumatibis*, Elliot, gen. nov. .... *Ibis gigantea*, Oustalet.  
 (1877) *Lampribis*, Elliot, gen. nov. .... *Ibis olivacea*, Du Bus.

## KEY TO THE GENERA.

- A. Head, and neck for nearly its entire length naked.  
 a. Skull oblong on top; webs of scapulars decomposed; tarsi and middle toe equal ..... 1. *Ibis*.  
 b. Skull square on top, middle toe three fourths the length of tarsus ..... 2. *Thaumatibis*.
- B. Head and upper part of neck naked.  
 a. Skull square on top; occiput sloping to forehead, which descends rapidly to maxilla. Tarsus half an inch longer than middle toe ..... 3. *Graptocephalus*.  
 b. Skull oblong on top.  
 a'. Base of neck covered with stiffened spiny shafts ... 4. *Carphibis*.  
 b'. Back of head covered with papillæ ..... 5. *Inocotis*.
- C. Head and throat naked; occiput projecting beyond the line of the neck; neck feathered behind nearly to the head.  
 a. Neck covered with loose, extremely narrow, lengthened and pointed feathers; tail long, rounded ..... 6. *Comatibis*.  
 b. Neck covered with soft short feathers; tail long, square ..... 7. *Geronticus*.
- D. Front and sides of head, and throat, naked ..... 8. *Phimosus*.
- E. Fore part of head on top and face naked; throat feathered ..... 9. *Nipponia*.
- F. Top of head feathered.  
 a. Sides of head and throat naked; tail very long, cuneate ..... 10. *Cercibis*.  
 b. Space around the eye and line on sides of throat naked ..... 11. *Theristicus*.  
 c. Space around the eye bare; throat covered with long feathers; head crested ..... 12. *Lophotibis*.  
 d. Space between the eye and maxilla bare; a naked line on throat along the lower margin of mandible ..... 13. *Hagedashia*.
- G. Head and throat feathered.  
 a. Bare wattle pendent from the throat ..... 14. *Bostrychia*.  
 b. Narrow line on forehead at base of culmen and space between the eye and maxilla bare ..... 15. *Harpiprion*.  
 c. Space between eye and maxilla bare.  
 a'. Feathers of the neck long and loose; thighs feathered nearly to the knee ..... 16. *Molybdophanes*.  
 b'. Feathers of the neck short; thighs bare for nearly their entire length ..... 17. *Falcinellus*.
- H. Forehead and space around and behind the eye naked.  
 a. Throat feathered ..... 18. *Lampribis*.  
 b. Throat naked ..... 19. *Eudocimus*.

## GEOGRAPHICAL DISTRIBUTION.

The birds composing the subfamily of which this Monograph treats are distributed everywhere throughout the globe, being found in every zoogeographical division yet named; and if the number of species of a family which exists in any particular portion of the earth is an indication that it there had its origin, then we may consider that *Ibis* appeared first in the eastern hemisphere; for, of the twenty-five species recognized in this paper, fifteen are found to dwell upon the eastern continents, or on the islands composing the Indian

archipelago; and eight of these, or a little over half, are natives of the Ethiopian region.

In reviewing the geographical distribution of the members of the Ibidinæ, commencing in the far east, and treating those species met with in the Australian region, it will be found that the great continent of Australia possesses three species, viz. *I. æthiopica*, *Carphibis spinicollis*, and *Falcinellus igneus*. The second of these has not been obtained as yet elsewhere, although it is stated to have been seen once in New Guinea. The first of the species above named (*I. æthiopica*) has quite an extended range, as it apparently is identical with the African species, and, besides Australia, it is found also in Ceram and Salwatty of the Austro-Malayan division of the Australian region. Anciently this species was a dweller in Egypt, as it was there worshipped, and the mummied remains are found in great numbers; but there is no authentic record of its having been seen in that land in modern times.

Another great division in which these birds are found is the Oriental region; and here we see that in India, as usually understood, the *Geronticus papillosus* and *I. melanocephala* are distributed generally. The last-named species is also a native of Ceylon and Java of the Indo-Malayan islands; and the *Grptocephalus davisoni* is an inhabitant of the Tenasserim Provinces.

In the Indo-Chinese subregion the extraordinary *Thaumatibis gigantea* is found in Cochin China, and *Grptocephalus davisoni* in Siam and Cambodja. In the Palæarctic region the *Nipponia nippon* is found in Siberia, Northern China, and Japan, and also in Formosa of the Oriental region.

The Ethiopian region, the next in order, has the *I. æthiopica* distributed generally south of the Great Sahara. In Abyssinia the *Bostrychia carunculata* and *Comatibis comata* are found, the latter species extending its range northward to Algeria in the Palæarctic region, its limits being apparently the northern edge of the great desert. Proceeding southwards along the east coast, the *Geronticus calvus* is met with in the vicinity of the Orange river; and this species seems to go quite across the continent, as it is also a native of Damara Land on the west coast. On this side also the *Hagedashia chalcoptera* ranges from the Gambia in the north to the Cape colony; and the *Lampribis olivacea* is met with on the Guinea coast and on Prince's Island.

Madagascar (Malayan subregion) has three species, *I. melanocephala*, *Lophotibis cristata*, and *I. bernieri*. The last two are not found elsewhere, while the *I. bernieri* is very closely allied to the *I. æthiopica*. One other species remains to be noticed, the *Falcinellus igneus*, which is found nearly everywhere throughout the eastern hemisphere.

In the Nearctic region five species of *Ibis* occur; but of them one is only an accidental visitor. The *Falcinellus igneus* is met with in the Alleghany subregion, occasionally as far north as Massachusetts. *F. guaruana* is found in the middle province of the United States and northward to the Columbia river, while *F. thalassinus* is met with on the Pacific coast to California. The *Eudocimus ruber* is only a

straggler; and I am not aware of a specimen having been procured within the limits of this region, although it has been seen a few times by naturalists. *Eudocimus albus* is found in the southern part of the Alleghany and Rocky-mountain subregions, going northwards as far as the Carolinas and westwards to Texas.

In the Neotropical region the remaining species of the subfamily are found.

Beginning in the north with the Mexican subregion, we have the *E. albus* and the *Harpiprion cayanensis*, which range from Panama, along the northern portion of South America and down the east coast into Brazil—the Brazilian subregion. In the Antillean subregion we find the *F. igneus* in the islands of Cuba and Porto Rico, and perhaps some more; and the *E. ruber* is a native of Cuba and probably other islands to the southwards, as it is stated to be abundant on the Orinoco and Amazons, in the Brazilian subregion.

In Columbia the *Phimosus infuscatus* is met with; and this species extends its range southwards to the Argentine Republic. *Theristicus caudatus* inhabits the continent from Peru on the north to the Straits of Magellan; and the *H. cærulescens* is a native of Brazil and the Argentine Republic. *C. oxycerca* is found in Brazil in the Amazonian subregion, and as far westward as Columbia. *F. guarana* appears to be spread over the whole of South America, with perhaps the exception of Peru. In this last country *F. ridgwayi* is found; and *F. thalassina* is an inhabitant of the west coast from the Straits of Magellan to California in the Nearctic region.

#### 1. IBIS ÆTHIOPICA.

*Tantalus æthiopicus*, Lath. Ind. Orn. (1790), vol. ii. p. 706. sp. 12.

*Numenius ibis*, Cuv. Ann. du Mus. (1805) vol. iv. p. 116, t. 53.

*Ibis religiosa*, Savig. Hist. de l'Égypte (1810) Ois. t. 7. fig. 1, (text) vol. iii. p. 392; Vieill. Nouv. Dict. Hist. Nat. (1817) vol. xvi. p. 9; Temm. Man. Ornith. (1820) vol. iv. p. 390; Vieill. Ency. Méth. (1823) p. 1144; Wagl. Syst. Av. (1827) sp. 2; Hemp. & Ehrenb. Sym. Phys. (1828) p. 17; Cuv. Règn. Anim. (1829) p. 519; Less. Trait. Orn. (1831) p. 568. sp. 15; Wagl. Isis (1832) p. 1231; Sykes, Proc. Zool. Soc. (1832) p. 160. sp. 188; Bon. Consp. Gen. Av. (1857) vol. ii. p. 151; Schleg. Mus. Pays-B. (1863) livr. iv. p. 12; Kirk, Ibis (1864) p. 364; Bree, B. Eur. 1st ed. vol. iv. p. 45, pl. 13; Schleg. Proc. Zool. Soc. (1866) p. 425; Sharpe, Proc. Zool. Soc. (1871) p. 614.

*Ibis egretta*, Temm. Man. Orn. vol. iv. p. 391; Bon. Consp. Gen. Av. (1857) vol. ii. p. 151.

*Ibis molucca*, Cuv. MS. Mus. Paris; id. Règn. Anim. p. 520; Less. Trait. Orn. (1831) p. 568. sp. 13.

*Tantalus ibis*, J. Brookes, Linn. Trans. vol. xvi. (1830) p. 499.

*Ibis strictipennis*, Gould, Proc. Zool. Soc. (1837) p. 106; Bon. Consp. Gen. Av. (1857) vol. ii. p. 151; Schleg. Mus. Pays-B. (1863) livr. 4, p. 14; Garrod, Proc. Zool. Soc. (1873) pp. 467, 638.

*Threskiornis strictipennis*, Gould, B. Austr. vol. vi. pl. 46; id. Hand-b. B. Austr. (1865) vol. ii. p. 284.

*Threskiornis æthiopicus*, Gray, App. List Gen. Birds (1842) p. 13; Gurney, Ibis (1860) p. 219, (1865) p. 275.

*Geronticus strictipennis*, Gray, Gen. B. (1849) vol. iii. p. 567. sp. 7; id. Hand-l. B. (1871) pt. iii. p. 40.

*Geronticus æthiopicus*, Gray, Gen. B. (1849) vol. iii. p. 566. sp. 5; Layard, B. S. Afr. (1867) p. 320. sp. 604; Gray, Handl. B. (1871) pt. iii. p. 40; Bartlett, Ibis (1876) p. 211.

*Ibis æthiopica*, von Heugl. Syst. Ueber. Vög. Nordost.-Afr. (1855) p. 213. sp. 633; Gurney, Ibis (1868) p. 259; Finsch & Hartl. Vög. Ost.-Afr. (1870) p. 783; Gurney, Anderss. B. Damaral. (1872) p. 297; Shelley, B. Egypt (1872) p. 261; Heugl. Ornith. Nordost.-Afr. (1873) Band ii. Abth. 1, p. 1135; Ayres, Ibis (1874) p. 105.

*Threskiornis religiosa*, Hartl. Syst. Orn. W. Afr. (1857) p. 232. sp. 658; Gurney, Ibis (1859) p. 153. sp. 9, (1865) p. 275.

*Hab.* Africa, Senegambia (*Hartl.*); Casamanze (*Verr.*); Mosambique (*Peters*); Cameroons (*Crossley*); Transvaal (*Ayres*); St. George, Elmina, Gold-Coast (*Pel*); Australia, Ceram (*Schlegel*); Salawatty (*Rosenberg*).

The Sacred Ibis is no longer met with upon the Nile south of Kartoum; and I do not know of any authentic account of its having been seen in Egypt in modern times. In ancient days it must have been very numerous, as great quantities of mummies of these birds are found in the tombs and pits throughout Egypt. Strabo states that every street in Alexandria was full of them in his time, and they were useful in picking up all kinds of offal thrown out of the butchers' shops. He also says they were troublesome because they devoured every thing, were dirty, and were prevented with difficulty from polluting what was clean and not given to them. Hermopolis was the patron city of this bird; and it appears to have been worshipped throughout the land. It was the emblem of Thoth, the scribe of Osiris, who wrote down the deeds of the deceased; and its portrait is seen upon many of the monuments that remain. Vierthaler says that on the White and Blue Nile it builds in trees, nesting in great companies during the months of August, September, and October.

This species is the type of Savigny's genus *Ibis*; and I have consequently retained this term for it and its congeneric relatives.

Mr. Gould has separated, in his 'Birds of Australia,' the Black-necked Ibis of that country from *I. æthiopica*, on account of the lengthened feathers on the lower part of the throat, and has called it *I. strictipennis*; and the species has generally been accepted by ornithologists as valid. Another less conspicuous character is the extent of the dark-green colour on the ends of the primaries. Inasmuch as the lengthened neck-feathers of *I. melanocephala* are present in some specimens and not in others (being assumed in the breeding-season), and are therefore of no value as a specific character, it does not seem at all natural that the same character among speci-

mens of the present species should entitle such individuals to a distinctive rank, as it is only a part of the seasonal dress. In regard to the extent of the greenish-black colour on the ends of the primaries, I find it varies greatly in different examples from the same country. Thus, one in the Paris Museum, from the Cape of Good Hope, has the end of the first primary greenish black for  $1\frac{3}{4}$  inch; while another, from Sumatra, in the same collection has the first primary covered for  $3\frac{1}{4}$  inches from the tip with the same colour. In the face of such facts, and with specimens before me from Australia, the Moluccas, and Africa, no two of which are exactly alike in their coloration, as above stated, I cannot do otherwise than consider Mr. Gould's bird from Australia the same as the African *I. æthiopica*, and consign his name to the list of its synonyms. Mr. Gould says that in Australia this bird goes in small flocks from five to twenty in number, and frequents the wet hollows of lagoons, and banks of rivers, seeking frogs, newts, and insects. It is wary, and difficult to approach sufficiently near to bring it within shooting-distance.

Mr. Ayres states that this species frequents the Bay of Natal and the mouths of the rivers along the coast, and are very shy. He has seen them in company with Spoonbills and White Herons, sunning themselves on the upper boughs of the mangroves, and at low water feeding on the mud-banks with the Curlews, Egrets, and Herons. When flying they usually form a figure like Swans and Geese. It arrives in the Zambesi region, according to Dr. Kirk, from the north in December, and frequents the sea-coast. He says the flesh is very good eating.

Gould describes the back of the head and neck as crossed by narrow distinct bands of rose-pink, and on the crown of the head is a series of oval spots arranged in the form of a star of the same colour. However, while in some specimens these are conspicuous, in others they are scarcely apparent, and in the dried skins these marks are not visible. As the allied form *I. melanocephala* has also this same style of coloration, as stated by Blyth, it has no specific value.

Head and neck bare of feathers; skin black; tips of the primaries greenish black, varying in extent among individuals on the first primary from 1 inch to  $3\frac{1}{4}$  inches. Tertiaries with open, much lengthened and diminished webs falling over and covering the lower part of the wing, blackish purple. Entire rest of plumage pure white. In some specimens the feathers of the lower part of the neck are lengthened into a tuft. Bill black; iris reddish brown. Legs horn-colour.

Total length 29 to 30 inches; wing 14 inches; tail 6 inches; bill along culmen varying from 5 to 8 inches; tarsus  $3\frac{3}{4}$  inches.

Young have the neck covered with short white feathers.

## 2. IBIS BERNIERI.

*Ibis bernieri*, Bon. Consp. Gen. Av. (1857) vol. ii. p. 151; Sclat. Proc. Zool. Soc. (1870) p. 382.

*Ibis religiosa*, Schleg. & Poll. Rech. Faun. Madag. (1868) p. 126.  
*Geronticus bernieri*, Gray, Handl. B. (1871) pt. iii. p. 40.

*Hab.* Madagascar.

Precisely like the *I. aethiopica* in colour of plumage, but apparently distinct, or at all events a geographical race, distinguished from its near relative by the much less extent of bare skin on the neck and the white iris. Tertiaries black with a bluish gloss, their webs open and diminished. Entire rest of plumage pure white. Bill black, feet and legs black.

Entire length 26 inches; wing  $13\frac{1}{2}$  inches; tail 7 inches; bill along culmen  $5\frac{1}{2}$  inches; tarsus 3 inches.

### 3. IBIS MELANOCEPHALA.

*Black-headed Ibis*, Lath. Gen. Syn. Supp. p. 240.

*Tantalus melanocephalus*, Lath. Ind. Orn. (1790) vol. ii. p. 709. sp. 21; Wagl. Isis (1829) p. 760.

*Ibis melanocephala*, Vieill. Nouv. Dict. Hist. Nat. (1817) vol. xvi. p. 23; id. Ency. Méth. (1823) tom. iii. p. 1150; Wagl. Syst. Av. (1827); Jard. & Selby, Orn. Ill. pl. 120; Bon. Consp. Gen. Av. (1857) vol. iii. p. 151; Schleg. Mus. P.-Bas. (1863) livr. 4, p. 14; Garrod, Proc. Zool. Soc. (1873) pp. 467, 638.

*Numenius de Macei*, Cuv. Ann. Mus. Hist. Nat. (1805) vol. iv. p. 125.

*Ibis leucon*, Temm. Plan. Col. no. 481.

*Ibis macei*, Wagl. Syst. Av. (1827) sp. 3.

*Ibis bengala*, Cuv. MS. Paris Mus.; Less. Trait. Orn. (1831) p. 568.

*Ibis religiosa*, Sykes' Cat. p. 188. sp. 1.

*Threskiornis melanocephalus*, Blyth, Cat. B. Mus. Asiat. Soc. (1849) p. 275; Gray, Gen. B. (1849) vol. iii. p. 567; Jerd. B. Ind. (1864) vol. iii. p. 768. sp. 941; Swinh. Proc. Zool. Soc. (1863) p. 318. sp. 320; Blyth, Ibis (1867) p. 174, (1870) p. 175; Gray, Handl. B. (1871) pt. iii. p. 40. sp. 10222; Holdsw. Proc. Zool. Soc. (1872) p. 479. sp. 290; Legge, Ibis (1875) p. 404.

*Ibis propinqua*, Swinh. Ibis (1861) p. 261; id. Proc. Zool. Soc. (1870) p. 428, (1871) p. 44.

*Hab.* India generally; scarce in Arakan (*Blyth*); Java (*Schlegel*); Ceylon (*Holdsworth*).

I place the *Ibis propinqua*, Swinhoe, as a synonym of *I. melanocephala*, as I do not perceive in his description (*l. c.*) any difference from the present species to entitle it to a separate specific rank. The "pectoral feathers, long and pointed like in *Herodias garzetta*," I do not consider of any specific value, as I find specimens of *I. melanocephala*, from Bengal and Pondicherry respectively, in the Paris Museum, with these lengthened feathers as well as without them, the one from Bengal having them very long and conspicuous, the other not having a trace of them. The latter specimen is Cuvier's type of *Ibis bengala* (MS. Mus. Paris); the former is marked as *Ibis macei*, Wagler. These feathers are assumed in the breeding-season, as stated by Blyth, and therefore cannot be accepted as indicating a

character sufficient to establish a species. In the Pondicherry example the desiccated plumes adorning the back are of a pale pearly white, indeed almost white, agreeing with Swinhoe's bird, which shows that this species varies in the colour of these plumes among individuals. I have never seen these feathers of the rich dark hue exhibited by *I. æthiopica*. Swinhoe speaks of Jerdon's description of *I. melanocephala* as showing that bird to have "black quills." It is true that Jerdon speaks of the "quills black with green reflections;" but this is evidently an error that he inadvertently made, because, lower down the page, he compares the present species with the *I. æthiopica* (as *I. religiosa*), and states they differ in the colour of their quills, the present species having the "apical portion hardly blackish, whilst in *I. religiosa* they are greenish-black." He might have said that the *I. melanocephala* when fully adult had the quills pure white.

Blyth states that occasionally the bare neck of this species is coloured behind like that of *I. strictipennis* (*I. æthiopica*), as figured by Gould in the 'Birds of Australia;' and also, contrary to what is stated by Mr. Gould, this species differs from *I. æthiopica* and resembles the Australian *I. strictipennis* in having the *long pectoral plumes when in breeding-dress*. The naked portion of the neck is considerably less extended than in *I. æthiopica*.

Head and neck denuded of feathers, skin black, occasionally with reddish bars across the back of neck. Scapulars and tertials with open lengthened barbs, rather thin in substance, and falling over the wing; the colour of these varies in individuals from a pearly white to almost a black shade. Rest of plumage and wings pure white. In the breeding-season the lower feathers of neck in front are much lengthened. Bill black; feet black. Total length about 29 inches; wings 14 inches; tail 5 inches; bill along culmen  $6\frac{3}{4}$  to  $7\frac{1}{2}$  inches; tarsi 4 inches.

*Young*.—The head and neck covered with short feathers, at first dark brown, then white; and the lengthened scapulars are absent.

#### 4. THAUMATIBIS GIGANTEA.

*Ibis gigantea*, Oustalet, Bull. Soc. Philomat. (1877) sér. 7, tom. i. p. 25.

*Hab.* Cochin China.

This fine species was sent to the Paris Museum by M. Harmond from Cochin China. There was only one skin, and that of a bird not in adult plumage. It is remarkable for its great size, approaching to that of the species of *Tantalus*. In fact it is a bird with the body of a *Tantalus* and the bill, legs, and feet of an *Ibis*. It is difficult to tell by the present specimen what would be the colours of the adult plumage; but the wing would apparently be for the greater part a silvery grey. It forms a seeming link between the genera *Tantalus* and *Ibis*; and as it obviously cannot be placed in any existing genus, I propose for it the term *Thaumatibis*, with the following characters:—

Head large, skull almost square on top, which, together with the

neck, is bare. Body large, heavy. Wings reaching to near the end of the tail. Bill curved; nostrils basal, placed in a groove. Middle toe three fourths the length of tarsus; outer toe longer than inner.

Head and upper part of neck bare, crossed on the back of neck by numerous black bars. Lower part of neck covered with short dark greenish feathers edged with grey. Back dark brown glossed with green. Scapulars dark brown, webs disunited. Secondaries, tertials, and greater wing-coverts silvery grey, blackish brown along the shaft of the feathers, and tipped with the same. Primaries brownish black. Underparts dark greyish brown in the central portion of breast, dark green on the flanks. Tail and under tail-coverts dark green. Bill dull red. Feet and legs Indian red.

Total length 42 inches; wing  $21\frac{1}{2}$  inches, tail 11, bill along culmen  $9\frac{1}{2}$ , tarsus  $4\frac{1}{2}$ , middle toe  $3\frac{1}{4}$ , the nail  $\frac{1}{4}$ , hind toe  $1\frac{1}{2}$ .

##### 5. GRAPTOCEPHALUS DAVISONI.

*Geronticus davisoni*, Hume, Str. Feath. vol. iii. (1875) p. 300.

*Ibis davisoni*, Oust. Bull. Soc. Philomat. Paris, 7<sup>me</sup> sér. tom. i. p. 28 (1877).

*Hab.* Pakchan estuary, Tennasserim Provinces (*Davison*); Ajudhja, Siam (*Bocourt*); Sombor, Camboja (*Harmond*).

This fine and very distinct species was first described by Mr. Hume (*l. c.*) from two specimens obtained by his collector, Mr. Davison, on the banks of the Pakchan estuary, in the extreme south of the Tenasserim Provinces. Specimens are in the Museum of Paris, brought at different times by MM. Bocourt and Harmond from Siam and Camboja. As stated by Mr. Hume, in coloration of plumage this species is almost exactly like the *Ibis papillosa*, Temminck, with which it has been confounded, although the wings and tail of the Siamese examples are a deeper blue than is seen in specimens of *I. papillosa*. The chief differences between the species are the entire absence of papillæ or warts upon the back of the head, the anterior portion alone being covered with small brown warts, and the peculiar coloration of the bare skin of the head and neck. This in the *G. davisoni* is black on the top and sides of the head; and (as indicated in the skin, which, when moistened, exhibited the colours) between this and the feathers of the neck is a broad band of rose-colour, which extends upwards onto the back of the head in a triangular shape, the point reaching to the level of the top of the head, where it is strongly tinged with blue. The black of the throat is concave-shaped at bottom, and curves upwards and inwards on the side of the neck, to and above the ears, and then is divided on the back of the head by the red colour mounting upward. Mr. Hume says that in his specimens this part of the throat is encircled by a broad white band, which becomes blue upon the occiput, and makes no mention of any red or rose-colour; nor does he state whether he was furnished by Mr. Davison with the colour of this naked part, as he describes it, or observed it on the skin of the prepared specimens. I do not suppose that there are two species; for one specimen in the Museum has an indication of a white ring on the neck; but I should be inclined to



believe, judging from the examples I have seen, that the Siamese birds, when alive, have very little white on the neck, the indication mentioned above being possibly caused by the rose-colour having entirely faded out. There was, unfortunately, no description of the colours of the naked skin sent with the specimens. The neck and upper part of the body is rufous brown, glossed with greenish bronze. Upper tail-coverts dark blue with green reflections on the edges of the webs. Scapulars like the back, some of the feathers having the webs disunited and open. Primaries and wings very deep rich Prussian blue, the lesser coverts white. Tail Prussian blue, with a green gloss on the edge of the feathers. Underparts rufous-brown, glossed with green. Under tail-coverts green, with a blue tinge. Bill, according to Hume, "very dark plumbeous, blue at base, shading to a dull ochraceous clay colour towards the tips." In the specimens before me it is apparently dark green, lightest at the tip. Legs and feet coral red. Hume gives the irides as "bright orange." Total length 33 inches; wing  $16\frac{1}{2}$ , tail 8, bill along culmen  $6\frac{1}{2}$ , tarsus 3 inches. Another specimen, also brought by M. Harmond from Camboja, measures as follows:—total length 37 inches; wing  $16\frac{1}{2}$ , tail 9, bill along culmen  $7\frac{3}{4}$ , tarsus  $3\frac{1}{4}$  inches. It appears to be a larger and stouter species than the *I. papillosus*. The sexes unfortunately are not indicated in any of the specimens. There are such trenchant differences exhibited by this species from all others of this group of birds, especially in the shape of its skull, which resembles somewhat of that its gigantic relative the *Thaumatibis gigantea*, that it would seem to be entitled to a separate generic rank, and I therefore propose to call it

#### GRAPTOCEPHALUS,

with the following characters:—

Head and neck bare, covered by a variously coloured skin. Skull square-shaped on top; occipital region high and wide, sloping to the forehead, which is prominent and descends rapidly to the maxilla. Secondaries are equal in length to the primaries, and both reach nearly to the tips of the rectrices. Second and third primaries equal and longest. Tarsus half an inch longer than the middle toe; outer toe slightly longer than inner. Tarsi covered with small hexagonal scales. Under tail-coverts extending over two thirds the length of the tail.

I could not remove the skull, and therefore am only able to describe the form as it appears in the skin.

#### 6. CARPHIBIS SPINICOLLIS.

*Ibis spinicollis*, Jameson, Edinb. New Phil. Journ. No. 37, p. 213; Jard. & Selb. Ill. Orn. vol. iv. pl. 17; Schleg. Mus. Pays-B. (1863) livr. 4, p. 12.

*Ibis lamellicollis*, La Fres. Mag. Zool. (1836) p. 1, pl. 57.

*Geronticus spinicollis*, Gray, Gen. Birds (1847) vol. iii. p. 567, sp. 3; Gould, B. Austr. vol. vi. pl. 45; Gray's Hand-l. B. (1871) pt. iii. p. 39.

*Carphibis spinicollis*, Reich. Nov. Syn. Av. (1851) pl. 82.

fig. 1009, 1010; Bon. Consp. Gen. Av. (1857) vol. iii. p. 152; Gould, Handb. B. Austr. (1865) vol. ii. p. 282.

*Ibis strictipennis*, Straw-throated Ibis, d'Alberris (quoted by Sclater), *Ibis* (1876) p. 361.

*Hab.* Australia. New Guinea.

This bird is peculiar among the members of this family in possessing the curious straw-coloured spines at the base of the neck in front, as though they were the stiffened shafts of feathers denuded of their webs and massed together. Both sexes apparently are thus adorned, though the spines are more slender and shorter in the female. This species is accustomed to congregate in immense flocks, and is seemingly distributed all over Australia; and, under the name of *Ibis strictipennis*, M. d'Alberris states that he saw it flying over him in New Guinea, of which country it is not at all unlikely to be an inhabitant.

Head, throat, and upper part of neck in front bare, skin black. Feathers of neck short, downy, and end in a point at base of occiput. Sides of neck white, back of neck black, this colour gradually lessening in width as it proceeds towards the occiput. Front of neck and breast covered with short stiff straw-coloured spines, which fall over the breast in front. Back and upper part of breast bright bronze-green with rich purple reflections. Secondaries dark purplish brown, with bright purple bronze spots along the edge of outer webs. Shoulders metallic green, succeeded by a patch of metallic blue, the feathers crossed by narrow bars of velvet black. Greater wing-coverts, and outer webs of tertials, purple bronze. Tail and entire underparts pure white. Bill black. Thighs crimson, graduating into blackish brown on the tarsi.

Immature birds have not the spines at all, or only just commencing to show, and the green on the breast is divided by the white of the lower parts, which is extended up to the neck.

Total length 32 inches; wing  $14\frac{1}{4}$ , tail  $6\frac{1}{2}$ , bill along culmen  $6\frac{3}{4}$ , tarsus  $3\frac{1}{2}$  inches.

#### 7. INOCOTIS PAPILLOSUS.

*Ibis papillosa*, Temm. Pl. Col. no. 304; Less. Trait. Orn. (1831) p. 568. sp. 12; Sykes, Proc. Zool. Soc. (1832) p. 162. sp. 190; Burgess, Proc. Zool. Soc. (1857) p. 74; Schleg. Mus. Pays-B. (1863) livr. 4, p. 11.

*Ibis papillata*, Wagl. Syst. Av. (1827) sp. 10; id. Isis (1829) p. 761.

*Inocotis papillosa*, Reich. Nov. Syst. Av. (1851) pl. 140. fig. 533; Bon. Consp. Gen. Av. (1857) vol. iii. p. 153.

*Geronticus papillata*, Wagl. Isis (1832) p. 1232.

*Geronticus papillosus*, Blyth, Cat. B. Mus. Asiat. Soc. (1849) p. 275. no. 1621; Gray, Gen. B. (1849) vol. iii. p. 567; Jerd. B. Ind. (1864) vol. iii. p. 769; Beavan, *Ibis* (1868) p. 400; Gray, Handl. B. (1871) pt. iii. p. 39.

*Hab.* India generally (*Blyth*).

Lieut. Burgess states that in the Deccan this species is much more

common than the Black-headed Ibis (*I. melanocephala*), and frequents open places together with the sandy shores of streams. They go in flocks, and feed chiefly on insects, as the stomach of one which was shot contained only heads, legs, and wing-cases of locusts; that of another was full of large grasshoppers and a lizard, while a third contained the chrysalides of butterflies. This bird roosts in trees, and breeds in the months of February, March, April, May, and June, and lays three or four pale bluish-white eggs, slightly streaked and spotted with brown,  $2\frac{4}{16}$  in. in length by  $1\frac{7}{10}$  in. in width. Captain Beavan procured it in the Maunbhoom district at Makun, near Ambekanugger, and also saw it at Julpigoorie, where it was deemed very fair eating, and therefore often shot.

Head and throat nude, skin black. A triangular patch of bright red papillæ on the back of the head, reaching above the eyes. Neck and upper parts fuscous brown, with a bronze-green gloss on the back. Wings shining steel-blue. A conspicuous white patch on the inner lesser coverts. Tail steel-blue, not so dark as the wings, with green reflections. Lower parts fuscous brown, under tail-coverts bronze-green. Bill greenish lead-colour; iris dull orange-red; legs and feet brick-red. Total length 30 inches; wing 18, tail 8, bill along culmen  $6\frac{1}{2}$ , tarsus 3.

#### 8. COMATIBIS COMATA.

*Ibis (Geronticus) comata*, Rüpp. Syst. Uebers. (1845) t. 45; Blanf. Zool. Abyss. (1870) p. 436. sp. 278.

*Geronticus comatus*, G. R. Gray, Gen. B. (1847) vol. iii. p. 567. sp. 13; Heugl. Syst. Uebers. Vög. Nordost-Afr. (1855) p. 313. sp. 636; Tristr. Ibis (1860) p. 78. sp. 127; Gray Hand-l. (1871) pt. iii. p. 40.

*Comatibis comata*, Reich. Nov. Syn. Av. (1851) pl. 291. figs. 2383, 2384; Bon. Consp. Gen. Av. (1857) vol. iii. p. 153.

*Ibis comata*, Schleg. Mus. Pays.-B. (1863) livr. 4, p. 9; Heugl. Ornith. Nordost-Afr. (1873) Band ii. Abth. 2, p. 1144.

*Hab.* North-east Africa, Abyssinia, Algeria.

The Rev. H. B. Tristram met with this species in Algeria beyond Bou Guizoun, on the road to El Aghouat. It appeared to prefer arid mountain-ranges, and consorted with the Raven and Falcon. Its food consisted of lizards and serpents; and it breeds in inaccessible holes of precipices. A coarse egg of a deep blue colour, about the size of that of a common Heron, was shown to him as belonging to this species. It did not appear to be gregarious. The legs and feet are peculiarly coarse and rough, adapted rather for rocks and sand than mud and water. According to Blanford this species did not seem to be common in Abyssinia on the route traversed by him, as he only met with it twice, once near Senafé, and again a large flock near Antale. Von Heuglin met with it in winter on the coast of Abyssinia, and in February in large flocks on the high plains of Woggara, together with the *Bostrychia carunculata*. It seems to breed there.

Top, sides of head, and upper part of throat bare of feathers;

skin brilliant crimson. Back of head and neck covered with long loose feathers, dark purple with green reflections. Back, wings, and tail dark greenish-bronze with a large patch of red bronze upon the shoulder. Primaries dark green. Entire underparts very dark greenish-bronze, almost black. Legs and feet bright red. Bill crimson. Total length 29 inches; wing 16, tail 8, bill along culmen 5, tarsus 3.

The young has all the face covered with dirty-white feathers, changing to slate-grey upon the lower part of the neck.

#### 9. GERONTICUS CALVUS.

*Courly à tête nue du Cap de bonne Espérance*, Buff. Pl. Enl. no. 867.

*Tantalus calvus*, Bodd. Tabl. Pl. Enl. d. D'Aub. (1783) p. 52; Lath. Ind. Ornith. (1790). vol. ii. p. 708. sp. 17.

*Black Ibis*, Lath. Gen. Syn. (1783) vol. iii. p. 112. sp. 11.

*Bald Ibis*, Lath. Gen. Syn. (1783) vol. iii. p. 116. sp. 16.

*Tantalus niger*, Gmel. Syst. Nat. (1788) p. 650. sp. 14; Lath. Ind. Orn. (1790) vol. ii. p. 707. sp. 13; Vieill. Nouv. Dict. Hist. Nat. (1817) vol. xvi. p. 21.

*Ibis calva*, Vieill. Nouv. Dict. Hist. Nat. (1817) vol. xvi. p. 23; id. Ency. Méth. (1823) tom. iii. p. 1150; Wagl. Syst. Av. (1827) sp. 11; id. Isis (1829) p. 761; Schleg. Mus. P.-Bas (1863) livr. 4, p. 11.

*Ibis gonocephala*, Wagl. Isis (1829), p. 761.

*Geronticus calvus*, Wagl. Isis (1832) p. 1232; Gray, Gen. Birds (1849) vol. iii. p. 567. sp. 2; Bon. Consp. Gen. Av. (1857) vol. iii. p. 153; Gurney, Ibis (1860) p. 219. sp. 116; Layard, B. S. Afr. (1867) p. 321. sp. 606; Gray, Hand-l. B. (1871) pt. iii. p. 39; Gurney, B. Damara L. (1872) p. 297.

*Hab.* South Africa (*Layard*), Orange River, Damara Land (*Andersson*).

This species was named by Boddaert (*l. c.*) *Tantalus calvus*. It is true that Forster in his 'Descriptiones Animalium' gave the name of *capensis* to the same bird; but as this does not appear to have been published by the author, and was unrecognized until Lichtenstein issued his edition in 1844, Forster's name will of course sink into a synonym.

According to Mr. Ayres this species feeds entirely on insects, chiefly beetles. They frequent the land from which the grass has been burnt, and are very wary, being constantly on the move all day. Although living inland, during the winter months they approach within ten miles of the coast. Steedman states that this Ibis nests in companies in the clefts of the sides of precipices. In this respect it resembles the *G. comatus*. Layard says that the Bald Ibis, known to the Dutch colonists as the *Wilde Kalkoen* (wild Turkey), is not rare on the eastern frontier, but not often found on the western. He understood that it was a very foul feeder, frequenting the vicinity of villages and acting the part of a scavenger. One that Sir George Grey had in captivity walked very rapidly, and was always occupied in

seeking for food, probing the ground with its bill, and drawing out the earth-worms, which it swallowed at a gulp. Mr. Vigne shot this species at Tygerhoek, near Caledon, on the river Zouder End.

Layard says that the bare portion of the neck is of a deep *red colour*, while Mr. Ayres, as quoted by Gurney (*Ibis*, 1860, p. 209), states that this part is *greenish white*, the top of the head only being bright red. From the dried skin it is difficult to ascertain which is correct; but I have followed Mr. Ayres, thinking that perhaps his opportunities of examining the bird in the flesh have been greater than those of Mr. Layard.

Top of the head bare, bright red; neck and throat in front denuded of feathers, skin greenish white. Entire plumage rich bronze-green, with the exception of a large patch upon the shoulders of a reddish bronze, violet in certain lights. Legs and feet red. Bill red. Total length 32 inches; wing 16, tail  $9\frac{1}{2}$ , bill along culmen 6, tarsus  $2\frac{3}{4}$ .

#### 10. PHIMOSUS INFUSCATUS.

*Curucán afeytado*, Azara, *Apunt. Hist. Nat. Parag.* (1802-5), no. 365, p. 201.

*Ibis infuscata*, Licht. *Doubl.* (1823) p. 75; Schleg. *Mus. P.-Bas* (1863) livr. 4, p. 8; Wyatt, *Ibis* (1871) p. 384.

*Ibis nudifrons*, Spix, *Av. Bras.* t. 86 (1825); *Wagl. Syst. Av.* (1827) sp. 6; Less. *Trait. Orn.* (1831) p. 567.

*Phimosus infuscatus*, *Wagl. Isis* (1832) p. 1232; *Bon. Consp. Gen. Av.* (1857) vol. iii. p. 156; *Sclat. & Salv. Nomen. Av. Neotr.* (1873) p. 127.

*Geronticus infuscatus*, Gray, *Gen. Birds* (1849) vol. iii. p. 566. sp. 16; *id. Hand-l. Birds* (1871) pt. iii. p. 41.

*Hab.* South America, from Columbia to the Argentine Republic.

The present bird was first described by Lichtenstein (*l. c.*). The manner in which the fore part of the head and the throat are denuded of feathers, as well as its small size, make it easily distinguishable from its relatives. Its range is quite extensive, as it is an inhabitant of South America, from Columbia to the Argentine Republic. There is no difficulty with the synonymy, as but one additional name seems to have been given it, *viz. nudifrons* of Spix.

Fore part and sides of head, and throat, red. Plumage of body dark-green bronze glossed with purple. Secondaries, primaries, and rectrices bright bronze green. Bill, legs, and feet red.

Total length 24 inches; wing  $11\frac{1}{2}$ , tail 6, bill along culmen  $5\frac{1}{4}$ , tarsus  $2\frac{1}{4}$ .

#### 11. NIPPONIA NIPPON.

*Ibis nippon*, Temm. *Pl. Col.* (1835) no. 551; Schleg. *Faun. Jap.* t. 71; *id. Handl. Dierk.* t. vii. p. 84; *id. Mus. Pays-Bas* (1863) livr. 4, p. 9; Blakiston, *Ibis* (1862) p. 331; Swinh. *Proc. Zool. Soc.* (1863) p. 318. sp. 321; *id. Ibis* (1863) p. 416, (1873) p. 249, (1875) p. 455; David, *Nouv. Archiv. Mus. Paris* (1867) *Bull.* p. 39;

Von Homeyer, Journ. für Ornith. (1870) p. 427; Taczan. Journ. für Orn. (1875) pp. 256-8.

*Nipponia temmincki*, Reich. Syn. Av. pl. 141. fig. 538.

*Nipponia nippon*, Bon. Consp. Gen. Av. (1857) ii. p. 152.

*Ibis (Geronticus) nippon*, Radde, Reise im Süd. v. Ost-Sib. (1863) p. 341.

*Geronticus nippon*, Gray, Hand-l. B. (1871) pt. iii. p. 40. sp. 10232.

*Ibis sinensis*, David, Compt. Rend. (1872) p. 64; Oust. Bull. Nouv. Archiv. Mus. Paris (1872) p. 129, pl. 6.

*Hab.* Japan; China, near Shanghai; Ningpo, North Formosa (*Swinhoe*); Siberia (*Radde*).

Swinhoe, who saw this species in Formosa, says that they are not regular in their visits to that island; but he has frequently observed about the end of April some half dozen of these birds on the river-shoals at Tamsuy. They did not seem to breed in Formosa. The birds of the year were a smoke-grey, deep on the head and neck, and nearly white on the wings and underparts. He also met with them at Ningpo, and gives in 'The Ibis' a full account of the species from his observations of it while there. On December 31st, 1872, a pair flew over him; and the male, perched in a lofty pine, kept throwing his head forward and uttering his love-note of *now, now* in a loud hoarse voice. In April they commenced putting on their dark breeding-feathers. On the 10th of June a live bird of the year, in grey plumage, was brought to him. It was very tame, refused fish, but eat raw beef. The cheeks and over the eye were covered with downy feathers; but the rest of the face was bare, and orange-yellow in colour instead of red. Irides light yellowish brown; legs and feet light brown, with a tinge of orange-flesh-colour. It had a full occipital crest, and delighted to expand it. On the 23rd of August he saw large parties of this Ibis on a lake, white birds and dusky ones in company. He visited the same lake again on November 18th, and saw large flocks of these birds; but then they were all white and rose-coloured, no grey ones among them. The lake-dwellers call them *Houy (red) le*. A large party of Ibis settled near him in the muddy water, where it was up to their tarsal knees. After remaining still for a few moments they advanced, jerking their bills about in every direction under water. They probably felt their prey, and every thing caught was thrown into the throat by a few nods of the head. Their captures were small fishes, as was ascertained by dissection. When tired or satisfied each one flew to a ridge of earth near by, stretched himself, yawned, preened his feathers a little, and, sinking to the usual contracted position, remained quite still. When approached they sprang at once into the air from their crouching attitude, their wings glowing as if under a rising or setting sun, their bills chattering and uttering a *gaw*-like murmur, mingled with guttural cries like *gok, gok*. They fly steadily, the legs stretched out behind, reaching just beyond the tail, the head full forward, the bill and forehead looking black. The Rosy Ibis breeds in company, but often in pairs by themselves, and have eggs in January,

when the ground is frozen and often covered with snow. The young are fully fledged and have the appearance of adult birds by April. They retain their grey plumage throughout the summer, and moult about October.

In a male of the year the proventriculus was granulated beneath the outer surface,  $1\frac{3}{4}$  inch long,  $\cdot 9$  at broadest; stomach of an irregular oval, with strong lateral tendons and gummy adnate epithelium,  $2\frac{3}{4}$  inches long by  $2\frac{1}{4}$  broad, full of half-digested little fish and a few small shrimps; intestine white,  $\cdot 2$ – $\cdot 4$  thick, about 6 feet long, with cæca 3 inches from the anus, the right one about  $\cdot 4$  long, the left little more than a pimple; testes small and bluish black, the left twice the size of the right. The flesh cooked was coarse and fishy. An adult male had testes much larger, unequal in size, and ochraceous yellow. The whole of the flesh, fat, cartilage, and bone was saturated with the vermilion tint that appears on the wings and soft external parts of the birds. The trachea was  $6\frac{1}{2}$  inches, consisting of a series of rings close together, broad on one side, narrow on the other, until just before reaching the bronchi, when four or five uniform rings occur ending in a projecting semicircle of bone as thick as two of the broad parts of the upper rings; below this two crescentic bony ridges commenced the short bronchi. The trachea averages  $\cdot 5$  inch in breadth, becoming narrower towards its end. The tongue is short,  $\cdot 6$  inch, triangular, with a concave papillose base; the hyoids thick and curved, the first joint  $1\cdot 4$  inch, the second  $\cdot 8$  long. The eggs measure from 2 inches in length by  $1\cdot 25$  in breadth to  $2\cdot 6$  by  $1\cdot 6$ . They were pale bluish green in colour, and had a rough surface.

I have examined the specimens obtained by Père David at Choléang, Province of Tchakiang, and named by him (*l. c.*) *Ibis sinensis*; and I agree with M. Oustalet (*l. c.*) that they are only the young of the present species,—young of the year, which have not altogether assumed the adult dress, the grey or plumbeous colour still lingering upon the upper portions of the wings, mantle, and neck.

The plumage of the adult is a beautiful rosy white. The shafts of the feathers of the wings and tail are pale vermilion, and the webs rose-colour. A long pendent open crest flows from the back of the head; top of head and face bare of feathers; skin bright red; bill black, its tip vermilion; legs and feet Indian-red; iris vermilion. Total length 31 inches; wings  $16\frac{1}{2}$ , tail  $6\frac{1}{2}$ , bill along culmen  $6\frac{1}{2}$ , tarsus  $3\frac{1}{2}$ .

*Young*.—Cheeks and over the eyes covered with downy feathers, rest of face bare, orange-yellow; general plumage dusky cream-colour, glossed with rose-colour; primaries blackish brown; legs and feet light brown; irides light yellowish brown.

## 12. CERCIBIS OXYCERCA.

*Ibis oxycerca*, Spix, Av. Brasil. (1825) pl. 87, p. 69.

*Cercibis oxycercus*, Wagl. Isis (1832) p. 1232.

*Hab.* Brazil, river Amazons, westward to Bogota.

This is a scarce species in collections, and was first described by

Spix (*l. c.*) from Brazil. A specimen in Messrs. Salvin and Godman's collection, obtained in the vicinity of Bogota, would seem to show that it ranged nearly across the continent. It is a bird of rather dull plumage, having but little of the metallic coloration which renders many of the species of this group so beautiful. I have not been able to learn any thing regarding the economy or habits of the species.

Sides of head, including the eye and throat, bare of feathers, skin red; general plumage very dark olive-green, with purple reflections on the neck; wings dark olive-green, primaries dark rufous brown, secondaries dark purple; tail dark grass-green, with blue reflections. Total length, without bill, 27 inches; wing 16, tail  $11\frac{1}{2}$ , bill along culmen  $6\frac{1}{2}$ , tarsus  $2\frac{1}{2}$ .

### 13. *THERISTICUS CAUDATUS.*

*Courly à col blanc de Cayenne*, Buff. Pl. Enl. no. 976.

*Scolopax caudatus*, Bodd. Tabl. Pl. Enl. Daub. (1783) p. 57.

*Black-faced Ibis*, Lath. Gen. Syn. (1783) vol. iii. p. 108, pl. 79.

*White-necked Ibis*, Lath. Gen. Syn. (1783) vol. iii. p. 109. sp. 6.

*Tantalus melanopsis*, Gmel. Syst. Nat. (1788) p. 653. sp. 19; Lath. Ind. Orn. (1790) vol. ii. p. 704. sp. 8.

*Tantalus albicollis*, Gmel. Syst. Nat. (1788) vol. i. p. 652, sp. 20, juv.; Lath. Ind. Orn. (1790) p. 904. sp. 6; Vieill. Enc. Méth. (1823) tom. iii. p. 1146.

*Mandurrea ó curucáu*, Azara, Apunt. Hist. Nat. Parag. iii. p. 189. sp. 5.

*Ibis albicollis*, Vieill. Nouv. Dict. Hist. Nat. (1819) vol. xvi. p. 17, juv.; Less. Trait. Orn. (1831) p. 567, sp. 7.

*Ibis melanopsis*, Vieill. Nouv. Dict. Hist. Nat. (1819) vol. xvi. p. 20; *id.* Ency. Méth. (1823) tom. iii. p. 1148; Wagl. Syst. Av. (1827) sp. 17; Darw. Voy. Beag. vol. iii. p. 128; Schleg. Mus. Pays-Bas (1863) livr. 4, p. 7; Sclat. & Salv. Proc. Zool. Soc. (1869) p. 600; Hudson, Proc. Zool. Soc. (1872) p. 549.

*Theristicus melanopsis*, Wagl. Isis (1832) p. 1232; Bon. Consp. Gen. Av. (1857) vol. iii. p. 155; Cunningh. Ibis (1868) p. 126; Newton, Ibis (1870) p. 502; *id.* Proc. Zool. Soc. (1870), p. 56, pl. iv. fig. 8 (egg); Taczan. Proc. Zool. Soc. (1874) p. 562.

*Theristicus melanops*, Fraser, Proc. Zool. Soc. (1843) p. 117.

*Theristicus albicollis*, Bon. Consp. Gen. Av. (1857) vol. iii. p. 154. sp. 2.

*Vanduria de Inverno*, Hudson, Proc. Zool. Soc. (1871) p. 261.

*Hab.* Chili (*Bridges*); Pitumarca, Peru (*Whitely*); Buenos Ayres (*Hudson*); Rio Negro (*Hudson*); Straits of Magellan (*Cunningham*).

Mr. Hudson states that this bird appears in May in Buenos Ayres, and is very common on the pampas about latitude  $38^{\circ}$ . It frequents dry ground, covered with loose grass or low cardoon bushes, and feeds in flocks of from forty to fifty individuals. They swallow the larvæ of the large horned beetle, quantities of which insect are often found in their stomachs. About sunset they take wing, uttering loud cries,



and seek the nearest watercourse. When flying they frequently make eccentric evolutions, the entire flock descending with great rapidity, each individual wheeling about in a zig-zag course. In this manner they go on for some time, screaming loudly all the while. Their flight is swift and easy, and on the arrival of spring they depart for the south, making their summer resort probably in the northern part of Patagonia. This Ibis was observed, however, in the Straits of Magellan by Dr. Cunningham in various localities during the months of December, January, and February. It was shy and wary, flying in flocks of from four to eight, and had a cry resembling *qua-qua*, *qua-qua*. It was found rather good eating. In a female he procured he found the sternum had a very deep keel, and the scapulæ were broad. The portion of the trachea below the insertion of the sterno-tracheal muscles, though presenting no striking peculiarity of form, had the bony rings ankylosed so as to form an immovable tube. The stomach was crammed with worms and large larvæ. An egg obtained at Elizabeth Island was  $2.71 \times 1.86$ . "Dull surface, of a pale greenish white, with engrained blotches (mostly small) of neutral tint, and some few blotches, spots and specks of deep dull brown; towards the larger end some hair-like streaks of a lighter shade of the same, and so far having an Ibidine or Plataleine character; but at first sight the egg looks as if it might have been laid by an exhausted Gull." This resembles the egg described by Mr. Darwin (*l. c.*).

This species is known generally to ornithologists as *Ibis* (*Theristicus*) *melanopsis*, the name given to it by Gmelin. This, however, is antedated by Boddaert, who conferred upon the *Courly à col blanc de Cayenne* of Buffon (*l. c.*) the appellation *Scolopax! caudatus*, which, having priority over all others, must be the one for the species to bear in future.

Sides of throat, and lores bare, skin black; top of head and lower part of neck in front reddish chestnut; neck white, a narrow line of feathers running up the centre of the throat to the chin; back and wing greyish brown, with green reflections, feathers edged with light brown or whitish; tertials and outer webs of secondaries for two thirds their basal length white, remainder dark green; primaries dark green; rump and upper tail-coverts light bronzy green; tail dark bronze-green; underparts brownish black with green reflections. Total length 33 inches; wing  $16\frac{1}{4}$ , tail  $9\frac{3}{4}$ , bill along culmen 7, tarsus  $3\frac{1}{2}$ .

#### 14. LOPHOTIBIS CRISTATA.

*Le Courlis huppé*, Buff. Plan. Enlum. no. 841.

*Tantalus cristatus*, Bodd. Tabl. Pl. Enl. Daub. (1783) p. 51; Gmel. Syst. Nat. (1788) vol. i. p. 652. sp. 13; Lath. Ind. Orn. (1790) vol. ii. p. 709. sp. 20.

*Ibis cristata*, Vieill. Nouv. Dict. Hist. Nat. (1817) vol. xvii. p. 19; id. Ency. Méth. (1823) tom. iii. p. 1148; Wagl. Syst. Av. (1827) sp. 13; Schleg. Mus. P.-Bas (1863) livr. 4. p. 6; id. Proc. Zool. Soc. (1866) p. 425; Schleg. & Poll. Recher. Faun. Madag. (1868) p. 127.

*Lophotibis cristatus*, Reich. Nov. Syn. Av. (1851) pl. 83. fig. 637; Bon. Consp. Gen. Av. (1857) p. 154.

*Hab.* Madagascar.

This is one of the very handsomest members of this subfamily. It is a native of Madagascar, and has been known to ornithologists for nearly one hundred years. It is too conspicuous a bird, and has too many and striking peculiarities to permit it to be confounded with any of its relatives; consequently its synonymy is simple, no second name having been given to it. Like so many of the *Ibidinæ*, it apparently belongs to a distinct genus, of which it is as yet the only representative.

Head—forehead metallic green; top of head covered with long crest-feathers, white with dark chestnut tips, some of the most lengthened feathers wholly white; a full lengthened metallic green nuchal crest springs from beneath the white ones just mentioned, and is continued by the feathers of the neck of the same colour nearly to the mantle; bare space around the eye bright red; cheeks brownish; chin, throat, and sides of neck blackish brown; back, breast, and underparts reddish chestnut; wing white; scapulars reddish brown; rump dark green, almost black; tail dark blue with green reflections; flanks and thighs bronzy green; bill olive-green?, brownish towards the tip; legs and feet bright red.

Total length 26 inches; wing 14, tail  $7\frac{1}{2}$ , bill along culmen  $5\frac{1}{2}$ , tarsus  $2\frac{3}{4}$ .

#### 15. HAGEDASHIA CHALCOPTEA<sup>1</sup>.

*Tantalus hagedash*, Lath. Ind. Orn. (1790) vol. ii. p. 708. sp. 23.

*Ibis hagedash*, Vieill. Nouv. Dict. Hist. Nat. (1817) vol. xvi. p. 19; id. Ency. Méth. (1823) tom. iii. p. 1147; Wagl. Syst. Av. (1827) sp. 16; id. Isis (1829) p. 760; Less. Trait. Orn. (1831) p. 567. sp. 8; Schleg. Mus. P.-Bas (1863) livr. 4, p. 10; Finsch & Hartl. Vög. Ost-Afr. (1870) p. 735; Heugl. Ornith. Nordost-Afr. (1873) Band ii. Abth. 1, p. 1141.

*Ibis chalcoptera*, Vieill. Nouv. Dict. Hist. Nat. (1817) vol. xvi. p. 9; id. Ency. Méth. (1823) tom. iii. p. 1144; id. Gal. Ois. (1834) pl. 246; Wagl. Syst. Av. (1827) sp. 9.

*Geronticus hagedash*, Gray, Gen. Birds (1849) vol. iii. p. 566. sp. 10; Hartl. Syst. Ornith. West-Afr. (1857) p. 231. sp. 656; Brehm, Jour. für Ornith. (1858) p. 330; Gurney, Ibis (1865) p. 274, (1868) p. 260; Layard B. S. Afr. (1867) p. 320. sp. 605; Gray, Hand-l. B. (1871) pt. iii. p. 40; Bocage, Jour. für Ornith. (1876) p. 300.

*Harpiprion hagedash*, von Heugl. Syst. Uebers. Vög. Nordost-Afr. (1855) p. 313. sp. 635.

*Hagedashia caffrensis*, Bon. Consp. Gen. Av. (1857) vol. iii. p. 152; Gurney, Anders. B. Damar. Land (1872) p. 298.

<sup>1</sup> Bonaparte (*l. c.*) and some others call this species "*caffrensis*, Licht. Cat. Hamb." Not having been able to examine this book, I do not know whether Lichtenstein's name antedates that of Vieillot, or not.

*Hab.* Africa, Gambia, Old Calabar (*Jard.*); Mossambique (*Peters*).

Mr. Ayres states that the Caffer Ibis go in families of from four to twelve individuals. They frequent the dense bush when feeding, and are usually very wary. They feed on beetles and other insects, hunting for them in old gardens and other localities where these are most abundant. Their notes are loud and harsh, and in still weather can be heard for a considerable distance. They generally roost in high trees overhanging the water; and the nest, which is built of coarse sticks and lined with fine grass, is placed upon a bough. It is made just large enough to keep the eggs from rolling out. In the colony of Natal these birds are becoming very scarce, as when properly cooked their flesh is very good, and great numbers are killed. Dr. A. Brehm, who met with this species in Sennaar, gives the following account of it in the 'Journal für Ornithologie,' 1858, p. 330:—"Towards evening he begins to think of his night quarters, which are single trees close to the river, or standing on islands. Here he meets his sacred cousin the 'Insatiable' (*Tantalus ibis*), the Marabu, the Spoonbill, one or other of the Pelicans, and similar company, frequently also a troop of monkeys, with whom he vies in roaring till a late hour of the night. A monkey will sometimes amuse himself by trying to catch the Ibis by his tuft, or by otherwise annoying him; then, indeed, he can be heard to roar! He rises, shrieks as if he were spitted, circles round the tree several times, and again sweeps back to his place, when the monkey is perhaps mischievous enough once more to disturb his bedfellow, and the old row begins afresh, although the patriarch of the monkey-herd has several times, with his deep gurgling tones, admonished the offenders to keep the peace."

As this species does not apparently agree with any of the other genera, I have retained for it Bonaparte's term *Hagedashia*; and since the name *chalcoptera* was bestowed upon the species by Vieillot in 1817, that will of necessity become the specific title to be employed.

Top of head, neck, and entire underparts very light brown, feathers edged with white; cheeks and throat dark greyish brown, with a white line beneath and behind the brown on the cheeks, and a naked space upon the lower margin of mandible; upper parts and scapulars yellowish bronzy green; wings pale metallic green, changing to a rose-colour in certain lights; secondaries dark blue; tertiaries deep blue, their outer webs yellowish bronze, forming a bar beneath the light green across the wings when closed; primaries dark purple-brown; bill black, ridge towards the base crimson; legs and feet dull red.

Total length 26 inches; wing 15, tail  $6\frac{3}{4}$ , bill along culmen  $4\frac{3}{4}$ , tarsus  $2\frac{1}{2}$ .

#### 16. *BOSTRYCHIA CARUNCULATA.*

*Ibis carunculatus*, Rüpp. Faun. Abyss. t. xix. (1835); Heugl, Ornith. Nordost-Afr. (1873) Band ii. Abth. 1, p. 1139.

*Geronticus carunculatus*, G. R. Gray, Gen. Birds (1847) vol. iii. p. 567. sp. 11; id. Hand-l. B. (1871) pt. iii. p. 40.

*Bostrychia carunculata*, Reich. Nov. Syn. Av. (1851) pl. 83. fig. 1011; Bon. Con. Gen. Av. (1857) vol. iii. p. 152.

*Harpiprion carunculatus*, Von Heugl. Syst. Übers. Vög. Nordost-Afr. (1855) p. 313. sp. 634.

*Ibis (Harpiprion) carunculata*, Blanf. Zool. Abyss. (1870) p. 437. sp. 276.

*Hab.* Abyssinia.

This species is very abundant, according to Blanford (*l. c.*), throughout the higher portions of the highlands of Abyssinia traversed by him. It was common at Senafé, in the swamps and meadows bordering the lake at Ashangi, and especially on the Wadela and Dalanta plateaux. It is met with either solitary or in small flocks, keeps to open meadows or cultivated fields, and feeds on snails, caterpillars, beetles, locusts, &c. Its voice is harsh; but it seldom utters its cry.

This bird is remarkable for the long wattle that hangs down from the lower part of the throat, and is the only member of this group possessing such a peculiar character. It is the type of Reichenbach's genus *Bostrychia*.

Head, crest, and neck dark brown, the feathers edged with greyish white; back dark brown, with a slight greenish gloss, feathers edged with light brown; back and upper tail-coverts pale green-bronze; wings and scapulars greenish bronze, darker than the rump, with reddish reflections; secondaries dark green bronze, edges of outer webs with purple reflections; great coverts white along the shoulder; those below brownish black, bordered with white; primaries dark bronze-green; tail dark bronze-green, the feathers with purple reflections on their edges; underparts dark olive-brown with green reflections, feathers tipped with greyish white; under tail-coverts very long, extending two thirds the length of the rectrices, dark green with a purple gloss; bill dull red, a long narrow red wattle hangs from the lower part of the throat, an inch and three quarters in length in its dried state; legs and feet red. Total length 25 inches; wing 14, tail  $7\frac{1}{2}$ , bill along culmen  $4\frac{1}{4}$ , tarsus  $2\frac{1}{4}$ .

#### 17. HARPIPRION CAYANENSIS.

*Courly vert de Cayenne*, Buff. Pl. Enlum. no. 820.

*Cayenne Ibis*, Lath. Gen. Syn. vol. iii. p. 107. sp. 3.

*Tantalus cayanensis*, Gmel. Syst. Nat. (1788) vol. i. p. 652. sp. 17; Lath. Ind. Orn. (1790) vol. ii. p. 704. sp. 3; Less. Trait. Orn. (1831) p. 567. sp. 2.

*Ibis sylvatica*, Vieill. Nouv. Dict. Hist. Nat. (1817) vol. xvi. p. 16; id. Ency. Méth. tom. iii. p. 1146 (1823).

*Ibis dentirostris*, Wagl. Syst. Av. (1827) sp. 7.

*Harpiprion cayanensis*, Wagl. Isis (1832) p. 1232; Fraser, Proc. Zool. Soc. (1843) p. 117; Boie, Consp. Gen. Av. (1857) vol. ii. p. 155; Sclat. & Salv. Nomencl. Av. Neot. (1873) p. 127.

? *Ibis cayanensis*, Schleg. Mus. Pays-Bas, liv. iv. p. 8.

? *Geronticus cayanensis*, Gray, Gen. Birds (1847) vol. iii. p. 567; id. Hand-l. B. (1871) pt. iii. p. 40.

*Hab.* From Panama, through Northern South America to Brazil.

Top and sides of head and throat blackish brown, with a purple tinge; narrow line on forehead and lores bare, skin black; back and sides of neck dark metallic green; back and wings dark bronzy green, with red reflections in certain lights; tail dark green, with blue reflections; primaries deep blue; entire underparts dark bronze-green; bill dark green for two thirds its length from base, pale green for the remainder; legs and feet lead-colour. Total length  $22\frac{1}{2}$  inches; wing 13, tail  $7\frac{1}{4}$ , bill  $5\frac{1}{2}$ , tarsus  $2\frac{1}{2}$ .

#### 18. MOLYBDOPHANES CÆRULESCENS.

*Curucáu aplomado*, Azara Apunt. Hist. Nat. Parag. y Rio Plata (1802-5) iii. p. 195, no. 363.

*Ibis cærulescens*, Vieill. Nouv. Dict. Hist. Nat. (1817) vol. xvi. p. 18; id. Ency. Méth. (1823) tom. iii. p. 1147; Schleg. Mus. P.-Bas (1863) livr. 4, p. 9; Sclat. & Salv. Proc. Zool. Soc. (1869) p. 635.

*Ibis plumbea*, Temm. Pl. Col. 235; Wagl. Syst. Av. (1827) sp. 14; Less. Trait. Orn. (1831) p. 567.

*Harpiprion plumbeus*, Wagl. Isis (1832) p. 1232.

*Geronticus cærulescens*, Gray, Gen. Birds (1847) vol. iii. p. 567. sp. 9; id. Hand-l. B. (1871) pt. iii. p. 40.

*Molybdophanes cærulescens*, Reich. Nov. Syn. Av. pl. 291. figs. 2383-84 (1851); Bon. Consp. Gen. Av. (1857) vol. ii. p. 154.

*Harpiprion cærulescens*, Sclat. & Salv. Nomencl. Av. Neotr. (1873) p. 127.

*Hab.* Brazil, Conchitas; Argentine Republic (*Hudson*).

This species, the *Curucáu aplomado* of Azara, was described by Vieillot (*l.c.*), and afterwards figured by Temminck under a different name in his 'Planches Coloriées.' It is the type of Reichenbach's genus *Molybdophanes*, and is restricted apparently to Brazil, south of the Amazons, and to the Argentine Republic, where, however, it is not uncommon.

A white bar commences above and behind the eye and covers the forehead. A white line at the base of the mandible. Top of head and lengthened nuchal crest dark brown, with a slight greenish tinge. Throat and neck covered with long narrow feathers, light brown, in certain lights having a pinkish tinge. Upper parts pale bronzy green. Wings like the back; in some lights the feathers have a silvery gloss. Primaries deep blue, greenish towards the edges of the outer webs. Tail dark green. Entire underparts brownish grey, with light pink reflections in certain lights. Bill and bare space in front of the eye black. Legs and feet yellow in the skin.

Total length 33 inches; wings  $15\frac{1}{2}$ , tail  $7\frac{1}{2}$ , bill along culmen  $6\frac{1}{2}$ , tarsus  $3\frac{1}{2}$ .

#### 19. FALCINELLUS IGNEUS.

*Tantalus falcinellus*, Linn. Syst. Nat. (1766) p. 241. sp. 2;

Gmel. Syst. Nat. (1788) p. 648. sp. 2; Lath. Ind. Orn. (1790) vol. ii. p. 707. sp. 14.

? *Grey Ibis*, Lath. Gen. Syn. (1783) vol. iii. p. 3. sp. 7.

*Green Ibis*, Lath. Gen. Syn. (1783) vol. iii. p. 114. sp. 13.

*Glossy Ibis*, Lath. Gen. Syn. (1783) vol. iii. p. 115. sp. 14.

*Bay Ibis*, Lath. Gen. Syn. (1783) vol. iii. p. 113. sp. 12.

*Courlis d'Italie*, Buff. Planch. Enl. no. 819.

*Tantalus igneus*, Gmel. Syst. Nat. (1788) p. 649. sp. 9; Lath. Ind. Orn. (1790) vol. ii. p. 708. sp. 16.

? *Tantalus griseus*, Gmel. Syst. Nat. (1788) p. 653. sp. 21.

*Tantalus viridis*, Gmel. Syst. Nat. (1788) p. 648, sp. 8; Lath. Ind. Orn. (1790) vol. ii. p. 707. sp. 15.

*Tantalus niger*, Gmel. Syst. Nat. (1788) vol. ii. p. 650. sp. 14.

*Tantalus mexicanus*, Gmel. Syst. Nat. (1788) p. 652. sp. 18, juv.; Lath. Ind. Orn. (1790) p. 704. sp. 4; Ord, Journ. Acad. Nat. Scien. Phil. (1817) vol. i. p. 53.

*Numenius falcinellus*, Pall. Zoog. Rosso-Asiat. (1811) vol. ii. p. 165.

*Ibis sacra*, Temm. Man. Ornith. (1815) p. 385.

*Ibis falcinellus*, Vieill. Nouv. Dict. Hist. Nat. (1817) vol. xvi. p. 23; Temm. Man. Orn. (1820) vol. ii. p. 598, vol. iv. p. 389; Vieill. Ency. Méth. (1823) tom. iii. p. 1143; Wagl. Syst. Av. (1827); Cuv. Règn. Anim. (1829) p. 520; Less. Trait. Orn. (1831) p. 566. sp. 1; Sykes, Proc. Zool. Soc. (1832) p. 162; Nuttall, Orn. U. S. (1834) vol. ii. p. 88; Bon. Comp. List (1838) p. 49. sp. 340; Vigne, Proc. Zool. Soc. (1841) p. 7; Aud. B. Amer. 8vo ed. (1842) vol. vi. p. 50, pl. 358; id. Orn. Biog. vol. iv. p. 608; Savig. Desc. Egypt. Zool. Text, vol. iii. p. 401, Atl. pl. 7. fig. 2; Gray, Gen. Birds (1849) vol. iii. p. 566; MacGill. Brit. Birds (1852) vol. i. p. 493; Hartl. Syst. Ornith. W. Afr. (1857) p. 230. sp. 655; Schleg. Mus. Pays-B. livr. iv. p. 2; Kirk, Ibis (1864) p. 334; David, Nouv. Archiv. Mus. Paris (1867) p. 39; Layard, B. S. Afr. (1867) p. 319. sp. 603; Schleg. & Poll. Rech. Faun. Madag. (1868) p. 128; Von Drost, Journ. für Orn. (1869) p. 342; Hudson, Proc. Zool. Soc. (1870) p. 799; Von Pelz. Reis. Nov. Vög. pp. 125-127; Finsch & Hartl. Vög. Ost-Afr. (1870) p. 730; Gray, Hand-l. B. (1871) pt. iii. p. 39; Gund. Jour. für Orn. (1871) p. 283; Swinh. Proc. Zool. Soc. (1871) p. 411; Shelley, B. Egypt (1872) p. 262; Heugl. Ornith. Nordost-Afr. (1873) Band ii. Abth. 1, p. 1132; Severtz. Jour. für Orn. (1873) p. 385; Ridgw. Am. Nat. (1874) p. 110; Heugl. Jour. für Orn. (1874) p. 400; Ridgw. Ann. N. Y. Lyc. Nat. Hist. (1874) p. 386; Danf. & Brown, Ibis (1875) p. 426.

*Tantalides falcinellus*, Wagl. Isis (1832) p. 1231.

*Tringa autumnalis*, Hasselq. It. Pal. deutsche Ausg. p. 306.

*Ibis noir*, Savig. Hist. Nat. Myth. de l'Ibis, p. 36, fig. 4, juv.

*Ibis erythrorhyncha*, Gould, Proc. Zool. Soc. (1837) p. 127, juv.

*Ibis ordii*, Bon. Comp. List (1838) p. 49; Darw. Voy. Beagle (1841) Aves, p. 129; Baird, B. N. Amer. (1860) p. 685; Sclat. Proc. Zool. Soc. (1864) p. 179; Allen, Proc. Essex Inst. (1864)

vol. iv. p. 86; Lawr. Ann. N.Y. Lyc. Nat. Hist. (1866) p. 292; Turnb. Birds E. Penn. (1869) p. 44.

*Falcinellus igneus*, Gray, Gen. B. 2nd ed. (1841) p. 87; Gould, B. Austr. vol. vi. pl. 47; Blyth, Cat. Birds Mus. Asiat. Soc. (1849) p. 274; Bon. Consp. Gen. Av. (1857) vol. iii. p. 158; Heugl. Syst. Uebers. Vög. Nordost-Afr. (1855) p. 314. sp. 637; Jerd. B. Ind. (1864) vol. iii. p. 770; Gould, Handb. B. Austr. (1865) p. 286; Holds. Proc. Zool. Soc. (1872) p. 479; Sclat. & Salv. Nomen. Av. Neot. p. 126; Bartl. Proc. Zool. Soc. (1875) p. 68; Legge, Ibis (1875) p. 404.

*Plegadis falcinellus*, Kaup, Fr. Vög. Eur. Taf. 43. fig. 3, p. 378; Fritsch, Jour. für Ornith. (1871) p. 370.

*Tantalus bengalensis*, Licht. Bon. Consp. Gen. Av. (1857) vol. ii. p. 158.

*Ibis peregrina*, Müll. Bon. Consp. Gen. Av. (1857) vol. ii. p. 159.

*Eudocimus erythrorhynchus*, Bon. Consp. Gen. Av. (1857) p. 159.

*Falcinellus ordii*, Coues, Proc. Acad. Nat. Scien. Phil. (1866) p. 96; Taczan. Proc. Zool. Soc. (1874) p. 562; Gundl. Jour. für Orn. (1874) p. 313.

*Falcinellus erythrorhynchus*, Gmel. Jour. für Ornith. (1871) p. 285.

*Ibis falcinellus*, var. *ordii*, Coues, Birds N. West (1874) p. 517.

*Eudocimus falcinellus*, Bar. du Bocage, Jour. für Ornith. (1876) p. 300.

*Hab.* Eastern United States, West Indies and Eastern Hemisphere.

There are apparently four species of the so-called Glossy Ibis, so far as our present material enables us to judge, three of which are restricted to the New World, while the fourth, the present species, is an inhabitant of the eastern part of the United States, the West Indies, and is moreover generally distributed throughout the eastern hemisphere. The American *F. igneus* was separated by Bonaparte from the European as *F. ordii*; but there does not seem to be the slightest difference between them, and Bonaparte's name should become a synonym. This bird can be readily distinguished from its relatives when adult by having the top of the head green.

Top of head and sides of face metallic dark green, with purple reflections. Bare space in front of and a little surrounding the eye bluish or slaty blue. Neck, back, and entire underparts dark cinnamon-red, with purple reflections on some of the back feathers. Scapulars and greater wing-coverts metallic purple. Secondaries grass-green, with purple gloss. Primaries dark bronze-green. Rump dark green, glossed with purple. Tail dark green, with purple reflections; undercoverts purple. Bill black, bare skin at base slate-blue; feet and legs blackish. Tarsi scutellated anteriorly transversely, covered behind with hexagonal scales.

Total length 25 inches; wing 12, tail  $4\frac{3}{4}$ , bill along culmen 6, tarsus  $4\frac{1}{4}$ .

## 20. FALCINELLUS GUARAUNA.

?? *Scolopax guaraua*, Linn. Syst. Nat. (1766) p. 242.

*Ibis chalconoptera*, Temm. Pl. Col. no. 511 (1830); Wagl. Syst. Av. (1827) sp. 9; Vieill.

?? *Ibis mexicana*, Vieill. Nouv. Dict. Hist. Nat. (1817) vol. xvi. p. 9; id. Ency. Méth. (1823) p. 1144.

? *Ibis guarana*, Wagl. Syst. Av. (1827) sp. 8 (?); id. Isis (1829), p. 759. sp. 1 (?); Cass. Wilkes, U.S. Exp. Exped. (1858) p. 302; Cabot, Proc. Bost. Soc. Nat. Hist. (1850) vol. 3, p. 313 (in part).

? *Tantalides guarana*, Wagl. Isis (1832) p. 1231.

*Eudocimus guarana*, Bon. Consp. Gen. Av. (1857) vol. ii. p. 159.

?? *Ibis brevirostris*, Peale, Zool. Exped. Birds (1848) p. 219, 1st ed., juv.

*Hab.* Columbia river to Chili and Buenos Ayres.

The *Scolopax guarana* of Linnæus was founded upon the *Guarauna* of Margrave, a name given to a young bird said to have come from Brazil. Although it is impossible to decide with certainty what this bird really was, it is possible that it was the young of the present species, as it is not known that any other species of *Falcinellus* is found in Brazil. It will be best, however, even if a second species of this genus should be ascertained to inhabit Brazil, to retain the name of *guarauna* for the present bird, as otherwise a new name altogether would probably have to be given to it, since the only one which has certainly been applied to it, the *chalconoptera* of Temminck, had already been given previously by Vieillot to an African Ibis. The species has a wide distribution, ranging, according to Ridgway, from Chili and Buenos Ayres to the Columbia river.

A white band, enclosing the eye, passes around the entire base of bill. Head, neck, and underparts purplish chestnut. Back with metallic purple and violet reflections. Wings and tail bright green, varying with bronze and purple in certain lights. Shoulders reddish chestnut. Under tail-coverts have also metallic green and violet reflections. Bill apparently dark red.

## 21. FALCINELLUS RIDGWAYI.

*Falcinellus ridgwayi*, Allen, Bull. Mus. Comp. Zool. Cambr. iii. p. 355 (1876).

*Ibis falcinellus*, Scl. et Salv. P. Z. S. 1869, p. 156.

*Hab.* Lake Titicaca. Peru.

This form, thus far only known from Peru, is closely allied to the previous one, *F. guarana*, but seems not to have the white front on the head. Several specimens are in Messrs. Salvin and Godman's collection, sent by Mr. Whitely from Peru. It is probable that the species has been confounded with the *F. guarana*; for it seems hardly probable that it should be restricted to Peru, as all its relatives wander over such vast extent of country. It is not unlikely that its range will be found to be much greater than is at present supposed.

Head and neck dark chestnut-red, or purplish chestnut. Back dark green, with metallic purple reflexions. Wings metallic grass-green, with bronze and bright purple reflexions. Primaries bright grass-green. Entire underparts dark purple, the under tail-coverts



with green reflexions at their tips. Tail bright metallic grass-green, with rich purple reflexions. Thighs reddish. Bill apparently dark red. Feet and legs black. Total length without bill 17 inches; wing 11, tail 5, bill along culmen  $3\frac{1}{2}$ , tarsus  $2\frac{1}{2}$ .

## 22. FALCINELLUS THALASSINUS.

*Ibis thalassina*, Ridgway, Am. Nat. (1874) p. 110; Allen, Bull. Mus. Comp. Zool. Camb. (1876) p. 356.

*Ibis guarauna*, Baird, B. N. Amer. Atl. pl. 87.

*Hab.* Pacific coast of America from California to Chili (*Ridgway*); Straits of Magellan (*King*).

This seems to be among the very smallest members of this group of birds; it certainly is of the genus to which it belongs. It is readily recognized by the vivid green of the upper parts, and the brown head and neck, these last parts giving the bird the appearance of not being adult. A specimen in Messrs. Salvin and Godman's collection was brought from the Straits of Magellan by Capt. King, thus extending the range beyond that given by Mr. Ridgway, viz. quite to the end of the South-American continent.

Head and neck and underparts dark rufous brown, with some slight greenish reflections upon the flanks. Wings and upper parts and tail brilliant grass-green. Throat and cheeks light-brown, streaked with five white marks. Bare skin between the eye and bill, partly surrounding the former, apparently red. Bill reddish orange. Legs and feet dark red. Total length without bill  $13\frac{1}{2}$  inches; wing 9, tail  $4\frac{1}{4}$ , bill along culmen  $3\frac{1}{4}$ , tarsus 3.

## 23. LAMPTRIBIS OLIVACEA. (Plate LI.)

*Ibis olivacea*, Du Bus, Bullet. Acad. Brux. (1837) p. 105; id. Esquiss. Ornith. pl. 3; Reichenb. J. f. O. (1874) p. 378.

*Hagedashia olivacea*, Bon. Consp. Gen. Av. (1857) vol. ii. p. 153. sp. 2.

*Comatibis olivaceus*, Hartl. Syst. Orn. West-Afr. (1857) p. 231. sp. 657.

*Geronticus olivaceus*, Dohrn, Proc. Zool. Soc. (1866) p. 330. sp. 27.

Native name "Puwahor Aprawariu."

*Hab.* Guinea (*Hartl.*); Prince's Island (*Dohrn*); Denkeria (*Ussher*).

This species is extremely rare; and I know of only three or four specimens, the majority of the museums in Europe not having it represented in their collections. It is very distinct from all other known species, and, like many of its relatives, belongs apparently to a genus different from any yet instituted, and is placed best between the *Falcinellus* and *Eudocimus*. I propose for it the term *Lamptribis*, with the following characters:—

Space around and behind the eye, extending backwards to a point, and entire base of mandibles bare of feathers; the feathers of the throat reaching between the crura of mandible. Culmen on its basal

third extremely compressed laterally and forming a distinct elevated ridge above the maxilla. Nostrils set in a membrane at the base of culmen. Secondaries as long as the primaries, extending three fourths the length of the tail. Middle toe and tarsus of equal length; outer toe longer than inner.

Skin around base of bill, extending backwards and including the eye, denuded of feathers, in the skin jet black. Feathers on top of head dark green, in some lights with a coppery tinge. From the occiput springs a long loose crest, dark metallic grass-green, central part of some of the feathers dark buff. Upper parts bright shining olive-green, coppery in some lights. Neck and entire underparts rich dark buff, every feather edged with dark olive-brown. Wings bright metallic shining grass-green. Primaries and secondaries Prussian blue. Under tail-coverts dark grass-green. Bill bright red. Feet and legs red.

Total length without bill  $16\frac{1}{2}$  inches; wings  $10\frac{1}{2}$ , tail 6, bill along culmen  $4\frac{3}{4}$ , tarsus 2.

Young similar to the adult, but wants the brilliant colouring of the wing, which is a dark green with Prussian-blue primaries and secondaries; and the underparts are dark olive-brown, with an occasional deep buff centre among the feathers.

The specimens\*described are in the collection of my friend Capt. Shelley.

#### 24. EUDOCIMUS ALBUS.

*Tantalus albus*, Linn. Syst. Nat. (1766) p. 242. sp. 6; Gmel. Syst. Nat. (1788) p. 651. sp. 6; Lath. Ind. Orn. (1790) vol. ii. p. 705. sp. 9; Wils. Am. Orn. (1814) vol. viii. pl. 66; Bon. Wils. Am. Orn. (1832) vol. iii. p. 64, pl. lxvi. fig. 3.

*Courly blanc d'Amérique*, Buff. Pl. Enl. no. 915.

*Scolopax alba*, Bodd. Tab. Pl. Enl. Daubent. (1783) p. 55.

*White Ibis*, Lath. Gen. Syn. (1783) vol. iii. p. 3. sp. 9.

*Tantalus albus*, var. *b*, Lath. Ind. Orn. (1790) vol. ii. p. 705.

*Tantalus coco*, Jacquin, Beyt. Gesch. Vög. (1784) p. 13. sp. x.; Gmel. Syst. Nat. (1788) vol. i. p. 652. sp. 15.

*Ibis alba*, Vieill. Nouv. Dict. Hist. Nat. (1817) vol. xvi. p. 16; id. Ency. Méth. tom. iii. p. 1145 (1823); Wagl. Syst. Av. (1827) sp. 5; Less. Trait. Ornith. (1831) p. 567, sp. 5; Wagl. Isis (1832) p. 1231; Nuttall, Orn. U. S. (1834) vol. ii. p. 86; Bon. Comp. List (1838) p. 49. sp. 317; Aud. B. Amer. 8vo ed. (1842) vol. vi. p. 54, pl. 360; id. Orn. Biog. vol. vii. p. 173, vol. v. p. 593; G. R. Gray, Gen. Birds (1847) vol. iii. p. 565. sp. 2; Baird, B. N. Amer. (1860) p. 684; Schleg. Mus. P.-Bas (1863) livr. 4, p. 5; Gray, Hand-l. Birds (1871) pt. iii. p. 38; Gundl. J. f. O. (1871) p. 272; Sclat. & Salv. Nomencl. Av. Neot. (1873) p. 126.

*Ibis coco*, Vieill. Nouv. Dict. Hist. Nat. (1817) vol. xvi. p. 19; id. Ency. Méth. (1823) tom. iii. p. 1148.

*Ibis longirostris*, Wagl, Isis (1829) p. 760; G. R. Gray, Gen. Birds (1847) vol. iii. p. 565. sp. 3, pl. 152; id. Hand-l. Birds (1871) pt. iii. p. 39.

*Eudocimus alba*, Wagl. Isis (1832) p. 1232.

*Eudocimus longirostris*, Wagl. Isis (1832) p. 1234.

*Leucibis alba*, Reich. Nov. Syn. Av. pl. 141. fig. 526 (1851).

*Hab.* Southern North America; Central America; Cuba.

The white Ibis is found in Florida in great flocks; and in the places selected by these birds to breed, many thousands are sometimes congregated together. The nest, which is flat and composed of sticks, is placed upon the fork of some branch; and as many as forty-seven, according to Audubon, have been seen on one tree. The young fly in four or five weeks; and as soon as they are able to take care of themselves the old birds leave them. They feed on shellfish, slugs, snails, &c. When flying the species presents a beautiful appearance, each member of the flock imitating exactly the movements of the leader, as he proceeds with alternate flappings and sailings. At times they mount upwards to a great height and perform various and graceful evolutions, showing to great advantage with the sun shining upon their pure white plumage relieved only by the jet-black tips of the primaries.

Tips of primaries for about two inches black with bluish reflections, entire rest of plumage pure white. Anterior half of head bare, feathers reaching to about the middle of the eye, throat bare; the skin of these portions light red. Bill red, apical portion black. Tarsi have the anterior half transversely scutellated, hind part covered with hexagonal scales, and, with the feet, are red.

Total length 29 inches; wing 11, tail  $4\frac{1}{2}$ , bill along culmen  $6\frac{1}{3}$ , tarsus  $3\frac{1}{2}$ . Young:—Head and neck light brown, the feathers edged with white. Wings, back and tail chocolate-brown. Entire underparts and rump white. Bill entirely red; feet and legs flesh-colour.

## 25. EUDOCIMUS RUBER.

*Tantalus ruber*, Linn. Syst. Nat. (1766) p. 241. sp. 5; Gmel. Syst. Nat. (1788) vol. i. p. 651. sp. 5; Lath. Ind. Orn. (1790) vol. ii. p. 703. sp. 2; Wils. Am. Ornith. (1814) vol. viii. pl. 66; Cuv. Règn. Anim. (1829) p. 520; Less. Trait. Ornith. (1831) p. 567. sp. 3; Bon. Wils. Am. Orn. (1832) vol. iii. p. 63, pl. lxvi. fig. 2.

*Tantalus minutus*, Linn. Syst. Nat. (1766) p. 241. sp. 3; Gmel. Syst. Nat. (1788) p. 650. sp. 3; Lath. Ind. Orn. (1790) vol. ii. p. 708. sp. 19; Vieill. Nouv. Dict. Hist. Nat. (1817) vol. xvi. p. 23; id. Ency. Méth. (1823) tom. iii. p. 1151.

*Tantalus fuscus*, Linn. Syst. Nat. (1766) p. 242. sp. 7, juv.; Gmel. Syst. Av. (1788) p. 651. sp. 7, juv.; Lath. Ind. Orn. (1790) p. 705. sp. 8.

*Courly rouge de Brésil*, Buff. Pl. Enl. no. 80, juv., 81, ad.

*Brown Ibis*, Lath. Gen. Syn. (1783) vol. iii. p. 110. sp. 8.

*Lesser Ibis*, Lath. Gen. Syn. (1783) vol. iii. p. 117. sp. 18.

*Ibis rubra*, Vieill. Nouv. Dict. Hist. Nat. (1817) vol. xvi. p. 22; id. Ency. Méth. (1823) tom. iii. p. 1150; Wagl. Syst. Av. (1827) sp. 4; Nutt. Orn. U. S. (1834) vol. ii. p. 84; Aud. B. Amer. 8vo ed. (1842) vol. vi. pl. 359, p. 53; id. Orn. Biog. vol. v. p. 62; G. R.

Gray, Gen. Birds (1847) vol. iii. p. 565. sp. 1; Baird, B. N. Am. (1860) p. 683; Schleg. Mus. Pays-Bas (1863) livr. 4, p. 6; Taylor, Ibis (1864) p. 95; Coues, Ibis (1865) p. 159; Dresser, Ibis (1866) p. 32; Léot. Ois. Trinid. (1866) p. 440; Gray, Hand-l. B. (1871) pt. iii. p. 38; Gundl. J. f. O. (1871) p. 275; Sclat. & Salv. Nomencl. Av. Neotr. (1873) p. 126; Garrod, Proc. Zool. Soc. (1873) pp. 467, 638 (1875), p. 342; Gulliv. Proc. Zool. Soc. (1875) p. 488.

*Ibis minuta*, Vieill. Nouv. Dict. Hist. Nat. (1817) vol. xvi. p. 23.

*Ibis fusca*, Vieill. Nouv. Dict. Hist. Nat. (1817) vol. xvi. p. 17; id. Ency. Méth. (1823) tom. iii. p. 1146.

*Ibis leucopygia*, Spix, Av. Bras. t. 88, juv.

*Eudocimus ruber*, Wagler, Isis (1832) p. 1232; Gundl. J. f. O. (1856) vol. iv. p. 348.

*Guara ruber*, Reich. Nov. Syn. Av. pl. 139. figs. 525-27 (1851).

*Hab.* Cuba (*Gundlach*); North-eastern coast of South America to the mouths of the Amazon; Florida (*Aud.*), accidental.

If this species has been met with on the continent of North America, it is probable that it has only accidentally strayed there from its usual haunts, as it is properly an inhabitant of North-eastern South America, its appearance even in the West Indies, we may suppose, being uncertain and made at irregular intervals. As the genus *Ibis* was formed by Savigny for the *I. æthiopica* (Lath.), or Sacred Ibis, it cannot be retained for this bird and its allies, as has been generally done; and as *Eudocimus* of Wagler comes next, that must be the term employed. As there is no rule by which Moehring's genera can be received, and so many of them are rejected even by those who cite his works, it is not allowable that his term *Ibis*, instituted for this species, should take precedence of that of Savigny.

Entire plumage bright red, with the tips of the primaries jet-black for about two inches. Forehead, face, and throat bare, feathers coming forward anterior to the eye on top of head; bare space of throat and face red. Bill red, tip blackish. Legs and feet red.

Total length 25 inches; wing 10, tail  $4\frac{1}{2}$ , bill along culmen  $4\frac{1}{3}$ .

## 7. Descriptions of new Species of Phytophagous Coleoptera.

By MARTIN JACOBY.

[Received May 23, 1877.]

### Genus AULACOSCELIS, Chevrol.

#### 1. AULACOSCELIS MELANOCEPHALUS, sp. nov.

Elongate, subovate, widened behind; head and thorax shining black; epistome separated from the face by a deep transverse groove; antennæ entirely black, similar in length and shape to *A. melanocera*, Stål. Head smooth, shining, with a few scattered punctures. Thorax about half as long as broad, subquadrate; sides rounded from apex to about two thirds of their length, from there

to the base slightly sinuate, with the posterior angles depressed and acute; a transverse depression, bounded on each side by a short longitudinal ridge, is situated near the base. Surface moderately convex, entirely impunctate; scutellum broad, semiovate, smooth. Elytra broader at the base than the thorax, slightly widened behind, apex rounded; a short longitudinal depression is placed near the base of the shoulders. The entire surface of a light brick-red colour without gloss, finely and closely punctate; underside and legs black.

Length  $3\frac{1}{2}$  lines.

*Hab.* Guatemala.

Collected by Mr. O. Salvin.

#### Genus MEGASCELIS, Latreille.

##### 2. MEGASCELIS PURPUREICOLLIS, sp. nov.

Elongate, rather robust. Head shining coppery red, closely punctate, covered at its lower half with rather long golden pubescence, and traversed through its entire length by a distinct median groove; eyes emarginate; epistome greenish black; sides metallic, separated from the front by several strongly raised tubercles; antennæ with the first three joints testaceous, the rest fuscous. Thorax cylindrical, constricted distinctly behind the middle, of the same colour as the head, very finely punctate and rugose, covered almost entirely by yellow golden hair. Scutellum subquadrate, clothed with greenish golden pubescence. Elytra parallel, dark purplish, with about ten rows of elevated longitudinal ridges, the interspaces of which are distinctly transversely wrinkled, covered entirely with short golden pubescence, more strongly marked along the suture and the lateral margins, and plainly visible to the naked eye. Body below fuscous, with a metallic hue and silvery pubescence; legs flavous, tarsi almost black.

Length 3 lines.

*Hab.* Chontales, Nicaragua.

Collected by Mr. Janson.

#### CLYTHRINÆ.

#### Genus DACHRYS, Lacordaire.

##### 3. DACHRYS BIPARTITA, sp. nov.

Oblong, widened behind; head distinctly and somewhat coarsely punctate, especially near the inner border of the eyes, black, shining; antennæ with the four basal joints fulvous, the rest black, the latter colour also occupying partly the first joint in some specimens; in length they do not reach to the base of the thorax, and have the first joint very swollen and almost globular, the second extremely short, the third nearly three times the length of the second and thickened at its apex, the fourth a little longer than the second, and the rest transverse, subquadrate. Thorax transverse, with the anterior margin not advanced in front, and the posterior slightly lobed in the middle, the sides very slightly, the posterior angles strongly rounded, the anterior ones distinct; surface shining black, every-

where evenly and finely punctate; scutellum broadly triangular, with a few fine punctures at each side, black. Elytra about twice and a half as long as the thorax, distinctly widened towards the middle and rounded at the apex, regularly punctate-striate, the punctures only disappearing at the extreme apex, the interstices smooth and shining; their whole basal half is occupied by an almost square patch of bright fulvous, while the posterior part is shining black, and has at its apex another rounded spot of fulvous. Legs black, covered, as well as the entire underside, with fine silky whitish hairs.

Length 2 lines.

*Hab.* Chontales, Nicaragua.

Collected by Mr. M. Janson.

This species will be easily distinguished from *D. scutellaris* by the strong punctation of its head, the colour of the antennæ, and the design of its elytra.

#### EUMOLPIDÆ.

##### Genus METAXYONYCHA, Chevrol.

#### 4. METAXYONYCHA TRIDENTATA, nov. sp.

Subcylindrical, semiconvex, testaceous. Head with a distinct fovea in the middle and an oblique depression below each eye, both of which are deeply but sparingly punctate, lower part of face sparingly punctate, testaceous, apex of mandibulæ black; antennæ nearly as long as the body, joints 5, 6, 7, and the last fuscous, the rest flavous. Thorax very convex on the disk, anterior and posterior margins parallel, the angles tuberculate; the lateral margins very widened in the middle, and at that place very distinctly three-dentate. A profound impression is placed on the surface on each side near the middle; and the entire disk is irregularly and coarsely punctured. Scutellum smooth. Elytra much wider than the thorax, the sides parallel, with about ten longitudinal more or less distinct costæ, which for the most part unite at their extremities, the intervals of which are coarsely and deeply punctate; each elytron with two transverse spots of a shining metallic light green, the first situated on the shoulder, of a nearly square shape, and extending halfway across the elytra, the second below the middle, of a narrow band-like shape, a little curved, and not touching the sutural margin. Underside light testaceous as well as the legs. Tarsi a little darker.

Length 4 lines.

*Hab.* Chontales, Nicaragua.

Collected by Mr. Janson.

##### Genus RHYPARIDA, Baly.

#### 5. RHYPARIDA MADAGASCARIENSIS, sp. nov.

Oblong-ovate, entirely rufous, smooth, shining; head with a more or less distinct longitudinal depression in the middle sparingly but distinctly punctate; clypeus testaceous, distinctly separated from the face, the anterior edge emarginate and narrowly piceous, surface punctured the same as the head; labrum dark brown, mandibulæ

entirely piceous; four basal joints of the antennæ rufous, the rest black. Thorax about twice as broad as long, the sides regularly rounded, the anterior angles largely developed into a point and diverging outwardly, all the sides narrowly margined; surface very minutely granulose, remotely but distinctly punctured on the disk, the sides almost destitute of punctures; a faintly visible longitudinal and smooth line extends across the middle of the disk; scutellum slightly sinuate below the base at the sides, apex subacute, surface impunctate, minutely granulose. Elytra much wider than the thorax, scarcely narrowed behind, the apex regularly rounded, and the sides with a narrow but deep margin, each elytron with about six distinct striæ of small punctures, the sides confusedly punctate; the first stria, near the scutellum, is very short, the space between the second and third and the fourth and fifth is wider than between the rest of the striæ; the interstices also very minutely punctured and granulose. Underside testaceous, prosternum coarsely punctate near the sides, smooth in the middle; legs rufous, apex of tibiæ and the entire tarsi black. The posterior thighs with a small sharp tooth.

Length 4 lines.

*Hab.* Madagascar.

Collection Jacoby.

#### 6. RHYPARIDA COSTATIPENNIS, sp. nov.

Oblong, semiquadrate, piceous. Head piceous, rugose-punctate, epistome not separated, with the apex and the labrum of a fulvous colour; antennæ entirely flavous. Thorax with the anterior margin sinuate at the sides, the posterior margin rounded, and the lateral ones almost parallel at the apex, slightly widened behind the middle, all the angles obtuse and not produced into a distinct tooth; surface closely and coarsely punctuate, piceous. Scutellum smooth, broader than long. Elytra slightly wider at the base than the thorax, parallel with the apex, regularly rounded. Each elytron with thirteen rows of deeply impressed punctures, not diminishing in size towards the apex, with the interspaces costate, the costæ more raised towards the apex than near the base, and more or less minutely punctured; all the costæ unite at the apex in such a way that the first costa near the sutural margin forms a sharp angle with the last costa, and the intermediate ones in the same way with the corresponding costæ. The colour is a dark piceous, with a faint reflection of cupreous, the extreme lateral margin having a greenish reflection. Underside dark brown or piceous as well as the legs, with the tarsi testaceous. All the thighs armed below with an acute tooth.

Length  $2\frac{3}{4}$  lines.

*Hab.* Madagascar.

In my collection.

#### 7. RHYPARIDA NIGRICOLLIS, sp. nov.

Oblong, ovate, shining, elytra rufous, thorax, head, and feet black. Head obsoletely punctured on the vertex, with a longitudinal middle line, at the end of which is a shallow round fovea; epistome sepa-

rated from the head by a rather indistinct transverse groove, punctured a little more distinctly than the head; labrum fulvous, as well as the first two joints of the antennæ, the rest black. Thorax regularly convex, the sides much deflexed anteriorly, all the angles acute, and produced into a short tooth; surface almost smooth, a shallow transverse depression extends across the disk a little behind the middle, and is strongly punctured near the sides. Scutellum nearly as broad as long, smooth, rufous. Elytra wider than the thorax, rufous, shining, distinctly punctate-striate, the striæ strongly impressed near the base and diminishing towards the apex. The first stria is very short and the second curved obliquely upwards towards the base; below the basilar space is a shallow indistinct fovea. The seventh and the following striæ commence on the hinder portion of the humeral callus, this latter being limited by the strongly impressed sixth stria up to the base of the elytra. Entire underside, with the exception of the abdomen, which is light-fulvous-coloured, black. Intermediate and posterior thighs with a distinct tooth.

Length 3 lines.

*Hab.* Madagascar.

In the collection of the British Museum and my own.

#### Genus SCELODONTA, Westwood.

##### 8. SCELODONTA VIRIDIMACULATA, sp. nov.

Subquadrate, semiconvex, brownish, opaque. Head with the vertex coarsely rugose, cupreous, lower face indistinctly transversely rugose, shining metallic green at the sides, palpi testaceous, antennæ black; thorax subcylindrical, the anterior and posterior margins much widened in the middle, closely covered with transverse raised strigæ of a brownish purplish colour, with a metallic-green narrow longitudinal stripe in the middle, and the sides to a greater extent ornamented with the same colour. Scutellum pentagonal, entirely green. Elytra much wider at base than the thorax, longitudinally costate throughout, the interspaces deeply punctured and partly reticulate, of the same brownish ground-colour as the thorax, with a transverse band commencing a little below the shoulder, where it is widest, and extending in an oblique direction to a short distance from the suture, of a shining metallic green, while another narrower stripe of the same colour is situated at a short distance from the apex, having an upward direction, and is connected with the apical part of the sutural and exterior margin by a narrow border of metallic green. Underside metallic green. Legs purplish, each thigh armed with a short tooth.

Length 3 lines.

*Hab.* Cameroons, Africa.

In my collection.

#### Genus DERMORRHYTIS, Baly.

##### 9. DERMORRHYTIS CÆRULEA, sp. nov.

Elongate, shining, above violet-blue; head slightly convex, with



a distinct, short, longitudinal middle groove, strongly punctate, longitudinally rugose near the eyes, violet-blue; epistome wedge-shaped, separated from the front, with the anterior margin emarginate, strongly punctured, and covered with short whitish pubescence; labrum, mandibulæ, and the last joints of the palpi black, the first two joints testaceous, antennæ with the seventh joint the longest, the first much thickened and nearly globular, the second less than half the length of the third, the last joints elongate and almost cylindrical; the first five joints are of a greenish black colour and shining, while the rest is very light flavous and strongly covered with whitish hair; thorax with the sides obliquely deflexed in front and converging from the base to the apex, with the anterior angles produced into a short tooth, and the extreme lateral margins slightly waved, posterior margin transversely grooved through its entire length, above subcylindrical, covered with crowded large punctures near the base, more finely near the apex, shining greenish violet; scutellum with the apex broadly rounded, scarcely longer than broad, impunctate; elytra broader than the thorax, parallel, slightly narrower towards their apex, extremely closely and transversely rugose, strongly punctured near the base, and longitudinally costate near the extreme apex and the suture at its extremity, of a uniform violet-blue, with a greenish reflection; underside obscure metallic blue finely punctate; legs of the same colour, tarsi light brownish, covered with yellowish pubescence.

Length 4 lines.

*Hab.* Borneo.

Collection Jacoby.

#### CHRYSOMELIDÆ.

#### Genus DORYPHORA, Illig.

#### 10. DORYPHORA BICOLOR, sp. nov.

Ovate, convex, piceous above, shining; head black, opaque, very remotely and finely punctate, labrum fulvous; antennæ black, with the first two joints beneath testaceous; thorax black, moderately convex, the lateral margins parallel at the base till about the middle, from there moderately rounded to the apex, the anterior angles not much produced, surface distinctly and not closely punctate, the punctuation much stronger than the head, but not stronger near the sides than on the disk; scutellum triangular, impunctate. Elytra a little wider at the base than the thorax, regularly rounded towards the apex, punctate-striate, the striæ arranged in double rows, which are now and then, especially towards the sides, a little irregular, of a dark piceous colour; a narrow flavous band extends from across the base of each elytron along the lateral margins (leaving, however, a small border of the ground-colour) to the apex, and, after running upwards close to the suture to the middle of the elytra, is connected by another transverse band of the same size and colour with the lateral one. Body beneath and legs shining black, the mesosternal process rather long and slightly curved.

Length 5 lines.

*Hab.* Chontales, Nicaragua.

Collected by Mr. M. Janson.

This species resembles much in pattern *D. sheppardi*, Baly; but it is easily distinguished from that species by its small size and the double rows of punctures on the elytra, the punctuation in *D. sheppardi* being more irregular, and so coarse as to be distinctly visible to the naked eye.

11. *DORYPHORA ORNATA*, sp. nov.

Ovate, convex, shining; head black, covered with fine and remote punctures, labrum fulvous; mandibulæ, palpi, and antennæ black; thorax very shining black, with a slight greenish tint, evenly and distinctly but not closely punctate, with two or three rather deep impressions near the lateral margins; scutellum entirely impunctate; elytra strongly punctate-striate, the striæ running together in pairs, more obsolete towards the apex, shining black, each elytron with four spots of a bright fulvous colour, situated as follows—one oval-shaped near the scutellum, another near the sutural line, exactly in the middle, a larger pear-shaped spot reaching from the base of the shoulder to a little before the middle, and a large triangular patch occupying the entire apex and terminating in a sharp point; this patch contains a small roundish black spot near its extremity; body below, feet, and tarsi black, shining.

Length 5 lines.

*Hab.* Chontales, Nicaragua.

Collected by Mr. Janson.

12. *DORYPHORA ANTENNALIS*, sp. nov.

Ovate, convex; head and thorax dark brown, elytra flavous, with brown, irregular, longitudinal patches. Head with a few fine irregularly distributed punctures; antennæ almost filiform, with the third joint nearly double the length of the fourth and the longest, the following joints slightly stouter, and the last very nearly as long as the third, and very pointed at the apex, the first five joints brown, the rest fuscous, with the exception of the last, which is of a light testaceous colour, labrum and palpi brown, thorax with the lateral margins parallel until about the middle, from there slightly widened and much rounded towards the apex, the anterior angles acute, surface deeply but not closely punctate, with a distinct longitudinal depression at a little distance from the lateral margin; scutellum triangular, smooth, brown, margined with black; elytra wider at the base than the thorax, oblong-ovate, regularly rounded near the apex, distinctly striate-punctate till about the middle, very obsoletely from there to the apex flavous, lateral margin, the suture, an oblong patch, much widened in the middle, running in an oblique direction from the base near the scutellum towards the sutural margin behind the middle, and another longitudinal subquadrate patch near the apex, not touching the suture nor the exterior margin, dark brown; in the middle of the elytra another short streak of the same colour is

attached to the sutural stripe, causing the latter to assume a widened appearance. Body below and legs lighter or darker brown, metasternal process proportionately long, stout, and curved near the apex.

*Var.* Thorax, head, and markings on the elytra dark fuscous or black.

Length  $4\frac{1}{2}$  lines.

*Hab.* Chontales, Nicaragua.

Collected by Mr. Janson.

It is doubtful if this species ought to be retained in the genus *Doryphora*, as the filiform antennæ distinguish it from the other species of this genus, and show rather its affinity to the genus *Prosi-cela* of Chevrolat, from which it is, again, distinguished by the strong development of the metasternal process.

### 13. DORYPHORA SEXMACULATA, sp. nov.

Oblong, ovate; head and thorax greenish or brown, elytra greenish black, each elytron with three large fulvous spots. Head closely and finely punctate, with a smooth longitudinal middle line; labrum and palpi pitchy; antennæ rather long, gradually increasing in width towards the apex, greenish black or brown; thorax but little convex in the middle, with the anterior margin slightly sinuate, the anterior and posterior angles very acute, and the surface closely and evenly punctate, the punctuation a little stronger than that of the head; scutellum triangular, impunctate, shining; elytra a little wider at the base than the thorax, strongly punctate-striate, the striæ more regular near the sutural line than near the sides, greenish black, an irregular oblong spot at the base near the scutellum, a triangular-shaped one, of larger size, in the middle, near the lateral margin, and another, of the same size or larger, near the apex of each elytron fulvous; body below and legs greenish.

Length 6 lines.

*Hab.* Peru.

Collection Jacoby.

This species varies, as the description shows, in colour, from greenish to brown as regards the head, antennæ, and thorax, as well as the entire underside, with the legs, but does not differ in other respects.

### 14. DORYPHORA CHRYSOMELOIDES, sp. nov.

Ovate, very convex, and much widened behind, very shining, of a uniform greenish bronze-colour; head with a more or less distinct middle line on the vertex, very irregular, and rather strongly punctate, with a triangular flavous spot near the base; epistome separated from the front by a more or less rounded thin groove, punctured; labrum and mandibulæ greenish black; antennæ not half the length of the body, the first joints metallic green, the rest violaceous black and transversely subquadrate. Thorax with the anterior margin slightly produced in the middle, and a shallow, more or less distinct fovea near the lateral margins; disk finely punctate, the punctures

much stronger near the sides, entirely shining green, with a bronze reflection; scutellum impunctate. Elytra very widened from behind the middle, everywhere irregularly and very finely covered with punctures, the interstices having a scratched appearance, shining green, with a coppery reflection. Body below of the same colour; metasternal process conical, slightly curved.

Length  $5\frac{1}{2}$ -6 lines.

*Hab.* Peru.

Two specimens in my collection.

This species seems nearly to agree with Stål's description of his *D. nitidissima*, but differs in the irregular and fine punctuation of the elytra, and the smaller size as well as the colour of the antennæ.

#### 15. DORYPHORA BISBIMACULATA, sp. nov.

Ovate, moderately convex; head greenish, distinctly punctured, labrum dark fulvous, mandibulæ black; first four joints of the antennæ testaceous, more or less stained with fuscous, the rest black, and gradually increasing in width. Thorax with the middle of the anterior margin straight, the posterior one rounded, and the sides almost crescent-shape, and deeply depressed before the lateral margins; surface on the disk finely and not closely, sides strongly and deeply punctate; the entire disk is occupied by a flavous patch, leaving a narrow anterior and posterior margin, as well as the sides to a greater extent, greenish black. Elytra scarcely wider at the base than the thorax, parallel towards the middle, and slightly widened behind, the surface irregularly punctate-striate, the striæ sometimes running in double rows, but near the sides the punctuation is altogether irregular and confused; the colour consists of the same greenish tint as the head, slightly shining; and each elytron is marked with two large spots of a fulvous colour, of which one, of a semiquadrate form, is situated a little before the middle, without reaching either the lateral or the sutural margin; another spot, of a more triangular shape, is placed closer to the suture, near the apex, being accompanied in some specimens by two more minute spots near the lateral margin. Entire underside and legs black, shining.

Length 6 lines.

*Hab.* Chontales, Nicaragua.

Collected by Mr. Janson.

#### Genus CALLIGRAPHA, Chev.

#### 16. CALLIGRAPHA DISTINGUENDA, sp. nov.

Oblong-ovate. Head with a fine but distinct longitudinal middle line, epistome separated by a triangular groove from the front, strongly punctate, vertex very sparingly punctured, brown; labrum fulvous; mandibulæ fuscous. Antennæ with the first four joints fulvous, the rest black; they reach to a little more than the base of the thorax, and have the last five joints transversely subquadrate and the extremity acute. Thorax with the lateral margins almost parallel, a little wider at the base than at the apex, posterior margin

broadly rounded, and the anterior angles subrotundate; the disk contains some remote but strongly marked punctures, while the sides and the commencement of the posterior margin is strongly impressed with large punctures, distinctly visible to the naked eye; surface uniformly darkish brown. Scutellum elongate, triangular, smooth, black. Elytra scarcely wider at the base than the thorax, slightly widened behind the middle, surface rather convex; they are regularly striate-punctate on their inner half, while the outer portion contains numerous irregularly distributed punctures, not so deeply impressed as those near the suture, of a light testaceous colour, the suture and four spots on each elytron of a greenish black colour, and placed as follows:—two longitudinal streaks, a little widened at their extremities a little below the base, of equal size, one of which is situated near the scutellum, the other near the exterior margin; a transverse vitta a little behind the middle, not touching the lateral nor the sutural margin, sinuate in middle, and forming at the sutural end a short angle parallel with the suture; and another short oblique spot near the apex: this spot is sometimes connected with the transverse vitta by a thin line. Body below shining cupreous, with a greenish tinge. Abdominal segments each with a shallow fovea near the sides.

*Var. a.* The spots on the elytra not much darker than the ground-colour, and indistinct (immature?).

Length  $4\frac{1}{2}$  lines.

*Hab.* Chontales, Nicaragua.

Collected by Mr. Janson.

Although this beetle is, in the punctuation and markings of the elytra, quite different from other species belonging to this genus, its structural characters agree in every particular.

#### 17. CALLIGRAPHA ELEGANTULA, sp. nov.

Oblong, moderately convex; head shining, greenish black, with a longitudinal middle line, strongly punctate as well as the epistome; labrum fulvous at the base; antennæ with the first six joints metallic violet-blue above, testaceous below, the rest black, and longer than broad. Thorax of the same colour as the head, the anterior margin slightly widened in the middle, the posterior one broadly rounded, each side with a distinct rounded fovea, variolose punctate; disk remotely and finely punctured. Scutellum greenish, smooth. Elytra broader at the base than the thorax, straw-coloured, with the following shining greenish black markings:—a common sutural vitta, commencing a little below the base, slightly narrowed in the middle, and extending to the apex; a longitudinal narrow stripe, club-shaped at its extremity, accompanies the sutural vitta without touching it from the first third of each elytron to a little behind the middle, and having a roundish spot above it near its base; an oblique large spot on the shoulder, pointed at its apex; three transverse spots, of which the first is the smallest, the others of irregular shape below the humeral one, all at equal distance from the lateral margin, which remains of the ground-colour; three small round

spots placed triangularly near the apex, and sometimes connected with each other, and another round spot in the middle, near the subsutural stripe. Entire underside and legs shining greenish black. The abdominal segments punctate and thinly pubescent at their base.

Length 4 lines.

*Hab.* Costa Rica.

Collection Jacoby.

#### GALLERUCIDÆ.

##### Genus MONOCESTA, Clark.

##### 18. MONOCESTA DIMIDIATA, sp. nov.

Subelongate, ovate, much dilated posteriorly, anterior half reddish brown, posterior black; head sparingly and obsoletely striate, with a distinct longitudinal impressed line through its entire length, and a deep transverse groove between the eyes, brown, shining; antennæ nearly half the length of the body, black, with the exception of the first joint, which is reddish fulvous; thorax transverse, a little narrowed in the middle, broadly emarginate near the anterior angles, with a deep oblique depression on each side towards the middle, shining reddish brown, closely but very obsoletely punctured, the disk nearly smooth; scutellum finely punctuate, very rounded at the apex. Elytra greatly dilated almost from the base to behind their middle, impressed below the shoulder near the lateral margin, and narrowly margined, apex simple, extremely close and finely punctured throughout, reddish brown at their anterior half, black from there to the apex. Anterior part of the underside fulvous, part of breast, entire abdominal segments and legs (with the exception of the first two pairs of the anterior thighs, which are fulvous) black.

Length 7 lines.

*Hab.* Peru.

In my collection.

##### 19. MONOCESTA NICARAGUENSIS, sp. nov.

Broadly ovate, rufo-fulvous, pubescent. Head and vertex impressed with a longitudinal groove, minutely punctate and sparingly pubescent, labrum and mandibulæ darker; antennæ black. Thorax much narrowed in the middle, the apex slightly wider than the base and rounded; surface irregularly and transversely impressed, sparingly pubescent. Elytra broadly margined, much dilated posteriorly, the punctuation scarcely visible, and covered everywhere with rather long reddish brown hair. Body below, together with the tibiæ, fuscous, anterior pair of thighs fulvous.

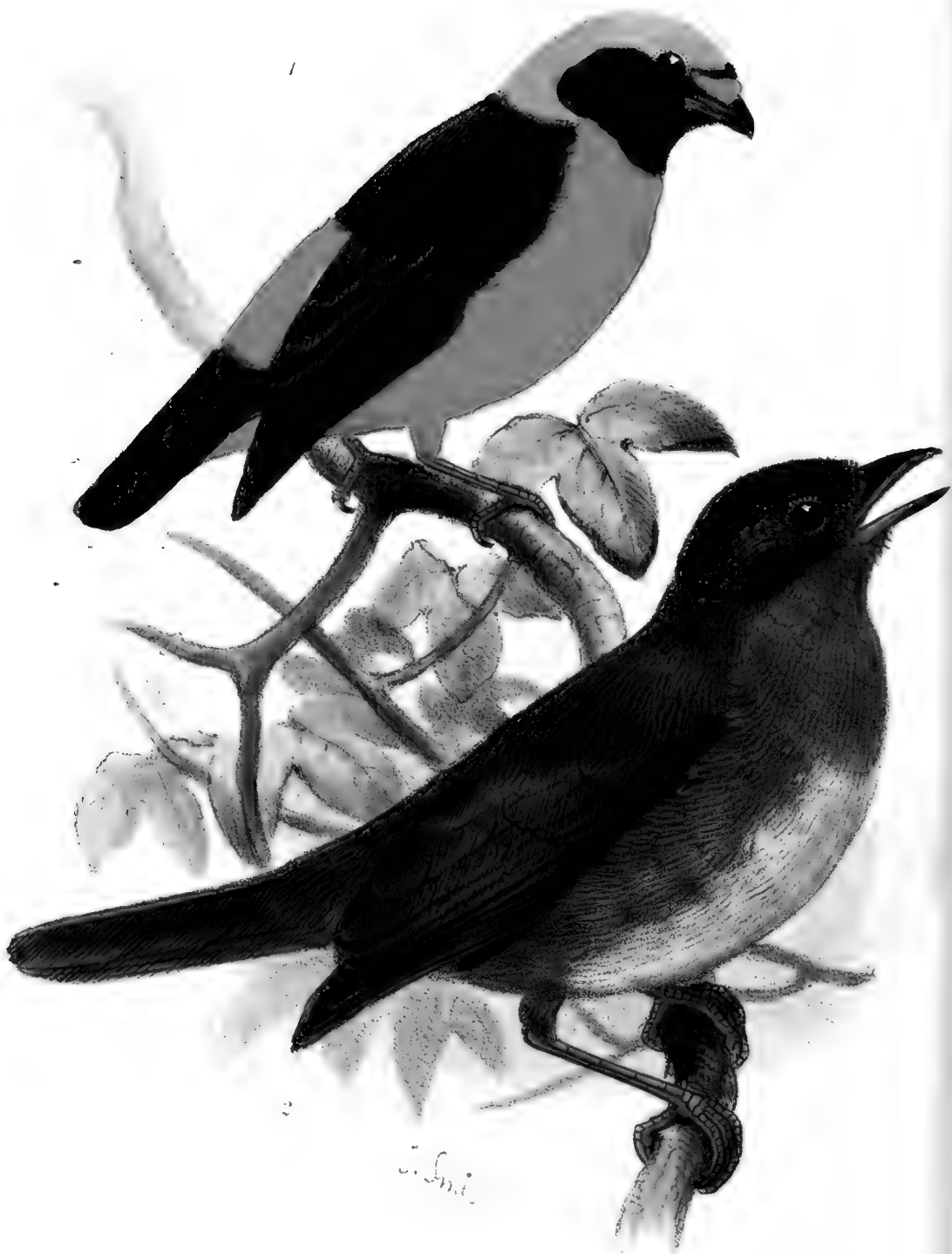
Length 5 lines.

*Hab.* Chontales, Nicaragua.

Collected by Mr. Janson.

Among the posteriorly dilated species of this genus, the present one will be recognized by the uniform coloration of the entire upper surface, the rather long pubescence, and the colour of the antennæ, all of which are exactly the same in all the specimens before me.





J. Smit lith

Hanhart imp

1 EUPHONIA DISIGNIS  
2 PHYLLOSCOPUS PHŒOCEPHALUS



8. Descriptions of six new Species of South-American Birds.  
By P. L. SCLATER, M.A., Ph.D., F.R.S., and OSBERT  
SALVIN, M.A., F.R.S.

[Received June 4, 1877.]

(Plate LII.)

We have again to offer to the Society descriptions of six apparently new species of birds from collections made in Ecuador and Peru, that have lately reached us.

1. *BASILEUTERUS CASTANEICEPS*, sp. nov.

*Brunnescenti-olivaceus pileo medio castaneo-rufo, utrinque lineâ nigrâ limbatâ: loris et capitis lateribus cinereis: subtus albus, lateraliter in cinereum trahens, crisso et campteris alarum flavescentibus: rostro corneo, pedibus pallide corylinis: long. tota 5·3, alæ 3·0, caudæ 2·5.*

*Hab.* Jina<sup>1</sup> in rep. Æquatorianâ (C. Buckley.)

*Mus.* S.-G.

*Obs.* Species pileo ad *B. coronatum*, ventre albo ad *B. leucoblepharum* et hujus affines magis appropinquans.

This species must be placed in the section "B, b" of the genus as divided by Sclater (P. Z. S. 1865, p. 283), near *B. leucoblepharus* and *B. stragulatus*, although its head-colouring is that of *B. coronatus* (section B, a).

2. *EUPHONIA INSIGNIS*, sp. nov. (Plate LII. fig. 1.)

*Supra purpurescenti-nigra, dorso postico flavo: pileo et cervice postica cæruleis: fronte aurantiacâ, lineâ nigrâ postice marginatâ: subtus aurantiaco-flava, gutture nigro; subalaribus flavidis, remigum marginibus internis albis: rostro nigro, pedibus fuscis: long. tota 4·6, alæ 2·6, caudæ 1·6.*

*Hab.* Jina, in rep. Æquatorianâ (C. Buckley.)

*Mus.* S.-G.

*Obs.* Species *E. nigricolli* affinis, sed fronte aurantiacâ distinguenda.

Mr. Buckley has sent two skins of what we suppose to be males of this very distinct species.

3. *CHLOROSPINGUS PHÆOCEPHALUS*, sp. nov. (Plate LII. fig. 2.)

*Oleagineo-viridis, pileo fuscescente: subtus dilutior et flavescens, ventre medio ochrascenti-cinereo, crisso sicut latera flavicante; gutture paulum fuscescente: subalaribus flavicanti-albis, remigum marginibus internis pallide cinereis: rostro corneo, pedibus corylinis: long. tota 5·3, alæ 3·0, caudæ 2·3.*

*Hab.* In rep. Æquator. Jina (C. Buckley); Chillanes (Fraser).

*Mus.* S.-G. et P. L. S.

<sup>1</sup> Jina lies on the head-waters of Rio Santiago, not very far from Cuenca.

*Obs.* Species *Ch. flavipectori* forsan proxima, sed gutture fuscescente dignoscenda.

Of this *Chlorospingus* Mr. C. Buckley obtained a single skin at Jina, in Ecuador, during his recent excursion into that country. Selater has long had a specimen of the same bird, which was collected by Fraser at Chillanes, in Ecuador, in 1858. The latter has hitherto been erroneously referred to *C. albitemporalis*, under the impression that it might be an immature bird. The species is of the general size and structure of *C. flavipectus*.

#### 4. TODIROSTRUM RUFIGENE, sp. nov.

*Supra læte olivaceum, pileo et capitis lateribus rufis: alis nigris, tectricum apicibus et secundariorum marginibus externis flavis, remigibus extus olivaceo stricte marginatis: caudâ fuscescenti-olivaceâ, rectricibus externis maculâ apicali flavicante præditis: subtus flavum, pectore sordide albicante, gutture rufescente, hypochondriis in olivaceum trahentibus: rostro nigro, pedibus pallide corylimis: long. tota 3·3, alæ 1·6, caudæ rectr. ext. 1·0, med. 1·25.*

*Hab.* Mongi, in rep. Æquator. (*C. Buckley*).

*Mus.* S.-G.

*Obs.* Sp. *T. ruficipiti* affine, sed gutture et capitis lateribus rufescentibus diversa.

#### 5. LATHERIA CRYPTOLOPHA, sp. nov.

*Saturate olivacea fere unicolor: corpore subtus præcipue in ventre medio paulo flavescentiore: subalaribus flavissimis; alis et caudâ fuscis extus olivaceis; primariis internis et secundariis intus pallido fulvescenti marginatis: cristâ capitis obtectâ saturate castaneâ: rostro nigro: pedibus plumbeis: long. tota 9·0, alæ 5·6, caudæ 4·2, rostri u rictu 1·1, tarsi 1.*

*Hab.* Mongi, rep. Æquat. orientalis.

*Mus.* S.-G.

*Obs.* *L. subalari* affinis, sed dorso postico, caudâ, et alis extus olivascentibus nec grisescantibus, cristâ quoque capitis castaneâ nec nigrâ distinguenda.

Mr. Buckley has sent a single skin of this fine species, which at one time we thought might possibly prove to be a male of *L. subalari*; but on examining the type specimen of the latter in the British Museum, we find that it doubtless is a male, having a concealed black crest, and the hinder portion of the body and tail ashy, as given in Selater's original description. In the present bird the crest is deep chestnut, and the lower portion of the body olive-green, like the back.

#### 6. FULIGULA NATIONI, sp. nov.

*Fusco-brunnea; subtus paulo brunnescentior: corpore undique albido minutissime irrorato: capite summo et collo usque ad pectus nigricantibus, genis et gutture anteriore rufescentibus: angulo inter ramos mandibulæ (sicut in speciebus omnibus hujus*



Fig. 2.

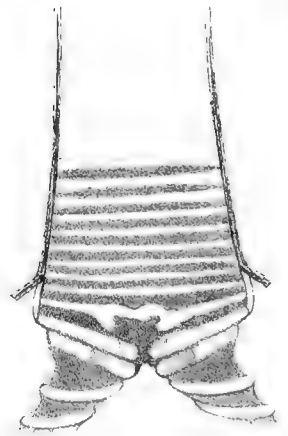


Fig. 3.



Fig. 1.

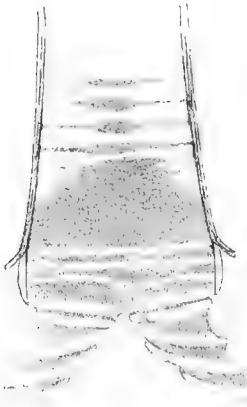


Fig. 4.

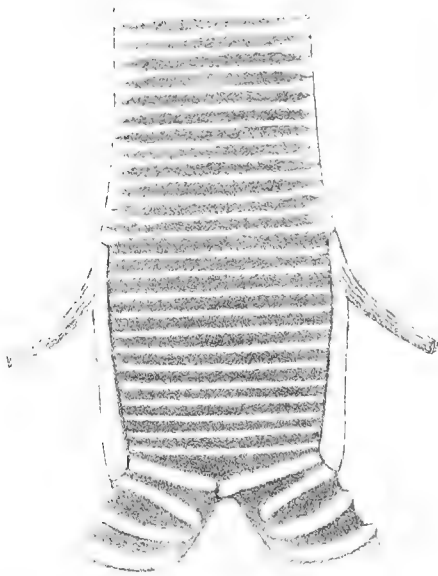


Fig. 5.

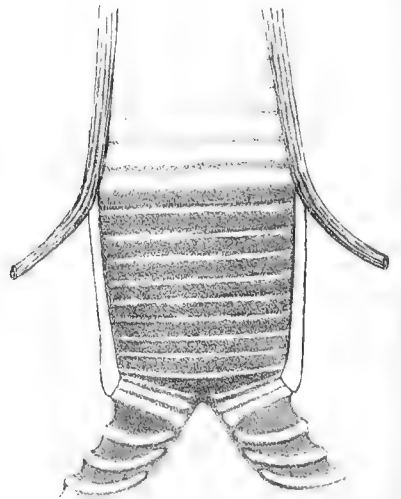


Fig. 6.



Fig. 7.

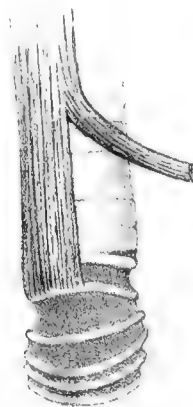


Fig. 8.



generis) albo : remigibus fusco-nigris, primariis internis medially albidis : speculo alari albo : rostro et pedibus brunnescentibus : long. tota 17, alæ 7·8, caudæ 2·3, rostri a rictu 2, tarsi 1·4, dig. med. cum ungue 2·3.

*Hab.* Peruvia occidentalis, prope Lima (Nation).

*Mus.* S.-G.

*Obs.* *F. collari* forsan affinis, sed speculo alari albo nec griseo, genis et gutture rufescentibus facile distinguenda.

A specimen of this curious duck was received by Mr. Sclater from Prof. Nation by post<sup>1</sup>, in January last. In a subsequent letter Prof. Nation says that it is found occasionally in the fresh-water lakes near Lima, in company with *Querquedula cyanoptera*, and *Dafila bahamensis*. The example sent is a female; and Prof. Nation believes the colouring of the plumage in both sexes to be alike. The irides are of a brownish red, the bill and tarsi brownish.

## 9. Notes on the Anatomy of Passerine Birds.—Part III.

By A. H. GARROD, F.R.S., Prosector to the Society.

[Received June 1, 1877.]

(Plate LIII.)

On the present occasion I take the opportunity of describing the voice-organ in some species of the non-oscine (mesomyodian) Passeres in which that structure is, so far as I am aware, unknown.

Leaving any deductions until I have recorded the nature of the structures, I will commence with an account of the syrinx in some of the Tracheophonæ.

*Hylactes megapodius*.—In this species the syrinx is not identical with any of those described by J. Müller<sup>2</sup>. It does not differ much from those of *Scytalopus indigoticus* and *Chamæza brevicauda* in its essential structure. By Müller, however, no mention is made of a peculiarity which I find in this species, which seems to me to throw some light upon the method of development of the tracheophone syrinx. This consists in the way in which the characteristic very slender rings of the specialized voice-organ, instead of ceasing abruptly at its upper end, continue upwards on the anterior surface of the trachea for a considerable distance, whilst posteriorly they suddenly change their breadth superiorly where the syrinx ceases. Figures 4 and 5 of Plate LIII represent the anterior and posterior views of the organ.

The *processus vocales*, which rest on the first and second modified and ossified bronchial semi-rings, extend up as far as the tracheal true ring, twelfth from the bottom. These twelve lowermost tracheal

<sup>1</sup> By the same conveyance Prof. Nation has also recently sent us the skins of *Rallus virginianus* (previously not known so far south, see P. Z. S. 1868, p. 445), *Lamprosar warcewiczii* (= *Quiscalus æquatorialis*, ScL.), *Rhodopsis vesper*, *Myrtis fanny*, and *Thaumastura cora*, all from the vicinity of Lima.

<sup>2</sup> Abh. Akad. der Wissenschaften zu Berlin, 1847.

rings are incomplete opposite the *processus vocales* (in other words, at their sides), as they are in all the Tracheophonæ; and the lowest is also broken, as it were, in the middle line behind.

Posteriorly the lower nine are extremely slender; the tenth (counting upwards) is somewhat thicker, the eleventh still more evidently so, whilst the twelfth is as thick as any of the superior rings.

Anteriorly there are twenty-three of the lower tracheal rings, which are quite slender in the middle line, especially the lowest three; and of these the twelve lowest (those split laterally) are slender from one side to the other, whilst the upper eleven appear thick at their extreme ends on account of the intrusion, for a short distance round the sides of the tracheal tube, of the thickening above recorded of their hinder parts, which diminishes rapidly in a spindle-pointed manner.

The lowest tracheal ring is as slender as those just above it; and it is worthy of note that the *processus vocales* rest upon the thickened second bronchial semi-ring as well as on the first. These vocal processes cannot be detached from the sides of the trachea without injuring it; and the sterno-tracheal muscles arise from their apices, to which are also attached thin muscular sheets which extend up the windpipe laterally and a little posteriorly.

*Grallaria guatemalensis*.—In this species also the specialized syrinx does not cease abruptly at its upper end, the superior rings of the trachea, which help to constitute it, gradually losing their individual character. Figs. 1 and 2 (Plate LIII.) represent the front and back view of the organ, which is peculiarly shallow for its width, and involves but six of the lowermost tracheal rings. These six are incomplete at their sides where they are in contact with the *processus vocales*, which latter are small, flat, fusiform ossifications, pointed both at their upper and lower ends, and just touch the upper of the two superior enlarged and ossified bronchial semi-rings, the remainder of each bronchus being of the normal character. The lowermost tracheal is incomplete in the middle line in front, as well as at the sides, whilst behind it is thickened, and sends small downward processes on each side of the middle line in such a manner as to develop a notch between them. Figure 3 represents the left-side view of these structures, seen from the interior of the organ, *a* being the *processus vocalis*. From figure 1 it can be seen that the tracheal rings four, five, and six from the bottom are not ossified at all in front, and that rings seven, eight, and nine are only so at their sides, whilst ring ten, with those just above it, are extremely thin in the middle. Posteriorly also, from figure 2 it can be inferred that the rings above the bottom ones are very slender, becoming thicker by degrees above the sixth, which is the highest of those constituting the voice-organ.

With reference to the muscles, it may be stated that the lateral muscle of the trachea on each side covers and joins the upper extremity of the *processus vocalis*, turning off to become the *musculus sterno-trachealis* opposite the ring third from the end, and sending no continuation on to act directly upon the bronchial semi-rings.

*Lipaugus cineraceus*.—In this species the single specimen at my disposal, which Mr. Edward Bartlett has most kindly given me, has the lower part of the windpipe considerably damaged by shot. Nevertheless, as one side is comparatively uninjured, I have been able to make out the essential points in the structure of the syrinx, which does not differ much from that of *Pipra leucocilla*, as represented by Müller<sup>1</sup>. The lowermost rings of the trachea are not peculiar, each one being deep, and meeting, at its superior and inferior margins, the rings above and below it. The first and second bronchial semi-rings resemble those of the trachea in their flatness, depth, and approximation, the third being the first normal bronchial ring. It, with those which follow, are slightly peculiar in that they are ossified throughout, except in a small part, equal to about one sixth the breadth of each semi-ring, one third distant from their anterior ends, where they retain their primitive cartilaginous structure (*vide* Plate LIII. figs. 6 and 7).

The lateral muscle of the trachea is of considerable breadth, being most developed anteriorly, those of the opposite sides coming nearly into contact in the middle line in front. Opposite the tracheal ring seventh from the bottom, the small sterno-trachealis is differentiated off from the posterior portion of this muscle, by far its larger anterior part continuing downwards to become the intrinsic muscle of the syrinx, which ceases at its insertion into the anterior half of the third bronchial semi-ring. It exhibits no tendency to split into two as in *Pipra leucocilla*.

It may be mentioned that the second bronchial semi-ring is somewhat expanded at its ends, intruding more into the membranous completion of the bronchial tube than do those which follow it. The damaged condition of my specimen makes it impossible to determine whether the antero-posterior bar, which is situated at the point of bifurcation of the trachea, is formed by the last tracheal ring, or by the completion and junction of the first bronchial rings of either side. I am inclined to think it depends on the latter of these conditions.

*Chiromachæris manacus*, according to the description given by Müller, agrees exactly with this species, as far as its syrinx is concerned.

*Heteropelma veræ-pacis*.—It is Mr. Salvin whom I have to thank for a specimen of this species, as well as the next to be described, in spirit. Its voice-organ is most simple. The single, broad lateral muscle of each side of the trachea continues down to the middle of the second bronchial semi-ring, which is scarcely different from those below it either in bulk or appearance; and the one above it resembles it. There is, however, a considerable interval between it and the third, whilst it almost touches the first. None of the lowermost tracheal rings are peculiar in any way.

*Hadrostomus aglaia* is a bird in which the calibre of the lower end of the trachea is very inconsiderable, and the syrinx is correspondingly difficult to investigate. The tracheal rings are not modi-

<sup>1</sup> *Loc. cit.* plate iv. figs. 9-11.

fied, except the last, which is developed into a three-way piece from the presence of a bar running from before backwards at the middle of the lower margin. The first bronchial half-ring is of the same flattened and deep nature as the tracheal rings, and, like them also, is not separated from the three-way piece by any interval. To its anterior end, on each side, as well as to the front of the three-way piece, the intrinsic muscle is attached, which descends, broad and thin, down the front of the lower part of the trachea, in contact with its fellow of the opposite side, there to terminate (*vide* Plate LIII. fig. 8).

The second bronchial semi-ring is not modified. It is separated by a short interval from the first, and by a strikingly considerable one from the third, which is the commencement of the normal bronchus. I could not find that the muscles of the syrinx sent any fibres to this second ring, as in *Pachyrhamphus atricapillus*, described by Müller, although otherwise this structure is almost identical in the two birds. If they are present they must be extremely feeble; and the relative distances of the upper bronchial semi-rings favours the view that some special arrangement exists.

The account, above given, of the voice-organs in the aberrant Passeres in question, is entirely confirmatory of the results arrived at by Johannes Müller. Both *Hylactes* and *Grallaria* are completely tracheophone, as he predicted they would be found to be, although they agree with one another, and differ from those previously described in having the syringeal end of the trachea less abruptly distinguishable as being composed of two parts. Neither *Lipaugus*, nor *Heteropelma*, nor *Hadrostromus* are far from the mesomyodian types already known, as far as their voice-organs are concerned, which structure clearly shows that our nomenclature is an inefficient one when it places *Hadrostromus* as far from *Pachyrhamphus* as either is from *Tityra*.

Again, also, that the Pipridæ and Cotingidæ should be considered to be different families is not borne out by the nature of the lower larynx; and it seems hardly possible to allow a difference in tarsal scutellation to constitute a family difference, when not borne out by more important points of internal structure.

#### EXPLANATION OF PLATE LIII.

Fig. 1. Syrinx of *Grallaria guatemalensis*, front view.

2. The same, back view.

3. The same, lateral view, from within, showing the fusiform *processus vocalis*.

4. Syrinx of *Hylactes megapodius*, front view.

5. The same, back view.

6. Syrinx of *Lipaugus cineraceus*, front view.

7. The same, side view.

8. Syrinx of *Hadrostromus aglaïæ*, front view.



10. Notes on a small Collection of Land and Freshwater Shells from South-east Madagascar, with descriptions of new Species. By GEORGE FRENCH ANGAS, C.M.Z.S., F.L.S., &c.

[Received June 2, 1877.]

(Plate LIV.)

Mr. Edward Bartlett has placed in my hands for examination a small collection of land and fluviatile shells collected by Mr. Waters at Ekongo, on the south-east coast of Madagascar. It contains the following species:—

<i>Achatina acuta</i> , Fér.	<i>Cyclostomus bicarinatus</i> , Sow.,
<i>Helix cornu-giganteum</i> , Lam.	and several varieties.
— <i>farafanga</i> , H. Ad.	— <i>boivini</i> , Pfr.
— <i>souverbei</i> , Fisch.	— <i>tricarinatus</i> , Lam.
— <i>sepulchralis</i> , Fér., and vars.	— <i>multifasciatus</i> , Grate.
— <i>omphaloides</i> , Pfr.	<i>Melania amarula</i> , Lam.
— <i>calypso</i> , Pfr.	<i>Melania</i> , sp.?
— <i>xystera</i> , Valenc., and vars.	<i>Navicella lineata</i> , Lam.
— <i>devali</i> , Petit.	— <i>eximia</i> .
<i>Megalostoma crocea</i> .	<i>Lymnæa natalensis</i> , Krauss, large
<i>Cyclotus macareae</i> , Petit.	var.
	<i>Nerita caffra</i> , Wood.

**BULIMUS BALSTONI**, n. sp. (Plate LIV. fig. 7.)

Shell imperforate, elongately ovate, somewhat thin, shining, irregularly longitudinally striated, and crossed here and there with concentric lines, giving portions of the surface somewhat of a tessellated appearance, rich chestnut-brown, paler towards the apex; spire elongately conical, somewhat obtuse at the apex; whorls 7, slightly convex, the last longer than the spire; sutures impressed, margined, and crenulated; aperture ovately oblong, bluish purple within; outer lip slightly arcuate, and a little thickened at the edge; inner lip with a strong callus, which is slightly flattened and expanded over the columella.

Alt. 3 inches 9 lines, diam. 1 inch 4 lines; length of aperture 1 inch 6 lines, breadth 9 lines.

*Hab.* Ekongo, S.E. coast of Madagascar.

This fine *Bulimus* must not be confounded with *B. clavator* of Petit de la Saussaye, another Madagascar species. They are distinct in form, texture, and other characters.

At the request of Mr. Edward Bartlett I have called this species after Mr. R. J. Balston.

**HELIX WATERSI**, n. sp. (Plate LIV. figs. 3 a, 3 b.)

Shell with a small compressed umbilicus, discoidal, rather solid; obliquely closely striated with irregular, somewhat undulating, erect striae, which are crossed by numerous concentric lines, exhibiting here and there a minutely reticulated appearance at the points of crossing,

light purplish brown, becoming darker behind the lip, partially covered with a pale straw-coloured epidermis; spire depressed, whorls 4, rapidly increasing, somewhat convex, the last very wide, swollen, bluntly keeled, with a slight depression above the keel; aperture nearly horizontal, transversely lunately ovate, margined within with a broad band of purplish black, interior pale lilac; peristome thickened, expanded, and reflected, edged with white; margins approximating and joined by a callus.

Diam. maj. 1 inch 8 lines, min. 1 inch  $3\frac{1}{2}$  lines, alt. 9 lines.

*Hab.* Ekongo, S.E. coast of Madagascar.

This interesting shell may at once be distinguished from *H. sepu-chralis* and its allies by its elaborate sculpture, and by the expanded form of the aperture.

*HELIX EKONGENSIS*, n. sp. (Plate LIV. fig. 4.)

Shell minutely umbilicated, depressedly globose, very thin, the oblique lines of growth crossed by exceedingly fine, close-set, concentric lines, pale horn-colour, with one narrow brown band above the suture on the upper whorls, and two on the last whorl, one on either side of the periphery; spine depressedly conical, apex obtuse; whorls 6, flatly convex, the last not descending; aperture oblique, lunately ovate; outer thin, simple.

Diam. maj. 11 lines, min. 10 lines, alt. 6 lines.

*Hab.* Ekongo, S.E. Madagascar.

*HELIX BALSTONI*, n. sp. (Plate LIV. fig. 5.)

Shell imperforate, depressedly conoidal, thin, sculptured all over with extremely fine, close-set, engraved lines that cross each other obliquely both ways, giving the surface a delicately shagreened appearance under the lens, fulvous horn-colour throughout; spire depressedly conical, apex somewhat obtuse; whorls 6, flatly convex, the last sharply keeled at the periphery, not descending in front; base convex, shining; aperture oblique, quadrately ovate; outer lip thin, simple.

Diam. maj. 1 inch 2 lines, min. 1 inch, alt. 7 lines.

*Hab.* Interior of Madagascar.

In form, this species greatly resembles *Helix semidecussata*, Pfr., from India; but the sculpture of the whorls is quite different, and is remarkable for its extreme delicacy and beauty.

At the request of Mr. Edward Bartlett I have named this shell after Mr. W. E. Balston.

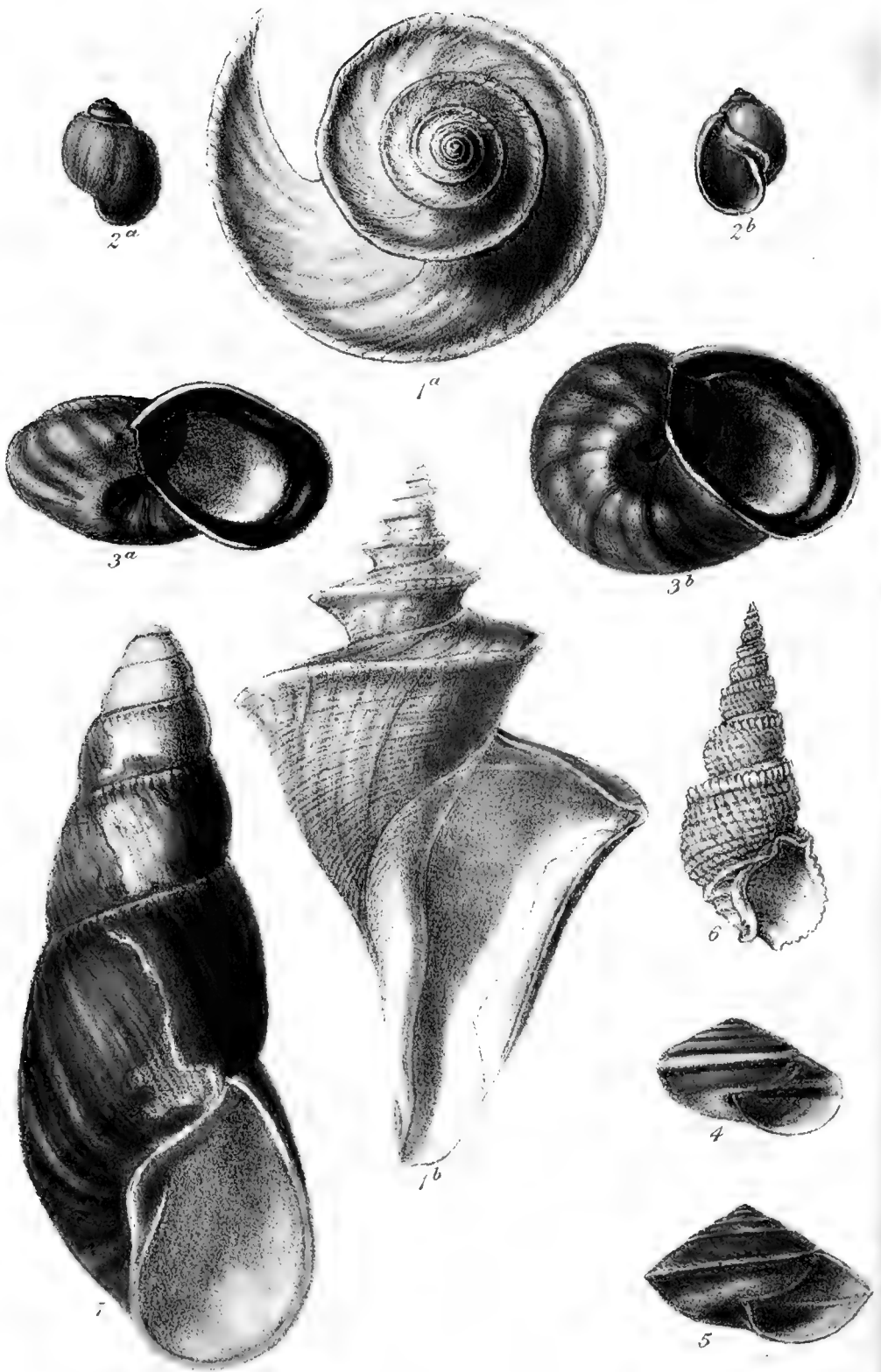
*PHYSA MADAGASCARIENSIS*, n. sp. (Plate LIV. figs. 2 a, 2 b.)

Shell sinistral, perforate, thin, longitudinally plicately striated, the striæ being more regular on the upper whorls, horn-coloured; spire obtusely conical, apex blunt; whorls  $4\frac{1}{2}$ , convex, the last large and inflated; aperture ovate, narrower above; outer lip thin, simple, arcuate; columella with a broad callus expanded over the umbilical region.

Alt. 8 lines, diam.  $5\frac{1}{2}$  lines.

*Hab.* Okongo, S.E. Madagascar.





M & H Hanhart imp.

11. Descriptions of a new Genus of Gasteropodous Mollusca from Japan, and of a new Species of *Bullia* from Kurrachi. By GEORGE FRENCH ANGAS, C.M.Z.S., F.L.S., &c.

[Received June 2, 1877.]

(Plate LIV.)

Subfamily FUSINÆ.

THATCHERIA, new genus.

Shell angularly pyriform, solid; spire prominent, shorter than the aperture, many-whorled, whorls flattened above, strongly keeled at the periphery and contracted below; aperture with a broad incurved sinus between the extremity of the last keel and the junction of the body-whorl; basal canal wide and open; columella smooth; outer lip simple below the sinus.

THATCHERIA MIRABILIS, n. sp. (Plate LIV. figs. 1 *a*, 1 *b*.)

Shell angularly pyriform, solid, yellowish white; spire elevated, and acuminate towards the apex; whorls 8, flattened, and slightly excavated above, strongly and prominently keeled at the periphery, and sloping inwards below, above the keels finely arcuately striate, below irregularly more or less crenately concentrically ridged; aperture triangularly subquadrate, pure white, and shining within; columella smooth, slightly arcuate above, nearly straight below, white; outer lip with a broad excavated sinus extending from its juncture with the body-whorl to the extremity of the last keel; below the keel, which is very prominent, the lip is simple and arcuate.

Alt. 3 inches 6 lines. Diam. 2 inches. Length of aperture 2 inches 2 lines.

*Hab.* Seas of Japan.

This very remarkable shell, quite unlike anything hitherto met with, was recently brought from Japan by Mr. Charles Thatcher. The specimen is believed to be unique. Without a knowledge of the operculum, its exact generic position cannot be determined; but at present I regard it as belonging to the subfamily Fusinæ.

BULLIA (LEIODOMUS) KURRACHENSIS, n. sp. (Plate LIV. fig. 6.)

Shell acuminately turreted, solid, white, tinged with rose-colour on the upper whorls; spire elongated, apex very sharp; whorls 9, somewhat convex, excavated and strongly keeled below the sutures, regularly transversely ribbed and longitudinally ridged with the lines of growth, the ridges becoming more or less imbricate and angled upon the keel, overlapping each other and forming a slight irregular coronation, last whorl with a sharp keel near the base; aperture ovate, outer lip simple.

Alt. 1 inch 9 lines. Diam. 9 lines.

*Hab.* Kurrachi, Scinde, N.W. India.

The type specimen of this elegantly turreted species was obtained  
Proc. Zool. Soc.—1877, No. XXXIV. 34

a short time ago on the beach near Manora Point, Kurrachi, by my daughter, Mrs. John Bruce. I have placed it in the British Museum.

## EXPLANATION OF PLATE LIV.

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| <p>Figs. 1 a, 1 b. <i>Thatcheria mirabilis</i>, p. 529.<br/>         2 a, 2 b. <i>Physa madagascariensis</i>, p. 528.<br/>         3 a, 3 b. <i>Helix watersi</i>, p. 527.</p> | <p>Fig. 4. <i>Helix ekongensis</i>, p. 528.<br/>         5. — <i>balstoni</i>, p. 528.<br/>         6. <i>Leiodomus kurrachensis</i>, p. 529.<br/>         7. <i>Bulimus balstoni</i>, p. 527.</p> |
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June 19, 1877.

E. W. Holdsworth, Esq., F.Z.S., in the Chair.

The Secretary made the following report on the additions to the Society's Menagerie during May 1877:—

The total number of registered additions to the Society's Menagerie during the month of May was 164, of which 15 were by birth, 82 by presentation, 34 by purchase, while 21 were received in exchange, and 12 on deposit. The total number of departures during the same period, by death and removals, was 161.

The most noticeable additions during the month were:—

1. Seven Raccoon-like Dogs (*Nyctereutes procyonides*) born in the Menagerie on the 2nd May. We are fortunate, as I have already remarked (P. Z. S. 1876, p. 695), in having an example of both sexes of this scarce species of *Canis* in our collection, and still more fortunate that they have bred with us and produced such a large litter.

2. A Pangolin (*Manis tricuspis*) purchased May 24th from Mr. Cross, of Liverpool, being, so far as I know, the first example of this remarkable form of the Edentata that has ever reached us alive.

The animal, which, I regret to have to add, died on the 27th ult. from debility consequent upon ulceration of the tongue, is a male, probably not quite mature. It measures  $28\frac{1}{2}$  inches in length, the body being  $13\frac{1}{2}$  and the tail 15 inches long. There are 7 series of scales on the head, 20 or 21 on the back, and 38 on the tail (see woodcut, p. 531).

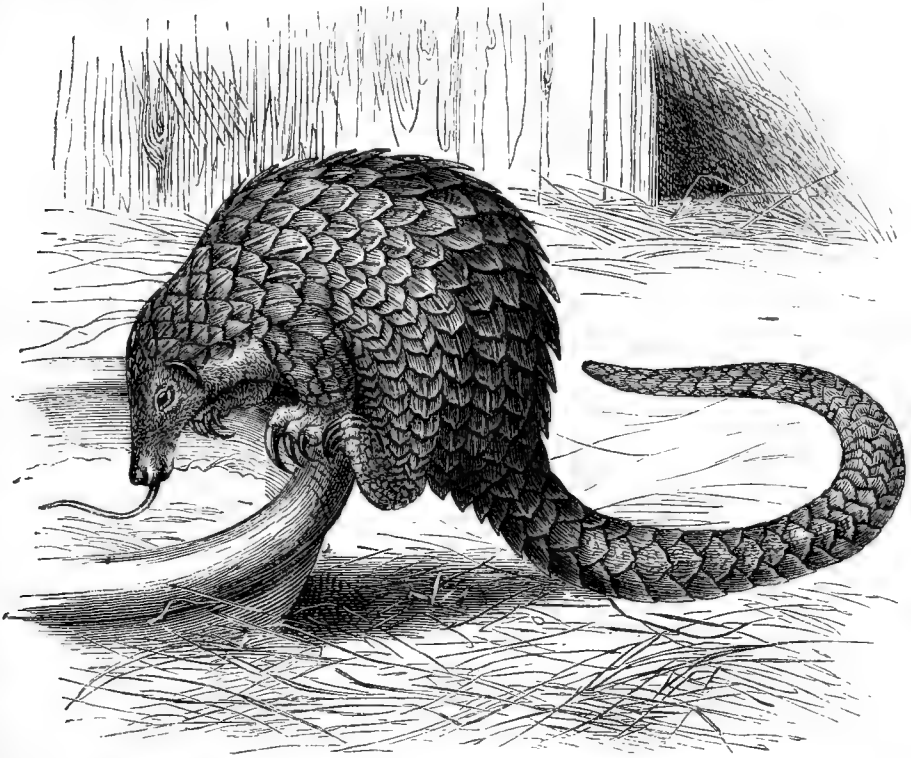
Prof. Garrod promises to give us a full account of the anatomy of this interesting animal, of which there is still much to be learnt.

3. An African Buzzard (*Buteo tachardus*), captured in the Red Sea, and presented by Mr. Andrew Anderson, F.Z.S., May 22nd, 1877.

Mr. Anderson sends me the subjoined note on the capture of this bird:—

On the afternoon of the 27th April, while off the Zebayer Islands, in the Red Sea, about midway between the coast of Africa and Arabia [lat.  $15^{\circ} 2' N.$ , long.  $42^{\circ} 18' E.$ ], a large flight of big-looking birds suddenly made their appearance; and, so far as I could count them, some 15 or 20 remained with the S.S. 'Europa,' settling now and again on the rigging.

During the night four were captured; but I only succeeded in becoming possessed of two, which, judging from the difference in their size, must have been ♂ and ♀. The smaller one, presumably



*Manis tricuspis*, from a drawing by Mr. Wood, F.Z.S., published in the 'Illustrated London News' for July 28th, 1877.

the ♂, was in a very rufous or rather ochreous-red phase of plumage; this one, I regret to say, died the day before we reached Liverpool.

The one that has been placed in the Gardens is of a brown colour, and I should say is a ♀ bird. The four specimens I examined in life varied considerably in plumage, as much so as *Buteo ferox* does.

4. A Guianan crested Eagle (*Morphnus guianensis*), purchased May 23rd, and said to have been received from the Upper Amazons. This is the first example of this remarkable bird of prey that we have received alive.

5. A one-wattled Cassowary (*Casuarus uniappendiculatus*), obtained from the Royal Zoological Society of Amsterdam on the 24th May. This is a not quite adult example of this fine Cassowary, of which we have previously had but a single young specimen in the collection<sup>1</sup>.

6. A male of the new Mesopotamian Fallow Deer, lately described and figured by Sir Victor Brooke in the Society's Proceedings (see P. Z. S. 1875, p. 261, pl. xxxviii., and 1876, p. 298). This fine animal was obtained for the Society through the exertions of Mr. Robertson, H.B.M. Vice-Consul at Bussorah, and brought to this country (very appropriately!) by the S.S. 'Mesopotamia,' Capt. Phillips, of whom it was purchased for the sum of £50. It is a

<sup>1</sup> See P. Z. S. 1875, p. 85, pl. xx.

male, very tame, and in excellent health, and is now growing a pair of those singular horns which render it so easily distinguishable from the common Fallow Deer.

7. An animal sold to us on the 29th May by Mr. Arthur Mosenthal as a Cheetah, but which appears to belong to a new species of the genus *Felis*, distinct from, although closely allied to that animal.

It is a male, probably not quite fully grown. It presents generally the appearance of a Cheetah (*Felis jubata*), but is thicker in the body, and has shorter and stouter limbs, and a much thicker tail. When adult it will probably be considerably larger than the Cheetah, and is larger even now than our three specimens of that animal. The fur is much more woolly and dense than in the Cheetah, as is particularly noticeable on the ears, mane and tail. The whole of the body is of a pale isabelline colour, rather paler on the belly and lower parts, but covered all over, including the belly, with roundish dark fulvous blotches. There are no traces of the black spots which are so conspicuous in all the varieties of the Cheetah which I have seen, nor of the characteristic black line between the mouth and eye.

Until we know more about this animal, and further examples of it have been obtained, it is perhaps too early to say that we have here a new species amongst the larger Cats; but after having looked through the descriptions of the varieties of the Cheetah given by different authors, and having especially studied the descriptions of the *Felis jubata* and *F. guttata*, as distinguished by Wagner, I believe it impossible to associate the present animal with any of them, and I propose to give it the temporary designation of *Felis lanea* or Woolly Cheetah. Mr. Mosenthal informs me that this animal, though shipped at Cape Town, was originally procured from Beaufort West in the Cape Colony. It is difficult to understand how such a distinct animal can have so long escaped the observations of naturalists.

Mr. Bartlett, by whom my attention was first directed to it, tells me that he has examined many Cheetah's skins from Africa, but never saw one any thing like that of the present animal. We have had in the collection Cheetahs from South Africa, Eastern Africa, Syria, and India, and have no doubt they all belong to one species. At the present moment we have in the Gardens examples of both African and Indian forms.

Mr. Smit's drawing (Plate LV.), together with the preceding notes, will, I trust, serve to make the differences between *Felis lanea* and *F. jubata* intelligible to naturalists<sup>1</sup>.

<sup>1</sup> At first one might be inclined to suppose that our animal was the *Felis jubata* of Duvernoy (Mém. Mus. d'H. N. Strasbourg, ii. p. 10), as distinguished by him from *Felis guttata*, as follows:—

“Le *felis jubata* se distingue par sa robe jaune nankin parsemée partout, même sous le ventre, de taches rondes, de couleur foncée. Il l'est encore par des formes plus épaisses et une assez forte crinière.

“Le *felis guttata* en diffère par des formes plus grêles, des jambes plus hautes, son pelage d'un fauve orangé foncé ou clair, parsemé de taches rondes et noires, excepté en dessous, où il est quelquefois d'un blanc pur et sans aucune tache ou n'en a que de ternes.”

But on looking more narrowly into Duvernoy's description, particularly to his





J Smit hth

FELIS LATERALIS

Harhart imp



The Secretary read an extract from a letter addressed to him by Monsieur J. M. Cornely, C.M.Z.S., dated Château Beaujardin, Tours, France, June 5th, stating that his female *Hydropotes inermis*, which had been impregnated by the Society's male, sent to Tours for that purpose, had just produced three young ones, one of which, however, had been born dead; the dead one weighed 1175 grammes, and was about 45 centims. in length.

Mr. J. E. Harting, F.Z.S., exhibited a variety of the Common Snipe, and made the following remarks:—

The Snipe which I have the pleasure of exhibiting this evening is remarkable from the circumstance that the colour of the plumage is exactly intermediate between that of the Common Snipe and the so-called Sabine's Snipe. It seems, indeed, to form a connecting link, as it were, between the two, and to lead to the conclusion (already shared in by many ornithologists) that the so-called Sabine's Snipe is not a valid species, but a melanism of the Common Snipe.

Some years ago, before I had examined as many specimens of Sabine's Snipe as I have since seen, I thought from various characters (such as the absence of the longitudinal half-lines on the dorsal plumage, and the ovate shape of the feathers generally) that Sabine's Snipe might be a good species; but having now examined some fifteen or sixteen different specimens, I am inclined to believe that the ovate shape of the feathers is characteristic of age, and indicates a young bird, and that the so-called species ought to be regarded simply as a melanism of the common species.

The specimen now exhibited was killed in Ireland last Christmas; and a brief notice of it will be found in the 'Zoologist' for January last, pp. 24, 25.

Mr. B. Tegetmeier, F.Z.S., exhibited a specimen of the sternum of the Tawny Owl (*Syrnium aluco*) which presented a curious malformation. There was a complete absence of ossification down the middle line, the moieties of the sternum, in contact superiorly, being widely divergent inferiorly, although each was quite of normal form. The furcula was not peculiar.

Mr. John Murray, C.M.Z.S., Naturalist of the 'Challenger' Expedition, exhibited and made remarks on a series of Shark's teeth, Whale's ear-bones, and other specimens dredged up during the voyage of the 'Challenger.'

Prof. Garrod, F.R.S., read a description of the brain of the Sumatran Rhinoceros.

This paper will be published in the Society's 'Transactions.'

The following papers were read:—

reference to the black line below the eye in his *F. jubata*, I think it impossible to identify it with the present animal.

1. Reports on the Collections of Birds made during the Voyage of H.M.S. 'Challenger.'—No. I. General Remarks on the Collections. By P. L. SCLATER, M.A., Ph.D., F.R.S.

[Received May 24, 1877.]

At the request of Sir C. Wyville Thomson, I have had great pleasure in undertaking the determination of the skins of birds collected during the voyage of H.M.S. 'Challenger' round the world in the years 1874-6. The whole collection embraces about 900 specimens in skins, besides which there is a considerable series of sea-birds in salt and spirit, which will be used principally for anatomical purposes, and a collection of eggs, principally of oceanic species.

The collection was formed under the superintendence of Mr. John Murray, one of the naturalists of the Expedition, and the skins chiefly prepared by Mr. Frederick Pearcey, who accompanied the vessel as taxidermist. They are, nearly without exception, in an excellent state of preservation.

Mr. Murray has placed at my disposal his ornithological note-book, which contains the history of every individual specimen, and many other particulars, which add greatly to the value of the collection.

It will be recollected that the main object of the 'Challenger' Expedition was the exploration of the depths of the ocean, and that the collecting of birds of any sort, especially land birds, formed but a very subordinate part of the original plan. Ornithologists must therefore not be surprised that so small a collection was made during a three years' voyage, but rather be very thankful to Sir C. Wyville Thomson and his coadjutors for having devoted so much extra attention to a branch of science in which investigations were not required of them.

For the purpose of study, I have divided the collection of bird-skins as follows:—

- A. Terrestrial Birds.
- B. Oceanic Birds.

The Terrestrial Birds fall into the following ten geographical categories, to which I have added the approximate number of skins:—

1. <i>Atlantic Islands, i. e.</i> Tristan da Cunha and Inaccessible	12
2. <i>Kerguelen Land</i> .....	16
3. <i>Cape York, Australia</i> .....	60
4. <i>Aroo Islands</i> .....	62
5. <i>Moluccas, i. e.</i> Banda, Ternate, Amboyna, and Ké. . . .	70
6. <i>Philippines</i> .....	95
7. <i>Admiralty Islands</i> .....	56
8. <i>South Pacific Islands, i. e.</i> Friendly Islands, Fijis, New Hebrides, and Tahiti .....	135
9. <i>Sandwich Islands</i> .....	24
10. <i>Antarctic America, Juan Fernandez, and Falklands</i> ..	149

Total approximate number of skins . . . . 679

Besides these a few specimens (26 in all) were obtained at Hongkong, China, Japan, New Zealand, St. Jago, Cape Verd, and one or two other localities, but nothing like series which necessitate special examination.

Under the head *Oceanic Birds* I place the members of the following families, which are most conveniently studied as groups:—

Laridæ .....	47 specimens
Procellariidæ .....	80 „
Steganopodes.....	33 „
Spheniscidæ .....	38 „
	—
Total. .	198 „

To aid me in my task I have been fortunate enough to obtain the valuable assistance of the Marquess of Tweeddale, our President, for the determination of the Philippine Birds, of Mr. O. Salvin as regards the Procellariidæ, of Mr. Howard Saunders for the Laridæ, of Dr. Finsch for the birds of the South Pacific Islands; and I hope to get that of Count T. Salvadori for some of the Moluccan and Papuan birds.

The members of the other groups I trust to be able to determine myself personally or in conjunction with my constant fellow-worker Mr. O. Salvin.

With the approbation of Sir C. Wyville Thomson I propose to communicate the results of the investigations of these gentlemen and myself on this subject to the Society in a series of reports, which will be accompanied by extracts from Mr. Murray's ornithological journal.

2. Reports on the Collections of Birds made during the Voyage of H.M.S. 'Challenger.'—No. II. On the Birds of the Philippine Islands. By ARTHUR, Marquis of TWEEDDALE, F.R.S., President of the Society.

[Received June 8, 1877.]

The 'Challenger' Expedition, during its stay in the Philippine archipelago, visited six islands, viz. Panay (Ilo-ilo), Luzon (Manila), Zebu, Camiguin, Malanipa, and Mindanao (Zamboanga and Pasa-nanca). It is not on record that two of these islands, Camiguin and Malanipa, had ever been previously visited by any ornithological collector; while from Mindanao only some nineteen species of birds were known. Dr. Steere, at about the time the 'Challenger' was near Mindanao, collected many additional species of birds on that island, as he had also done in the islands of Zebu and Panay; and as the results of his researches have already been made known by

Mr. Bowdler Sharpe<sup>1</sup>, some of the discoveries made by the 'Challenger' naturalists have been anticipated. In order that the exact course taken by the 'Challenger' may be recorded, with the dates on which the expedition arrived at and departed from the different islands, I transcribe the following extracts from Mr. J. Murray's ornithological note-book, adding to each extract the names of the birds, as I have determined them:—

"Ship arrived at Ilo-ilo on the 28th [October 1874], at 5 P.M. On the 30th the following birds were shot. These are all from the island opposite the town:—

[ <i>Osmotreron axillaris.</i>	<i>Centrococcyx viridis.</i>
<i>Broderipus acrorhynchus.</i>	<i>Corvus philippinus.</i>
<i>Loriculus panayensis.</i>	<i>Corydalla lugubris.</i>
<i>Entomobia gularis.</i>	<i>Lalage dominica.</i>
<i>Sauropatis chloris.</i>	<i>Orthotomus castaneiceps.</i>
<i>Pelargopsis gigantea?</i>	<i>Arachnechthra jugularis.</i> ]

"The ship arrived at Manila on the 11th January, 1875, and left there on the 14th January. The following two birds were shot from the ship during the stay:—

[ <i>Larus ridibundus.</i>	<i>Hydrochelidon hybrida.</i> ]
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"The ship arrived at Zebu on the 18th January, 1875, and left on the 24th. During the stay Percy and some of the officers shot the following birds:—

[ <i>Broderipus acrorhynchus.</i>	<i>Demiegretta sacra.</i>
<i>Artamus leucorhynchus.</i>	<i>Hypsipetes philippinensis.</i>
<i>Sauropatis chloris.</i>	<i>Lanius lucionensis.</i>
<i>Haliastur intermedius.</i>	<i>Merops philippinus.</i> ]
<i>Numenius phæopus.</i>	

"Parties landed on the volcanic island of Camiguin on the 26th January, 1875, for a few hours in the afternoon, and the following birds were shot:—

[ <i>Corvus philippinus.</i>	<i>Arachnechthra jugularis.</i>
<i>Calornis panayensis.</i>	<i>Tringoides hypoleucos.</i> ]
<i>Sauropatis chloris.</i>	

"On the 30th of January a party landed, early in the morning, on the island of Malanipa, Basilan Straits, near Zamboanga, and returned to the ship at 2 P.M. The following birds were shot:—

[ <i>Eudynamis mindanensis.</i>	<i>Numenius phæopus.</i>
<i>Myristicivora bicolor.</i>	<i>Nectarophila julia.</i>
<i>Haliastur intermedius.</i>	<i>Totanus incanus.</i>
<i>Tanygnathus lucionensis.</i>	<i>Hypothymis azurea.</i> ]
<i>Pelargopsis gigantea.</i>	

<sup>1</sup> Trans. Linn. Soc. ser. 2, Zool. vol. i. I am much indebted to Mr. Sharpe for his courtesy in permitting me to peruse his paper while it was passing through the press. Without this assistance it would have been impossible for me to have completed this report at so early a date.

“On the 1st February, 1875, a party of four officers and three men left the ship with tent &c., and went up to the high land beyond Zamboanga. The tent was pitched in a valley called Pasananca, at a distance from Zamboanga of some seven miles. The tent and baggage had to be transported on horseback. The party remained at the spot the 2nd, 3rd, and 4th, and returned to the ship on the 5th, at about midday. The following birds were obtained by the party, and were skinned by Percy at the tent:—

[ <i>Buceros mindanensis</i> .	<i>Harpactes ardens</i> .
<i>Broderipus acrorhynchus</i> .	<i>Erythropitta erythrogastra</i> .
<i>Merops philippinus</i> .	<i>Chrysocolaptes lucidus</i> .
— <i>bicolor</i> .	<i>Prioniturus discurus</i> .
<i>Entomobia gularis</i> .	<i>Calobates melanops</i> .
<i>Pelargopsis gigantea</i> .	<i>Dicaeum mindanense</i> .
<i>Dicrurus striatus</i> .	<i>Haliastur intermedius</i> .
<i>Hypsipetes rufigularis</i> .	<i>Tringoides hypoleucus</i> .
<i>Ixus goiavier</i> .	<i>Eurystomus orientalis</i> .
<i>Phabotreron brevirostris</i> .	<i>Rhynchæa capensis</i> .
<i>Batrachostomus septimus</i> .	<i>Gallinago stenura</i> .]”

Two more species were obtained at Zamboanga, which are not included in Mr. Murray's notes:—

<i>Charadrius fulvus</i> .	<i>Sterna bergii</i> .
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It will be seen that twelve species were obtained in Panay, two in Luzon, nine in Zebu, five in Camiguin, nine in Malanipa, and twenty-four in Mindanao.

Mr. Murray's field-notes will be found added under the head of each species, included in brackets, together with the collection-numbers.

The ornithological results of the 'Challenger's' short stay in the Philippine archipelago may be summarized as follows:—

Specimens obtained, 98.

Species obtained, 49.

New species obtained, 7:—

<i>Loriculus panayensis</i> .	<i>Buceros mindanensis</i> .
<i>Batrachostomus septimus</i> .	<i>Dicaeum mindanense</i> .
<i>Dicrurus striatus</i> .	<i>Phabotreron brevirostris</i> .
<i>Nectarophila julia</i> .	

Genera added, 2:—

<i>Batrachostomus</i> .	<i>Demiegretta</i> .
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Habitat determined within the archipelago, 1:—

*Rhynchæa capensis*.

Habitat corrected, 1:—

*Chrysocolaptes lucidus*.

Known species added to the Philippine fauna, 4:

<i>Totanus incanus</i> .	<i>Demiegretta sacra</i> .
<i>Gallinago stenura</i> .	<i>Sterna bergii</i> .

Range of known Philippine species extended within the archipelago, 23 :—

	Malanipa.	Mindanao.	Camiguin.	Panay.	Zebu.
<i>Tanygnathus lucionensis</i> .....	*				
<i>Haliastur intermedius</i> .....	*	*	.....	.....	*
<i>Merops philippinus</i> .....	.....	.....	.....	.....	*
<i>Pelargopsis gigantea</i> .....	*				
<i>Entomobia gularis</i> .....	.....	*			
<i>Sauropatis chloris</i> .....	.....	.....	*	*	
<i>Eudynamis mindanensis</i> .....	*				
<i>Artamus leucorhynchus</i> .....	.....	.....	.....	.....	*
<i>Hypothymis azurea</i> .....	*				
<i>Broderipus acrorhynchus</i> .....	.....	.....	.....	*	
<i>Ixus goiavier</i> .....	.....	*			
<i>Hypsipetes ruficularis</i> .....	.....	*			
<i>Calobates melanope</i> .....	.....	*			
<i>Corydalla lugubris</i> .....	.....	.....	.....	*	
<i>Arachnechthra jugularis</i> .....	.....	.....	*		
<i>Corvus philippinus</i> .....	.....	*	*	*	
<i>Calornis panayensis</i> .....	.....	.....	*		
<i>Munia jagori</i> .....	.....	*			
<i>Osmotreron axillaris</i> .....	.....	.....	.....	*	
<i>Myristicivora bicolor</i> .....	*				
<i>Charadrius fulvus</i> .....	.....	*			
<i>Numenius phæopus</i> .....	*				
<i>Tringoides hypoleucos</i> .....	.....	*	*		
	7	9	5	5	3

### 1. PRIONITURUS DISCURUS.

*Psittacus discurus*, Vieill. Gal. des Ois. i. p. 7, t. 76, "Mindanao" (1825).

*Prioniturus discurus*, Walden, Trans. Zool. Soc. ix. p. 132. no. 2.

[No. 431, ♂. Pasananca. Eyes grey. It frequents the banana-trees, and feeds on their fruit, of which the stomach was full.]

Luzon and Guimaras individuals do not differ from this typical example.

### 2. TANYGNATHUS LUCIONENSIS.

*Psittacus lucionensis*, Linn. Syst. Nat. i. p. 146. no. 31 (1766); Walden, t. c. p. 133. no. 8.

[No. 399, ♂. Malanipa. Eyes white.]

Does not differ from typical examples. The locality is new.

### 3. LORICULUS PANAYENSIS, n. sp.

"*Loriculus regulus*, Souancé," Sharpe, Trans. Linn. Soc. ser. 2, Zool. vol. i.

[No. 348, ♂. } Ilo-ilo. Eyes brown; feet orange; bill red. Sto-  
No. 349, ♀. } mach had seeds.]



♂. Grass-green, below lighter. Forehead and sinciput bright blood-red; vertex and occiput green, washed with golden yellow; a narrow band, separating the red sinciput from the golden vertex, yellow. A golden mark across the nape. Uropygium and upper tail-coverts dark scarlet. A decided line round the mouth and base of mandible verditer-blue. Breast yellowish green. Outer webs of quills dark green, inner black, above; quills underneath black, most of the inner webs of primaries being blue, and all of the inner webs of the remaining quills. Rectrices dark green, blue underneath. Short under wing-coverts dark green, longer blue. Bill coral-red.

♀. Like the male, but differs in having the vertex and occiput green, and no blue round the mouth.

	Wing. in.	Tail. in.	Tarsus. in.	Bill from nostril. in.
♂.	3·62	2·12	0·37	0·43
♀.	3·56	2·00	0·37	0·43

This species above closely resembles *L. regulus*, ex Negros, but differs in wanting the red pectoral patch and in having blue feathers at the base of the mandible. The female only differs from that of *L. regulus* in having no blue feathers round the mouth, though a few are present at the top of the throat.

Dr. O. Finsch has remarked (Ibis, 1874, p. 208) that *L. chrysonotus* has no orange mark on the nape; but I find this mark very conspicuous in a specimen belonging to my series of the species, ex Zebu.

#### 4. HALIASTUR INTERMEDIUS.

*Haliastur intermedius*, Gurney, Ibis, 1865, p. 28; Walden, *t. c.* p. 142. no. 17.

[No. 373, ♂. Zebu. Eyes brown. Shot from the ship at the anchorage at Zebu.

No. 374, ♂. Zebu. Eyes brown. Stomach contained offal.

No. 398, ♂. Malanipa. Eyes yellow.

No. 434, ♂. Pasananca. Eyes brown.]

Not previously recorded from these three localities.

#### 5. CHRYSOCOLAPTES LUCIDUS.

*Picus lucidus*, Scop, Del. Fl. Faun. Insubr. ii. p. 89. no. 51 (1786); Walden, *t. c.* p. 147. no. 32.

[No. 430, ♂. Pasananca. Eyes red.]

Unless *C. maculiceps*, Sharpe (*t. c.*), belongs to this species, this Mindanao specimen appears to be the first that has been brought to Europe since Sonnerat's day; for now that I have the opportunity of comparing it with *C. hæmatribon*, I doubt the correctness of the identification of Jagor's young bird ex Luzon by Dr. v. Martens (J. f. Orn. 1866, p. 20. no. 110), and for the reason that, first, *C. lucidus* is a representative form of *C. hæmatribon*, and secondly, if a Luzon bird, it would have been found by some one of the collectors who have well worked the vicinity of Manila since Sonnerat collected in its neighbourhood. If this be so, Sonnerat must have obtained his own type specimen and that of Buffon, not

in Luzon, but at or near Zamboango, where the naturalists of the 'Challenger' procured this one. The species is accurately described, from Sonnerat's type specimen in the Paris Museum, by Malherbe (Monogr. Picidæ, ii. p. 85), although his figure (*op. cit.* t. 16. fig. 3) shows too little carmine and too much golden on the wings, and thus is inconsistent with his own description.

Mr. Sharpe's type specimen has unfortunately gone to America. It was obtained in Basilan by Mr. Steere, and, from the description and specific title, seems to have been a male in imperfect plumage. It has the concealed white spots on the webs of the outer rectrices, which constitute one of the peculiar characters of *C. lucidus*. Sonnerat, in his plate (Voy. N. Guin. pl. 37), exhibits these spots on all the rectrices; but this is an error. If not the same as *C. lucidus*, *C. maculiceps* is a very closely allied representative form. *C. lucidus*, together with *C. xanthocephalus* and *C. hæmatribon*, form a small subgroup of which the only other member occurs in Ceylon (*C. stricklandi*); but *C. lucidus*, with its partly golden wings, seems to be a connecting link with the typical species of *Chrysocolaptes*.

#### 6. HARPACTES ARDENS.

*Trogon ardens*, Temm. Pl. Col. 404, ♀, "Mindanao" (1826); Walden, *t. c.* p. 149. no. 34.

[No. 428, ♂. Pasananca. Legs bluish; bill orange; eyes hazel. Stomach had insects.]

Luzon males do not differ from this typical example.

#### 7. MEROPS PHILIPPINUS.

*Merops philippinus*, Linn. Syst. Nat. ed. 13 (Vindob.), i. p. 183. no. 5 (1767); Walden, *t. c.* p. 149. no. 35.

[No. 380, ♂. Zebu. Eyes red.

No. 412, ♂. } Pasananca. Bill and feet black. Eyes red.]  
 No. 413, ♀. }

These examples in no respect differ from Luzon and Negros individuals, or, indeed, from examples from any part of the Indian region. Not hitherto recorded from Zebu.

#### 8. MEROPS BICOLOR.

*Merops bicolor*, Bodd. Tab. Pl. Enl. p. 15. no. 252 (1783); Walden, *t. c.* p. 150. no. 36, t. xxvi. f. 1.

[No. 414, ♂. Pasananca. Eyes red; feet violet (slightly).]

Both the above species of Bee-eaters were common about the camps, and seemed to associate much together and to have the same habits.

Not to be distinguished from Luzon and Negros individuals.

#### 9. EURYSTOMUS ORIENTALIS.

*Coracias orientalis*, Linn. Syst. Nat. i. p. 154. no. 4 (1766); Walden, *t. c.* p. 152. no. 37.

[No. 436. ? Pasananca. Feet and bill red; tip of mandible black.]

Agrees with Ceylon examples as well as with those from localities already mentioned (*l. c.*).

## 10. PELARGOPSIS GIGANTEA.

*Pelargopsis gigantea*, Walden, Ann. & Mag. Nat. Hist. ser. 4, xiii. p. 123 (1874).

[No. 352, ♂. Ilo-ilo. Eyes black; feet red; bill red, tipped with black. Stomach had fish.

No. 400, ♀. Malanipa. Eyes black.

No. 417, ♂. Pasananca. Eyes black; bill and legs red. Had in the stomach an eel about 6 inches long.]

The example from Malanipa (No. 400), from which island the species has not been hitherto recorded, and the one from Pasananca (No. 417) are somewhat smaller than the type specimen of *P. gigantea*, but in other respects do not differ specifically. In colouring the Malanipa bird is hardly distinguishable from the type; but the Mindanao example has the wings, scapulars, and interscapulars a much purer blue. The Panay bird (No. 352) has the same parts of a still purer blue (as opposed to greenish blue), and all the plumage, including the head, which is more or less white in the type, is creamy buff, most intense on the flanks, abdomen, and under tail-coverts.

Our acquaintance with the mutations of colouring and what they denote in many of the so-called species of this group is yet very limited; and I prefer to retain for the present the Ilo-ilo bird under the title above given.

The specimens measure as follows:—

	Wing. in.	Tail. in.	Bill from forehead. in.	gape. in.
Type, <i>ex</i> Sulu, near Borneo .	6·56	4·25	3·50	4·00
♂, <i>ex</i> Pasananca . . . . .	6·00	4·00	3·25	3·56
♀, <i>ex</i> Malanipa . . . . .	6·06	4·00	3·25	3·56
♂, <i>ex</i> Ilo-ilo. . . . .	6·00	4·00	3·12	3·62

## 11. ENTOMOBIA GULARIS.

*Alcedo gularis*, Kuhl, Buff. & D'Auben. Fig. Av. Col. Nom. Syst. p. 4 (1820); Walden, *t. c.* p. 154. no. 44.

[No. 350, ♂. } Ilo-ilo. Eyes black; legs and bill dark red.

No. 351, ♂. } Stomach had insects.

No. 415, ♂. } Pasananca. Eyes black; feet and bill red.]

No. 416, ♀. }

Luzon, Negros, and Zebu individuals agree well with these Panay and Mindanao examples. The last island is a new locality for the species.

## 12. SAUROPATIS CHLORIS.

*Alcedo chloris*, Bodd. Tabl. Pl. Enl. p. 49 (1783); Walden, *t. c.* p. 155. no. 47.

[No. 353, ♂. } Ilo-ilo. Eyes black. Stomach had insects.

No. 554, ♀. }

No. 371, ♂. } Zebu. Eyes black.

No. 372, ♀. }

No. 387, ♂. } Camiguin.]

No. 388, ♀. }

A Zebu male (No. 371) has the pectoral and flank feathers conspicuously margined with greyish brown; and this is observed in a less degree in a female (No. 354) from Ilo-ilo. Panay and Camiguin are new localities.

13. *BATRACHOSTOMUS SEPTIMUS*, n. sp.

[No. 427, ♀. Pasananca. Eyes brown. Stomach had insects.]

*Rufous phase*.—Head, interscapulars, and elongated occipital crest rufous brown, most of the feathers with a pair of pale rufous spots on either web, and defined by a narrow brown transverse bar. Elongated auriculars barred alternately with brown and rufous. A patch before the eye albescent rufous. A conspicuous nuchal collar formed by a series of very broad feathers brown at the base, then an irregular subdued brown transverse narrow band, followed by a pale rufous band, then another narrow zig-zag brown band, which is succeeded by another pale rufous band, bounded below by a broad transverse dark brown almost black band, which is succeeded by a still broader white band, bordered again with black; the white band is separated from the black above and below by a rusty margin. Feathers of the back, rump, and upper tail-coverts rufous, with irregular transverse brown markings, and in some with brown centres. Scapulars tawny rufous and pure rufous, irregularly marked with brown zigzags, several with a subterminal black mark and a terminal tawny rufous spot. Wing-coverts chestnut, with brown vermiculations; the greater coverts with large, pure white, ovoid terminal drops, mostly situated on the outer webs, and bounded above and on the inner margins with black. Quills brown on the inner webs, pale rufous on the outer, with obscure pale brown marks. Tertiaries pale rufous on the outer webs, much indented with the brown of the inner webs. Innermost tertiaries pale rufous on both webs, transversely marked with cloudy brown. Tips of several of the inner webs of the quills pale rufous. Rectrices pale rufous, traversed by several bars of rufous brown, each bar being bounded above and below by a brown line. Penultimate pair of rectrices with rufous spots, rather than bands. Exterior short pair with almost pure white spots on the inner web. Chin and throat dingy rufous, intersected by brown zigzag lines. A gular collar, formed of broad feathers with a broad subterminal pure white band, bounded below and above by a narrow dark brown band. Feathers of the upper breast dingy rufous freckled brown, pale tawny rufous at the base, with brown transverse lines and traces of white spots on the margins of some of the webs. Concealed lower breast- and flank-plumes mostly pure white, with dark grey markings near the base and terminated with rufous freckled with brown. Abdominal feathers pale albescent rufous, striated with brown, and some marked with pure white. Feathers of the ventral region isabelline white, with small obscure pale tawny rufous margins. Under tail-coverts isabelline, the longer with subterminal marks of brown and rusty. Under wing-coverts greyish white, banded with rufous brown. Thigh-coverts dark rufous brown. Stiff nasal plumes rufous, tipped brown. Wing 6 inches, tail 4·5, tarsus 0·68,

middle toe 0·75, bill (from forehead) 1·12, width of gape 1·37. The tarsus is feathered anteriorly for about one fourth of its length; the bill is massive.

#### 14. EUDYNAMIS MINDANENSIS.

*Cuculus mindanensis*, Linn. Syst. Nat. i. p. 169. no. 3 (1766); Walden, *t. c.* p. 162. no. 61.

[No. 392, ♂. }  
No. 393, ♂. } Malanipa. Eyes red.]  
No. 394, ♀. }

Malanipa is a new locality for this species; but, from its proximity to Mindanao, the examples may be considered typical.

The two males are in full black plumage, with a green gloss. They have, however, a shorter wing than Guimaras examples, the only other Philippine examples I have been able to compare them with. The female is without a tail; and in the absence of any other Philippine individuals of that sex I can make no satisfactory comparisons.

	Wing.	Tail.	Bill,	Tarsus.	Middle toe.
	in.	in.	from nostril.	in.	in.
No. 392, ♂.	7·38	7·62	0·75	1·25	1·12
No. 393, ♂.	7·38	8·00	0·75	1·25	1·12
No. 394, ♀.	6·75	..	0·75	1·25	1·12

No. 392 has a pure white primary wing-covert.  
Mindanao individuals remain a desideratum.

#### 15. CENTROCOCYX VIRIDIS.

*Cuculus viridis*, Scop. Del. Fl. Faun. Insubr. ii. p. 89. no. 47 (1786); Walden, *t. c.* p. 163. no. 64.

[No. 355, ♀. Ilo-ilo. Eyes red. Stomach had insects.]

A young bird, with many new feathers coming in. Old feathers of the body and tail brown. Examples from Luzon, Negros, Zebu, and Guimaras (*mus. nostr.*) do not differ from this typical specimen. There is no record of a Panay example having reached Europe since Sonnerat's time.

#### 16. BUCEROS MINDANENSIS, n. sp.

[No. 407, ♂. }  
No. 408, ♀. } Pasananca. Eyes yellowish grey; legs, base and knob of bill red; tips of upper and lower mandible white.

No. 409, ♀. Pasananca. Bill nearly uniform black, tinged with red; eyes blue. On the whole, appears a much younger bird.

The stomachs of all contained seeds and fruit, and grubs, centipedes, grasshoppers, &c. These birds make a loud sound, like a crow somewhat, and frequent the highest trees. Several times in the early morning we came upon them on the ground under the trees; and I rather think they scrape at the roots of trees for food.]

These examples belong to a representative form of *B. hydrocorax*, *ex Luzon*. They differ from that species in having a corrugated

plate on the basal part of the sides of the mandible, by the casque being narrower, by the general dimensions being less, and by the anterior three fourths of the mandible and about the anterior half of the maxilla being white, and the rufous of the thigh-coverts, of the head, nape, and throat being much darker.

♂ adult. Casque, posterior half of maxilla, rami of mandible, and posterior part of gonyes blood-red. Corrugated lateral plates of mandible darker blood-red. Remainder of bill pale straw-white. Feathers surrounding the eye and clothing the base of mandible, chin, and gullet black. Head, nape, and upper part of breast, lower throat, and thigh-coverts deep rufous maroon. Upper throat tawny. Breast black. Interscapulars and wing-coverts ruddy brown. Upper tail-coverts ferruginous. Under tail-coverts and vent light dingy rust-colour. Quills black; secondaries narrowly margined externally with ferruginous, and tipped with rusty white. Rectrices ruddy ochre.

♀ adult. Like male, as is the case in *B. hydrocorax*.

♀ juv. Differs chiefly by the casque not being so fully developed anteriorly and not overhanging the true culmen, and in its culmen being dingy brown and grey-brown, with indications of red on the casque and at base of mandible. The grooved lateral plates have not appeared. The tarsus and feet in all appear to have been blood-red.

In true *B. hydrocorax* slight indications of grooves are perceptible on the walls of the base of the mandible; but they are cut in the substance of the mandible, and do not form part of an adhering plate.

	Wing.	Tail.	Tarsus.	Mid. toe.	Bill, from gape.	Casque.	
						Length.	Breadth.
<i>B. hydrocorax</i> ♂ .....	in. 16·00	in. 14·25	in. 3·00	in. 2·00	in. 7·00	in. 5·75	in. 2·30
<i>B. mindanensis</i> ♂ .....	15·50	14·00	3·00	1·60	6·62	6·00	2·00
"    "    ♀ .....	14·25	12·50	2·75	1·75	6·25	5·75	1·87
"    "    ♀ juv.	14·25	13·50	3·00	1·75	5·62	4·50	1·50

#### 17. LANIUS LUCIONENSIS.

*Lanius lucionensis*, Linn., S. N. i. p. 135, No. 10 (1766); Walden, *t. c.* p. 171. no. 72, t. xxix. f. 1.

[No. 379, ♂. Zebu. Eyes hazel.]

#### 18. ARTAMUS LEUCORHYNUS.

*Lanius leucorhynus*, Linn., Mantissa Plant. p. 524, "Imarishia" (1771); Walden, *t. c.* p. 174. no. 73.

[No. 369, ♂. } Zebu. Eyes brown. Stomachs had insects.]  
 No. 370, ♀. }

Not hitherto recorded from Zebu. Philippine examples of this species exhibit two slightly differing phases of dress, one in which the upper plumage is of a light bluish and cinereous colour, the

other where it is more of a smoky brown and bluish ash. This does not seem to depend on sex; for one of these examples (*ex* Zebu, No. 369) is marked ♂, while I possess a Luzon example exactly similar, which Dr. Meyer determined to be a ♀. The other Zebu example (No. 370) is marked ♀, and is in the paler bluish-grey attire.

19. LALAGE DOMINICA.

*Turdus dominicus*, L. S. Müller, Suppl. p. 145. no. 56 (1776); Walden, *t. c.* p. 178.

[No. 358, ♀. Ilo-ilo. Eyes brown. Stomach had insects.]

20. DICRURUS STRIATUS, n. sp.

[No. 418, ♂. }  
No. 419, ♂. } Pasananca. Eyes red; feet and bills black.  
No. 420, ♀. }

♂, ♀. Nasal and frontal plumes black; vertex and occiput clothed with glistening green-black scale-like feathers; nape, interscapulars, back, uropygium, and under surface velvety bluish black; feathers of lower throat and of breast with glistening, bluish-black, central, narrow lines, imparting a striated appearance; outer edges of the primaries (first and second excepted), exposed surface of all the remaining quills, all the wing-coverts and wing-lining, and the exposed surface of the rectrices glistening green-black; quills above and below and under surface of the webs of the laterals, black; bill and feet black; wing 5·37 inches, tail 4·62, tarsus 0·90, bill from forehead 1·44.

Of the same type as *D. balicassius*, with the tail but slightly forked.

21. HYPOTHYMIS AZUREA.

*Muscicapa azurea*, Bodd. Tab. Pl. Enl. p. 41 (1783); Walden, *t. c.* p. 182. no. 85.

[No. 406, ♂. Malanipa. Eyes hazel.]

An additional locality for this species.

22. HIRUNDO GUTTURALIS.

*Hirundo gutturalis*, Scop. Del. Fl. Faun. Insubr. ii. p. 96. no. 115 (1786); Walden, *t. c.* p. 184. no. 88.

[No. 362 (?). Caught on board the ship, Oct. 21, 1874, between the Moluccas and the Philippines.]

23. BODERIPUS ACORRHYNCHUS.

*Oriolus acorhynchus*, Vigors, P. Z. S. 1831, p. 97, "Manilla;" Walden, *t. c.* p. 185. no. 90.

[No. 347, ♂. Ilo-ilo. Eyes white. Stomach had insects or, rather, grubs.

No. 365, ♂. }  
No. 366, ♂. } Zebu. Eyes red.]  
No. 367, ♀. }  
No. 368, ♀. }

[No. 410, ♂. }  
 No. 411, ♀. } Pasananca. Eyes red ; bill reddish.]

These examples all agree with typical. The difference of the colour of the iris in the Panay bird is curious ; from that island the species has not hitherto been recorded.

24. ERYTHROPITTA ERYTHROGASTRA.

*Pitta erythrogastra*, Temm. Pl. Col. 212 (1823) ; Walden, *t. c.* p. 187. no. 94.

[No. 429, ♂. Pasananca. Eyes black ; feet slate-coloured. Insects in the stomach.]

The exact origin of the original type is not recorded ; but I cannot detect any important difference between this Mindanao individual and examples from Luzon.

25. IXUS GOIAVIER.

*Muscicapa goiavier*, Scop. Del. Fl. Faun. Insubr. ii. p. 96. no. 109 (1786) ; Walden, *t. c.* p. 190. no. 99.

[No. 343, ♂. Zamboanga.

No. 424, ♂. }  
 No. 425, ♂. } Pasananca. Eyes hazel.]

New to Mindanao.

26. HYPSPETES PHILIPPINENSIS.

*Turdus philippinensis*, Gm. S. N. i. p. 814. no. 40 (1788) ; Walden, *t. c.* p. 191. no. 102.

[No. 378, ♂. Zebu. Eyes hazel.]

27. HYPSPETES RUFIGULARIS.

*Hypsipetes rufigularis*, Sharpe, Tr. L. S. ser. 2. Zool. vol. i.

[No. 421, ♂. }  
 No. 422, ♂. } Pasananca. Eyes brown or hazel.]  
 No. 423, ♀. }

The female is somewhat smaller, with a shorter bill. An addition to the fauna of Mindanao.

28. ORTHOTOMUS CASTANEICEPS.

*Orthotomus castaneiceps*, Walden, Ann. N. H. (4) i. p. 252, "Guimaras" (1st Oct. 1872) ; Walden, Tr. Z. S. ix. p. 195. no. 113 ; Sharpe, Trans. Linn. Soc. ser. 2. Zool. vol. i. ; id. Ibis, 1877, p. 114.

The type was a male ; but this Panay female does not differ.

[No. 359, ♀. Ilo-ilo. Eyes brown. Stomach had insects.]

29. CALOBATES MELANOPE.

*Motacilla melanope*, Pallas, Reisen Russischen Reichs, iii. p. 696. no. 16 (1776) ; Walden, *t. c.* p. 196. no. 114.

[No. 432, ♀. Pasananca.]

A female with greyish brown upper plumage ; tail 3.56. Recorded for the first time from Mindanao.



30. *CORYDALLA LUGUBRIS*.

*Corydalla lugubris*, Walden, *t. c.* p. 198. no. 117 (1875).

[No. 357, ♂. Ilo-ilo. Eyes hazel. Stomach had seeds.]

Panay is an additional locality.

This example differs from the type in having the tertiaries and most of the wing-coverts broadly margined externally with pale rufous, not albescent. The pectoral feathers are tinged with pale rufous; and the brown central streaks are much broader than in the type. The flanks are washed with pale rufous.

31. *DICÆUM MINDANENSE*, n. sp.

[No. 433, ♂. Pasananca.]

♂. Above—cheeks and ear-coverts fuliginous olive-green. Below greyish white, most grey on the breast; quills dark brown, narrowly margined with olive-green on outer webs; tertiaries with the olive-green margins broader; rectrices dark brown, faintly edged with olive; axillaries and under wing-coverts white; feet and bill black. Wing 1·0; tail 1·1; bill, from forehead, 0·59; tarsus 1·5. The bill is not normal, being longer than the head.

This species is a representative form of *D. hypoleucum*, ex Basilan, which is black above and larger.

32. *NECTAROPHILA JULIÆ*, sp. nov.

[No. 402, ♂. } Eyes hazel. Were quite numerous on the island,  
No. 403, ♂. } generally about the tops of the high trees.]

*manipa*

♂. Forehead, entire head, and nape brilliant metallic coppery green; chin, throat, and upper breast brilliant metallic amethystine; space before the eyes black; cheeks and ear-coverts brown; lesser wing-coverts, uropygium, and upper tail-coverts brilliant metallic emerald-green; breast-feathers deep yellow, with orange-coloured tips; abdomen, vent, and under tail-coverts yellowish olive-green; under wing-coverts pale yellow and white; axillaries pale yellow; back and major wing-coverts and scapulars maroon-red; quills dark brown, externally margined with yellowish ruddy brown; rectrices black; bill and feet black. The second example has no orange edging to the pectoral feathers.

♀. Dull olive-green above, a narrow line passing from the base of bill over the eye pale yellow: chin, throat, abdomen, vent, and under tail-coverts pale yellow; breast the same, tinged with grey; minor wing-coverts olive-green, some tipped and centred with ruddy brown; quills dark brown, margined with ruddy brown; greater wing-coverts and scapulars ruddy brown, mixed with olive-green; inner edges of some of the quills margined with white; axillaries and under wing-coverts pale yellow and white; cheeks pale yellow; ear-coverts olive-green; rectrices black, middle pair narrowly, the others broadly tipped with white, outer pair for nearly half their length white; bill and feet black.

	Wing.	Tail.	Tarsus.	Bill, from gape.
♂ .....	1·94	1·35	0·5	0·75
♀ .....	1·87	1·25	0·5	0·62

A true *Nectarophila*.

### 33. ARACHNECTHRA JUGULARIS.

*Certhia jugularis*, Linn. S. N. i. p. 185. no. 7 (1766); Walden, *t. c.* p. 200. no. 123.

[No. 360, ♂. Ilo-ilo. Eyes black. Stomach had insects.

No. 389, ♂. }  
No. 390, ♂. } Camiguin.]

These examples agree with those noted (*l. c.*). Not known hitherto from Camiguin.

### 34. CORVUS PHILIPPINUS.

*Corvus philippinus*, Bp. Compt. Rend. xxxvii. p. 830 (1853); Walden, *t. c.* p. 201. no. 125.

[No. 343, ♂. Zamboanga.

No. 356, ♂. Ilo-ilo. Eyes black. Stomach had seeds, worms, &c.

No. 382, ♀ {  
No. 383, ♀ { Camiguin. These birds have been seen at most of the places we have been at in the Philippines and on this island they were quite abundant.]

This species has not hitherto been known to inhabit the three islands above named. The four examples in the collection cannot be separated from those which inhabit Luzon, Negros, and Cujo; and, like them, their dimensions exceed those of the single type specimen of *C. brevipennis*, Schlegel, at Leyden. *C. philippinus*, however, is nothing but a slightly smaller form of *C. validus*, ex Sumatra, with a greenish rather than a bluish gloss on the under plumage. The following Table shows the principal dimensions of the species from six Philippine islands, together with those of typical examples of *C. validus*.

#### *Corvus philippinus*.

	Wing.	Tail.	Bill, from nostril.	Gonys.	Tarsus.
Luzon, ♀ .....	11·50	8·25	1·50	1·00	2·25
Negros, ♂ .....	12·25	8·75	1·75	1·00	2·35
—, ♀ .....	12·13	8·67	1·67	1·00	2·35
Cujo, ♀ .....	11·50	8·00	1·37	0·90	2·25
Camiguin, ♀ .....	12·25	8·75	1·75	1·25	2·25
—, ♀ .....	12·50	9·00	1·50	1·00	2·25
Ilo-ilo, ♂ .....	11·75	8·85	1·62	1·12	2·20
Zamboanga, ♂ .....	11·81	8·50	1·62	1·00	2·20

#### *Corvus validus*, ex Sumatra.

Lampong .....	12·80	8·75	1·75	1·00	2·37
— .....	12·75	8·62	1·62	0·87	2·30

*Corvus philippinus* belongs to a small group of Crows differing but little from one another in tint, but separable by their dimensions, more especially that of the bills. *C. violaceus* is the smallest, then *C. enca*, *C. philippinus*, *C. validus*, and *C. validissimus*.

## 35. CALORNIS PANAYENSIS.

*Muscicapa panayensis*, Scop. Del. Fl. Faun. Insubr. ii. p. 96. no. 110 (1786); Walden, *t. c.* p. 205. no. 128.

[No. 384, ♂. }  
No. 385, ♂. } Camiguin. Eyes orange. Stomach had seeds.]  
No. 386, ♂. }

These examples do not differ from Luzon, Negros, and Zebu individuals. The locality is new.

## 36. MUNIA JAGORI.

*Dermophrys jagori*, Cab. J. für O. 1872, p. 316. no. 6; Walden, *t. c.* p. 207. no. 132.

[No. 339, ♂. }  
No. 340, ♀. } Zamboanga.]

The two Mindanao examples do not appear to be in perfect dress. The rectrices of the female are tinged with ochre. New to Mindanao.

## 37. OSMOTRERON AXILLARIS.

*Treron axillaris*, G. R. Gray; Bp. Compt. Rend. xxxix. p. 875 (1854); Walden, *t. c.* p. 211. no. 136.

[No. 346, ♀. Ilo-ilo. Eyes white; feet greenish. Stomach had fruit.]

New to Panay.

## 38. PHABOTRERON BREVIROSTRIS, n. sp.

[No. 426, ♂. Pasnanaca. Eyes white; feet coral-red; bill black.]

♂. Forehead pale ruddy fulvous; vertex pale grey, passing over into amethystine on the occiput and nape; from the gape, passing below the eye, a black line, bordered underneath by a white line starting from below the eye and reaching to the nape; back of the neck emerald-green, becoming yellow-green lower down; some of the lowermost feathers being amethystine, then bluish green, terminated by yellow-green; others yellow-green, then amethystine, terminated with blue-green; back mixed amethystine and dull yellow-green; uropygium and upper tail-coverts dull yellow-green with scarcely any iridescence; wing-coverts the same, but tinged with amethystine; quills brown, edged with pale rufous or fulvous; secondaries like wing-coverts, but without any iridescence; chin and throat pale ruddy fulvous like the forehead; remainder of underplumage ruddy fulvous, with an amethystine tinge on the breast and sides of neck; under tail-coverts pale French grey; under wing-coverts like abdomen, but deeper in shade; middle pair of rectrices pure amethystine, with a dark grey terminal band tinged with amethystine; remaining rectrices with a much broader terminal and pure grey band, the remaining part of each being deeply tinged with amethystine; outer pair with a broad, dark-brown subterminal band also washed with amethystine. Wing 4.75, tail 3.50, tarsus 0.75, bill from forehead 0.72.

This is a small representative form of *P. leucotis*, from which it

chiefly differs by its rufo-fulvous forehead, its pure amethystine rectrices, and its short bill.

39. *MYRISTICIVORA BICOLOR.*

*Columba bicolor*, Scop. Del. Fl. Faun. Insubr. ii. p. 94. no. 97 (1786); Walden, *t. c.* p. 217. no. 143.

[No. 395, ♂. } Malanipa. Eyes brown. These were abundant  
No. 396, ♀. } on the island, but kept to the tops of the highest  
No. 397, ♀. } trees.]

The two sexes are alike. The locality is new.

40. *CHARADRIUS FULVUS.*

*Charadrius fulvus*, Gm. S. N. i. p. 687. no. 18 (1788); Walden, *t. c.* p. 226. no. 159.

[No. 341, ♂. } Zamboanga.]  
No. 342, ♀. }

For the first time recorded from Mindanao.

41. *NUMENIUS PHÆOPUS.*

*Scolopax phæopus*, Linn. S. N. i. p. 243. no. 4 (1766); Walden, *t. c.* p. 232. no. 181.

[No. 375, ♂. } Zebu. Eyes hazel. Stomach with shells.  
No. 376, ♀. }  
No. 401, ♂. Malanipa.]

A new locality.

42. *TRINGOIDES HYPOLEUCOS.*

*Tringa hypoleucos*, Linn. S. N. i. p. 250. no. 14 (1766); Walden, *t. c.* p. 234. no. 183.

[No. 391, ♀. Camiguin.  
No. 435, ♂. Pasananca. Eyes hazel.]

This cosmopolitan species has not been hitherto made known as an inhabitant of either Camiguin or Mindanao.

43. *TOTANUS INCANUS.*

*Scolopax incanus*, Gm. S. N. i. p. 658 (1788).

[No. 405, ♂. Malanipa.]

For the first time recorded from any part of the archipelago. Pale ashy above; forehead and superciliaries, chin and throat pure white, clouded with grey on the breast and flanks. Wing 6.25. The dimensions of the wing in this species vary exceedingly. In an example (♂) from Fiji, No. 26 (*mus. nostr.*), the wing measures 7.20. Above it is dark ashy, and the grey on the breast is much deeper in tone. The Malanipa example was shot on January 30th.

44. *GALLINAGO STENURA.*

*Scolopax stenura*, Kuhl, MS.; *S. stenura*, Bp. An. St. Nat. 1829.

[No. 438, ♀. Zamboanga.]

Not hitherto recorded from any Philippine island.

## 45. RHYNCHÆA CAPENSIS.

*Scolopax capensis*, Linn. S. N. i. p. 246. no. 14 (1766); Walden, *t. c.* p. 235. no. 189.

[No. 437, ♂. Zamboanga. Eyes hazel.]

Known to inhabit the Philippines, but no exact locality hitherto recorded.

## 46. DEMIEGRETТА SACRA.

*Ardea sacra*, Gm. S. N. i. p. 640 (1788).

[No. 377, ♂. Zebu. Eyes orange.]

In ashy-blue plumage and in full breeding-dress.

For the first time noted as an inhabitant of a Philippine island.

## 47. LARUS RIDIBUNDUS.

*Larus ridibundus*, Linn. S. N. i. p. 225. no. 9 (1766); v. Martens, *J. für O.* 1866, p. 30.

*Larus*, sp., Walden, *t. c.* no. 206.

[No. 363, ♂. Manila.]

Dr. v. Martens's (*l. c.*) identification of the Manila specimens sent to Berlin by Jagor is thus confirmed.

## 48. STERNA BERGII.

*Sterna bergii*, Licht. Verz. d. Doubl. Berl. Mus. p. 80 (1823).

[No. 345, ♂. Zamboanga.]

New to the Philippines.

## 49. HYDROCHELIDON HYBRIDA.

*Sterna hybrida*, Pallas, *Zoogr. Rosso-As.ii.* p. 338. no. 395 (1831).

*Hydrochelidon leucopareia*, Natt.; Walden, *t. c.* p. 344. no. 207.

[No. 364, ♀. Manila.]

3. Reports on the Collection of Birds made during the Voyage of H.M.S. 'Challenger.'—No. III. "On the Birds of the Admiralty Islands." By P. L. SCLATER, M.A., Ph.D., F.R.S.

[Received June 15, 1877.]

"The 'Challenger' arrived at Nares Harbour, Admiralty Islands, on the 3rd of March 1875, and anchored to the lee of Wild Island about 6.30 P.M. She left again on the afternoon of March 10th." (*J. Murray*, MS.)

The Admiralty Islands lie in lat. 2° 18' S., long. 146° 44' E., to the north of New Guinea. Discovered by Le Maire and Schouten in 1616, or, according to other authorities, by Carteret in 1767, they are still very imperfectly known, and the 'Challenger' Naturalists were the first Europeans to visit them.

Nares Harbour lies on the north side of the principal island, "Admiralty Island," and is marked in the new Admiralty Chart of

the "Pacific Ocean," 1875. For some details of the 'Challenger's' visit, and remarks on the nature of the country, which appears to be densely wooded, Lieut. Campbell's 'Log-letters' (p. 259 *et seq.*) may be referred to.

The specimens of birds obtained during the sojourn of the 'Challenger' at Nares Harbour are 56 in number, and embrace examples of 27 species. Of these seven appear to be new to science.

	Specimens.	Species.	New species.
Passeres .....	17	7	4
Coccyges .....	2	1	
Psittaci .....	10	1	
Accipitres .....	2	2	
Herodiones.....	4	2	
Steganopodes.....	1	1	
Columbæ .....	8	2	2
Gallinæ .....	1	1	1
Ralli .....	1	1	
Limicolæ .....	7	6	
Gaviæ.....	3	3	
	56	27	7

### 1. RHIPIDURA SEMIRUBRA, sp. nov.

*Supra læte castaneo-rubra; alis caudaque nigricantibus, secundariis extus et reatricibus ad basin rubris dorso concoloribus, his omnibus albo late terminatis, subtus alba, torque subgutturali et pectoris maculis quibusdam nigris; hypochondriis rufescentibus, crisso rufo; rostro nigricante, pedibus obscure cinereis: long. tota 5·5, alæ 2·8, caudæ rotundatæ reatr. ext. 2·8, med. 3·0.*

*Hab.* Ins. Admiralitatis.

*Obs.* Species quoad formam *Rh. rufifronti* ex Australiâ similis, sed dorso toto castaneo diversa.

One "male" of this Flycatcher (No. 496), "insects in stomach."

### 2. MONARCHA INORNATUS, Garnot.

*Muscicapa inornata*, Garnot, Zool. Voy. Coq. i. p. 590, Atlas, t. 16. fig. 1.

*Monarcha inornata*, G. R. Gray, P. Z. S. 1858, p. 177.

Three skins (493, ♂; 494, ♂; and 495, ♀) of this species are in the collection. The sexes are alike.

"Eyes hazel: bill and feet indigo-blue."—*J. M.*

I have compared them with skins of this species collected by Wallace, in the British Museum. *M. fulviventris*, Hartlaub, P. Z. S. 1867, p. 830, of the Echiquier Islands, is nearly allied, if not identical.

### 3. MONARCHA INFELIX, sp. nov.

*Supra nigerrimus, tetricibus alarum minoribus et capitis pone oculum et cervicis lateribus albis; subtus albus, gula et pectore toto cum faciei ante oculos lateribus nigerrimis; caudæ reatricibus*

*lateralibus albis, mediis ad basin et ad apicem nigris; subalaribus albis; rostro et pedibus nigris: long. tota 5·8, alæ 3·2, caudæ 2·8, rem. quarto et quinto æqualibus et longissimis.*

*Hab.* Ins. Admiralitatis.

*Obs.* Species formâ et habitu, ut videtur, *M. loricati*, sed pectore nigro et alarum tectricibus albis distinguenda.

A single specimen of this species (no. 497) was "shot on the main Island;" insects in stomach. Unfortunately it is in a very imperfect state, the bill and greater part of the tail-feathers having been shot away. It is possible that the two centre tail-feathers, which are apparently absent, may be wholly black as in *M. loricatus*; the three outer ones are wholly white.

#### 4. PHILEMON ALBITORQUES, sp. nov.

*Supra obscure fuscus, plumis subtus cinereis; alis caudaque nigricantioribus; fascia cervicis postica et toto corpore subtus albis cineraceo adumbratis; capitis plumis brevibus, rigidiusculis, fronte loris et oculorum ambitu fere denudatis; subalaribus cum ventre concoloribus; rostro nigricanti-corneo, mandibula inferiore ad basin flava; pedibus obscure cinereis: long. tota 13·5, alæ 7·3, caudæ rectr. lat. 4·2, med. 5·5, tarsi 2·0.*

*Hab.* Ins. Admiralitatis.

*Obs.* Species torque colli postico insignis, rostro ad basin paulum incrassato et tumido, pedibus robustis.

A single example of this fine Honeyeater (no. 481) was "shot on Wild Island."

"Female: eyes brown; feet grey; bill dark, base of the lower mandible yellow: stomach had grasshoppers.

"This bird made a noise like the 'Leather-head' of Australia, but much louder."—*J. M.*

The specimen is moulting, both new wing- and tail-feathers being not fully developed. The breast is slightly stained with yellow, as is often the case with the Meliphagidæ.

#### 5. NECTARINIA FRENATA, Müller.

Four examples (487, male; 488, male; 489, female; and 490, female) of this rather widely spread Sun-bird (see remarks as to range, P. Z. S. 1877, p. 104). Mr. Murray notes, "eyes hazel." None of the specimens are in full dress.

#### 6. MYZOMELA PAMMELÆNA, sp. nov.

*Nigerrima, remigum marginibus internis cineraceo-albidis, rostro et pedibus nigris: long. tota 5·0, alæ 2·7, caudæ 2·0.*

*Hab.* Ins. Admiralitatis.

*Obs.* Affinis *M. nigritæ*, sed crassitie majore, rostro longiore et subalaribus nigris diversa.

Two specimens of this apparently new *Myzomela* (491, 492) are in the collection. The one described (491) is marked "male, eyes hazel," and is evidently adult. In the other (492), apparently young,

<sup>1</sup> I. e. *Philemon* (sive *Tropidorhynchus*) *corniculatus*.

the plumage is mixed with cinereous, the feet not so dark, and the under surface of the wings more white. But the size alone is sufficient to distinguish it from its Papuan representative.

7. *CALORNIS*, sp. inc.<sup>1</sup>

463, male; 464, male; 465, male; 466, female; 467, female.

"Eyes orange: stomachs contained seeds and grubs.

"This was, perhaps, the commonest bird at the Admiralty Islands."—*J. M.*

Lord Tweeddale, who has kindly examined these skins for me, writes as follows:—"Nos. 463-466. The purple reflexions being restricted to the head, chin, and throat distinguishes these examples from all others known to me. They may belong to either *C. viridescens*, Gray, *C. gularis*, Gray, or *C. amboinensis*, Gray; for I do not possess typical examples, but I believe that all these are little more than stages of *C. metallica*. If they do not fall under either of these three titles, I think they may be safely described and named; for their distinctive characters are well marked.

"No. 467. This belongs to a distinct species, very close to *C. cantoroides*, Gray."

The question of the different subspecies of *Calornis*, which has been ably treated of by Lord Tweeddale and Mr. Sharpe, is one that, in the absence of a large series for comparison, I should fear to venture on. As regards specimen no. 467, there may perhaps have been an error in the label, and the bird may have been obtained elsewhere.

8. *HALCYON SAUROPHAGA*, Gould.

Two examples (498, 499), agreeing with other specimens of this species in every respect. "Shot on D'Entrecasteau Island, one by Capt. Thomson. Eyes brown; bill and feet dark; base of lower mandible flesh-coloured or white."—*J. M.*

9. *TRICHOGLOSSUS CYANOGRAMMUS*, Wagler; Finsch, Papag. ii. p. 830.

Ten skins of this fine species (449-456, males; and 457, 458, females) are in the collection. The breast is of a brighter red than in an example of the same bird from Humboldt Bay, New Guinea, and the purplish edgings of the breast-feathers are wider. There is also more brown on the nape in some of the skins.

"Eyes orange; bill and feet black: seeds generally in stomachs."—*J. M.*

10. *HALIAETUS LEUCOGASTER*, Gm.; Sharpe, Cat. i. p. 307.

"Female (no. 478, from Maclear Island): eyes brown; cere black; bill horn-colour; claws black; legs flesh-colour: in stomach a Starling (*Calornis*?) and remains of a Tern."—*J. M.*

11. *PANDION HALIAETUS*.

"Male (no. 479) shot on D'Entrecasteau Island: stomach had fish."—*J. M.*

<sup>1</sup> Cf. Walden, Trans. Zool. Soc. viii. p. 79, et Sharpe, Ibis, 1876, p. 46.



## 12. FREGATA ARIEL (Gould).

"No. 482, male: eyes black, flesh of throat red: fish in stomach. Shot from the pinnace, while hovering with others over a shoal of fish."—*J. M.*

## 13. NYCTICORAX CALEDONICUS, Lath.; Gould, B. Austr. vi. pl. 63.

Three specimens of this Night-heron, two adult (474, male; 475, female) and one in young plumage (476), were shot on Pigeon Island.

## 14. ARDEA SACRA, Gm.; Finsch &amp; Hartl. Orn. Central-Polyn. p. 201.

A specimen (no. 480) in grey plumage, with a few white feathers on the throat; "eyes yellow; legs had a yellowish tinge; bill black."—*J. M.*

## 15. CARPOPHAGA RHODINOLEMA, sp. nov.

*Supra æneo-viridis, alis caudaque saturatoribus, remigibus et rectricibus intus nigricantibus; capite et cervice totis et corpore inferiore canis; genis gulaque rosaceo indutis; crisso obscure castaneo; mento et oculorum ambitu anguste albis; rostronigro, pedibus rubris: long. tota 12·6; alæ 9·3, caudæ 5·6.*

*Hab. Ins. Admiraltatis.*

Four examples of this Fruit-Pigeon (nos. 468, 469, 470, males; 471, female) belonging to the group of *C. ænea* are in the collection.

The Marquis of Tweeddale, who has kindly compared the birds for me with his series, writes:—

"Apart from its dimensions, this *Carpophaga*, from the Admiralty Islands, only differs from individuals of *C. ænea*, ex Ceylon, Malabar, Central India, Burma, the Andamans, Borneo, Java, the Philippines, and Hainan, in having no rosy or vinous tint on the grey part of the plumage, excepting on that of the throat, cheeks, and ear-coverts. In example no. 468 this is very well marked.

"The outer webs of the primaries are not conspicuously powdered with grey as is the case in Central-Indian, Burman, Javan, Bornean, Hainan, and Philippine examples. But I do not attach much importance to this difference at present; for I suspect this powdering comes on only when the quills are old, and indications are evident on some of the quills of no. 468."

Mr. Murray writes:—

"These birds were in immense numbers, but more especially on a small island near the mainland, hence called 'Pigeon Island.' On the first day four guns bagged 85 in two hours. Another day 230 were taken, another 200, another 150. Three eggs were got. This island was about two acres in extent. The Pigeons always returned to it from the mainland, however much they were disturbed. It would seem to have been their breeding-place."—*J. M.*

16. *PTILOPUS JOHANNIS*, sp. nov.

*Clare psittaceo-viridis, maculis scapularium paucis obscure cæruleis; fascia pectoris semilunari lata, ventre imo et crisso latissime flavis; pileo et ventre medio pulcherrime lilacinis; remigibus et rectricibus subtile dilute plumbeis, harum vitta apicali dilutiore, fere albicante; rostro nigro, pedibus obscure rubris: long. tota 7·5, alæ 4·7, caudæ 2·5.*

Fem. *viridis, fere unicolor, ventre medio et crisso flavis.*

*Hab.* Ins. Admiralitatis.

*Obs.* Species affinis *Pt. bello* et *Pt. specioso*, sed colore pilei et ventris lilacino distincta.

Of this splendid little Fruit-Pigeon, which I have great pleasure in naming after Mr. John Murray, three males (459, 460, 461) and one female (462) were "shot on Wild and D'Entrecasteaux Islands."

"Eyes of males light yellow, of females white; feet light red or pink colour; tip of bill light green."—*J. M.*

17. *MEGAPODIUS RUBRIFRONS*, sp. nov.

*Supra olivaceo-brunneus, dorso superiore et corpore subtus nigricanti-plumbeis; ventre imo obscuriore; capitis plumis brevibus, rigidiusculis, fusco-nigris, in genis et gutture parce sparsis et cutem rubram ostendentibus; pilei parte anteriore fere omnino denudata rubra; rostro flavo, ad basin nigricante; pedibus (in pelle) fere nigris: long. tota 11·0, alæ 8·5, caudæ 3·0, tarsi 2·4, rostri a rictu 1·4.*

*Hab.* Ins. Admiralitatis.

*Obs.* Species fronte denudatâ rubrâ insignis, *M. eremitæ* (Hartl. P. Z. S. 1867, p. 830) affinis, sed pedibus obscuris.

There is a single skin of this species, "no. 472, male: eyes brown, bill yellowish, feet and legs dark horn-colour: stomach contained straw-material."—*J. M.*

There is a second specimen in spirits. Both were shot on Pigeon Island.

18. *PORPHYRIO INDICUS*, Horsf.; Walden, Trans. Zool. Soc. viii. p. 92.

A single "male" specimen (no. 473) apparently of this wide-ranging species was "shot on Pigeon Island by Mr. Buchanan, who says it was sitting on a tree. Stomach had seeds: eyes red; bill red; legs dull red."—*J. M.*

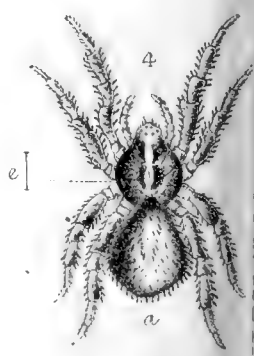
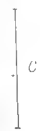
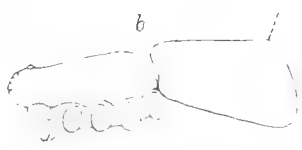
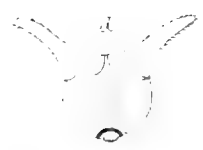
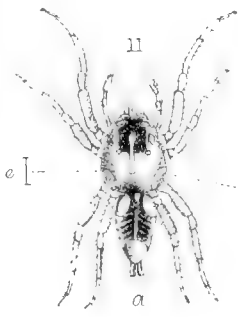
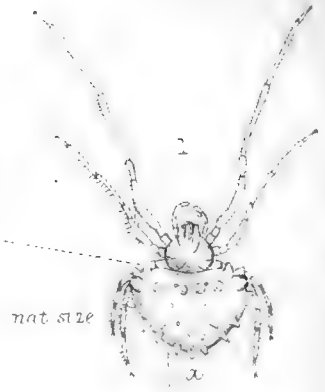
19. *ESACUS MAGNIROSTRIS* (Temm.); Gould, B. Austr. vol. vi. pl. vi.

One specimen (no. 477, female), "shot on Pigeon Island: eyes yellow; bill black: stomach had shells: legs and base of the bill yellow."

20. *CHARADRIUS MONGOLICUS*, Pallas; Harting, Ibis, 1870, p. 384.

One example (no. 504), "female: eyes black; bill, legs, and feet black."—*J. M.*



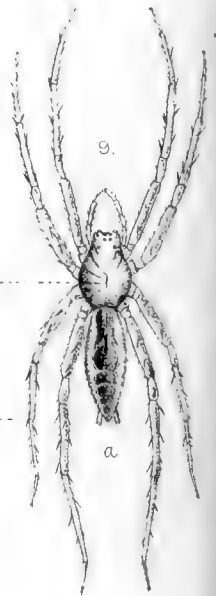
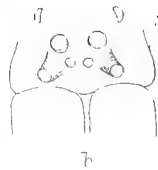
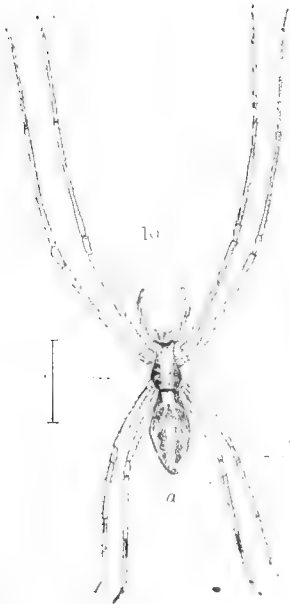
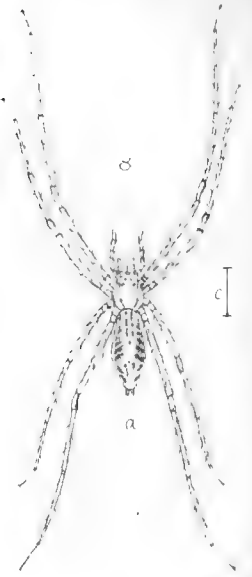
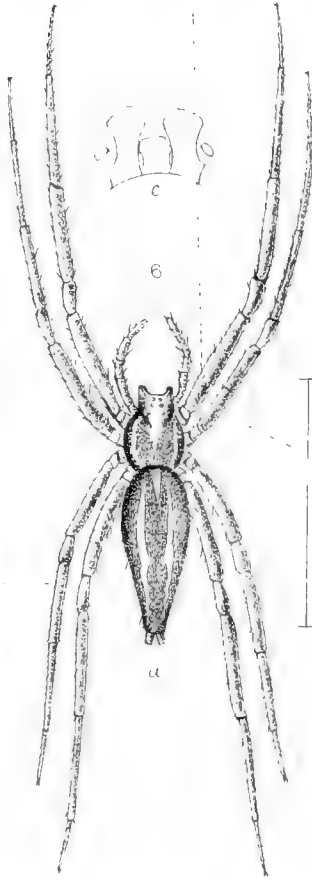
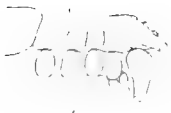
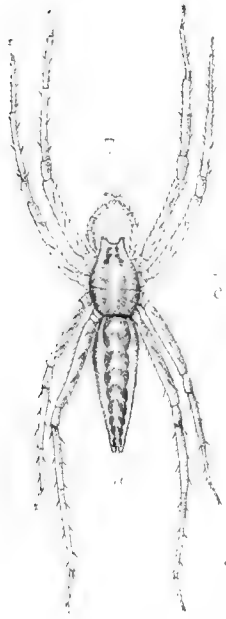


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NEW GENERA AND SPECIES OF ARANEIDEA.





## 21. STREPSILAS INTERPRES.

Two specimens (nos. 500, 501, males) were obtained on the main island. "Stomachs had pieces of shell," &c.—*J. M.*

## 22. NUMENIUS UROPYGIALIS, Gould.

One skin (483), "female."

## 23. TOTANUS INCANUS, Gm.

*Actitis incana*, Finsch et Hartl. Orn. Central-Polyn. p. 182.

One example (502), "female: eyes brown, legs green, bill dark."  
—*J. M.*

## 24. TRINGOIDES HYPOLEUCOS (Linn.).

One specimen, a female, no. 503 of MS. Cat.

## 25. ANOUS STOLIDUS (Linn.).

A female (no. 485): "eyes black.

"This Tern was most abundant here, and could always be seen in immense numbers, feeding on the shoals of fishes."—*J. M.*

## 26. ANOUS MELANOGENYS, Gray; Saunders, P. Z. S. 1876, p. 670.

One "female" (no. 485): "eyes black." Mr. Howard Saunders has kindly determined the Laridæ for me.

## 27. STERNA BEBGII, Licht.

One skin (no. 486): "eyes black."

4. On some new Species of Araneidea, with Characters of two new Genera, and some Remarks on the Families Podophthalmides and Dinopides. By the REV. O. P. CAMBRIDGE, M.A., C.M.Z.S., &c.

[Received May 30, 1877.]

(Plates LVI. & LVII.)

The twelve Spiders included in the following descriptions belong to six widely separated families, and are inhabitants of localities very distant from each other, comprising Australia, India, Ceylon, the west coast of Africa, the island of Samoa, and Brazil.

Of the first family (Gasteracanthides) there are three species, which I have, for the present at least, included in the genus *Cyrtarachne*, Thor., though two of them, one from the river Coanza, and the other from Rockhampton, are very abnormal species, and may perhaps eventually form the types of one, if not of two new genera.

In the next family (Cryptothelides) the Spider described is from Ceylon,—*Cryptothele ceylonica*; it is remarkable, not only from its own special and very peculiar characters, but because it is as yet

only the second species known, either of the genus or family, which were lately founded by Dr. Ludwig Koch upon an Australian Spider. The present species is thus another instance of a Spider peculiar (so far as our present knowledge goes) to Ceylon and Australia. Previous instances have been furnished in the genera *Amycle* and *Miagrammopes*.

Of the third family (Eripides) little is known. Two species only besides the present, have been described; and all of them are from Brazil, the present being the first recorded example of the male sex. The close affinity between the Eripides and Stephanopides has not yet received sufficient attention. The latter family is (as at present known) exclusively from Australia and New Zealand, while the former is South-American.

The family Podophthalmides, which is the next contained in this paper, is one of which one (West-African) species only has before been named. Dr. Ludwig Koch, indeed, describes a second species from the river Anseba, E. Africa; but, being doubtful as to its distinctness, he has given it no name. The genus *Podophthalma* (Cappello) is an instance of the difficulty, in some cases, of assigning a systematic place to a Spider. Dr. L. Koch, 'Ägyptische und Abyssinische Arachniden,' p. 36, would place this genus in the family Agelenides; M. Simon thinks that it belongs, "without any doubt whatever," to the family Oxyopides, while to myself it appears necessary to constitute the type species (with those here described) and the genus *Ocyale* (Sav.) a distinct family next to the Lycosides. That there is some affinity with the Agelenides, I have myself observed (see *infra*, p. 566, the remarks there made having been written before those of Dr. L. Koch had come under my notice).

Of the five species of *Podophthalma* described below, one is from East-Central India, another from the river Coanza, two from Madagascar, and one from Brazil. Two of these, *P. incerta* and *P. diversa*, undoubtedly show characters which give some support to Dr. L. Koch's view of their systematic position; and these may perhaps have to be separated under another generic appellation, and be removed to the Agelenides; but how far the typical species of *Podophthalma* would necessarily follow them, should they be so removed, is not so clear to me at present.

The fifth family, Dinopides, including the genus *Avella* described below, contains now three genera and is an exceedingly remarkable group; and I confess that its systematic position is, as yet, a puzzle to me. Walckenaer, as well as Macleay, who founded it, placed *Dinopis* in the family Lycosides, between which and the Salticids I have at present left it, though that place will probably not long retain it. I cannot, however, agree with Dr. L. Koch, who places *Dinopis* in the family Eresides (*vide infra*, p. 573); I would rather suggest that its place is nearer to the Agelenides, though in the absence of any knowledge of its habits it is impossible to speak with certainty upon this point.

The new Salticid genus *Athamas*, the last Spider here described,



adds another to the numerous generic, or subgeneric, forms of the genus *Salticus*, Latreille. It has a close affinity to *Lyssomanes*, Hentz; but its differences from that, as well as from another allied genus, *Jelskia*, Tacz., appear to me to warrant its being made the type of a separate group.

Fam. GASTERACANTHIDES.

Gen. CYRTARACHNE, Thor.

CYRTARACHNE LONGIPES, sp. n. (Plate LVI. fig. 1.)

Adult female, length nearly 7 lines.

It is with great hesitation that I include the present West-African Spider in the genus *Cyrtarachne*, differing, as it does, from the typical species in the greater length and slenderness of the first and second pairs of legs, as well as in the higher eye-eminences. The form, however, of the maxillæ and labium is similar; and as the three long and remarkable spines on the cephalothorax are represented in some (if not in all) of the typical Australian species of *Cyrtarachne*, I have thought it best to place it provisionally with them until perhaps other species from West Africa may prove it to belong to a group specially characterized by the peculiarities noted, and so to require a separate genus for their reception.

The *cephalothorax* of this Spider is broad and rounded behind, much narrower in front, and strongly constricted laterally at the caput. The occipital region is gibbous and has three long, strong, pointed, tapering, nearly erect spines in a line along the middle. These spines are almost straight, but rather divergent; the central one is the longest, and the anterior the shortest. Its colour is yellow strongly tinged with brownish orange on the caput, and covered with a fine, silky, whitish pubescence. The three spines are also similarly clothed; and their basal portion is similar to the caput in colour, their upper part being of a deep blackish red-brown.

The *eyes* are very small, and of an amber-colour; they are seated on three strong, somewhat tuberculiform eminences placed in a transverse line at the fore part of the caput. The central eminence (which is much the largest and highest) has four eyes near its summit, in the form of a quadrangle, whose transverse is rather longer than its longitudinal diameter; the two posterior eyes of these four are the largest of the eight. The eyes of each lateral pair are placed contiguous to each other near the upper extremity, on the outer sides of the lateral eminences.

The *legs* are rather slender, and differ considerably in length; those of the first pair are much the longest; next to them are those of the second pair; and the third pair are a good deal the shortest. They are of a dull yellow colour, the femora tinged with orange, and (excepting these joints) unequally annulated with dull reddish brown; they are also furnished with numerous long, prominent, fine, silky, whitish hairs, but no spines; and each tarsus terminates with three rather sharply bent claws, the two superior ones pectinated at their base. The *tibiæ* are gradually enlarged at their anterior extremities.

The *palpi* are short, and similar to the legs in colour and clothing.

The *falces* are tolerably long and strong, subconical, straight, perpendicular, and of a yellow-brown colour.

The *maxillæ* are moderate in size and strength, broad and rather rounded at their extremities, much bent downwards and backwards, and inclined towards the labium. They are of a rather orange yellow-brown colour, the extremities being pale yellow.

The *labium* is small, short, and of a semicircular form; its colour is yellow-brown, and the apex pale yellow.

The *sternum* is heart-shaped, hollowed at its fore extremity, and of a pale orange yellow-brown colour.

The *abdomen* is large, very convex above, of a short broad heart-shape when seen from above, and hollowed at the middle of its fore extremity on the upperside. Its cuticle is of a semicorneous nature; and besides numerous blunt, conical, various-sized, but smaller tubercles (principally on the sides and hinder part), there is a large, circular, shining, glossy one on each of the fore corners (or rather shoulders) of the abdomen. These large round tubercles are of a yellow-brown colour, rather brighter in hue than the rest of the abdomen, the underside of the latter being the palest.

The tubercles on the sides and hinder part are symmetrically placed; and four form a curved transverse line with the two large circular ones. On the middle of the upperside are six, not very large, round, sigilliform spots or markings, in two longitudinal lines of three each. The sides and underside have numerous, small, somewhat similar, impressed spots, connected with each other by pale brown venose streaks. The whole of the abdomen, excepting the two circular tubercles, is dotted with fine silky hairs; those at the extremities of the conical tubercles form a tuft, apparently connected for a little distance from their bases and then spreading out in all directions, giving the abdomen a very peculiar and characteristic appearance. The spinners are short, tolerably strong, and two-jointed, those of the inferior pair being much the strongest. The genital aperture is very small and inconspicuous.

A single example of this very remarkable Spider was received from the banks of the river Coanza, in West Africa, where it was found in 1873 by Mr. Henry Rogers, of Freshwater, Isle of Wight.

CYRTARACHNE FURCATA, sp. n. (Plate LVI. fig. 2.)

Adult female, length 6 lines.

Length of the example described (an immature female) nearly  $4\frac{1}{2}$  lines.

The *cephalothorax* of this Spider resembles that of *C. longipes* in the elevated prominences on which the central and two lateral pairs of eyes are traced, but differs in the much more prominent clypeus. There is also on the occiput a strong, furcate, somewhat spiniform eminence, the height of which is a little greater than that of the central ocular eminence; the prongs of this occipital eminence are blunt-pointed, and range in a line with the central ocular one; also in a line between the occipital one and each of those bearing

the lateral pairs of eyes is another, shorter, erect, rather slender, blunt-pointed, somewhat nipple-like eminence. The lower fore corners of the clypeus are prominent. The colour of the cephalothorax is pale whitish straw-colour, marked and clouded in a somewhat radiated form, on the sides, with brownish yellow; it is clothed with longish, pale, slender hairs; and from the middle of the summit of the central ocular eminence issue two longish, black, curved and almost contiguous black bristles.

The *eyes* are small; those of the central group (four in number) form a square on the front of the upper extremity of the middle eminence; those of each lateral pair are contiguous to each other on the outer side of the summit of the lateral eminences, and are widely removed from the middle group.

The *legs* are neither very long nor strong; those of the first and second pairs differ but little in length, though perhaps the second pair are slightly the longest, and the third pair are the shortest. They are of a straw-yellow colour, semiannulated with brown, and clothed with longish fine hairs.

The *palpi* are similar in colour to the legs, and have a single curved pectinated claw at their extremity.

The *falces* are moderately long and strong, perpendicular, and similar in colour to the palpi.

The *maxillæ* and *labium* are like those of *A. trispinosa* in form, and are similar to the legs in colour.

The *sternum* is of a somewhat triangular shape; it is of a yellowish colour, clouded with brownish in the middle, and marked with a black spot opposite to the basal joints of the second, third, and fourth pairs of legs.

The *abdomen* is large, very short, subtriangular, or somewhat heart-shaped, extremely convex above, and projects considerably over the base of the cephalothorax. On the upperside are some not very large, bluntish, conical protuberances; two of them are in a straight transverse line, wide apart towards the fore margins; the rest, eight in number, are arranged in a somewhat circular group at the posterior extremity. The upperside is of a dull sooty hue, mapped out into rather roundish-angled patches of various forms and sizes, which are divided from each other by clear and intersecting straw-yellow stripes; most of these patches have a central blackish spot on the fore part; and from each of the three immediately in front of each of the two foremost conical protuberances rises a long, erect, somewhat lanceolate black bristle, there being also several others of the same kind on the sides and hinder part; the patches above described are almost obsolete on the middle and hinder part of the upperside, which are then of a plain straw-yellow colour. The underside is suffused with yellow-brown; the hinder slope (*i. e.* the part between the protuberances at the hinder extremity and the spinners) and sides are streaked vertically with pale yellow-brown lines.

An adult female of this Spider was received from Paramatta (Australia), where it was found by Mr. Barlow, and sent to me by my kind friend Mr. Frederick Bond several years ago. I have also very

lately received an immature female from Rockhampton, N. S. W., through Mr. E. Janson.

CYRTARACHNE HOBSONI, sp. n. (Plate LVI. fig. 3.)

Adult female, length  $5\frac{1}{4}$  lines.

The *cephalothorax* of this Spider is of the same general form as that of *C. longipes*; but the prominence on which the four central eyes are placed is much less projecting, and the spines are much shorter; besides the three in the central longitudinal line (of which the middle one is much the longest and strongest, the other two being very short), there are two or three other short ones on each side in an oblique line, between the long central spine and the lateral eyes. The colour of the cephalothorax is dark yellowish brown, thinly clothed with hairs, and rather paler on the fore part of the caput.

The *eyes* of the central group form a square, those of the posterior pair being rather larger than the anterior ones; those of each lateral pair are close together on a prominence, and very small, but widely removed from the central group.

The *legs* are short and rather slender; there is very little, if any, difference in length between those of the first and second pairs, those of the third pair being the shortest; they are of a brownish yellow colour, annulated, but not very distinctly, with darker yellow-brown; the femora are palest, but most distinctly annulated; the legs are destitute of spines, being furnished with hairs only.

The *palpi* are short, slender, and similar to the legs in colours and armature.

The *falces* are moderately long and strong, and perpendicular, and of a dark yellow-brown colour.

The *maxillæ* and *labium* exactly resemble those of *A. trispinosa* in form, and are of the same colour as the falces.

The *sternum* is of a triangular form, its fore side hollowed, and its colour yellow-brown.

The *abdomen* is of great size, of a corneous nature, and appears to overwhelm the cephalothorax; it is of a short heart-shape, its shoulder-portions, as well as the posterior extremity, being large, prominent and rounded, and, together with the sides, studded with round, raised, dark red-brown bosses or protuberances of various sizes; the two largest of these are placed one on each of the summits of the shoulder-portions; the three next in size form a triangle on the hinder portion; the sides are deeply rugulose; the ground-colour of the upperside is a lightish yellow-brown; in the hollow centre of the fore side is a large, yellow, somewhat irregularly formed patch, with an irregular black marking on each shoulder-part, and two other longer ones, one on each side, near the hinder portion. The underside is darker than the upper, its lateral portions marked strongly but irregularly with connected brown streaks.

The example from which the above description has been made was received from Bombay, where it was found, and kindly sent to me, by Major Julian Hobson. Three other examples, similar to the one

described, excepting in being much smaller, have more recently been sent to me from Ceylon by Mr. G. H. K. Thwaites.

Fam. CRYPTOTHELIDES.

Gen. CRYPTOTHELE, L. Koch.

CRYPTOTHELE CEYLONICA, sp. n. (Plate LVI. fig. 4.)

Adult female, length  $1\frac{3}{4}$  line.

*Cephalothorax* oval behind, but constricted laterally at the caput; it is generally flattened, and its sides much depressed; its upper surface is roughened and clothed with coarse bent bristles and hairs; these are mainly disposed in two curved lines along the middle, enclosing the thoracic junction in an elongated oval figure. The colour of the cephalothorax is a uniform yellowish brown; and the height of the clypeus (which retreats considerably) is just equal to the length of the falces.

The *eyes* are seated on black spots in three transverse rows—2, 2, 4, at the slightly produced upper extremity of the caput. Those of the foremost row are of tolerable size and the largest of the eight; these are separated by an interval of an eye's diameter; those of the middle row are next in size, and are contiguous to each other; this row is separated from the first by about the diameter of one of the eyes of the foremost row. The hinder row is curved, the convexity of the curve directed backwards; its eyes (four in number) are of about equal size, but much smaller than the rest; those of the central pair of this row are separated by an interval of an eye's diameter, and form a line scarcely differing in length from that of the middle row; the hind laterals are each separated from the hind central next to it by an interval of about double the length of that which divides the central pair from each other, and equal to that which separates these last from those of the middle row.

The *legs* are short, strong, and differ but little in length; those of the fourth pair are slightly the longest; and the difference between those of the second and third pairs is very little, the third pair being perhaps the shortest. They are similar to the cephalothorax in colour; and the several joints (at least the tibiæ, genua, and femora) are of a gouty or somewhat nodose form, and furnished with coarse tuberculose spines, curved spine-like bristles of uniform thickness throughout their length, and hairs; each tarsus ends with three claws. Some portions of the legs appeared to be darker than the rest; but this was caused, I think, by extraneous matter clogged up among the bristles.

The *palpi* are short, similar to the legs in colour, and furnished with short, coarse bristles and hairs.

The *falces* are short, not very strong, subconical, considerably directed backwards, and a little paler in colour than the cephalothorax.

The *maxillæ* are short, and rather weak, slightly curved, and much inclined towards the labium, over which they fit closely, with their extremities almost meeting; their colour is like that of the falces.

The *labium* is similar in colour to the maxillæ; and is of a somewhat subtriangular form, rounded at the apex; it is large in comparison with the size of the maxillæ, its apex reaching very nearly to their extremities.

The *sternum* is large, heart-shaped, truncated at its anterior extremity, of a yellowish colour, and clothed thinly with coarse hairs.

The *abdomen* is short, broadest and rounded at its hinder extremity. This part is prolonged into a kind of flap which bends downwards and underneath, so as totally to conceal the spinners, whose number and form consequently could not be discerned. According to Dr. L. Koch (*Die Arachn. Austr.*) the spinners of this genus are two in number. The colour of the abdomen is of a darker hue than the cephalothorax; its whole surface is rugulose and clothed with coarse, bent, spiny bristles and hairs. The example described was much disfigured by extraneous substances, dirt and dust, accumulated and retained by its peculiar curved bristly armature.

A single example of this remarkable Spider was received some time since from Ceylon, where it was found, and kindly forwarded to me among many other Spiders, by Mr. G. H. K. Thwaites.

The type of this genus is Australian; and its close affinity to *Stephanopis* (Cambr.) is very evident. The discovery of a second species, so nearly allied to the Australian one, gives another proof of a similarity between the Ceylon and Australian Arachnids. Two other forms common to these two regions are the remarkable genera *Amycle*, Cambr., and *Miagrammopes*, id. Although nearly allied to *Cryptothele verrucosa*, L. Koch, the present Spider may be easily distinguished by a great difference in the relative size and position of the eyes.

#### Fam. ERIPIDES.

##### Gen. ERIPUS, Walck.

##### ERIPUS QUINQUEGIBBOSUS, sp. n. (Plate LVI. fig. 5.)

The *cephalothorax* is broad and round behind, and much constricted laterally at the caput; this latter part is elevated at its fore part into two considerable conical divergent eminences, and has a third eminence of a rather stronger and blunter form at the occiput. The surface of the cephalothorax is granulose; the caput is of a reddish orange-yellow brown, suffused more or less on the sides with dark red-brown, in which colour it joins with the line of the thoracic region; the summit of the occipital eminence, as well as a stripe running from it forwards, is bright yellow; and the facies has three dark-brown perpendicular streaks; the outer ones are somewhat sinuous, the middle one straight; the three eminences are furnished with short bristly hairs.

The *eyes* are in three transverse rows, 2, 2, 4; the lower or foremost row is the shortest; and the hinder one is curved, the convexity of the curve being directed backwards. Those of the first row are amber-coloured, and divided by rather over two diameters' interval; those of the next row are larger, and are placed in front of the base of the two conical eminences on the caput, being separated by an

interval of double the extent of that between the eyes of the first row, and their colour is black, with a narrow orange margin; the laterals of the hinder row are placed rather behind, and near the summit of the eminence, and are divided from those of the second row by an interval equal to that between the second and first rows; the two centrals of the hinder row are seated behind the bases of the eminences, and are considerably further apart than each is from the lateral, of the same row, on its side.

The lateral eyes of the three rows form on each side a very nearly straight line; and its length is rather greater than the height of the clypeus.

The *legs* are strong; those of the first and second pairs are much the longest, the difference in their length being very slight; the first are perhaps a little the longest, and the third pair shortest. They are of a yellow colour, clouded with orange and brown in parts, and the two basal joints are bright red-brown. The femora, tibiæ, and metatarsi of the first two pairs are furnished with spines; those on the femora are in front; those on the other two joints are underneath. Each tarsus terminates with two curved claws, furnished beneath the basal portion with, apparently, no more than 1-3 denticulations.

The *palpi* are short and rather strong; the radial joint is shorter than the cubital, but less stout, and has its fore extremity on the outer side produced into a furcate projection; the upper prong forms a short, curved, pointed, claw-like apophysis; the under one adheres close to the outer side of the digital joint, and is of a flattened form, pointed at the end, and much longer and larger than the upper prong; the digital joint is large, of a broad oval form, of a brownish yellow colour, the rest of the palpus being yellow; the palpal organs are simple in structure, and apparently inscribed by a filiform spine.

The *falces* are short, strong, subconical, perpendicular, and of a deep yellowish-red colour.

The *maxillæ* are moderate in length and strength, straight, but rather inclined towards the labium, and a little the broadest at their extremities, their colour being reddish yellow-brown, palest at the extremities.

The *labium* is of the same colour as the maxillæ; its breadth and height are about equal; but its base is broader than its apex, which is rounded.

The *sternum* is heart-shaped, of an orange-yellow colour, margined with dark red-brown.

The *abdomen* is broadest and most convex at the hinder extremity; the hinder part, sides, and underside are rugulose; and the whole surface is covered with small, red-brown, shining tubercles; on the upperside are two long, slightly tapering, strongly divergent prominences; and at the middle of the upper part of the hinder extremity is another, shorter and more sharply pointed; a little lower down on each side of the hinder extremity is another still shorter, or simply conical eminence: the upperside of the abdomen, including the eminences, is of an orange-yellow colour; the two anterior eminences have each two longitudinal red-brown stripes, the foremost of which

reaches to the fore margin of the abdomen; each of the other eminences has a single, less distinct, stripe of a similar colour; and on the fore half of the upperside of the abdomen is a central longitudinally brown marking which is produced at its hinder end until it meets the stripe on the third eminence; four red-brown impressed spots form a square (whose fore side is the shortest) about the middle of the upperside. The sides and underparts are yellow-brown; the spinners are short, compact, and encircled at their base by a yellow-brown corneous-looking fillet or rim. A large round area at the fore part of the underside, including the spiracular plates and the junctional pedicle, are of a coriaceous texture and bright red-brown colour.

A single example of this distinct and remarkable Spider was contained in a collection made for me in Minas Geraes in 1871, by Mr. Henry Rogers. So far as I know, this is the first male of the genus yet described. The genus, indeed, which is closely allied to *Stephanopsis* (Cambr.), consists at present of but three species, *E. heterogaster*, Latr., *E. spinipes*, Bl., and *E. quinquegibbosa*, all being found in Brazil. The present species cannot be confounded with either of the other two, not only differing in the number of the abdominal prominences, but in their form and colour also: these prominences are three in *E. spinipes*, five in *E. quinquegibbosa*, and seven in *E. heterogaster*, the last being also of a large size, while the other two are quite small.

#### Fam. PODOPHTHALMIDES.

##### Gen. PODOPHTHALMA, Capello.

The examination of the examples described below long ago convinced me that the genus *Podophthalma* is closely allied to *Ocyale*. This is contrary to the conclusion lately arrived at by M. Simon (Bull. Soc. Zool. de France, 1876, séance du 7 Juillet), who considers *Podophthalma* to belong to the family Oxyopides. The form of the cephalothorax and maxillæ, as well as the position of the eyes, are totally different from those of *Oxyopes*; there is, however, perhaps some affinity between them; at any rate there is a certain resemblance in the general form of *Podophthalma* and *Oxyopes*; but even in this respect the resemblance between the former and *Ocyale* is still more close, while in the form of the cephalothorax there is a very striking similarity; and if in *Ocyale* the lateral eyes of the anterior row were separated a little more from each other, and seated at the prominent fore corners of the clypeus, this would make the eye-position exceedingly like that of *Podophthalma*. The species of *Ocyale* used to be placed in the genus *Dolomedes*. All arachnologists, I believe, now separate them from the latter genus, while still retaining them, next to it, in the family Lycosides. I have myself long since felt the necessity for constituting a family Podophthalmides for *Podophthalma* and one or two other (as I then conceived) allied genera, forming a passage from the Thomisides to the Lycosides through *Ocyale*. I have recently found reason to doubt the family affinity between



*Podophthalma* and those others which I had imagined formerly to be allied genera, viz. *Labdacus*, Cambr., and *Triclararia*, C. Koch. I would now suggest that *Ocyale* should be joined with *Podophthalma* to form a family, Podophthalmides, which might be placed between the Lycosides and Sphasides, and followed by the family Salticidae; or perhaps a yet more natural arrangement would be, still to place the Podophthalmides, as I have hitherto done, between the Thomisides and Lycosides. In this case *Triclararia* and *Labdacus* would form a transition from the Thomisides to the Podophthalmides, and the latter, although followed immediately by the Oxyopides, would lead unmistakably to the Lycosides through *Ocyale*. The Oxyopides would, indeed, thus intervene between *Ocyale* and *Dolomedes*; but of course this kind of discrepancy cannot be always avoided in a linear arrangement.

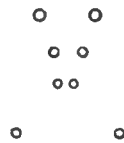
In any case *Triclararia* and *Labdacus*, both of which have three terminal tarsal claws, must be separated from the Thomisides, and should form a family (Triclaridae) between them and the Podophthalmides. The arrangement would thus be THOMISIDES, TRICLARIDES, PODOPHTHALMIDES, OXYOPIDES, LYCOSIDES, SALTICIDES.

*PODOPHTHALMA ELLIOTTI*, sp. n. (Plate LVII. fig. 6.)

Adult male, length very nearly 9 lines,

The *cephalothorax* of this fine species is oval, much flattened above, and the fore part of the caput, especially the clypeal portion, considerably produced; at each corner of this part there is a strong, somewhat cylindrical, rather elongated, tubercular prominence, beneath the fore extremity of which is one of the fore lateral eyes. The colour of the cephalothorax is yellow-brown, with a broadish paler margin and central band; and it is pretty densely clothed with coarse greyish-white pubescence, almost entirely concealing the real colour of the surface. The longitudinal thoracic indentation is strong, and the ordinary converging furrows well marked.

The *eyes* are in four transverse rows, 2, 2, 2, 2; or they may be perhaps more correctly described as forming a large quadrangular figure of four eyes, and about the middle of it is another small quadrangle of the remaining four. The anterior side of the larger quadrangle is longer than the posterior one, while the posterior side of the inner quadrangle is longer than the anterior; in both figures the length is greater than the breadth. The eyes of the foremost row are the largest of the eight; and this row is the same distance from the next one as the latter is from the posterior (or fourth) row, the third row being equidistant between the second and fourth. The eyes of the third row (which are rather smaller than those of the fourth) are separated by an eye's diameter; and those of the second row, which is the shortest of the four, are also much the smallest, and are divided from each other by an eye's diameter. The eyes may also be described as forming a St. Andrew's Cross, whose base is rather longer than the width of the upper part.



The *legs* are long and moderately strong, furnished with hairs, bristles, and strongish spines; their relative length is 1, 4, 2, 3, or 4, 1, 2, 3, the difference between 1 and 2 being slight (in the only male examined the fourth pair were wanting); the shorter hairs are white, and give a grey hue to the legs, whose real colour is yellow-brown with here and there a paler annulus. Each tarsus ends with three claws, of which the superior pair are distinctly pectinated.

The *palpi* are moderate in length and strength, and their colour and clothing of grey hairs are like those of the legs; the radial joint is a little longer and stronger than the cubital, being enlarged gradually towards its fore extremity, where, on the outer side, is a short, deep red-brown, curved, blunt-pointed, corneous apophysis; there is also a long, tapering, spine-like, prominent bristle at the inner side of its posterior extremity; the digital joint is large and hairy, and its length exceeds that of the radial and cubital joints together, being almost, if not quite, equal to that of the humeral joint; in its general form and appearance the digital joint is like that of *Tegeitaria* and *Ocyale*, the fore extremity being much produced into a long, narrow, tapering point. The palpal organs are placed beneath the posterior half of the digital joint, and comprise several strong, bulbous-looking, corneous processes, each terminating in a sharp point.

The *falces* are strong, tolerably long, and straight, but directed rather backwards towards the sternum; they are similar to the cephalothorax in colour, and are also clothed with grey hairs and a few prominent dark bristles.

The *maxillæ* are strong, tolerably long, broader at their upper extremity than at the middle, and straight, almost exactly resembling those of *Ocyale*, *Dolomedes*, and many *Lycosæ*, their colour and clothing being similar to those of the falces.

The *labium* is of a short oblong form, half the length only of the maxillæ, and truncated at the apex; this is paler than the rest, the general colour being like that of the maxillæ.

The *sternum* is of a short heart-shape, and its colour and clothing are like those of the falces.

The *abdomen* is long, and tapers gradually to its hinder extremity; its general colour is yellowish brown, clothed with hairs, most of which have a greyish hue; the upperside is occupied by a broad, tapering, longitudinal dark-brown band, whose margins at the hinder part are bluntly denticulate; this band is bordered on each side by a pale yellow-brown stripe, clothed densely with white hairs; and another similar longitudinal stripe occupies the middle of its anterior portion; and on each side of this latter stripe is a largish, round, dark-brown, impressed spot.

The *female* resembles the male, but is larger. In the female the legs of the fourth pair appear to be the longest; and probably those of the male are also similarly proportioned. The spinners are short, two-jointed, of equal, or nearly equal, length; and those of the inferior pair are the strongest. The form of the genital aperture is peculiar and characteristic.

Several adult females and one adult male of this species were most kindly given to me, among other Spiders, by Sir Walter Elliot, K.C.S.I., by whom they were found some years ago in East Central India. Having been preserved in spirit for some years, it is probable that their present colours are not quite the same as those of the living Spider.

*PODOPHTHALMA AFFINITATA*, sp. n.

A portion only of this Spider has come before me; this portion consists of the cephalothorax and falces, together with the maxillæ, labium, sternum, and legs, as far as, and including, the femora. It is evidently nearly allied to *P. bayoniana*, Capello; but as it differs in the colour, as well as in the size of the eyes, I am inclined to describe it as distinct, although, of course, no details of the abdomen and other absent parts can be given.

The colour of the cephalothorax, as well as of all the other parts above mentioned, is yellow. The form also of the cephalothorax appears to be more flattened than in Capello's type species; and when looked at sideways there is no difference in the convexity of the caput and thorax.

The eyes are on black tuberculate spots; the length of the posterior and anterior rows is equal; the interval between those of the third row (or that next to the posterior one) is less than an eye's diameter: these two eyes are rather the largest of the eight; those of the first and fourth rows are next in size, and are apparently about equal. The interval also between those of the second row is less than an eye's diameter; and the intervals between the second and third, and the third and fourth rows are equal, being less than that between the second and first. The distance between each eye of the second row and that of the first row, on its side, is considerably less than the distance between it and the eye of the fourth row on its side. The length of the rectangle formed by the eyes of the first and fourth rows is greater than its breadth, but evidently not as much greater as it is represented to be in the figure of *P. bayoniana*, where also the posterior row of eyes is given as longer than the anterior one.

From the relative lengths of the femora I should judge the relative lengths of the legs to be 4, 1, 2, 3.

The length of the cephalothorax is very nearly 3 lines.

The falces are slightly divergent.

The fragment from which the above notes have been made was received in a small collection of Spiders sent to me by Mr. Henry Rogers from the west coast of Africa, on the banks of the river Coanza.

*PODOPHTHALMA HILARIS*, sp. n. (Plate LVII. fig. 7.)

Immature female, length  $7\frac{1}{2}$  lines.

In general form and appearance this Spider is much like *P. elliottii*: its colours, however, are much richer; and its markings, as well as the relative size of the eyes differ.

The *cephalothorax* is of a dark rich yellowish brown colour with a very narrow marginal yellow line, and a longitudinal yellow stripe

along nearly the middle of each side, together with a narrow stripe or line of the same colour along the middle from the second row of eyes, each to the posterior margin; all these yellow lines and stripes are thickly clothed with white hairs.

The *eyes* are in the same position as those of *P. elliotii*, but those of the third row are smaller in proportion than in that species, being scarcely larger than those of the second row; those of the fourth (or posterior) row are also smaller.

The *legs* are long and rather slender; their relative length is 4, 1, 2, 3; and they are of a brownish-yellow colour, the femora considerably clouded with brown. They are thinly clothed with white pubescence, as well as other hairs, bristles, and rather slender spines.

The *palpi* are moderately long, of a yellowish hue, and furnished with hairs, long bristles, and slender spines.

The *falces* are rather long and strong, prominently rounded in profile, almost perpendicular, of a yellowish colour, striped with brown on their basal half, and clothed with bristly and white hairs.

The *maxillæ* are straight, enlarged and rounded at their extremities, and, together with the labium (which is of an oblong-oval form truncated at its apex), of a yellowish hue.

The *sternum* is heart-shaped, yellow, with two dark-brown, irregular, parallel stripes or markings along the middle, and clothed with white hairs.

*Abdomen* long, narrow-oval, much produced and tapering to the spinners. The upperside is pale yellowish, the middle line occupied by a broad, tapering, dark, rich-brown longitudinal band strongly and distinctly denticulated along the whole of its posterior half; the middle longitudinal line of this band is charged with a series of reddish yellow-brown markings, those on the hinder part being triangular and representing the normal angular bars or chevrons; immediately outside the margin of the central brown band, on each side, is a narrow stripe of white hairs; a broadish dark-brown band runs along each side, and is traversed obliquely by a yellowish stripe. The lower part of the sides is pale yellow thinly spotted with brown; and the underside is more of a yellow-brownish hue. These parts, and, indeed, the whole abdomen, are more or less clothed with short grey and white hairs. The spinners are short, two-jointed, compact, and equal in length, those of the inferior pair being the strongest.

Four immature examples of this fine and handsome species were received, through the kindness of Mr. R. H. Meade, of Bradford, from Madagascar.

PODOPHTHALMA INCERTA, sp. n. (Plate LVII. fig. 8.)

Immature female, length not quite  $2\frac{1}{2}$  lines.

This Spider is of very great interest, because by a slight modification in the position of the eyes, the close relationship between *Podophthalma* and *Ocyale* is very distinctly shown.

The *cephalothorax* is of the ordinary shape, oval behind, considerably compressed laterally at the caput, and truncated on lower

margin of clypeus; its colour is yellow, with a few small brown markings round the lateral margin, and a faint brown, broad, longitudinal central band divided longitudinally on the caput by a narrow yellow line, and broken in upon by short radiating yellowish streaks indicating the normal thoracic indentations.

The *eyes* are on conspicuous black tubercular spots, and vary a little from the normal position, those of the first and second rows forming together a curved line of four eyes, the curve directed backwards; this is caused by the group which consists of the second, third, and fourth rows being advanced so much closer towards the fore margin of the clypeus, while still retaining their own relative position. This arrangement brings the general position of the eyes into very nearly that of the genus *Ocyale*; the exterior eyes, however, of the first row still occupy the same position as those of the first row in the typical *Podophthalma* (*i. e.* quite at the lower corners of the clypeus), and are also seated in front of, and rather below, a tubercular eminence, though of less length than in the other (already described) species of *Podophthalma*. Another characteristic of the eyes of this Spider is that they are of considerable size, and vary from each other very slightly in that respect.

The *legs* are long, slender, and of a pale yellow colour, faintly annulated with yellow-brown. They were entirely destitute of hairs and spines; but there were evidences of these having been considerably rubbed off. Their relative length appears to be 4, 1, 2, 3.

The *palpi* are similar to the legs in colour, slender, and of moderate length.

The *fulces*, *maxillæ*, and *labium* present no difference from the normal form. They are of a pale yellow colour, except the labium, which is pale brown.

The *sternum* is heart-shaped, brown, with a distinct and complete dentated border, and central longitudinal oval patch of yellow.

The *abdomen* is oval, not so attenuated as in the other species, but more convex towards the anterior extremity; it is of a brownish-yellow colour, marked variously both above and below with brown stripes and markings, the sides and a broad transverse band on the underside just behind the middle being closely marked with white cretaceous spots and patches.

A single example only, received in company with those, already described, of *P. hilaris*, from Madagascar.

I have had some doubt whether it would not be proper to place this Spider in a new genus, on account of the difference in the eyes from the typical *Podophthalma*, especially as the next Spider described (*P. diversa*, from Brazil) has a similar general position of the eyes, differing, however, in the two eyes of the second row (or rather the intermediate ones of the first) being much smaller than the rest, and so more nearly resembling those of the typical *Podophthalma*. On the whole, therefore, it is perhaps best at present to await the discovery of other species before forming a new genus for these two. This and the next species show some resemblance to *Lycosides*, Linn. (*Textrix*, Sund.), of the family Agelenides.

*PODOPHTHALMA DIVERSA*, sp. n. (Plate LVII. fig. 9.)

Immature female, length 6 lines.

This Spider is nearly allied to *P. incerta*, Camb.

The *cephalothorax* is broad, round, oval behind, greatly constricted laterally at the caput, which is rather produced and truncated in front. Although closely resembling in its form that of the typical *Podophtalma*, the cephalothorax is perhaps more nearly like that of *Agelena* and *Textrix*, with which genera there is no doubt an affinity, although in a linear arrangement these genera are removed at a great distance from *Podophtalma* (see introductory remarks, p. 558). The colour of the cephalothorax is yellow-brown, pretty thickly clothed with greyish-yellow pubescence.

The *eyes* are in the same position as those of *P. incerta*. The exterior ones, however, of the foremost row are not so near to the exterior (lower) corners of the clypeus; and the central pair of this row are distinctly (rather considerably, in fact) smaller than the rest. In this Spider, as well as in the last, *P. incerta*, the ocular area, looked at in profile, is less flattened, and thus the eyes of the third row project more forwards.

The *legs* are moderate in length and strength; their relative length is 4, 1, 2, 3. They are of a pale yellow-brown colour, furnished with hairs, bristles, and slender spines; and each tarsus terminates with three curved claws, of which those of the superior pair are strong and pectinated, and the inferior one is small.

The *palpi* are slender, of moderate length, and similar to the legs in colour and armature, terminating with a single, curved, pectinated claw.

The *falces* are straight, perpendicular, moderate in length and strength, similar to the cephalothorax in colour, and furnished in front with numerous bristles.

The *maxillæ* and *labium* are of normal form; the former are dull pale yellow, and the latter is tinged with yellow-brown.

The *sternum* is yellow-brown, darkest along the middle, of an oval heart-shape, and clothed with numerous erect bristly hairs.

The *abdomen* is of an elongate-oval form, pretty densely clothed with grey and other hairs intermixed with some prominent dark bristly ones. It is of a yellowish-brown colour, with a broad central longitudinal band on the upperside, the margins indented, and each indentation marked conspicuously with a patch of white hairs, and joined to the corresponding indentation on the opposite side by a slightly curved line of similar hairs; these transverse curved white lines are most conspicuous on the hinder half. The sides are closely marked with parallel broken lines of dark-brown elongate spots; and the underside is tinged with darker yellow-brown, which, however, is obscured by the clothing of short yellow-grey pubescent hairs.

The spinners of the superior pair are rather longer than those of the inferior, though less strong.

Several examples (all immature females) were collected by Mr. Henry Rogers, in Minas Geraes, Brazil.

## Fam. DINOPIDES.

Until lately one genus alone of this group (*Dinopis*, Macleay) had been characterized. It has always appeared to me impossible to place *Dinopis* in any known or recognized family group; and consequently I have long since constituted it a family of itself, placing it between the Lycosides and Salticides, rather for want of a better place for it than for any really close affinity to either of them. It is more probable that its place will some day be found to be much nearer to the Agelenides than to either the Lycosides or Salticides. Dr. Ludwig Koch, writing in 1867 (Verh. k.-k. zool.-bot. Gesell. in Wien, 1867, p. 230), says that the position of *Dinopis* is without any doubt in the family Eresides, giving as a proof the position of the eyes and possession of calamistra and inframamillary organ. It would seem, however, scarcely possible to place in juxtaposition two Spiders more unlike each other than *Dinopis* and *Eresus*, whether we consider the general form, or any special point of structure from which a family affinity could be deduced. The mere position of the eyes is quite insufficient. *Podophthalma* has an eye-position very closely resembling *Dinopis*; and between other widely separated genera there may also be often found a similar eye-position. Relying upon this only, Walckenaer once placed a Theraphosid (*Idiops*) in the genus *Sphasus*; and as regards calamistra and the mamillary organ, these may certainly be considered of family value in some groups of genera possessing them, as in *Dictyna*, *Amaurobius*, *Titaneca*, and *Lethia*; but when we find them in such widely different Spiders as *Filistata*, *Æcobius*, and *Rhion*, all family value, at least with respect to them, vanishes. So, it appears to me, it is also in regard to *Dinopis*, where the flattened cephalothorax, enormous central pair of eyes, long and excessively slender legs, with a very peculiar form of maxillæ, labium, and sternum, must have far more weight than the calamistra and general position of the eyes taken by themselves. M. Simon has recently (Bull. Soc. Zool. de France, 1876, p. 218) characterized a second genus (*Menneus*) unmistakably allied to *Dinopis*, but, along with some minor characters, differing remarkably in having the tarsi of the first pair of legs subdivided. *Menneus* has also calamistra; and so also has another Spider, allied both to *Dinopis* and *Menneus*, and upon which I propose presently to found a third genus of the family Dinopides. This Spider, for which I propose the generic name *Avella*, has the flattened cephalothorax, the long slender legs, the peculiar maxillæ and labium, as well as the general eye-position of *Dinopis*; but the central pair of eyes are but little larger than the rest. With *Menneus* it agrees in having the tarsi of the first pair of legs subdivided, though it seems to me, with respect to other generic characters, quite distinct. It however possesses calamistra and an inframamillary organ (though the calamistra were of rather a peculiar nature). It is therefore probable that these portions of structure will here also prove a good family character within the limits of the Dinopid group; but this remains to be proved. Of course the family character thus attached

to these curious points of structure would at once fail if an undoubted Dinopid were found without them.

Gen. nov. *AVELLA*.

*Cephalothorax* longer than broad, oval behind, constricted laterally at the caput, and truncated in front; the lower corners of the clypeus prolonged into eye-bearing tubercular prominences; upper surface much flattened, the thorax and caput being on the same low level. The caput runs in a straight line to the middle pair of eyes, when it drops abruptly, at right angles, to the falces.

*Eyes* small, in three transverse rows, 4, 2, 2, and not differing greatly in size; the foremost row (of four) is strongly curved, the convexity of the curve directed backwards; the laterals of this row are placed at the extremity of cylindrical tubercles springing from the corners of the clypeus. Those of the second row are a little the largest of the eight. Those of the third or posterior row form a line not nearly so long as that formed by those of the first row.

*Legs* long, slender; relative length 1, 2, 4, 3—1 and 2 greatly exceeding 3 and 4 in length; the tarsi of the first pair subdivided. Each tarsus ends with three curved claws, of which the superior pair are pectinated; and there is a calamistrum on the metatarsus of each of the fourth pair.

*Palpi* short, slender, and terminating with a single curved pectinated claw.

*Falces* long, strong, and divergent.

*Maxillæ* long, strong, considerably constricted just above the insertion of the palpi, and thence greatly divergent, or bent outwards, and rounded at their extremities.

*Labium* oblong but broader at the base than at the apex, which is truncated; its length slightly exceeds one half that of the maxillæ.

*Sternum* of a somewhat subtriangular form, but much elongated.

*Abdomen* long, broadest in the middle, where there is a strong prominence on each side, with a supernumerary mamillary organ in front of the ordinary spinners.

*AVELLA DESPICIENS*, sp. n. (Plate LVII. fig. 10.)

Adult female, length rather over  $4\frac{1}{2}$  lines.

The *cephalothorax* is of a yellow-brown colour, with a broad central longitudinal band of a paler hue; this band runs through to the central pair of eyes; it is rather wider on the caput than on the thorax, and is thickly clothed with a grey pubescence, the rest of the cephalothorax being thinly clothed with similar pubescence. The area comprised by the six foremost eyes is of a rather chocolate red-brown colour.

The *eyes* may be described not only as in three transverse rows, but as also in two quadrangular figures, a large one with a small one in the middle of it; the foremost pair of the central quadrangle are the smallest of the eight, and separated from each other by about three diameters, and from the hinder pair by about two; the hinder pair are considerably larger and form a longer line than the



fore ones, being also separated from each other by two diameters, the distance from each to the eye of the hinder row on its side being somewhat greater than this. The tubercles, at the extremity of which the foremost eyes of the outer quadrangle are placed, are directed strongly outwards and downwards.

The *legs* are brown, slightly tinged with yellow, and furnished with hairs and a few short spines. The calamistra on the metatarsi of the fourth pair begin close to the hinder extremity of the joint, rather on the inner side, and continue along it for about one third of its length; the terminal tarsal joint of the first pair is less than a fourth of the length of the normal joint.

The *palpi* are similar to the legs in colour and annulation.

The *falces* are long, strong, perpendicular, and divergent, and of a dark, slightly yellowish brown colour.

The *maxillæ* and *labium* are of a similar hue, the apex of the latter and the inner sides of the former being of a pale whitish colour. The maxillæ are also rather closely fringed with hairs on their inner sides and at their extremities.

The *sternum* is of a dark brown and dull orange-yellowish hue mixed.

The *abdomen* was much shrunken; but its form is apparently elongate-oval, truncated in front, broad across the middle, where there is a strong somewhat conically pointed prominence on each side. It is clothed with short hairs; and the femoral hue is a mixture of brown-grey and reddish-yellow. The lateral prominences are joined by a somewhat raised transverse curved ridge clothed with grey hairs, the colour of the abdomen in front of the ridge being dark reddish yellow-brown; and extending from it to the spinners is a broad dentated paler yellow-brown band.

A single example of this very interesting and important Spider was received, among numerous examples of other groups, from Rockhampton, Australia, through Mr. E. W. Janson, in the present year (1877). The relation of this Spider to *Dinopis* and *Menneus* is noted above.

#### Fam. SALTICIDES.

#### Gen. nov. ATHAMAS.

This genus is closely allied to *Lyssomanes*, Hentz, as well as to *Jelskia*, Tacz. It differs, however, from both in the shortness of the cephalothorax and also of the abdomen. From *Lyssomanes*, Hentz, it differs in the superior and inferior spinners being of equal length, whereas in that genus those of the superior pair are much longer, slender, and three-jointed.

*Cephalothorax* short, massive, quadrate, very convex above; the sides and hinder slope almost vertical.

*Eyes* very unequal in size, disposed in four transverse lines of two each, and almost of the same length.

*Legs* rather slender, and moderately long; those of the first pair longest, and of the second pair shortest.

*Maxillæ* rather short, slightly divergent, and much the broadest at their extremities, which are rounded.

*Labium* short, small, and of a somewhat curviangular form.

*Abdomen* small, short, oval, and sloping from its most convex part, near the fore margin, to the spinners.

ATHAMAS WHITMEEI, sp. n. (Plate LVI. fig. 11.)

Adult male, length  $1\frac{1}{2}$  line.

The *cephalothorax* of this very pretty and distinct Spider is of a yellow-brown colour, with a large pale patch on each side of the hinder extremity, and the ocular area black, thinly clothed with short white hairs, and shining, in some lights, with a strong metallic dark violet hue; a pale stripe densely clothed with bright white squamose hairs runs through the middle of the hinder half of the ocular area to the beginning of the posterior slope; there is also a spot of similar hairs on each side towards the hinder part, and another on each side near the hinder part of the ocular area, just below the eyes of the third row; the height of the clypeus is rather less than the diameter of one of the first row of eyes.

The *eyes* may be described not only as in four transverse rows or four pairs, but as in two longitudinal, and nearly straight, parallel lines. The foremost pair are of enormous size, contiguous to each other, and placed on the vertical front of the caput; the two next to them are on the upper edge of the caput, and form a line but very slightly longer than the first pair; they are also large, but not nearly so large as the former, and are separated by rather less than two diameters; those of the next row are very minute and not easily distinguished, they form a line shorter than the last-mentioned eyes, but separated by a rather wider interval; these minute eyes are about halfway between those of the second and fourth rows. Those of the fourth row are considerably smaller than those of the second, and are divided by an interval of three diameters. The line, however, that they form is nearly of the same length.

The *legs* are yellow, the femora and the two other basal joints of the first pair being much stronger than the rest, and brownish black on each side. This, however, is apparently not a constant character; or at any rate it does not always exist at the first coming of the Spider to maturity, but probably is acquired later; for in one of the examples before me the first pair are of the same colour as the rest, and the femora of only ordinary comparative strength, and the legs themselves shorter and weaker. They are furnished sparingly with hairs and a few slender spines, except the first pair, in which there are five pairs of long strong spines beneath the tibiæ, and three pairs (rather longer and stronger still) beneath the metatarsus, disposed in two longitudinal parallel rows; these spines are much less strongly developed in the example before mentioned, whose fore legs are less strong than those of the other specimen.

The *palpi* are pale yellow, short and slender; the radial joint is, if any thing, a little shorter than the cubital, and has a very small, slender, pointed apophysis at its fore extremity on the outer side;

this apophysis is very difficult to distinguish clearly; the digital joint is of a narrow form, and tapers a little towards its fore extremity, its length being nearly, if not quite, equal to that of the cubital and radial joints together; all these three joints are clothed with longish coarse white hairs. The *palpal* organs are simple but well developed; they are not conspicuous, being of a similar colour to the rest of the palpus, and much obscured by the white hairs on the digital and radial joints.

The *falces* are short, straight, vertical, and not very strong; they are of a brownish-yellow colour with a broad rather oblique dark yellow-brown longitudinal stripe on the fore side.

The *maxillæ* are yellow-brown, paler at their extremities.

The *labium* is also yellow-brown, palest at the apex.

The *sternum* is heart-shaped and of a pale yellow colour.

The *abdomen* is of a palish yellow hue; on the fore half of the upperside a clearer yellow elongate-oblong central marking is indicated by a dark-brown dentated marginal line, and terminates posteriorly with a short transverse curved dark-brown stripe, behind which, again, are two longitudinal curved dark-brown markings inclosing a circular area covered densely with white squamose hairs which extend forwards also to the transverse stripe above described. The sides are marked with a few dark-brown spots and markings; and on each side of the fore extremity of the oblong central marking is a large patch of white squamose hairs. In front, below the fore margin, are some coarse, bristly, black, upturned hairs.

The spinners are of a blackish hue, tipped with pale yellowish; those of the inferior pair are much the strongest, though of the same length as the superior pair; and those of the central pair are nearly as long as the rest. There is evidently some variety in the abdominal markings of this species, since in the other example before noted the upperside of the abdomen is generally suffused with dark blackish brown, showing faintly the longitudinal oblong central yellowish marking on the fore part; the posterior and two anterior large patches of white squamose hairs, however, are even more conspicuous in this than in the other example.

Two adult male examples were received from the Rev. S. J. Whitmee, by whom they were found in the island of Samoa, and kindly sent to me, together with a few other Spiders.

#### LIST OF SPIDERS.

##### Fam. GASTERACANTHIDES.

- Cyrtarachne longipes*, sp. n., river Coanza, p. 559, Pl. LVI. fig. 1.  
 — *furcata*, sp. n., Rockhampton, p. 560, Pl. LVI. fig. 2.  
 — *hobsoni*, sp. n., Bombay and Ceylon, p. 562, Pl. LVI. fig. 3.

##### Fam. CRYPTOTHELIDES.

- Cryptothele ceylonica*, sp. n., Ceylon, p. 563, Pl. LVI. fig. 4.

##### Fam. ERIPIDES.

- Eriopus quinquegibbosus*, sp. n., Minas Geraes, p. 564, Pl. LVI. fig. 5.

## Fam. PODOPHTHALMIDES.

- Podophtalma ellioti*, sp. n., East Central India, p. 567, Pl. LVII. fig. 6.  
 — *affinitata*, sp. n., river Coanza, p. 569.  
 — *hilaris*, sp. n., Madagascar, p. 569, Pl. LVII. fig. 7.  
 — *incerta*, sp. n., Madagascar, p. 570, Pl. LVII. fig. 8.  
 — *diversa*, sp. n., Minas Geraes, p. 572, Pl. LVII. fig. 9.

## Fam. DINOPIDES.

*Avella*, g. n.

- Avella despiciens*, sp. n., Rockhampton, p. 574, Pl. LVII. fig. 10.

## Fam. SALTICIDES.

*Athamas*, g. n.

- Athamas whitmeei*, sp. n., island of Samoa, p. 576, Pl. LVI. fig. 11.

## EXPLANATION OF PLATES LVI. AND LVII.

## PLATE LVI.

- Fig. 1. *Cyrtarachne longipes*, sp. n., ♀.  
*a*, full figure, upperside, natural size; *b*, profile, without legs, enlarged; *c*, maxillæ, labium, and sternum.
2. *Cyrtarachne furcata*, sp. n., ♀.  
*a*, full figure, upperside, enlarged; *b*, profile, without legs; *c*, profile of cephalothorax, more enlarged; *d*, outline, natural size.
3. *Cyrtarachne hobsonii*, sp. n., ♀.  
*a*, full figure, upperside, enlarged; *b*, profile, without legs; *c*, natural length of Spider.
4. *Cryptothele ceylonica*, sp. n., ♀.  
*a*, full figure, upperside, enlarged; *b*, profile, without legs; *c*, fore part of caput, from behind, showing the eyes; *d*, maxillæ and labium; *e*, natural length of Spider.
5. *Eripus quinquegibbosus*, sp. n., ♂.  
*a*, full figure, upperside, enlarged; *b*, caput, in front; *c*, profile; *d*, abdomen from behind; *e*, natural length of Spider.
11. *Athamas whitmeei*, sp. n. et g. n., ♂.  
*a*, full figure, upperside, enlarged; *b*, profile, without legs; *c*, fore part of caput, from behind, showing position of the eyes; *d*, maxillæ and labium; *e*, natural length of Spider.

## PLATE LVII.

- Fig. 6. *Podophtalma ellioti*, sp. n., ♀.  
*a*, full figure, upperside, nearly of natural size; *b*, fore part of caput, showing position of the eyes; *c*, *d*, palpus of male; *e*, radial, and portion of cubital, joint of palpus, ♂, *f*, natural length of Spider.
7. *Podophtalma hilaris*, sp. n., ♀.  
*a*, full figure, upperside, enlarged; *b*, profile of cephalothorax; *c*, natural length of Spider.
8. *Podophtalma incerta*, sp. n., ♀.  
*a*, full figure, upperside, enlarged; *b*, fore part of caput, from in front, showing position of the eyes, *c*, natural length of Spider.
9. *Podophtalma diversa*, sp. n., ♀.  
*a*, full figure, upperside, enlarged; *b*, fore part of caput, from in front, showing position of the eyes; *c*, natural length of Spider.
10. *Avella despiciens*, sp. n. et g. n., ♀.  
*a*, full figure, upperside, enlarged; *b*, profile of cephalothorax; *c*, fore part of caput from in front, showing position of the eyes; *d*, part of metatarsus of one of fourth pair of legs, showing calamistrum; *e*, natural length of Spider.

## 5. Note on the Polish Swan. By J. H. GURNEY, F.Z.S.

[Received June 5th, 1877.]

On the 12th April, 1876, the female of a pair of "Polish Swans," received by me some weeks previously from the Gardens of this Society, completed laying a clutch of six eggs and commenced her incubation—there being no other Swans in this parish (Northrepps), and consequently no possibility of intermixture.

On the 21st and 22nd May the eggs were hatched, with the exception of one that was addled. I saw the cygnets on the 23rd, and made the following note respecting their coloration:—"The upper parts are brownish grey with a slight rufous tinge; the head, throat, and breast, where visible above the water, are white, but the white is not separated from the grey by any defined line, the two tints gradually blending into each other." On the 2nd June they were visited by an ornithological friend, Mr. Thomas Southwell, who described them at that date in the following words:—"The buff tinge was hardly perceptible, except on the back, which appeared of a rich creamy buff, with the underparts nearly pure white." Mr. Southwell brought with him for comparison the skin of an ordinary cygnet of similar age, which was about equally white on the head and underparts, but decidedly greyer on the back, and without any drab tint, according to a memorandum which I made at the time.

On the 7th June I made the following note:—"The cygnets seem to be gradually losing their drab tint on the back, though it is still visible, but it seems to be merging into a pale grey, almost white; a pure white spot, about the size of a pea, is conspicuous on the down of the forehead immediately above the bill.

On the 17th June the largest of the five cygnets was killed by a rat, which devoured the head, neck, and part of the back; the down on the remaining portion of the bird was pure white, the bill and feet being pale greenish-grey. On the 22nd I had a close view of the remaining four cygnets: their heads and necks were quite white; but the white spot on the forehead was still apparent, being a brighter white than the rest of the head; the down on the back was white, but apparently with slight remains of a drab tinge about the roots; the smallest cygnet appeared the whitest of the four. On the 17th July I again had a close view of the cygnets, and then made the following memorandum:—"The three largest are beginning to show the tail-feathers and some slight sprouts of wing-feathers; all these, with the down adjacent to them and the down on the thighs, are a pale cinnamon-brown; elsewhere they are white, except a slaty tint on the forehead, beneath which the little white frontal spot is still visible. The smallest cygnet, which is the most backward, is still white all over." On the 24th July small feathers of a cinnamon-brown were visible between and adjoining the wings of

the three largest cygnets, and the white down was in course of being moulted, flying off from the birds when they moved briskly; the white frontal spot was still perceptible. On the 3rd August the smallest and most backward cygnet died, being still in the down with the exception of a slight indication of the tail-feathers; it was tinged with brownish-grey on the wings and tail, and more slightly on the head, but elsewhere was white throughout. On the 27th September another cygnet died: it had lost its down and was well feathered throughout; its general colour was white; but the head and back of the neck were tinged with greyish brown; the feathers on the wing-coverts and back were also all more or less broadly tipped with a similar tint. The two surviving cygnets subsequently became pure white, but did not lose the greyish brown tint on the crown of the head till May 1877; and in fact one of them still (on June 4) retains traces of it. In the other bird it has been replaced by the ferruginous colour so common on the crown of the head of adult Swans, and which I think I have observed to be more conspicuous, in the ordinary race, in male than in female birds.

The old pair have again hatched a brood this spring, six in number; and the cygnets resemble those of last year, being of a pale greyish cinnamon-brown on the upper parts, but nearly white on the head. Whether the prevalence of this brownish-grey tint in both broods is an indication of one or both the parents not being quite true-bred, is a question which I am not competent to decide, but which may be worthy of consideration.

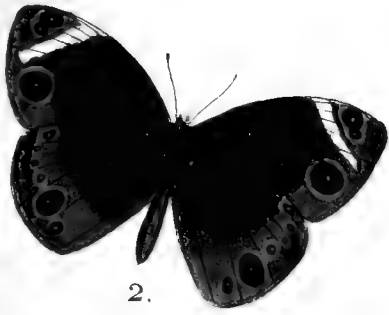
6. The Lepidopterous Fauna of the Andaman and Nicobar Islands. By F. MOORE, F.Z.S., Assistant Curator, India Museum, London.

[Received June 7th, 1877.]

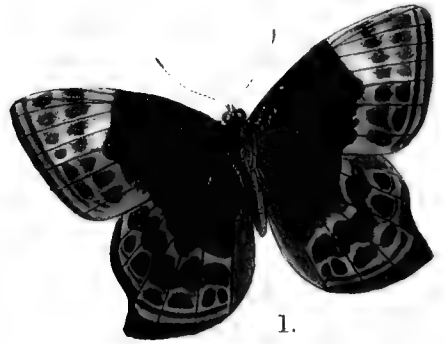
(Plates LVIII.—LX.)

*Note.*—The materials used for the accompanying paper were mostly collected in the S. Andamans by Mr. F. A. De Rœpstorff, the Deputy-Superintendent in charge of that Settlement. The specimens were forwarded to this country for disposal; and I have to thank the several gentlemen into whose hands they ultimately went for their kind permission to describe them. Those from the Nicobars were chiefly collected by Mr. R. Meldola, who accompanied the late Venus-Transit Expedition to those islands, to whom my thanks are also due.

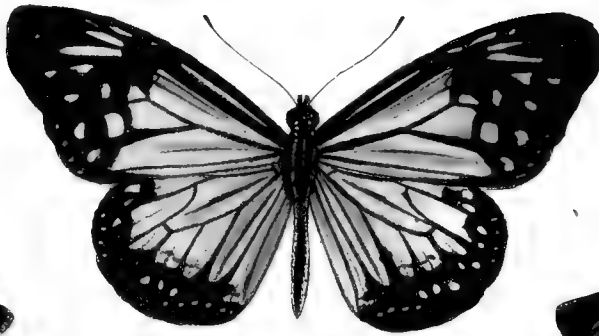
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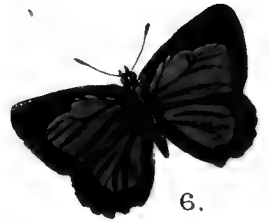
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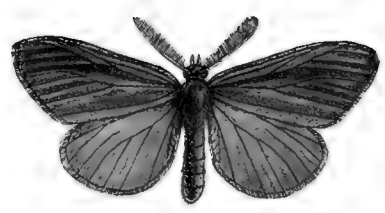
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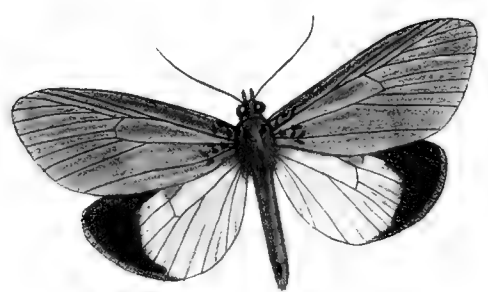
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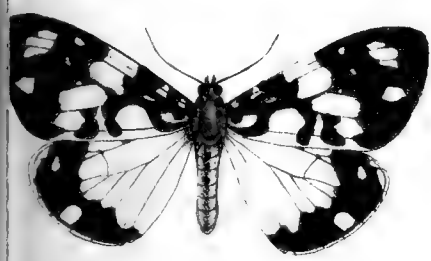
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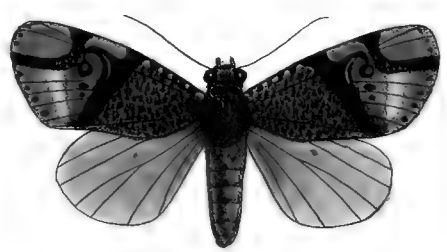
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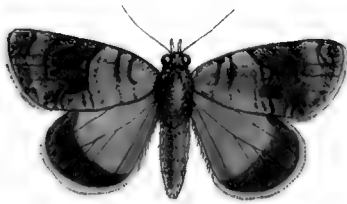
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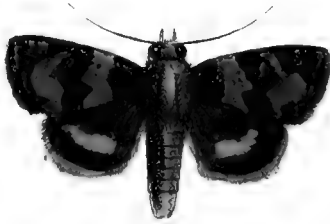
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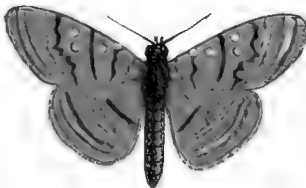
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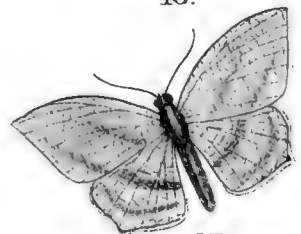
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## Tribe PAPILIONES.

## Family DANAIDÆ.

DANAIS LIMNIACE, Cram. Pap. Exot. i. pl. 59. f. D, E.

*D. leopardus*, Butler, P. Z. S. 1866, p. 52.

Nicobars (Nankowry), April, *Meldola*.

DANAIS AGLEOIDES, Felder, Verh. zool.-bot. Ges. 1862, p. 486.

Nicobars (Sambelong).

DANAIS GRAMMICA, Boisd. Spec. Gén. Lép. i. pl. 11. f. 10 (1836).

Nicobars (Kamorta), *Meldola*, April.

DANAIS MELANOLEUCA, n. sp. (Plate LVIII. fig. 3.)

*Male and female.* Black: fore wing with white space within the cell, two thirds of space between lower median and submedian veins; four discal spots, an indistinct costal basal streak, three costal spots before the apex, two lower elongated streaks, followed by a dentate spot and three smaller rounded submarginal spots; some marginal white dots near posterior angle, and a small spot below the apex; the space within the cell with short, narrow, dusky streaks from its

<sup>1</sup> Of which 93 are new species.

end, and a median dusky line within the space below the median vein: hind wing with white space within the cell and between the veins to one third from outer margin, the upper spaces concave, and the lower conical externally; an indistinct dusky lunule crossing the end of the two lower median spaces, a prominent black bifid streak within the cell, and a line between lower median and submedian; a submarginal series of small white spots, two between each vein (two being obsolete in the male on the sexual mark), and a marginal series of seven smaller spots from anal angle. Head and thorax with white spots and streaks. Abdomen cinereous brown above, white beneath. Femora and tibiæ white-streaked.

Expanse, ♂  $2\frac{3}{8}$ , ♀  $2\frac{1}{8}$  inches.

S. Andamans (Port Blair). In coll. H. Druce and F. Moore.  
Near to *D. vitrina*, Feld.

DANAIS NESIPPUS, Felder, Verh. zool.-bot. Ges. 1862, p. 486.  
Nicobars (Sambelong).

DANAIS PLEXIPPUS, Linn. S. N. i. 2. p. 767.

Nicobars (Nankowry and Kamorta), *Meldola*, April.

EUPLÆA NOVARA, Felder, Verh. zool.-bot. Ges. 1862, p. 482;  
Novara Reise, Lep. ii. p. 317, pl. 39. f. 7.

Nicobars (Kar Nicobar).

EUPLÆA ESPERI, Felder, Verh. zool.-bot. Ges. 1862, p. 482.  
Nicobars (Kar Nicobar).

EUPLÆA ANDAMANENSIS, Atkinson, P. Z. S. 1873, p. 736.  
S. Andamans (Port Blair).

EUPLÆA CAMORTA, n. sp.

*Male.* Upperside—both wings dark blackish olive-brown, paler on outer margins; fore wing with a short, straight, narrow silky streak between lower median and submedian veins; hind wing with the anterior border broadly cinereous, the upper part of the cell being slightly greyish brown. Underside paler; fore wing with four bluish-white spots, one being on the costa above end of the cell, another at its lower end, the other two outside; the sexual streak long, narrow, and patch on hind margin pale flesh-colour; hind wing with seven median bluish-white spots.

Expanse  $3\frac{1}{8}$  inches.

Nicobars (Kamorta), April 4th, 1875. In coll. R. Meldola.

HESTIA AGAMARSCHANA, Felder, Novara-Reise, Lep. ii. p. 351,  
pl. 43. f. 7 (1867).

S. Andamans (Port Blair).

#### Fam. SATYRIDÆ.

LETHE EUROPA, Fabr. Syst. Ent. p. 500 (1775); Hüb. Samml.  
Schmett. i. pl. 90. f. 1-4.

S. Andamans (Port Blair).

MELANITIS LEDA, Linn. S. N. i. 2. p. 773 (1767).

S. Andamans (Port Blair).

MYCALESIS MEDUS, Fabr. Syst. Ent. p. 488 (1775).

Nicobars (Kamorta), April, *Meldola*.

MYCALESIS DRUSIA, Cram. Pap. Exot. i. pl. 84. f. C, D.

S. Andamans (Port Blair); Nicobars (Kamorta), April, *Meldola*.

MYCALESIS SAMBA, Moore, Catal. Lep. E.I. C. i. p. 233.

S. Andamans (Port Blair).

MYCALESIS RADZA, n. sp. (Plate LVIII. fig. 1.)

*Male*. Upperside dark brown; fore wing with a narrow, oblique, subapical white band, below which is a large black ocellus with ochreous outer ring and a white central spot; hind wing with a smaller and less distinct ocellus near middle of outer margin. Underside brown; fore wing with a more prominent white oblique band and lower ocellus; two small geminate ocelli between the white band and apex; hind wing with an outer series of seven prominent ocelli enclosed within a narrow purple wavy line, the three upper and seventh ocelli small, fourth and sixth larger, the fifth largest. Nearest allied to *M. anaxias*.

Expanse  $1\frac{6}{8}$  inch.

S. Andamans (Port Blair). In coll. H. Druce.

ELYMNIA COTTONIS (*Melanitis cot.*), Hewitson, Ann. N. H. 1874, xiv. p. 358.

S. Andamans (Port Blair).

#### Fam. MORPHIDÆ.

AMATHUSIA PHIDIPPUS, Linn. S. N. i. 2. p. 752; Cram. Pap. Exot. i. pl. 69. f. A, B.

S. Andamans (Port Blair).

DISCOPHORA CELINDE, Stoll, Suppl. Cram. Pap. Exot. pl. 37. f. 1 (1790).

S. Andamans (Port Blair).

#### Fam. NYMPHALIDÆ.

CETHOSIA NICOBARICA, Felder, Verh. zool.-bot. Ges. 1862, p. 484; Novara-Reise, Lep. iii. pl. 48. f. 7, 8, ♂.

*Female*. Blacker than the male; fore wing with the lower basal portion and interspaces in cell dark greenish grey; subapical marks broader, the lower dentate mark formed into a streak; hind wing with the basal portion pale greenish grey. Underside greenish brown (in the male dull vermilion), interspaces of basal streaks greenish (in the male bluish); black median transverse zigzag markings and

discal dentate marks, and spots, reddish white-bordered; a black-and-white marginal sinuous band.

Expanse, ♂ 3, ♀  $3\frac{1}{2}$  inches.

Nicobars (Kondul); S. Andamans (Port Blair).

*CIRROCHROA ANJIRA*, n. sp.

Nearest allied to *C. aoris*. Differs in being less falcate in the fore wing, the male above having similar but more prominent black markings. In the fore wing the transverse discal sinuous line is more erect, and in the female is less pointed at the angles; the marginal double sinuous band is broader. The underside is darker in colour, the transverse pale lilac band broader on the fore wing and narrower on the hind wing; this band is also much less sinuous on its inner border.

Expanse, ♂  $2\frac{5}{8}$ , ♀  $2\frac{7}{8}$  inches.

S. Andamans (Port Blair). In coll. F. Moore.

*CYNTHIA EROTA*, Fabr. Ent. Syst. iii. 1, p. 76; Butler, Catal. Fabr. Lep. in Brit. Mus. p. 115.

S. Andamans (Port Blair).

*MESSARAS NICOBARICA*, Feld. Verh. zool.-bot. Ges. (1862) p. 486.

Nicobars (Sambelong); S. Andamans (Port Blair).

*ATELLA ALCIPE*, Cram. Pap. Exot. iv. pl. 389. f. G. H. (1782).

S. Andamans (Port Blair).

*PYRAMEIS CARDUI*, Linn. S. N. i. 2, p. 774.

S. Andamans (Port Blair).

*JUNONIA ŒNONE*, Linn. S. N. i. 2, p. 770; Cram. Pap. Exot. i. pl. 35. f. A, B, C.

S. Andamans (Port Blair).

*JUNONIA NICOBARIENSIS*, Felder, Verh. zool.-bot. Ges. 1862, p. 482.

Nicobars (Kar Nicobar).

*DOLESCHALLIA PRATIPA*, Felder, Wien. ent. Monats. iv. p. 399 (1860); Novara-Reise, Lep. iii. p. 406.

S. Andamans (Port Blair.)

*KALLIMA ALBOFASCIATA*, n. sp.

Upperside glossy greyish indigo-blue; fore wing with a median, oblique, cream-white band with irregular borders; hind part of wing indigo-blue, tinged with purplish lilac above posterior angle; apex broadly blue-black, with a small bluish-white subapical spot; a dark-bordered bluish-white diaphanous spot on middle of the disk; a sub-marginal, sinuous, blue-black line; hind wing indigo-blue, tinged with purplish lilac along upper part of exterior margin; costa



brownish; a submarginal sinuous blue-black line. Body greenish. Underside mottled greyish ochreous, black-speckled, varied with confluent brighter fasciæ on outer half; a pale-bordered dusky line from apex to tail; a subapical and discal spot on fore wing, and imperfect ocelli on hind wing.

Expanse  $3\frac{2}{3}$  inches.

S. Andamans (Port Blair). In coll. H. Druce and F. Moore.

*EURYTELA HORSFIELDI*, Boisd. Faun. Madag. p. 54, ♂.

*E. stephensi*, Boisd. *ibid.* p. 55, ♀ (1833).

S. Andamans (Port Blair).

*CYRESTIS FORMOSA*, Felder, Novara-Reise, Lep. iii. p. 412 (1867).

S. Andamans (Port Blair).

*DIADEMA BOLINA*, Linn. S. N. i. 2, p. 781; Clerck, Icon. t. 21. f. 2.

S. Andamans (Port Blair).

*DIADEMA JACINTHA*, Drury, Ill. Exot. Ent. ii. pl. 21. f. 1, 2 (1773); Donovan, Ins. China, pl. 33. f. 1.

S. Andamans (Port Blair); Nicobars (Tillangshong).

*HERONA ANDAMANA*, n. sp.

*Male and Female.* Differs from *H. marathus* in the wings being more falcated. On the upperside the colour is much darker, the markings are narrower, paler on the fore wing in the male, and white on both wings in the female. On the fore wing in both sexes the markings beyond the cell are elongated and pointed at the ends; on the hind wing the discal band is broken up into spots, and the marginal band from the anal angle is composed of lunules in the male and of large indistinct lunular spots in the female. On the underside the markings are also whiter in the male, and in the female white throughout.

Expanse 3 inches.

S. Andamans (Port Blair). In coll. W. Distant and F. Moore.

*PARTHENOS GAMBRISIUS*, Fabr. Ent. Syst. iii. 1, p. 85; Donovan, Ins. China, pl. 38; Doubleday & Hewits. Gen. D. Lep. pl. 51. f. 2.

S. Andamans (Port Blair).

*LIMENITIS ANARTA*, n. sp.

*Male.* Darker than the Indian form of *L. procris*. Differs in the narrower white maculated band on both wings, smaller subapical costal spots, and much smaller spot at end of the cell. The outer black markings are also broader; the marginal black dentate lunules are confluent and similar to those in *L. calidasa*.

Expanse  $2\frac{4}{5}$  inches.

S. Andamans (Port Blair). In coll. F. Moore.

NEPTIS CNACALIS, Hewitson, Ann. Nat. Hist. 1874, xiv. p. 357.  
S. Andamans (Port Blair).

NEPTIS ANDAMANA, n. sp.

*Male and female.* Upperside black: fore wing with a prominent white broad cell-streak and dentate spot beyond, a curved transverse discal series of widely separated spots, and two marginal rows of pale lunules, the outer row most distinct: hind wing with a white subbasal band, somewhat irregular, bordered and crossed by the veins; a submarginal row of whitish lunules; and a very indistinct pale median and submarginal line. Underside dusky ferruginous, markings as above, including a basal and subbasal streak, all very prominent and with black margins.

Expanse, ♂ 2, ♀  $2\frac{2}{8}$  inches.

S. Andamans (Port Blair). In coll. F. Moore.

NEPTIS MANANDA, n. sp. (Plate LVIII. fig. 4 ♀.)

*Male and Female.* Upperside black: fore wing with narrow dusky-white cell-streak and elongated pointed streak beyond; a discal curved transverse series of small white spots and two marginal rows of indistinct pale lunules; hind wing with broad white subbasal band, an indistinct pale brown submarginal narrow line, and a less distinct medial and marginal line. Underside dark chestnut-brown, markings as above, prominent, and purplish-white, including a narrow basal and subbasal streak on hind wing.

Expanse, ♂  $1\frac{7}{8}$ , ♀  $2\frac{2}{8}$  inches.

S. Andamans (Port Blair). In coll. F. Moore.

NEPTIS NICOBARICA, n. sp.

*Male and Female.* Nearest allied to *N. varmona*, markings similar; discal series on fore wing less curved, thus giving a wider marginal space; the marginal row of lunular spots very prominent: on the hind wing the outer or discal series of spots are smaller, and terminate more towards anal angle; the marginal lunular line distinct. Underside also similar, the marginal markings broader.

Expanse, ♂  $1\frac{7}{8}$ , ♀  $2\frac{1}{8}$  inches.

Nicobars, Kamorta (April). In coll. R. Meldola and F. Moore.

This is a different species from the allied Malayan *N. mamaja*, Butler, from Malacca.

TANAËCIA CIBARITIS (*Adolias cib.*), Hewitson, Ann. N. H. 1874, xiv. p. 358; id. Exot. Butt. v. *Adol.* pl. 4. f. 12, 13, 15.

S. Andamans (Port Blair).

TANAËCIA ACONTIUS (*Adol. acont.*), Hewitson, Ann. N. H. 1874, xiv. p. 357; id. Exot. Butt. v. *Adol.* pl. 4. f. 11.

S. Andamans (Port Blair).

SYMPHÆDRA TEUTOIDES, n. sp.

From *S. teuta* this form differs above in the male having the

maculated band more erect and the lower spots smaller; the band on the hind wing is also straighter, more evenly bordered on the inner edge, and regularly sinuous on its outer edge. The female on the fore wing has the band continuous and less broken up into spots; it is also broader at the costal end; the band on the hind wing, as in the male, is also more evenly edged within and regularly sinuous without. On the underside both sexes are much paler, are suffused with lilac exteriorly, and have no red in the discoidal marks.

Expanse, ♂  $2\frac{4}{8}$ , ♀  $3\frac{2}{8}$  inches.

S. Andamans. In coll. F. Moore and H. Druce.

Fam. LEMONIIDÆ.

ABISARA KAUSAMBI, Feld. Wien. ent. Monats. iv. p. 397 (1860).  
S. Andamans (Port Blair).

ABISARA BIFASCIATA, n. sp. (Plate LVIII. fig. 2, ♀.)

From the Malayan *A. kausambi* this differs on the upperside in the discal transverse bands being sinuous; and in the female these are prominent. The two bands on the fore wing of the female are separated and broadly white anteriorly; the upper and lower spots on the hind wing are also larger. On the underside the bands are broader and sinuous, and on the hind wing there are but two anterior spots instead of three.

Expanse, ♂  $1\frac{6}{8}$ , ♀  $1\frac{7}{8}$  inch.

S. Andamans (Port Blair). In coll. F. Moore.

Fam. LYCÆNIDÆ.

CURETIS SARONIS, n. sp.

*Male and Female.* Nearest allied to *C. insularis* of Java, but smaller, the fore wing on the upperside of the male having the black border less angulated on its inner margin; the underside of both wings is white with slight dusky undulated lines, *C. insularis* being cream-coloured and with rather prominent undulated lines. Female dark brown, with golden-yellow disk.

Expanse  $1\frac{3}{8}$  inch.

S. Andamans (Port Blair). In coll. F. Moore and H. Druce.

PITHECOPS HYLAX, Fabr. Syst. Ent. p. 526 (1775); Horsf. Catal. Lep. p. 66, pl. 1. f. 2; Butler, Catal. Fabr. Lep. B. M. p. 161.

S. Andamans (Port Blair).

CASTALIUS ETHION (*Lycæna eth.*), Hewitson; Doubleday & Hewits. Gen. D. Lep. pl. 76. f. 3; iid. Exot. Butt. v. *Lyc.* pl. i. f. 5.

CASTALIUS ELNA (*Lyc. el.*), Hewits. Exot. Butt. v. *Lyc.* pl. i. f. 8.  
S. Andamans (Port Blair).

CASTALIUS MANLUENA (*Lyc. man.*), Felder, Verh. zool.-bot. Ges. 1862, p. 484.

Nicobars (Kondul).

LAMPIDES ÆLIANUS, Fabr. Ent. Syst. iii. p. 280; Butler, Catal. Fabr. Lep. B. M. p. 166.

S. Andamans (Port Blair).

LAMPIDES CNEJUS, Fabr. Ent. Syst. Suppl. p. 430; Butler, *l. c.* p. 165.

Nicobars (Kamorta); April, *Meldola*.

LAMPIDES PANDAVA, Horsf. Catal. Lep. E.I. C. p. 84 (1829).

Nicobars (Nankowry and Kamorta); April, *Meldola*.

LAMPIDES STRABO, Fabr. Ent. Syst. iii. p. 287 (1793); Butler, Catal. Fabr. Lep. B. M. p. 165.

*Lycæna kandarpa*, Horsf. Catal. Lep. E.I. C. p. 82.

*Lycæna asoka*, Kollar, Hügel's Kaschm. iv. p. 419.

S. Andamans (Port Blair).

LAMPIDES KINKURKA, Felder, Verh. zool.-bot. Ges. 1862, p. 481; Novara-Reise, Lep. ii. p. 273, pl. 34. f. 24, 25.

Nicobars (Kar Nicobar and Nankowry), *Meldola*, April.

LAMPIDES KANKENA, Felder, Verh. zool.-bot. Ges. 1862, p. 481, Novara-Reise, Lep. ii. p. 270, pl. 34. f. 37.

Nicobars (Kar Nicobar).

LAMPIDES KONDULANA, Feld. Verh. zool.-bot. Ges. 1862, p. 484; Novara-Reise, Lep. ii. p. 271, pl. 34. f. 6.

Nicobars (Kondul); S. Andamans (Port Blair).

LYMPIDES MACROPHALMA, Felder, Verh. zool.-bot. Ges. 1862, p. 483; Novara-Reise, Lep. ii. p. 275, pl. 34. f. 35.

Nicobars (Pulo Milo).

POLYOMMATUS SANGRA, Moore, P. Z. S. 1865, p. 772, pl. 41. f. 8. S. Andamans (Port Blair); Nicobars (Kamorta), April, *Meldola*.

APHNÆUS ZOILUS, n. sp.

*Male*. Upperside dark blue, black on outer borders; fore wing with transverse bands of black; hind wing with large, red, anal lobe, the black spots silver-speckled. Underside pale golden-yellow, bands jet-black, and traversed by a silver line: fore wing with seven transverse bands, a marginal line, and two short, basal, longitudinal streaks, the upper streak crossing the vein and touching the costal margin; the first and second transverse band near base of the cell, the first joining the upper and the second joining the lower basal longitudinal streak, third crossing end of cell towards posterior angle, fourth and fifth subapical and joined together, the other two marginal: hind wing with six bands and a marginal line, the first or basal broken and joining the third above the red anal spot, second entire and running into the first and third at its lower end, fourth

and fifth short, sixth narrow; a short streak also above anal angle; red anal lobe as above.

Expanse  $1\frac{2}{8}$  inch.

S. Andamans. In coll. H. Druce and F. Moore.

Differs from typical *A. lohita* in its larger size, the different-coloured bands beneath, and the narrowness of the marginal band on the fore wing.

*HYPOLYCÆNA ANDAMANA*, n. sp.

*Male*. Upperside ultramarine blue; fore wing with a large black discal patch, abdominal margin dusky brown; cilia of hind wing grey, marginal anal streak and edge of tails white, anal lobe with a small reddish spot. Underside greyish blue; a brown discal transverse band on both wings, straight on fore wing, broken and zigzag on hind wing; a small black anal and a red-bordered black subanal spot.

*Female*. Upperside brown; both wings with an indistinct median transverse curved darker band; hind wing with white marginal outer line, discal lunular marks, and three black spots from anal angle, the first golden-speckled. Underside as in male, but slightly paler greyish blue. Allied to *H. erylus*.

Expanse, ♂  $1\frac{2}{8}$ , ♀  $1\frac{3}{8}$  inch.

S. Andamans (Port Blair). In coll. British Museum and F. Moore.

*HYPOLYCÆNA ELTOLA*, Hewitson, Ill. D. Lep. Suppl. p. 14, pl. 5. f. 37, 38 (1869).

S. Andamans (Port Blair).

*SITHON ARECA* (*Myrina a.*), Felder, Verh. zool.-bot. Ges. 1862, p. 481.

Nicobars (Kar Nicobar).

*SITHON KAMORTA* (*Myr. k.*) Felder, *l. c.* p. 485.

Nicobars (Sambelong).

*DEUDORIX ORSEIS*, Hewitson, Ill. D. Lep. p. 23, no. 20 (1863).

Nicobars (Kamorta), April, *Meldola*.

*DEUDORIX EPIJARBAS*, Moore, Catal. Lep. E.I. C. i. p. 32 (1857); Hewit's Ill. D. Lep. pl. 7. f. 16-18.

S. Andamans (Port Blair).

*MYRINA PRABHA*, n. sp. (Plate LVIII. fig. 5 ♀.)

*Male*. Upperside red: fore wing with black apical band; base of wing and costa dusky rufous-brown; hind wing with blackish costal border, subcostal veins, and narrow border on outer margin; abdominal margin dusky rufous-brown.

*Female*. Upperside red: fore wing with a broad black apical band and dusky rufous-brown base; hind wing dark rufous-brown; discal

veinlet, median and internal veins, and tail streaked with red, tip of tail white: body black above, white beneath; palpi and legs white-speckled. Underside ochreous yellow, with two outer indistinct rows of small brownish spots on fore wing, and two indistinct bands on hind wing, a speckled black-and-white mark at angle of tail.

Expanse, ♂  $1\frac{2}{5}$ , ♀  $1\frac{4}{5}$  inch.

S. Andamaus (Port Blair). In coll. F. Moore and H. Druce.

Quite a differently marked insect from its ally *Myr. atynnus*, Cram.

**AMBLYPODIA ZETA**, n. sp. (Plate LVIII. fig. 6, ♀.)

*Female*. Upperside brilliant cobalt-blue, apex and outer borders broadly black. Underside light umber brown; fore wing with two pale-bordered darker spots within the cell, two beyond, and a discal row of five spots; hind wing with two basal rows each of four pale-bordered darker spots, a discal duplex series of similar spots, and two marginal rows of pale-bordered dentate marks.

Expanse  $1\frac{1}{8}$  inch.

S. Andamans (Port Blair). In coll. F. Moore.

**AMBLYPODIA NAKULA**, Felder, Wien. ent. Monat. iv. p. 395 (1860); Novara-Reise, Lep. ii. p. 222, pl. 29. f. 16.

S. Andamans (Port Blair).

#### Fam. PIERIDÆ.

**TERIAS FORMOSA**, Hübn. Zutr. Ex. Schmett. f. 979 (1837).

S. Andamans (Port Blair).

**TERIAS NICOBARIENSIS**, Felder, Verh. zool.-bot. Ges. 1862, p. 480.

Nicobars (Kar Nicobar, Kamorta and Nankowry), April, *Meldola*. S. Andamans (Port Blair).

**HEBOMOIA GLAUCIPPE**, Linn. S. N. i. 2, p. 762; Drury, Ill. Exot. Ins. i. pl. 10. f. 1.

S. Andamans (Port Blair).

**IXIAS ANDAMANA**, n. sp.

*Male*. Upperside pale primrose-yellow, decreasing basally to yellowish white: fore wing with the apical portion brownish-black, subapical band ochreous red, and slightly recurved hindward and outward, and irregularly margined inwardly, its borders being also minutely black-speckled: hind wing with speckled bordered black marginal band, and a few speckles at its base. Underside bright gamboge-yellow: fore wing with a broad black-speckled spot at end of the cell; a recurved submarginal series of speckled spots ending in a black patch at angle: hind wing with a round costal brown-speckled spot, three anterior submarginal spots followed by indistinct smaller spots; a black dot at end of the cell, and a dot at end of each vein on outer margin.

*Female.* Differs in the fore wing from the male in having the yellow portion confined to the middle of the wing below the cell, the ochreous red band being narrow and broken by the upper median vein; the band on the hind wing is also broader: on the underside the yellow is of a deeper tint, and the markings darker and broader; the outer margins with minute black speckles and narrow strigæ.

Expanse, ♂  $2\frac{2}{5}$ , ♀  $2\frac{3}{8}$  inches.

S. Andamans. In coll. F. Moore.

APPIAS GALATHEA, Feld. Verh. zool.-bot. Ges. 1862, p. 485; Novara-Reise, p. 165.

Nicobars (Sambelong).

CATOPSILIA CATILLA, Cram. Pap. Exot. iii. pl. 229, f. D, E, ♀ (1782); Butler, Lep. Exot. p. 24, pl. 9. f. 7-10.

*Pieris hilaria*, Cram. pl. 339. f. A, B, ♂.

S. Andamans (Port Blair).

CATOPSILIA CROCALE, Cram. Pap. Exot. i. pl. 55, f. C, D (1779); Butler, Lep. Exot. pl. 9. f. 1, 2.

S. Andamans (Port Blair); Nicobars (Kamorta), April, *Meldola*.

CATOPSILIA CHRYSSEIS, Drury, Ill. Exot. Ent. i. pl. 12. f. 3, 4 (1773); Butler, *l. c.* pl. 15. f. 4-7.

S. Andamans (Port Blair).

PIERIS NAMA, Moore, Catal. Lep. E.I. C. i. p. 76; P. Z. S. 1857, p. 102, pl. 44. f. 1, 2; Hewits. Exot. Butt. *Pieridæ*, pl. 6. f. 37.

S. Andamans (Port Blair).

PIERIS LICHENOSA, n. sp.

Allied to *P. coronis* (Cram. pl. 44. f. B, C): differs on the upperside in the veins being black-lined, the apex of fore wing more evenly white-speckled between the veins, the hind wing having a well-formed marginal band. The underside is much darker green, and is densely covered with black speckles, giving the wings a mossy appearance.

Expanse  $2\frac{4}{5}$  inches.

S. Andamans. In coll. F. Moore.

ERONIA NARAKA, n. sp.

Nearest to *E. pingasa* of S. India; both wings in the male with similar broad black outer border and widened veins, but without the black streak within the cell; the fore wing also has two additional small blue costal spots above the discal series, and a small white spot near the apex. In the female the markings are narrower, shorter, and the marginal spots much smaller.

Expanse 3 inches.

S. Andamans (Port Blair). In coll. F. Moore and H. Druce.

## Fam. PAPILIONIDÆ.

## ORNITHOPTERA HELICONOIDES, n. sp.

*Male.* Upperside—fore wing entirely black: hind wing golden yellow, with black abdominal fold and, longitudinally from base of submedian to middle of lower median veinlet, a marginal band formed by a series of six conical spots decreasing in size from anal angle, the first or anal elongated at its apex, the second, third, fifth and sixth each with a contiguous small upper round spot; the space at base of wing broadly across end of cell to middle of costal vein also black. Underside as above; fore wing very slightly grey-streaked along base of lower median veinlets.

*Female.* Fore wing with prominent greyish-white streaks along the veins, and similar streaks within end of the cell: hind wing with black abdominal fold, a partly constricted elongated spot above anal angle, outer marginal band of large continuous cones, a discal series of five small spots, the space at base of wing occupying the interspace between the costal and subcostal to near its end. Underside as above. Abdomen greenish black above, yellow at sides and beneath. Red collar slightly perceptible in female.

Expanse, ♂  $5\frac{6}{8}$ , ♀  $6\frac{4}{8}$  inches.

S. Andamans (Port Blair). In coll. H. Druce.

PAPILIO MAYO, Atkinson, P. Z. S. 1873, p. 736, pl. lxiii. f. 1.

S. Andamans (Port Blair).

PAPILIO CHARICLES, Hewitson, Ann. Nat. Hist. 1874, xiv. p. 356; Exot. Butt. v. *Pap.* pl. xiv. f. 45, ♀.

S. Andamans (Port Blair).

PAPILIO RHODIFER, Butler, Ent. Monthly Mag. 1876, p. 57, ♀.

S. Andamans (Port Blair).

## PAPILIO ARISTOLOCHIE, var. CAMORTA.

*Female.* Differs from Indian and Malayan forms of *P. aristolochiæ* on the upperside of the hind wing in the absence of the discal markings, the only indication of these in the Nicobar form being a slight pale speckled streak at the junction of the two lower median veinlets and an upward elongation of the reddish anal spot. On the underside these are slightly more prominent.

Expanse  $3\frac{1}{2}$  inches.

Nicobars (Kamorta), April 6, 1875. In coll. R. Meldola and F. Moore.

PAPILIO PAMMON, var. NICOBARUS, Feld. Verh. zool.-bot. Gesch. 1862, p. 483.

Nicobars (Nancowry, Kamorta), and S. Andamans (Port Blair), *Meldola*, April.

PAPILIO AGAMEMNON, Linn. S. N. ii. p. 748; *Donov. Ins. China*, t. 27. f. 2.

S. Andamans (Port Blair); Nicobars (Kamorta), April, *Meldola*.



*PAPILIO EURYPYLUS* (?), Linn. S. N. ii. p. 754; Cram. Pap. Exot. ii. pl. 122, f. C, D.

? *Axion*, Feld.

S. Andamans (Port Blair).

*PAPILIO ANTIPHATES*, Cram. Pap. Exot. i. pl. 72, f. A, B.

S. Andamans (Port Blair).

Fam. *HESPERIDÆ*.

*ISMENE CHROMUS*, Cram. Pap. Exot. iii. pl. 284, f. E (1782).

S. Andamans (Port Blair).

*ISMENE MALAYANA*, Felder, Wien. ent. Monat. iv. p. 401 (1860); Novara-Reise, Lep. iii. pl. 72. f. 15.

S. Andamans (Port Blair).

*TAGIADES ALICA*, n. sp. (Plate LVIII. fig. 11, ♂.)

*Male*. Allied to *T. obscurus*, Mabille, from Java, but of a blacker colour, the fore wing being more pointed, the hind wing more produced at the anal angle. Markings above similar; on the underside the hind wing has more prominent black discal marks, and a much broader black border on the grey portion of the outer margin.

Expanse  $1\frac{7}{8}$  inch.

S. Andamans (Port Blair). In coll. F. Moore.

*TAGIADES HELFERI* (*Pteryg. h.*), Felder, Verh. zool.-bot. Ges. p. 483 (1862).

Nicobars (Pulo Milu).

*PLESIONEURA ALYSOS*, Moore, P. Z. S. 1865, p. 789.

S. Andamans (Port Blair).

*HESPERIA CAHIRA*, n. sp. (Plate LVIII. fig. 8.)

*Male and female*. Upperside dark rufous-brown, suffused with olive-brown at the base. *Male*. Fore wing with two small yellow spots at end of the cell, two on the disk, and two very small spots before the apex. *Female*, with a series of three small spots before the apex and another spot of the same size between them and the two on the disk; cilia of hind wing yellowish cinereous.

Underside of male rufous-brown; female olive-brown, with a pale greyish streak on middle of hind margin.

Expanse, ♂  $1\frac{5}{8}$ , ♀  $1\frac{6}{8}$  inch.

S. Andamans (Port Blair). In coll. F. Moore.

Near to *H. oceia*, Hewits.; differs in the male above in the absence of the basal tuft of hairs on the hind wing, and beneath also in the absence of the prominent and large white patch and its central spot on the fore wing.

*HESPERIA OCEIA*, Hewits. Desc. Hesp. p. 31 (1868).

S. Andamans (Port Blair).

*HESPERIA COLACA*, n. sp. (Plate LVIII. fig. 7.)

*Male and female.* Dark olive-brown; cilia cinereous; fore wing with a recurved discal series of seven small yellow spots, the second from the hind margin being the largest; a small spot also at end of the cell. Underside brown, apex and hind wing speckled with olive-green scales; a median discal series of small spots on hind wing. Near to *H. cinnara*.

Expanse, ♂  $1\frac{2}{10}$ , ♀  $1\frac{3}{10}$  inch.

S. Andamans (Port Blair). In coll. F. Moore.

*HESPERIA BETURIA*, Hewitson, Desc. Hesp. p. 36 (1868).

S. Andamans (Port Blair).

*HESPERIA MATHIAS*, Fabr. Ent. Syst. Supp. p. 433 (1798);  
Butler, Catal. Fabr. Lep. B. M. p. 275, pl. 3. f. 8.

Nicobars (Kamorta), April, *Meldola*.

*TELEGONUS THYRSIS*, Fabr. Syst. Ent. p. 532 (1775).

*H. pandia*, Moore, P. Z. S. 1865, p. 790.

S. Andamans (Port Blair).

*PAMPHILA PURREEA*, n. sp. (Plate LVIII. fig. 10.)

Upperside blackish brown; cilia yellow, slightly alternated with black; fore wing with a gamboge-yellow basal streak, and a median oblique irregular band commencing from near apex, extending to hind margin and terminating at its base; hind wing with a short median yellow wavy band. Underside sulphur-yellow; fore wing with a broad dark-brown basal streak, a small spot at end of cell, and a large patch at posterior angle; hind wing with a brown speckled streak along inner margin, terminating broadly at anal angle. Body above brown, head and thorax interspersed with yellow hairs; abdomen narrowly banded with yellow; palpi black above, yellow below. Legs and body beneath yellow.

Expanse  $1\frac{1}{8}$  inch.

S. Andamans (Port Blair). In coll. W. C. Hewitson and F. M.

*PAMPHILA GOLA*, n. sp. (Plate LVIII. fig. 9, ♂.)

*Male.* Upperside dark vinous-brown; fore wing with an oblique discal irregular sinuous-bordered golden-yellow band, the band bent before the apex and indented at end of the cell; hind wing with a median discal golden-yellow band, and a few hairs of the same colour at the base; cilia edged with golden yellow. Front of head, palpi, and legs golden yellow. Underside with the bands as above; costa and apex of fore wing and the hind wing suffused with yellow; both wings with a blackish streak at end of the cell.

Expanse 1 inch.

S. Andamans (Port Blair). In coll. F. Moore.

*PAMPHILA MESOIDES*, Butler, Trans. Linn. Soc. 1877.

S. Andamans, Port Blair.

## Tribe SPHINGES.

## Fam. SPHINGIDÆ.

PERGESA ACTEUS, Cram. Pap. Exot. iii. pl. 248. f. A (1782).  
S. Andamans (Port Blair).

PANACRA BUSIRIS, Walker, Catal. Lep. Het. B. M. viii. p. 158  
(1856).

S. Andamans (Port Blair).

ACHERONTIA MORTA, Hübner; Cram. Pap. Exot. iii. pl. 237. f. A.

*A. satanas*, Boisd. Hist. N. des Lép. pl. 16. f. 1.

*A. lethe*, Westw. Cab. Orient. Ent. p. 87, pl. 42. f. 2.

(?) *Sphinx lachesis*, Fabr. Ent. Syst. Suppl. p. 434.

S. Andamans (Port Blair).

CHÆROCAMPA NESSUS, Drury, Ill. Nat. Hist. ii. p. 46, pl. 27. f.  
1 (1773).

S. Andamans (Port Blair).

CHÆROCAMPA TENEBROSA, n. sp.

Upperside—fore wing dark buff-brown, with six oblique discal indistinct dusky bands, the fourth black-streaked where crossing the veins; a black spot near base and one at end of the cell; hind wing dark fuliginous-brown, palest at anal angle; thorax dark buff-brown; abdomen dusky brown above. Underside—fore wing dusky brown; discal oblique band reddish buff, slightly black-speckled, and with black spot on each vein: hind wing reddish buff, slightly black-speckled, with a discal series of black spots: abdomen beneath and legs pale buff-brown.

Expanse 3 inches.

S. Andamans (Port Blair). In coll. British Museum.

Allied to *C. lucasi*, Walk., but is a much darker insect.

TRIPTOGON ANDAMANA, n. sp.

*Male*. Nearest allied to *T. fuscescens*, Butler, but differs above on the fore wing in the median and subbasal transverse bands being bent and terminating on the hind margin more obliquely inwards, the basal bands each being waved, and the dark chestnut-brown spots near posterior angle smaller; hind wing less lobed and browner at anal angle, the spots smaller, and basal streaks not so prominent; and on the underside the inner dusky band on hind wing is curved.

Expanse 4 inches.

S. Andamans (Port Blair). In coll. British Museum.

CLANIS PHALARIS, Cram. Pap. Exot. ii. p. 83, pl. 149. f. A (1779).

*Sphinx pagana*, Fabr. Spec. Ins. ii. p. 146 (1781).

*Sph. nicobarensis*, Schwartz, Beyt. Suppl. à Klem. et Rœs. i. 1;  
Esper, Schmett. App. pl. 1. f. 1.

*Clanis nicobarensis*, Hübn. Verz. p. 138.

S. Andamans (Port Blair).

*CALYMNIA PAVONICA*, n. sp.

Similar to *C. panopus*, but differs from both Java and Indian specimens in its much darker colours, the fore wing having the basal band broken up and not continued obliquely onto the costa; between this and the discal band are two distinctly separated median, dusky, wavy bands: in the hind wing the markings are very black and with a distinct median broad fascia; the basal space red: thorax brown-black; abdomen very dark fawn-colour, apical segments only fringed with black.

Expanse 5 inches.

S. Andamans (Port Blair). In coll. British Museum.

*PROTOPARCE ORIENTALIS*, Butler, Trans. Zool. Soc. ix. p. 609 (1876).

*Sphinx convolvuli*, Moore, Catal. Lep. E.I. C. i. p. 267.

S. Andamans (Port Blair).

## Tribe BOMBYCES.

## Fam. AGARISTIDÆ.

*EUSEMIA ALBOMARGINATA*, Moore, P. Z. S. 1872, p. 569.

S. Andamans (Port Blair).

## Fam. ZYGÆNIDÆ.

## Subfam. THYRETINÆ.

*ERESSA AFFINIS*, n. sp. (Plate LIX. fig. 3.)

Allied to *E. confinis*, Walk. Transparent markings of fore wing similar, but more rounded, the spot within the cell smaller; space on hind wing confined to a median rounded spot beyond the cell, and crossed only by a single vein.

Expanse 1 inch.

S. Andamans (Port Blair). In coll. F. Moore.

Obtained also from the district of Calcutta and the Khasia hills by the late W. S. Atkinson, Esq.

## Subfam. EUCHROMIINÆ.

*EUCHROMIA POLYMENA*, Linn. S. N.; Cram. Pap. Exot. i. pl. 31. f. D.

S. Andamans (Port Blair).

## Fam. ARCTIIDÆ.

*ALPENUS BISERIATUS*, n. sp.

Pale orange-red, brightest on hind wing; fore wing with two transverse median recurved series of blackish spots, and two intermediate spots at end of the cell; some smaller spots at base of wing; hind wing with a black spot at end of the cell and at anal angle.

Body bright red, with black dorsal bands and yellow anal tuft. Palpi black at tip. Legs yellow; fore legs black-streaked.

Expanse  $1\frac{3}{8}$  inch.

S. Andamans (Port Blair). In coll. British Museum.

Allied to *A. (Spilosoma) maculifascia*, Walk., from Java.

Fam. LITHOSIIDÆ.

SESAPA ANDAMANA, n. sp.

Allied to *S. undulosa*, Walk.

Pale buff-yellow; fore wing with a purplish-black transverse, central recurved band, some irregularly disposed spots at base, a spot at end of the cell, an outer sinuous band, and a maculated marginal line. Underside dusky yellow on fore wing. Antennæ, palpi, and legs brownish.

Expanse  $\frac{6}{10}$  inch.

S. Andamans (Port Blair). In coll. British Museum.

LITHOSIA INTERMIXTA, Walk. Catal. Lep. Het. B. M. Suppl. p. 229.

S. Andamans (Port Blair).

LITHOSIA ANTICA, Walk. Catal. Lep. Het. B. M. ii. p. 505.

S. Andamans (Port Blair).

BARSINE TRIVITTATA, n. sp.

*Male.* Upperside—fore wing red, with black subbasal outwardly angled band, a median recurved band, and outer zigzag band; costa at apex and cilia black: hind wing pale red; cilia at apex blackish. Body, antennæ, and legs red. Underside—fore wing bright red, speckles at apex and cilia black; hind wing yellowish, speckles at apex blackish.

Expanse  $1\frac{1}{2}$  inch.

S. Andamans (Port Blair). In coll. British Museum.

BIZONE AMABILIS, n. sp. (Plate LIX. fig. 2, ♂.)

White: fore wing with four transverse crimson bands, male with confluent crimson spots, and female with a single spot at end of the cell; hind wing pale yellow, suffused with crimson externally. Underside pale crimson, whitish at base, bands slightly apparent. Antennæ, palpi, and spots on thorax crimson. Legs crimson, whitish beneath.

Expanse  $\frac{8}{10}$  inch.

S. Andamans (Port Blair). In coll. British Museum and F. Moore.

ARGINA CRIBRARIA, Cram. Pap. Exot. iii. pl. 208. f. C; Clerck, Icones, pl. 54. f. 4.

S. Andamans (Port Blair), Nicobars (Kamorta), April, *Meldola*.

Fam. **HYPSIDÆ.**

**PERIDROME ORBICULARIS**, Walk. Catal. Lep. Het. B. M. ii. p. 445 (1854).

*Aganopsis subquadrata*, H.-Schäff. Lep. Sp. Nov. p. 70, f. 501 (1856).

S. Andamans (Port Blair).

**EUPLOCIA MEMBLIARIA**, Cram. Pap. Exot. iii. p. 269. f. C, D.

S. Andamans (Port Blair).

**DAMALIS ALCIPHON**, Cram. Pap. Exot. ii. pl. 133. f. E.

S. Andamans (Port Blair).

**HYPSA ANDAMANA**, n. sp. (Plate LIX. fig. 5.)

Allied to *H. egens* from N. India.

Upperside much brighter ochreous: fore wing with a series of six basal black spots, two of which are within the cell; prominent ochreous-brown streaks between the veins, which form two partly confluent, transverse, irregular, median and outer bands. Underside—fore wing with a broad lunular black spot at end, and a large round spot in the middle of the cell; the hind wing has a small black spot at end of the cell on upper discocellular, and a small lunular spot above the end of the cell.

Expanse  $2\frac{4}{8}$  inches.

S. Andamans (Port Blair). In coll. F. Moore.

**HYPSA VENALBA**, n. sp.

*Female.* Upperside cinereous-black; base of fore wing and abdomen ochreous-yellow: fore wing with a broad white longitudinal dilated streak; some black spots at the base; veins narrowly lined with white to near outer margin; a white spot at upper end of the cell: hind wing white, with a broad black marginal band, and narrow spot at end of the cell; cilia white. Thorax with black spot on tegulæ, streak down middle, and a dorsal and lateral row of spots on abdomen. Antennæ black. Palpi ochry-yellow, first and second joints with a spot on outer side, and the entire third joint black. Legs black, streaked with grey.

Expanse  $2\frac{1}{10}$  inches.

S. Andamans (Port Blair). In coll. British Museum.

This species is nearest allied to *H. dama*.

**PHILONA CINERASCENS**, n. sp. (Plate LIX. fig. 6.)

Differs from *P. inops* in the fore wing being of a much darker cinereous colour, and the veins more prominently lined with white; the hind wing is white, the marginal band greyish-black and broader, and continued broadly along anterior margin on both upper and undersides; the fore wing beneath and the band on the hind wing are very dark fuliginous black, with a blacker median curved streak on fore wing, the space beneath the streak and the lower basal space of hind wing being white.

Expanse  $2\frac{1}{2}$  inches.

S. Andamans (Port Blair). In coll. British Museum and F. Moore.

Fam. CALLIDULIDÆ.

CLEOSIRIS CATAMITA, Geyer, Hübn. Zutr. f. 653, 654.

S. Andamans (Port Blair).

Fam. NYCTEMERIDÆ.

NYCTEMERA LACTICINIA, Cram. Pap. Exot. ii. pl. 128. f. E.

S. Andamans (Port Blair).

PITASILA, n. g.

Fore wing short, rather broad, costa slightly arched, apex angled, outer margin short, oblique, hind margin straight; subcostal vein five-branched, third, fourth, and fifth on a short foot-stalk from end of cell; first and third discocellulars very short, second bent inward; one radial from lower angle of upper discocellular; median vein four-branched, first and second starting from angles of lower discocellular, third contiguous, fourth at half length of cell; one submedian. Hind wing trigonal, apex rounded, exterior margin convex in the middle; subcostal vein two-branched, disposed as in fore wing; one submedian. Body short, attenuate in male. Antennæ slender, bipectinated in male to tip, minutely pectinated in female. Palpi porrect, third joint cylindrical. Legs naked.

PITASILA LEUCOSPILOTA, n. sp. (Plate LIX. fig. 7.)

*Male and female.* Fore wing with a series of four white spots from base of costa, the third largest, also two within the cell, three larger spots below the cell and confluent on hind margin, the lower basal enclosing a black spot, and the third two spots, one above the other in male, confluent in female; two spots also before the apex: hind wing with a broad black marginal band, on which are two small white spots, one near angle, the other on middle of margin; a small black spot at upper end of cell and two above it on margin; cilia white, at apical angle of hind wing. Underside as above. Head and thorax yellow; abdomen white, with yellow tip; black spots on head and thorax, also dorsal and lateral row on abdomen; antennæ black; legs white, streaked with black.

Expanse, ♂  $1\frac{3}{4}$ , ♀ 2 inches.

S. Andamans (Port Blair). In coll. Brit. Mus. and F. Moore.

Allied to *P. maculosum*, Feld. Nov.-Reise, pl. 103. f. 2, to *P. variolosa*, Feld. ib. pl. 129. f. 15, and also to *P. varians*, Walk.

Fam. EUSCHEMIDÆ.

EUSCHEMA ANDAMANA, n. sp.

*Male and female.* Upperside purple-black, both wings with the outer margin and discal spots darker purple-black: fore wing with a broad subbasal bright yellow band, which is irregularly margined and

narrowest on hind margin; a short subapical transverse row of decreasing purplish white spots. Abdomen golden yellow in male, in female purple-black beneath and with a dorsal row of black spots. Palpi and legs cinereous. Underside as above; discal black spots more prominent: hind wing with a small yellow basal streak and also a streak above the cell.

Expanse  $2\frac{6}{10}$  inches.

S. Andamans (Port Blair). In coll. Brit. Mus. and F. Moore.

Nearest allied to *E. auristriga*, Walk., and to *E. bernsteini*, Feld.

*E. RÖPSTORFFI*, n. sp.

Allied to *E. bellona*, Walk.

*Male*. Smaller in size, differs on fore wing in having the basal black markings formed into prominent bands instead of being composed of separate spots; the purplish white discal band is nearer the apex, broader, and more prominent: on the hind wing the black spots are larger, and there is also a distinct purplish white discal maculated band crossing the broad black margin.

Expanse  $2\frac{4}{10}$  to  $2\frac{8}{10}$  inches.

S. Andamans (Port Blair). In coll. British Museum.

*CELERENA ANDAMANA*, Feld. Nov.-Reise, Lep. iv. pl. 130. f. 18 (1875).

S. Andamans (Port Blair).

#### Fam. CHALCOSIIDÆ.

*CYCLOSLIA NIGRESCENS*, n. sp.

*Female*. Differs from *C. papalionaria* from Sikkim and Silhet in the fore wings being more acute at the apex, having broader pale yellow interspaces between the veins, and in the marginal row of spots being almost obsolete; the hind wing has a simple band with a marginal row of very indistinct small pale spots.

Expanse 3 inches.

S. Andamans (Port Blair). In coll. British Museum.

#### Fam. LIPARIDÆ.

*REDOA FLAVESCENS*, n. sp.

*Male*. Yellowish white; front of head brown. Antennæ pale brown, shafts white. Upperside with glittering silvery scales, exterior margins slightly fawn-coloured. Palpi white, brown at tip. Legs whitish.

Expanse  $1\frac{2}{8}$  inch.

S. Andamans (Port Blair). In coll. British Museum.

*REDOA SERICEA*, n. sp.

*Male*. Pure white; front of head brown. Antennæ pale brown, shafts white. Upperside covered with glittering silvery white scales; costa of fore wing ochreous; a black dot at end of the cell; exterior



margins and cilia of both wings fawn-colour. Legs white, fore and mid legs with black bands. Palpi pale brown, tipped with black.

Expanse  $1\frac{1}{8}$  inch.

S. Andamans (Port Blair). In coll. British Museum.

*CAVIRIA CYGNA*, n. sp.

*Female* white: fore wing silky white, with indistinctly apparent raised oblique bands: hind wing not silky. Palpi and fore legs ochry yellow, middle and hind tarsi pale ochry yellow.

Expanse  $1\frac{5}{8}$  inch.

S. Andamans (Port Blair). In coll. British Museum.

*LÆLIA VENOSA*, n. sp. (Plate LIX. fig. 1, ♂.)

*Male*. Upperside pale ochreous brown. Veins of fore wing and cilia of both wings ochreous white. Front of thorax, head, palpi, and abdomen ochreous yellow; thorax above greyish. Underside paler.

Expanse  $1\frac{5}{8}$  inch.

S. Andamans (Port Blair). In coll. F. Moore.

*EUPROCTIS DISCINOTA*, n. sp.

Upperside bright ochry yellow: fore wing with two median transverse dark chestnut-brown speckled bands, the outer band recurved and crossed by pale veins; a black spot at end of cell. Underside paler, both wings with an indistinct darker ochry transverse fascia, and a black spot at the end of the cell.

Expanse  $1\frac{5}{8}$  inch.

S. Andamans (Port Blair). In coll. British Museum.

#### Fam. PSYCHIDÆ.

##### MAHASENA, n. g.

Fore wing elongated, narrow, costa straight, apex rounded, exterior margin oblique, posterior margin convex in the middle; costal vein moderately stout; subcostal slender, four-branched, first and second branches arising before end of the cell, third at end of the cell, fourth from below the third at two thirds its length and terminating below the apex; discoidal cell broad at its end; upper discocellular vein long, inwardly oblique and bent outward at its middle; lower discocellular short, outwardly oblique, and emitting within the cell a discoidal veinlet at each end, which are joined together at two thirds their length, the end extending inwards towards base of the cell; upper radial arising from end of the cell, lower radial from angle of upper discocellular, both nearly straight; median vein moderately stout, short and twice bent at its end, four-branched, the two lower arising from the angles at its end, the third from end of the cell, and fourth at one third from base of the latter; submedian curved and bent below end of the cell, and thence extending straight to posterior angle, emitting a lower branch or internal veinlet at the angle, the lower branch being forked at half its length and extending to near base of the wing. Hind wing short, broad, trigonal, anterior

margin very convex; costal and subcostal parallel, extending to apex; cell broad, extending hindward towards outer margin; discocellulars nearly straight, outwardly oblique, emitting one radial from their middle; two discoidal veinlets within the cell, joined together at half their length and extending to near base of the cell; median vein long, its end bent nearly parallel with outer margin of wing, four-branched, the branches short, the two upper arising together at lower end of the cell, a straight submedian, and two internal veins. Body slender, abdomen attenuated, extending half its length beyond hind wings. Antennæ broadly bipectinated to tip. Legs slender, sparsely hairy; fore legs with long tibial spur.

MAHASENA ANDAMANA, n. sp. (Plate LIX. fig. 4, ♂.)

*Male.* Wings dark fuliginous brown, piceous towards the base. Body piceous, darkest on abdomen. Antennæ fuliginous brown. Legs brown.

Expanse 1 inch.

S. Andanans (Port Blair). In coll. F. Moore.

Fam. SATURNIIDÆ.

ACTIAS IGNESEENS, n. sp.

Differs from *A. leto* from Sikkim in having broader wings, shorter tails, and larger ocelli, in the subbasal and outer fiery-red bands being broader and confluent, the transverse zigzag band in both wings being contiguous to and touching the ocellus. On the underside the markings are more prominent, the outer band broader, and the basal more sinuous.

Expanse 6 inches.

S. Andamans (Port Blair). In coll. British Museum.

ACTIAS SELENE, McLeay, Zool. Misc. (1815), pl. 70; Cram. Pap. Exot. pl. 31. f. A. B.

S. Andamans (Port Blair).

ANTHEREA ANDAMANA, n. sp.

*Female.*—Upperside brownish-buff, base suffused with buff-yellow; ocelli small, ringed with black and yellow outwardly and red and white inwardly, talcose spot constricted: fore wing with transverse subbasal streaks, two discal lunular bands, and a nearly straight oblique outer band brown, the latter slightly bordered with dull red; costa and apex grey speckled with brown: hind wing with irregular subbasal streak, lunular median, and two wavy outer brown bands, the latter slightly tinged with red. Collar grey; thorax brown; abdomen and legs buff-brown; antennæ reddish brown. Underside greyish brown, inner bands brown, outer band of large triangular spots dark brown.

Expanse 7 inches.

S. Andamans (Port Blair). In coll. British Museum.

## Tribe NOCTUES.

## Fam. LEUCANIDÆ.

## LEUCANIA COSTALIS, n. sp. (Plate LIX. fig. 11.)

*Male and female.* Upperside cream-colour: fore wing sparsely irrorated with minute brown scales, crossed by two median indistinct blackish sinuous lines; a pale brown streak from base extending below and before the end of the cell, giving the appearance of a basal costal band; two spots within the cell, the inner largest; a marginal row of black dots: hind wing pale ochreous brown externally; veins darker. Underside paler; fore wing dusky brown in the middle; a marginal row of black dots on both wings. Palpi and legs speckled with black.

Expanse  $1\frac{2}{8}$  inch.

S. Andamans. In coll. F. Moore.

This species also occurs at Darjiling and Malabar.

## Fam. GLOTTULIDÆ.

## RAMADASA, n. g.

Fore wing short, broad, costa slightly convex, apex truncated, exterior margin oblique hindward, posterior margin slightly lobed towards the base; costal vein short, ending at half the length of costa; cell broad; subcostal vein six-branched, first and second branches arising close together a little beyond half length of the cell, the third and sixth at end of cell, the third terminating before the apex, the fourth and fifth arising below from near the base of third and terminating at and below the apex, the sixth running parallel below the fifth; median vein three-branched, branches at equal distances from end of the cell, each recurved; discocellulars of equal length; one radial, slightly recurved; submedian vein running parallel and close to median and lower branch, terminating on exterior margin considerably above posterior angle; internal vein straight, terminating above the angle. Hind wing trigonal, short, exterior margin produced in the middle; abdominal margin straight; cell short; subcostal vein three-branched, first branch arising from half the length of the cell, second and third starting together at end of the cell; median vein three-branched, lower branch arising from an angle before end of the cell, second and third together at base from end of cell; upper discocellular long, lower short; one radial; submedian vein straight. Antennæ very long, filiform. Palpi short, clothed with short adpressed scales; second joint short, conical, ascending. Body moderately stout; abdomen tapering towards the apex, extending beyond hind wing. Legs long; tibia clothed above with longish hair; mid and hind tibiæ spurred.

## RAMADASA PAVO. (Plate LIX. fig. 8.)

*Chasmina pavo*, Walk. Cat. Lep. Het. B. M. part ix. p. 147.

S. Andamans. In coll. British Museum and F. Moore.

## Fam. APAMIDÆ.

SPODOPTERA CILIUM, Guén. Noct. i. p. 156, ♂.

*S. insulsa*, Walk. Cat. Lep. Het. B. M. Suppl. p. 648, ♀.

S. Andamans (Port Blair).

SPODOPTERA NUBES, Guén. Noct. i. p. 155.

*P. infecta*, Walk. *l. c.* ix. p. 196.

S. Andamans (Port Blair).

PRODENIA CILIGERA, Guén. Noct. i. p. 164.

*P. glaucistriga*, Walk. *l. c.* ix. p. 197, ♀.

S. Andamans (Port Blair).

ILLATIA CEPHUSALIS, Walk. Cat. Lep. Het. B. M. xvi. p. 209 (1858).

*Miana inornata*, Walk. *l. c.* Suppl. p. 677.

S. Andamans (Port Blair).

PERIGEA CANORUFA, Walk. Cat. Lep. Het. B. M. Suppl. p. 683, ♂.

*P. illecta*, Walk. *l. c.* p. 684, ♀.

S. Andamans (Port Blair).

THALPOPHILA CUPREA, n. sp. (Plate LIX. fig. 10.)

Upperside—fore wing dark cupreous brown, some narrow curved purple lines and black streaks at the base, an irregular recurved sinuous purple line with black inner border across the disk; two similar-coloured spots in the cell, and dentate streaks on outer margin, bordered with white before the apex: hind wing golden yellow, with broad cupreous brown outer band. Thorax, palpi, legs, and abdomen beneath cupreous brown. Abdomen golden yellow, tip and dorsal tuft reddish. Underside pale reddish brown, yellowish at base; both wings with indistinct outer sinuous brown line.

Expanse  $1\frac{3}{8}$  inch.

Andamans. In coll. F. Moore.

## Fam. CARADRINIDÆ.

AMYNA SELENAMPHA, Guén. Noct. i. p. 406; Walk. Cat. Lep. Het. B. M. p. 1696.

*Alamis spoliata*, Walk. *l. c.* p. 1050.

S. Andamans (Port Blair).

## Fam. HAMEROSIDÆ.

APSARASA FIGURATA, n. sp.

Bluish black. Differs above in both sexes from *A. radians* from Sikkim in the fore wing having the smaller marginal spots of less size, in the large median spot on hind margin being broadest at its upper end, and in the hind wing having the white space confined to-

wards the anal angle. Abdomen black above and beneath, tip also black, has small lateral white spots only. On the underside the hind wing is marked at the base only with small spots, instead of distinct bands as in *A. radians*.

Expanse, ♂  $2\frac{6}{8}$ , ♀  $2\frac{7}{8}$  inches.

S. Andamans. In coll. British Museum and F. Moore.

The type of the genus *Apsarasa* is *Glottula radians*, Westw. Orient. Ent. pl. 28. f. 4.

Fam. ACONTIDÆ.

XANTHODES TRANSVERSA, Guén. Noct. ii. p. 211; Walk. Cat. Lep. B. M. p. 778.

S. Andamans (Port Blair).

ACONTIA SIGNIFERA, Walk. Cat. Lep. Het. B. M. xii. p. 793.

S. Andamans (Port Blair).

Fam. PALINDIDÆ.

HOMODES CROCEA. (Plate LX. fig. 3.)

*Homodes crocea*, Guén. Noct. ii. p. 280; Walk. Cat. Lep. Het. B. M. p. 853.

S. Andamans (Port Blair).

Fam. ERIOPIDÆ.

CALLOPISTRIA EXOTICA, Guén. Noct. ii. p. 294; Walk. *l. c.* xii. p. 865.

S. Andamans (Port Blair).

Fam. EURHIPIDÆ.

INGURA CRISTATRIX, Guén. Noct. ii. p. 313.

S. Andamans (Port Blair).

Fam. PLUSIIDÆ.

PLUSIODONTA CONDUCTENS, Walk. Cat. Lep. Het. B. M. xii. p. 963.

S. Andamans (Port Blair).

Fam. HEMICERIDÆ.

WESTERMANNIA TRIANGULARIS, n. sp.

Upperside—fore wing with the basal two thirds shining silvery white, tinged with pale fawn-colour; a subbasal triangular dusky brown patch, the inner angle of which extends to the base and lower angle on hind margin; a broad marginal chalybeous-speckled dark cupreous brown band; hind wing pale cupreous brown externally, pale vinous at the base. Head and basal joint of antennæ white; front of thorax yellowish, hind part of thorax and abdomen brown

with white segmental bands. Underside glossy brown, pale yellowish obliquely across the fore wing and at base of hind wing; abdomen beneath and legs yellowish white; fore legs with black bands.

Expanse  $1\frac{2}{8}$  inch.

S. Andamans (Port Blair). In coll. British Museum.

Differs from *W. superba* in its smaller size, darker colour, and difference of shape in the subbasal patch.

Fam. HYBLÆIDÆ.

NOLASENA DULCISSIMA, Walk. Journ. Linn. Soc. Zool. viii. p. 76.

S. Andamans (Port Blair).

Fam. GONOPTERIDÆ.

ANOMIS FULVIDA, Guén. Noct. ii. p. 397; Walk. Catal. Lep. Het. B. M. xiii. p. 988.

S. Andamans (Port Blair).

Fam. POLYDESMIDÆ.

POLYDESMATA BOARMOIDES, Guén. Noct. ii. p. 441; Walk. l. c. xiii. p. 1042.

*P. mastrucata*, Feld. & Roghfr. Nov.-Reise, Lep. iv. pl. iii. f. 31.

S. Andamans (Port Blair).

Fam. HYPOGRAMMIDÆ.

ERCHEIA TENEBROSA, Moore, P. Z. S. 1867, p. 66.

S. Andamans (Port Blair).

Fam. CATEPHIDÆ.

ANOPHIA OLIVASCENS, Guén. Noct. iii. p. 48; Walk. Catal. Lep. Het. B. M. p. 1128.

S. Andamans (Port Blair).

Fam. HYPOCALIDÆ.

HYPOCALA LATIVITTA, n. sp. (Plate LX. fig. 4.)

Upperside—fore wing ochreous brown, basal portion partly covered with short dark brown strigæ, and washed with greyish white on the hind margin and before the apex; a submarginal transverse series of short black pale-bordered dentate streaks, and marginal wavy black line; orbicular and reniform marks grey-speckled: hind wing golden yellow, with a broad black marginal band and an indistinct cell-spot; cilia yellowish white, the middle portion being blackish. Thorax greyish white, collar and tegula, head, and body beneath brownish ochreous. Abdomen yellow, with a greyish dorsal streak and black anal band. Underside yellowish at base, ochreous-white on outer borders; both wings with a broad black discal band, cell-streak, and a marginal row of dots.

Nearest to *H. biarcuata*.

Expanse  $1\frac{6}{8}$  inch.

S. Andamans. In coll. F. Moore.

## Fam. CATOCALIDÆ.

*BLENINA LICHENOSA*, n. sp. (Plate LX. fig. 2.)

Upperside—fore wing dark sap-green, with a broad black speckled basal, sinuous-margined discal band, and a sinuous marginal line, the bands being bordered with grey speckles; a black streak near hind part of discal band; two black dots in the cell: hind wing dark golden brown, with a median discal short recurved golden-yellow band: cilia yellow posteriorly, brownish anteriorly. Thorax sap-green, grey- and black-speckled; abdomen dark brown; legs pale brown, black-streaked; antennæ and palpi black. Underside pale golden brown; fore wing crossed by a suffused black discal band, and hind wing by a broad discal and a marginal band.

Expanse  $1\frac{4}{8}$  inch.

S. Andamans. In coll. F. Moore.

*BLENINA GRISEA*, n. sp. (Plate LX. fig. 1.)

Upperside—fore wing greyish, sparsely covered with sap-green speckles; crossed by a sinuous black subbasal, three discal, and a submarginal line, the space within the basal sinuous line and the upper portion of the discal lines darker green-speckled; a prominent quadrate black spot above middle of hind margin: hind wing golden yellow, with a broad golden-brown marginal band; cilia pale golden yellow at anal angle, cinereous brown at apex. Thorax grey, speckled with green and black; abdomen golden yellow. Underside pale golden brown; fore wing with an indistinct dusky black median band; hind wing with an indistinct dusky spot on anterior margin, and a broad blackish outer band; legs pale, black-speckled.

Expanse  $1\frac{4}{8}$  inch.

S. Andamans. In coll. F. Moore.

## Fam. OPHIDERIDÆ.

*OPHIDERES AURANTIA*, n. sp.

Upperside—fore wing deeply excavated on hind margin, dark ochry red, with numerous short transverse grey striæ, veins also grey-streaked; a narrow black oblique band from apex to middle of excavation on hind margin; the oblique band and two outer transverse dusky fasciæ washed inwardly with lilac: hind wing ochry yellow, with a black oval constricted spot above the anal angle and a short curved streak beyond it. Head, palpi, and antennæ dark ochry red; abdomen ochry yellow. Underside ochry yellow; fore wing with a dusky patch at apex and two short curved streaks above posterior angle; hind wing with a black spot above anal angle and an indistinct fascia beyond it.

Expanse 4 inches.

S. Andamans. In coll. British Museum.

*OPHIDERES FULLONICA*, Linn. (Guén. Noct. iii. p. 111).

*O. pomona*, Cram. Pap. Exot. i. pl. 77. f. C.

*O. dioscoræ*, Fabr. Spec. Ins. ii. p. 212.

S. Andamans (Port Blair).

OPHIDERES HYPERMNESTRA, Cram. Pap. Exot. iv. pl. 323. f. A, B.  
S. Andamans (Port Blair).

PHYLLODES CONSOBRINA, Westw. Cabinet Orient. Ent. pl. 28.  
f. 2.

*P. perspicillator*, Guén. Noct. iii. p. 120.  
S. Andamans (Port Blair).

POTAMOPHORA MANLIA, Cram. Pap. Exot. i. pl. 92. f. A.  
S. Andamans (Port Blair).

Fam. EREBIDÆ.

TAVIA SUBSTRUENS, Walk. Cat. Lep. Het. B. M. xiv. p. 1276.  
S. Andamans (Port Blair).

ARGIVA HIEROGLYPHICA, Drury, Ill. Exot. Ins. ii. pl. 2. f. 1.  
S. Andamans (Port Blair).

NYCTIPAO TRUNCATA, n. sp.

*Male.* Allied to *N. obliterans*, but differs in being smaller, the fore wing having the veins pale-streaked; an indistinct darker subapical recurved streak; the retort mark much smaller, compressed laterally and concave on its outer border, and the recurved streak beneath it not apparent; the hind wing is much smaller, shorter, and less produced at the apex.

Expanse  $3\frac{1}{4}$  inches.

S. Andamans. In coll. British Museum.

NYCTIPAO CREPUSCULARIS, Linn. S. N. 2811, 13; Clerck, Icones, pl. 53. f. 1, 4.

S. Andamans (Port Blair).

Fam. OMMATOPHORIDÆ.

SPEIREDONIA RETRAHENS, Walk. Cat. Lep. Het. B. M. xiv.  
p. 1294.

S. Andamans (Port Blair).

SPEIREDONIA CONSPICUA, Feld. Nov.-Reise, Lep. iv. pl. 113.  
f. 7.

S. Andamans (Port Blair).

Fam. HYPOPYRIDÆ.

SPIRAMA COHÆRENS, Walk. Cat. Lep. Het. B. M. xiv. p. 1321, ♀.  
S. Andamans (Port Blair).

HYPOPYRA PERSIMILIS, n. sp.

Similar to *H. ossigera*, but differs on the upperside in the fore wing having a distinct brown fascia from the apex to middle of hind margin, and the marginal white lunular band prominent; in the



hind wing the outer pale dentate lunular line is nearer the margin. On the underside the black lunular bands are more curved and wider apart, the outer band being nearer the margin. From *H. feniseica* it may be distinguished by its longer fore wings.

Expanse  $3\frac{1}{2}$  inches.

S. Andamans. In coll. British Museum and F. Moore.

*HAMODES DISCISTRIGA*, Moore, P. Z. S. 1867, p. 78.

S. Andamans (Port Blair).

*ENTOMOGRAMMA FAUTRIX*, Guén. Noct. iii. p. 204; Feld. Nov.-Reise, Lep. iv. pl. 115. f. 5.

S. Andamans (Port Blair).

Fam. OPHIUSIDÆ.

*LAGOPTERA HONESTA*, Hübn. Exot. Schmett. f. 1, 2.

S. Andamans (Port Blair).

*LAGOPTERA CORONATA*, Fabr. Ent. Syst. p. 596. no. 24.

*L. leonina*, Fabr. ib. no. 25.

*L. magica*, Hübn. Exot. Schmett. f. 535.

S. Andamans (Port Blair).

*ACHEA MELICERTA*, Drury, Ins. i. pl. 23.

*A. tigrina*, Fabr. Spec. Ins. no. 52.

S. Andamans (Port Blair).

*ACHEA NUBIFERA*, n. sp. (Plate LIX. fig. 9, ♂.)

*Male and female.* Upperside—fore wing vinous brown, crossed by an indistinct subbasal black wavy line and a discal recurved transverse sinuous line with pale lunular outer border; the disk in the male clouded with dark fuliginous brown: hind wing dark cinereous brown, crossed by a narrow white curved median band; a short ochreous streak before anal angle, a pale spot on middle of hind margin, and another at anterior angle. Thorax vinous brown; abdomen cinereous brown, anal tuft ochreous. Underside cinereous brown; disk of fore wing dark fuliginous brown; hind wing with a narrow streak at end of the cell, a transverse broad discal and narrow inner band of dark cinereous brown; palpi cinereous brown; legs cinereous brown above, femora and tibiæ ochreous beneath.

Expanse  $2\frac{5}{8}$  inches.

S. Andamans. In coll. F. Moore.

*OPHIUSA ARCUATA*, n. sp.

Fore wing vinous greyish brown, with a broad dark brown basal band occupying one third of the wing, the band partly crossed near the base by a short pale streak, and its border slightly convex at the middle; a transverse discal band, broadest on the costa, its outer border produced to a point before the apex and then incurved to the

hind margin ; two small dentate spots from the point of the band to the apex ; veins on outer margin streaked with grey ; hind wing dusky brown, with an indistinct pale purplish grey subbasal fascia and a streak from anal angle. Underside dusky brown, with indistinct darker sinuous transverse discal lines.

Expanse  $1\frac{7}{8}$  inch.

S. Andamans. In coll. F. Moore.

This species is also common in collections from India, Ceylon, and Java, and is the species described by M. Guénée (Noct. iii. p. 269) as the *O. joviana* of Cramer, remarking that the figure of *O. joviana* (Cram. pl. 399. fig. B) was not correctly given. Unfortunately for M. Guénée, several specimens of *O. joviana* before me, from the Madras and Malabar coasts of India, perfectly agree with Cramer's figure above quoted, and are, moreover, identical with specimens, also before me, from Java, collected by the late Dr. Horsfield, to which he has applied the name of *O. myops*.

#### HYPETRA STIGMATA, n. sp.

*Male*. Upperside purple-brown : fore wing with a broad, greyish-black, basal, outwardly-oblique band ; a similar band beyond, broad on the costa and including a curved brown streak and pale oblique spot, narrowing to hind margin before the angle ; the interspace between the bands pale ; a marginal row of pale spots and black confluent lunules ; cilia brown : hind wing with a black streak from anal angle and marginal lunules beneath : cilia at apex and anal angle white.

Underside brown, crossed by a median transverse row of partly connected black spots ; a cinereous silky band or patch in cell of fore wing, and a similar streak below apex of hind wing ; antennæ ferruginous-brown ; joints of palpi black at sides, white beneath ; legs black above, white beneath ; tarsi tufted and banded with white.

Expanse  $1\frac{4}{8}$  inch.

Andamans. In coll. British Museum.

#### Fam. POAPHILIDÆ.

##### ILUZIA PYRALINA, n. sp.

*Male*. Upperside pale brownish testaceous ; both wings with a nearly straight, narrow, brown pale inner-bordered band crossing from before the apex to middle of abdominal margin ; a marginal row of black pointed lunules ; fore wing with a brown border below the costa, a blackish spot within the cell, an oval spot at its end, and a few indistinct spots beyond ; hind wing with an indistinct blackish spot in the cell, and a prominent spot outside the band.

Underside yellowish testaceous ; fore wing with a black spot within and a larger spot at end of the cell, a transverse discal straight row of spots and marginal series of pointed lunules ; hind wing with a large spot in the cell, two curved, discal, transverse series of spots and marginal row of pointed lunules ; legs brownish, streaked with

dark brown; palpi dark chocolate-brown, apical joint pale testaceous; antennæ brown.

Expanse  $1\frac{5}{12}$  inch.

S. Andamans. In coll. British Museum.

Fam. PLATYDIDÆ.

EPISPARIS VARIALIS, Walk. Cat. Lep. Het. B. M. xvi. p. 7 (1858).

*E. signata*, Walker, l. c. Suppl. p. 1032.

S. Andamans (Port Blair).

Fam. REMIGIIDÆ.

REMIGIA ARCHESIA, Cram. Pap. Exot. iii. pl. 273. f. F, G, ♀.

*P. virbia*, Cram. l. c. f. H.

*R. bifasciata*, Walker, Cat. Lep. Het. B. M. Suppl. p. 1014.

S. Andamans (Port Blair).

REMIGIA GREGALIS, Guén. Noct. iii. p. 320.

S. Andamans (Port Blair).

Fam. THERMESIIDÆ.

SYMPIS TURBIDA, n. sp.

Upperside dark brown, suffused with purplish grey at the base, crossed by apparently four equidistant indistinct darker sinuous lines on the fore wing, and one across the middle of hind wing; a small blackish spot at lower end of cell on the fore wing. Underside dull brown, outer sinuous line slightly more prominent; hind wing with a submarginal series of pale points, one on each vein.

Expanse  $1\frac{6}{8}$  inch.

S. Andamans. In coll. F. Moore.

THERMESIA RETICULATA, Walker, Cat. Lep. Het. B. M. Suppl. p. 1062.

*Drepanodes scitaria*, Walker, l. c. Geom. p. 1488.

S. Andamans (Port Blair).

AZAZIA RUBRICANS, Boisduval, Walk. Cat. Lep. B. M. xv. p. 1576.

S. Andamans (Port Blair).

MESTLETA DUPLEXA, n. sp. (Plate LX. fig. 5.)

Upperside ochreous; a straight pale purplish-tinted band with ochreous-brown borders extending from apex to above anal angle; fore wing crossed by a subbasal and median sinuous indistinct lines; anterior border of hind wing pale yellow.

Underside much paler, markings nearly obsolete.

Expanse  $\frac{6}{8}$  inch.

S. Andamans. In coll. F. Moore.

## CAPNODES RUFESCENS, n. sp.

*Male.* Upperside light red; both wings crossed by rather broad dusky-grey wavy bands, which are more or less confluent; cilia purple, with a marginal whitish inner line; body dusky ferruginous.

Underside pale testaceous, speckled with ferruginous; legs pale testaceous.

Expanse  $1\frac{2}{10}$  inch.

Andamans. In coll. British Museum.

## CAPNODES TRIFASCIATA, n. sp.

*Female.* Upperside ferruginous; cilia purple; both wings crossed by three dusky-brown wavy bands and an outer lunular line, the basal and third bands traversed by a white, dotted, black, sinuous line; a marginal row of black pointed lunules.

Underside dusky-brown, palest on hind wing; both wings crossed by two curved, discal, indistinct, dusky bands; palpi and legs greyish, speckled with brown.

Expanse  $1\frac{3}{10}$  inch.

Andamans. In coll. British Museum.

## FASCELLINA CASTANEA, n. sp.

Differs from *F. chromataria* from Sikkim, on the fore wing, in the white spot at end of the cell being small, narrow, and pointing obliquely inward instead of outward, has also a smaller apical patch. On the underside the base of the wings is yellow, the transverse discal chestnut-brown band on the fore wing is sinuous on its outer border, and broad and produced before the apex. Other markings similar.

Expanse  $1\frac{4}{8}$  inch.

S. Andamans. In coll. British Museum.

## PLEURONA FALCATA. (Plate LX. fig. 6.)

*Pleurota falcata*, Walker, Cat. Lep. Het. B. M. Suppl. p. 1564. S. Andamans (Port Blair).

## Fam. HYPENIDÆ.

## HYPENA QUINQUELINEALIS, n. sp.

Upperside—fore wing purplish-cinereous; some short brown streaks on costa before the apex; three white lines with brown inner borders obliquely from apex to hind margin, an inner median wavy brown line; a brown line also on extreme outer margin, with a white ciliary border: hind wing pale testaceous white, with brown marginal line. Thorax cinereous white; abdomen testaceous white.

Underside pale testaceous; both wings reddish testaceous at the apex, and crossed by an indistinct, curved, discal, linear row of short brown streaks; legs and antennæ pale testaceous.

Expanse  $\frac{5}{8}$  inch.

S. Andamans. In coll. F. Moore.

**H. DENTILINEALIS**, n. sp.. (Plate LX. fig. 7.)

Upperside—fore wing testaceous-white, sparsely speckled with black scales; an oblique pale brown dentated line from apex to middle of hind margin; a short, black, linear spot at upper end of the cell; an oblique submarginal series of small, indistinct, black spots: hind wing and abdomen cinereous-brown: thorax testaceous-white.

Underside—fore wing testaceous-yellow, clouded with cinereous-brown; hind wing cinereous-white; antennæ and legs cinereous-brown.

Expanse 1 inch.

S. Andamans. In coll. F. Moore.

## Fam. HERMINIDÆ.

**BERTULA ALBINOTALIS**, n. sp.

Upperside dark purplish fawn-colour; a black, broad, subbasal, oblique band crossing both wings; a marginal wavy, yellow spotted black line; fore wing with a short, black, oblique, apical streak, which is indistinctly continued across the hind wing; a yellow oval spot at end of the cell.

Underside purplish-brown, a yellowish oval spot at end of cell in both wings. Body and legs brown.

Expanse  $1\frac{1}{2}$  inch.

Andamans. In coll. British Museum.

Allied to *B. mysalis* and *B. hypenalis*, Walk., from Ceylon.

**APPHADANA EVULSALIS**, Walk. Cat. Lep. Het. B. M. Suppl. 1212.

S. Andamans (Port Blair).

**HYDRILLODES SUBBASALIS**, n. sp. (Plate LX. fig. 8.)

Upperside—fore wing blackish-brown, with a broad, subbasal, pale yellowish-testaceous band, which is slightly brown-speckled, and has a blackish dot in the cell; hind wing pale testaceous, with an indistinct dusky brown marginal band.

Underside—fore wing brown; hind wing whitish-testaceous, with a submarginal row of pale lunules, and a black streak in the cell; palpi and legs blackish, streaked with pale testaceous.

Expanse 1 inch.

S. Andamans. In coll. British Museum and F. Moore.

**HYDRILLODES TRANSVERSALIS**, n. sp.

Upperside pale brown; fore wing with a white zigzag median transverse line; cilia of hind wing alternate brown and grey. Underside paler; both wings with a median discal transverse darker band, which is sinuous on the hind wing; palpi and legs above black speckled.

Expanse  $1\frac{1}{8}$  inch.

S. Andamans. In coll. F. Moore.

**CYCLOPTERYX CANALIFERALIS**, n. sp.

Upperside—fore wing pale sienna-brown, outer margin and cilia

fuliginous, with a median transverse narrow white wavy band, dentated and enclosing a small spot at end of the cell; some white speckles on costa at apex and also on the cilia: hind wing pale brown; cilia white: thorax sienna-brown, white-speckled; abdomen brown; palpi brown, basal points tipt with white. Legs white. Underside pale dusky brown, whitish at base of hind wing.

Expanse 1 inch.

S. Andamans (Port Blair). In coll. British Museum.

*RIVULA BIOCULALIS*, n. sp.

Pale ochry-yellow; fore wing with five short white transverse streaks on the costa, a row of white and black dots on outer margin, two pale-bordered black dots at end of the cell one above the other, and a transverse discal curved wavy brown line. Underside paler; fore wing brownish in the middle.

Expanse  $\frac{4}{5}$  inch.

S. Andamans (Port Blair). In coll. British Museum.

*RIVULA OCULALIS*, n. sp.

Upperside—fore wing pale testaceous, fawn-colour along the costa and exterior margin; a black spot with white centre at end of the cell; a black dot on middle of costa, and a row of pale-bordered black dots on outer margin; cilia black: hind wing pale yellowish-white, with narrow blackish marginal line; cilia white. Body and legs pale brown. Underside paler than above, markings the same.

Expanse  $\frac{4}{5}$  inch.

S. Andamans (Port Blair). In coll. British Museum.

Tribe PYRALES.

Fam. PYRALIDÆ.

*PYRALIS TRIFASCIALIS*, n. sp. (Plate LX. fig. 9.)

*Male*. Upperside ferruginous; fore wing with a white costal median band, a short oblique band at apex, and a paler white band below it to hind margin; hind wing with a transverse discal white band, the inner margin of which is bordered with dark ferruginous. Underside—fore wing with white bands as above; three oblique subbasal ferruginous-brown-maculated bands with purple interspaces: hind wing crossed by ferruginous-brown bands, the interspaces white and traversed with short-brown strigæ: legs whitish, streaked with ferruginous.

Expanse  $1\frac{1}{2}$  inch.

S. Andamans (Port Blair). In coll. F. Moore.

*PYRALIS OCHREALIS*, n. sp.

Ochry-yellow; fore wing with four darker slightly wavy transverse bands, and three on the hind wing terminating at anal angle; a darker marginal line. Body, antennæ and palpi yellow. Legs ochry-brown; fore tarsi and bands on tuft, streak beneath mid and hind tibiæ, and their tarsi white.

Expanse, ♂  $\frac{3}{4}$ , ♀ 1 inch.

S. Andamans (Port Blair).

Has also been taken in Sikkim. In coll. F. Moore.

Fam. ASOPIDÆ.

*SAMEA CUPRINALIS*, n. sp.

*Male* pale purplish-yellow, diaphanous; cilia whitish, alternated with brown; fore wing with two cupreous-brown spots in the cell, beneath which are two narrow wavy lines, a broad outer marginal band bordered by a narrow wavy inner line; hind wing with a pale-centred brown spot at end of cell and a narrow line beneath, a broad marginal band and inner wavy bordered line. Body purplish-yellow, brown-speckled; anal tuft white, antennæ pale brown. Legs pale-yellowish, fore legs and middle femora and tibiæ with a black spot at the joints.

Expanse  $\frac{6}{8}$  inch.

S. Andamans (Port Blair). In coll. British Museum.

*SAMEA PURPURASCENS*, n. sp.

*Male*. Upper and underside very pale purplish grey; fore wing with two blackish-bordered pearly white spots within the cell, and a short transverse series of smaller contiguous spots before the apex; two indistinct median transverse dusky-brown bands, which also cross the hind wings; outer edges of wings brown. Legs whitish, banded with brown.

Expanse  $\frac{8}{10}$  inch.

S. Andamans (Port Blair). In coll. British Museum.

*ASOPIA LIMBOLALIS*, n. sp.

Upperside silky gamboge-yellow; fore wing with four and hind wing with two short oblique transverse ochry-red bands; both wings with a broad golden-brown pale-bordered marginal band. Cilia of fore wing yellow, of hind wing brown, bordered by a blackish marginal line. Body ochry-brown above, beneath and legs yellowish-white. Palpi ochry-yellow. Underside pale silky-yellow with broad golden-brown band.

Expanse  $\frac{7}{10}$  inch.

S. Andamans (Port Blair). In coll. British Museum.

*LEUCINODES ORBONALIS*, Guén. Delt. et Pyr. p. 223 (1854).

S. Andamans (Port Blair).

*COPTOBASIS ANDAMANALIS*, n. sp. (Plate LX. fig. 14.)

Allied to *Cop. æmealis*, Walk.

Glossy cupreous-brown; fore wing with a pale yellowish spot at end of the cell, an oval spot beyond, and a smaller one beneath them; hind wing with two yellow median transverse spots. Cilia cinereous. Body above brown, beneath whitish. Palpi black tipped. Base of tibiæ and first joint of tarsi banded with black.

Expanse  $\frac{7}{8}$  inch.

S. Andamans (Port Blair). In coll. British Museum.

*COPTOBASIS LUNALIS*, Guén. Delt. et Pyr. p. 352.

*Botys Thyasalis*, Walk. Catal. Lep. B. M. xviii. p. 734.

S. Andamans (Port Blair).

*COPTOBASIS CUPREALIS*, n. sp. (Plate LX. fig. 13.)

Upperside bright coppery-brown; fore wing with three equidistant transverse black narrow bands; hind wing with two transverse bands, the outer one short, a marginal and ciliary black line. Underside paler, cinereous brown at base; transverse lines indistinct. Base of palpi white. Legs cinereous, fore and mid tibiæ with black bands.

Expanse 1 inch.

S. Andamans (Port Blair). In coll. F. Moore.

*PHYSEMATIA CONCORDALIS*, Lederer, Wien. ent. Monat. vii. p. 447, pl. 17. f. 14 (1863).

Nicobars.

*DICHOCROSIS FRENATALIS*, Lederer, Wien. ent. Monat. viii. p. 447, pl. 17. f. 15 (1863).

Nicobars.

#### Fam. HYDROCAMPIDÆ.

*OLIGOSTIGMA SEXPUNCTALIS*, n. sp. (Plate LX. fig. 12.)

*Male*. Fore wing ochry-yellow, with a black line on base of costa, a triangular spot bordered with silver beyond, two oblique subapical short bands from the apex, both lined within with silver, and a prominent silver streak with indistinct blackish lower border beneath the cell: hind wing transparent white at base, yellow at apex, a marginal quadrate black spot adorned with varied metallic scales, the cilia adjoining marked with six black spots with white interspaces; a short indistinct black-speckled streak bordered with silver above the black spot. Body pale ochreous, whitish beneath. Antennæ brown. Legs ochreous, streaked with brown.

Expanse  $\frac{7}{8}$  inch.

S. Andamans (Port Blair). In coll. F. Moore.

*OLIGOSTIGMA PARVALIS*, n. sp.

White: fore wing with a golden-yellow band on the costa, exterior, and hind borders, and short subapical bands; the band on exterior border with black margins: hind wing with two golden-yellow bands, each black-margined; a black spot on outer band below the apex.

Expanse  $\frac{4}{8}$  inch.

S. Andamans (Port Blair). In coll. F. Moore.

#### Fam. SICULIDÆ.

*RHODONEURA RETICULARIS*, n. sp.

Silvery white, veins of fore wing blackish. Upperside with blackish hexagonal-shaped reticulations; many of the spaces on fore wing



centred by a short streak. Underside as above; space within the cell and apex of fore wing slightly cupreous. Abdomen narrowly banded with black. Palpi and legs grey, tarsi banded with black. Antennæ brown.

Expanse  $1\frac{1}{8}$  inch.

S. Andamans (Port Blair). In coll. British Museum.

*RHODONEURA TETRAONALIS*, n. sp. (Plate LX. fig. 10.)

Male and female, silvery white. Upperside of both wings with numerous delicate greyish-black strigæ, crowded and slightly reticulated on the fore wing, and transversely and lineally disposed on the hind wing; fore wing with a darker streak on a space free from strigæ near posterior angle, and a black dot at the apex. Abdomen with slight dorsal black bands. Underside as above, metallic, silvered below the costa, strigæ darker, and streak on fore wing near posterior angle prominent; apical black spot large and centred with a white dot. Legs banded with black.

Expanse  $\frac{7}{8}$  inch.

S. Andamans (Port Blair). In coll. British Museum and F. Moore.

Allied to *R. puralis* and *R. bastialis*, Walk.

*RHODONEURA MARMOREALIS*, n. sp.

*Male*. Silvery white. Upperside reticulated with delicate greyish-black strigæ; costa of fore wing blackish, the edge dotted with white. Abdomen blackish-cinereous at tip, tuft brown. Underside reticulated as above; costa cupreous-brown. Legs greyish white; tibiæ streaked and tarsi banded with white.

Expanse  $\frac{6}{8}$  inch.

S. Andamans (Port Blair). In coll. British Museum and F. Moore.

#### Fam. SPILOMELIDÆ.

*PHALANGIODES NEPTISALIS*, Cram. Pap. Exot. iii. pl. 264. f. F; Guén. Delt. et Pyr. p. 279.

S. Andamans (Port Blair).

*PYCNARMON OBINUSALIS* (*Astura ob.*), Walk. Catal. Lep. B. M. xviii. p. 549.

Nicobars (Kamorta), April, *Meldola*.

*PYCNARMON DISCINOTALIS*, n. sp.

Allied to *P. (Zebronia) plutusalis*, Walk.

White: fore wing with four and hind wing with three dark-yellow transverse bands; the inner discal band on both wings bent towards the posterior angle; also a similar-coloured band on the outer margin, and dark band on cilia; a black spot within the cell.

Expanse  $\frac{7}{8}$  inch.

S. Andamans (Port Blair). In coll. British Museum.

May be distinguished from *P. plutusalis* by both wings having an

additional yellow band immediately on the outer margin, and only one dark band on cilia.

*CONCHYLODES ÆRIFERALIS*, n. sp.

Allied to *C. (Zebronia) lactiferalis*, Walk.

Wings pale brassy-yellow, costa whitish; fore wing with two black spots in the cell, first minute, a streak below each, a streak from costa before the apex terminating on a spot near posterior angle; two small spots on costa, one near base, the other before outer streak: hind wing with a black spot within the cell, another near middle of outer margin, and wavy transverse streak terminating in a spot on margin above anal angle. Body and legs white; antennæ yellowish.

Expanse  $\frac{8}{10}$  inch.

S. Andamans (Port Blair). In coll. British Museum.

Fam. MARGARONIDÆ.

*GLYPHODES ACTORIONALIS*, Walker, Catal. Lep. Het. B. M. xvii. p. 498 (1859).

S. Andamans (Port Blair.)

*GLYPHODES MARGINALIS*, n. sp. (Plate LX. fig. 15.)

*Male*. Silvery white; both wings with a broad marginal brown band, bordered inwardly by a wavy black line; fore wing with a brown streak along base of costa, a transverse narrow outward-curved subbasal band and a large spot at end of the cell; hind wing with an outward-curved brown streak below the cell. Body above silvery white; a dorsal streak from head to anal tuft, and sides of thorax brown; tuft yellow. Palpi brown. Legs whitish. Underside much paler-marked.

Expanse 1 inch.

S. Andamans. In coll. F. Moore.

*SYNCLERA CÆSALIS* (*Glyph. cæs.*), Walk. (*l. c.*) p. 449.

S. Andamans (Port Blair).

*CYDALIMA LATICOSTALIS* (*Margarodes lat.*), Guén. Delt. et Pyr. p. 303, ♀ (1854).

*Marg. leodicealis*, Walker, Catal. Lep. B. M. pt. xviii. p. 529.

S. Andamans (Port Blair).

*PACHYARCHES MALIFERALIS*, Walk. Catal. Lep. Het. B. M. Suppl. p. 1363 (1865).

S. Andamans (Port Blair).

*PACHYARCHES TIBIALIS*, n. sp.

*Male*. Pale green above, tinged with pale brown beneath; cilia cinereous; a woolly tuft near anal angle beneath; palpi green, white beneath; abdomen blackish at the tip; legs pale green; fore tibiæ

at the apex and a tuft on first joint of tarsi ochreous ; hind tibiæ clothed with brown hairs above.

Expanse  $1\frac{1}{8}$  inch.

S. Andamans. In coll. British Museum.

Calcutta District. In coll. F. Moore.

Allied to *P. maliferalis*, but differs in the absence of the black spot at end of the cell in both wings, and in the different-coloured palpi.

AUXOMITIA MIRIFICALIS, Lederer, Wien. ent. Monat. vii. p. 391, pl. 13. f. 1 (1863).

Nicobars ; S. Andamans (Port Blair).

Fam. BOTYDÆ.

BOTYS ILLISALIS, Walker, Catal. Lep. Het. B. M. xviii. p. 653 ; Lederer, Wien. ent. Mon. vii. pl. 9. f. 12.

S. Andamans (Port Blair).

BOTYS MULTILINEALIS, Guén. Delt. et Pyr. p. 327, pl. 8. f. 11 ; Lederer, Wien. ent. Mon. vii. pl. 11. f. 3.

*Zebronia salomealis*, Walk. Catal. Lep. B. M. xviii. p. 476.

*B. annuligeralis*, Walk. (*l. c.*) Suppl. p. 1424.

S. Andamans (Port Blair).

BOTYS SCINISALIS. (Plate LX. fig. 11.)

*Botys scinialis*, Walker, Catal. Lep. B. M. xviii. p. 648 (1859).

*B. disjunctalis*, Walk. Des. of Und. Lep. Het. p. 96 (1869).

S. Andamans (Port Blair).

BOTYS ARDEALIS, Felder, Novara-Reise, Lep. iv. pl. 131. f. 31.  
Nicobars.

BOTYS STULTALIS, Walker, Catal. Lep. Het. B. M. xviii. p. 669  
S. Andamans (Port Blair).

BOTYS THOASALIS. (Plate LX. fig. 16.)

*Botys thoasalis*, Walk. (*l. c.*) p. 692.

S. Andamans (Port Blair).

BOTYS VINACEALIS, n. sp.

Allied to *B. caletorialis*, Walk.

*Male.* Pale glossy purplish-brown ; fore wing with an indistinct blackish streak crossing end of the cell, a transverse zigzag line before the apex, another below the cell, and a similar recurved zigzag line on hind wing ; both wings with a marginal row of narrow blackish lunules. Body and antennæ pale brown, tip of abdomen above white. Fore legs with white bands, mid legs streaked laterally with white ; palpi dark brown, basal joint white.

Expanse  $1\frac{2}{10}$  inch.

S. Andamans (Port Blair). In coll. British Museum.

*BOTYS ABSTRUSALIS*, Walk. Catal. Lep. B. M. xvii. p. 663.

*B. retractalis*, Walk. (*l. c.*) Suppl. p. 1447.

S. Andamans (Port Blair).

*BOTYS OPALINALIS*, n. sp.

Upperside pale silky brownish yellow with greyish opaline reflections; fore wing with two very indistinct brownish spots in the cell and a recurved transverse discal line. Body and legs ochreous-white; palpi and antennæ brown. Underside ochreous-white.

Allied to *B. megapteralis*, Walk.

Expanse  $1\frac{2}{8}$  inch.

S. Andamans (Port Blair). In coll. F. Moore.

*BOTYS IMMUNDALIS*, Walk. Catal. Lep. Het. B. M. Suppl. p. 1448.

S. Andamans (Port Blair).

Tribe CRAMBICES.

Fam. GALLERIDÆ.

*PROPACHYS LINEALIS*, Moore, P. Z. S. 1867, p. 665, pl. 33. fig. 17.

S. Andamans (Port Blair).

Tribe URANIDES.

Fam. NYCTALEMONIDÆ.

*NYCTALEMON NAJABULA*, n. sp.

Smaller and of a much darker fuliginous-brown colour, both above and below, than the Indian *N. zampa* and the Malayan *N. docile*, and has a narrower median transverse pale band on both wings above than the former species; and on the underside these bands are well defined and narrow.

Expanse 5 inches.

S. Andamans (Port Blair). In coll. F. Moore.

Tribe GEOMETRES.

Fam. URAPTERIDÆ.

*URAPTERYX CROOPTERATA*, Kollar, Hügel's Kasch. iv. p. 483 (1844).

S. Andamans (Port Blair).

Fam. ENNOMIDÆ.

*HYPERYTHRA LUTEA*, Cram. Pap. Exot. iv. pl. 370. f. C, D, ♀.

*H. limbolaria*, Guén. Phal. i. p. 101, pl. 3. f. 3, 4, ♀.

*H. susceptaria*, Walk. Catal. Lep. B. M. Suppl. p. 1664, ♀.

*H. penicillaria*, Guén. (*l. c.*) p. 101, ♂.

S. Andamans (Port Blair).

## OMIZA AFFINIS, n. sp.

Differs from *O. pachiaris*, Walk., from Sikkim, above in being more uniformly coloured, the transverse band more prominent, and beneath in the darker and uniform chrome-colour of both wings, a smaller spot at end of the cells, and in the hind wing having a distinct recurved median band formed of dark chrome-coloured speckles.

Expanse  $1\frac{7}{8}$  inch.

S. Andamans (Port Blair). In coll. British Museum.

## Fam. BOARMIDÆ.

## AMBLYCHIA TORRIDA, n. sp.

Similar to *A. angeronaria* from Sikkim, but differs in the fore wing both above and beneath in having the transverse median pale maculated band terminating very broadly on the costa in the male, and in broad quadrate spots in the female. On the underside the distinct subbasal curved dusky band which crosses both wings of *A. angeronaria* are obsolete, and the outer transverse lunular bands are replaced by a uniform broad pale brownish fascia.

Expanse, ♂  $3\frac{1}{4}$ , ♀  $3\frac{3}{4}$  inches.

S. Andamans (Port Blair). In coll. British Museum and F. Moore.

*HYPOCHROMA PERFECTARIA*, Walk. Catal. Lep. B. M. p. 434.

*H. nyctemerata*, Walk. l. c. Suppl. p. 1543.

S. Andamans (Port Blair).

*BITHIA EXCLUSA* (*Hemerophila ex.*), Walk. Catal. Lep. B. M. xxii. p. 320 (1861).

*Acidalia imprimata*, Walk. l. c. p. 771.

*Macaria obstataria*, Walk. l. c. p. 928.

*B. lignaria*, Walk. l. c. Suppl. p. 1600.

S. Andamans (Port Blair).

## Fam. GEOMETRIDÆ.

*THALASSODES CÆLATARIA*, Walk. Catal. Lep. B. M. xxii. p. 552.

S. Andamans (Port Blair).

## Fam. PALYADÆ.

*EUMELIA LUDOVICATA*, Guén. Phal. i. p. 393.

S. Andamans (Port Blair).

## Fam. ACIDALIDÆ.

*TRYGODES DIVISARIA* (*Macaria div.*) Walk. Catal. Lep. B. M. xxiii. p. 927.

S. Andamans (Port Blair).

*ACIDALIA ATTENTATA*, Walk. Catal. Lep. B. M. xxiii. p. 754.

S. Andamans (Port Blair).

*ACIDALIA REMOTATA*, Guén. Phal. i. p. 458.

S. Andamans (Port Blair).

*ZANCLOPTERYX SAPONARIA*, H. Schöff. (Walk. Catal. Lep. B. M. xxiii. p. 810).

S. Andamans (Port Blair).

Fam. MICRONIDÆ.

*MICRONIA VAGATA*, n. sp. (Plate LX. fig. 18.)

*Male*. Form and pattern of *M. caseata*, Guén., from Java, Smaller in size, and pure white above, the oblique bands formed of short narrow grey strigæ and less prominent; the margins of the bands not linearly defined as in that species, being composed of more straggling strigæ, thus giving less open interspaces between the bands. Underside pale grey.

Expanse  $1\frac{3}{10}$  inch.

S. Andamans (Port Blair). In coll. F. Moore.

*MICRONIA ACULEATA*, Guén. Phal. ii. p. 26, pl. 13. f. 8.

S. Andamans (Port Blair).

*MICRONIA OBTUSATA*, Guén. Phal. ii. p. 25, pl. 5. f. 6.

S. Andamans (Port Blair).

*MICRONIA OBLIQUARIA*, n. sp. (Plate LX. fig. 17.)

White. Upperside with numerous short transverse dusky brown strigæ uniformly disposed: fore wing with two oblique dusky brown bands, formed by confluent strigæ proceeding from the apex and crossing the hind wing to abdominal margin; the hind wing also with an outer but less distinctly formed transverse band; a narrow black wavy marginal line on both wings, and small lanceolate spot at middle angle of hind wing. Underside white, with the bands indistinctly visible. Palpi and tarsi fuliginous.

Expanse  $1\frac{1}{8}$  inch.

S. Andamans (Port Blair). In coll. British Museum.

This species is also found at Darjiling.

*ZOMIA PALLIDA*, n. sp.

Fore wing pale greyish-white, sparsely streaked with brown, an indistinct transverse subbasal curved pale brown band and curved streak before posterior angle; hind wing pale ochreous at base. Body and legs pale brown; antennæ and palpi dark brown. Underside pale whitish testaceous.

Expanse  $1\frac{1}{8}$  inch.

S. Andamans (Port Blair). In coll. British Museum.

## Fam. MACARIDÆ.

MACARIA NORA, Walk. Catal. Lep. B. M. xxiii. p. 934.  
S. Andamans (Port Blair).

## Tribe TORTRICES.

GRAPHOLITHA NOVARANA, Felder, Novara-Reise, Lep. iv. pl. 137.  
f. 49.

Nicobars.

CHOREUTES NOVARÆ, Felder, Novara-Reise, Lep. iv. pl. 138. f. 14.  
Nicobars.

## Tribe TINEINES.

## Fam. GELECHIDÆ.

BINSITTA NIVIFERANA, Walk. Catal. Lep. B. M. pt. xxix. p. 832.  
S. Andamans (Port Blair).

BLABOPHANES INSULARIS, Felder, Novara-Reise, Lep. iv. pl. 140.  
f. 21.

S. Andamans (Port Blair).

SYME ORBICULARIS, Felder, Novara-Reise, Lep. iv. pl. 140. f. 27.  
S. Andamans (Port Blair).

*Tabular List, showing Geographical Distribution.*

	Andamans.	Nicobars.	Sumatra.	Java.	Malay penin- sula.	Burmab.	N.E. India.	S. India.	Ceylon.
PAPILIONES.									
Fam. <i>Danaidæ</i> .									
Danais limniace.....	..	*	..	..	..	*	*	*	*
— agleoides .....	..	*	..	*	..	*			
— grammica .....	..	*	*	*	*	*			
— melanoleuca, n. sp. ....	*								
— nesippus .....	..	*							
— plexippus .....	..	*	..	*	*	..	*	*	
Euplœa novaræ.....	..	*	..						
— esperi .....	..	*							
— andamanensis .....	*								
— camorta, n. sp. ....	..	*							
Hestia agamarschana .....	*								
Fam. <i>Satyridæ</i> .									
Lethe europa .....	*	..	..	*	*	..	*	*	
Melanitis leda .....	*	..	..	*	..	..	*	*	*





## Tabular List (continued.)

	Andamans.	Nicobars.	Sumatra.	Java.	Malay penin- sula.	Burmah.	N.E. India.	S. India.	Ceylon.
Lampides kondulana .....	*	*							
Lycænesthes macrophthalma ...	..	**							
Lycæna sangra .....	*	*	..	..	..	..	*	..	*
Aphnaeus zoilus, n. sp. ....	*	*							
Hypolycæna andamana, n. sp....	*	*							
— eltola.....	*	*							
Sithon areca .....	..	**							
— kamorta .....	..	**							
Deudorix orseis.....	..	*	*						
— epijarbas .....	*	..	..	..	..	..	*	..	*
Myrina prabha, n. sp. ....	*	*							
Amblypodia zeta, n. sp. ....	*	*							
— nakula .....	*	..	..	..	*				
Fam. Pieridæ.									
Terias formosa .....	*	..	..	*					
— nicobariensis .....	*	*							
Hebomoia glaucippe.....	*	..	..	*	..	*	*	..	*
Ixias andamana, n. sp.....	*	*							
Appias galathea .....	*	*							
Catopsilia catilla .....	*	..	..	*	*	..	*	*	*
— crocale .....	*	*	..	*	..	..	*	*	*
— chryseis .....	*	..	..	..	*	..	..	..	*
Pieris nama .....	*	..	..	..	..	..	*	..	..
— lichenosa, n. sp. ....	*	..	..	..	..	..	..	..	..
Eronia naraka, n. sp. ....	*	..	..	..	..	..	..	..	..
Fam. Papilionidæ.									
Ornithoptera heliconoides, n. sp. .	*	..	..	..	..	..	..	..	..
Papilio mayo.....	*	*							
— charicles .....	*	*							
— rhodifer .....	*	*							
— camorta, n. sp. ....	..	*							
— nicobarus .....	..	*							
— aganemnon .....	*	*	..	*	*	..	*	*	*
— ? eurypilus (? Axion) .....	*	..	*	..	*	..	..	..	..
— antiphates.....	*	..	*	*	..	..	*	..	..
Fam. Hesperidæ.									
Ismene chromus .....	*	..	*	*	..	..	..	*	*
— malayana .....	*	..	..	..	*	..	..	..	..
Tagiades alica, n. sp. ....	*	*							
— helferi .....	..	*							
Plesioneura alysos .....	*	..	*	*	..	..	*	*	*
Hesperia cahira, n. sp.....	*	..	..	..	..	..	..	..	..
— oceia .....	*	..	..	..	..	..	..	..	..
— colaca, n. sp.....	*	..	..	..	..	..	..	..	..
— mathias.....	..	*	..	*	..	..	*	*	*
— beturia .....	*	..	..	..	..	..	*	*	*
Telegonus thyrasis .....	*	..	..	..	..	*	*	*	*
Pamphila purreea, n. sp.....	*	..	..	..	..	..	..	..	..
— gola, n. sp. ....	*	..	..	..	..	..	..	..	..
— mesoides .....	*	..	..	*	*	..	..	..	*



## Tabular List (continued.)

	Andamans.	Nicobars.	Sumatra.	Java.	Malay penin- sula.	Burmah.	N. E. India.	S. India.	Ceylon.
Fam. <i>Liparidæ</i> .									
Redoa flavescens, n. sp. ....	*								
— sericea, n. sp. ....	*								
Caviria cygna, n. sp. ....	*								
Lælia venosa, n. sp. ....	*								
Euproctis discinota, n. sp. ....	*								
Fam. <i>Psychidæ</i> .									
Mahasena andamana, n. sp. ....	*								
Fam. <i>Saturniidæ</i> .									
Actias selene .....	*	...	...	...	...	...	*	*	*
— ignescens, n. sp. ....	*								
Antheræa andamana, n. sp. ....	*								
NOCTUES.									
Fam. <i>Leucanidæ</i> .									
Leucania costalis, n. sp. ....	*								
Fam. <i>Glottulidæ</i> .									
Ramadasa pavo .....	*	...	...	...	...	...	...	...	*
Fam. <i>Apamidæ</i> .									
Spodoptera cilium .....	*	...	...	*	...	...	*		
— nubes .....	*	...	...	*	...	...	*		
Prodenia ciligera .....	*	...	...	*	...	...	*	*	
Illatia cephusalis .....	*	...	...	...	...	...	...	*	
Perigea canorufa .....	*	...	...	...	...	...	*	*	
Thalpophila cuprea, n. sp. ....	*								
Fam. <i>Caradrinidæ</i> .									
Amyna selenampha .....	*	...	...	*	...	...	...	*	*
Fam. <i>Hamerosidæ</i> .									
Apsarasa figurata, n. sp. ....	*								
Fam. <i>Acontidæ</i> .									
Xanthodes transversa .....	*	...	...	*	...	...	*	*	
Acontia signifera .....	*	...	...	...	...	...	*		
Fam. <i>Palindidæ</i> .									
Homodes crocea .....	*	...	...	*	...	...	...	...	*
Fam. <i>Eriopidæ</i> .									
Callopietria exotica .....	*	...	...	*	...	...	*	...	*
Fam. <i>Eurhipidæ</i> .									
Ingura cristatrix .....	*	...	...	*					
Fam. <i>Plusiidæ</i> .									
Plusiodonta conducens.....	*	...	...	...	...	...	...	...	*

## Tabular List (continued.)

	Andamans.	Nicobars.	Sumatra.	Java.	Malay penin- sula.	Burmah.	N.E. India.	S. India.	Ceylon.
Fam. <i>Hemiceridæ</i> .									
Westermannia triangularis, n. sp. ....	*								
Fam. <i>Hyblæidæ</i> .									
Nolasena dulcissima.....	*	...	...	...	...	...	...	...	*
Fam. <i>Gonopteridæ</i> .									
Anomis fulvida.....	*	...	...	*	...	...	*	...	*
Fam. <i>Polydesmidæ</i> .									
Polydesma boarmoides.....	*	...	...	*	...	...	*	...	*
Fam. <i>Hypogrammidæ</i> .									
Ercheia tenebrosa.....	*	..	...	...	...	...	*		
Fam. <i>Catephidæ</i> .									
Anophia olivascens .....	*	...	...	*	...	...	*	...	*
Fam. <i>Hypocalidæ</i> .									
Hypocala lativitta, n. sp.....	*								
Fam. <i>Catocalidæ</i> .									
Blenina lichenosa, n. sp. ....	*								
— grisea, n. sp. ....	*								
Fam. <i>Ophideridæ</i> .									
Ophideres aurantia, n. sp. ....	*								
— fullonica .....	*	...	...	*	*	...	*	...	*
— hypermnestra .....	*	...	...	*	...	...	*	...	*
Phyllodes consobrina .....	*	...	...	...	...	...	*	...	*
Potamophora manlia .....	*	...	...	*	...	...	*	...	*
Fam. <i>Erebidæ</i> .									
Tavia substruens .....	*	...	...	...	...	...	*		
Fam. <i>Ommatophoridæ</i> .									
Speiredonia retrahens .....	*	...	...	*	...	...	...	*	*
— conspicua .....	*	...	...	...	...	...	...	...	...
Argiva hieroglyphica .....	*	...	...	*	...	...	*	*	*
Nyctipao crepuscularis.....	*	...	...	*	...	...	*	*	*
— truncata, n. sp. ....	*	...	...	...	...	...	...	...	...
Fam. <i>Hypopyridæ</i> .									
Spirama cohærens .....	*	...	...	...	...	...	*	...	*
Hypopyra persimilis, n. sp.....	*	...	...	...	...	...	...	...	...
Hamodes discistriga.....	*	...	...	...	...	...	*	...	...
Entomogramma fautrix .....	*	...	...	*	...	...	*	...	*
Fam. <i>Ophiusidæ</i> .									
Lagoptera honesta .....	*	...	...	...	...	...	*	*	*
— coronata .....	*	...	...	...	*	...	*	*	*





## Tabular List (continued).

	Andamans.	Nicobars.	Sumatra.	Java.	Malay penin- sula.	Burma.	N.E. India.	S. India.	Ceylon.
Fam. <i>Boarmidæ</i> .									
<i>Amblychia torrida</i> , n. sp.....	*								
<i>Hypochroma perfectaria</i> .....	*	...	...	...	...	...	*	*	
<i>Bithia exclusa</i> .....	*	...	...	...	...	...	*	...	*
Fam. <i>Geometridæ</i> .									
<i>Thalassodes cælataria</i> .....	*	...	...	...	...	...	...	...	*
Fam. <i>Palyadæ</i> .									
<i>Eumelea ludovicata</i> .....	*	...	...	...	...	...	...	...	*
Fam. <i>Acidalidæ</i> .									
<i>Trygodes divisara</i> .....	*	...	...	...	...	...	*	*	
<i>Acidalia attentata</i> .....	*	...	...	...	...	...	*		
— <i>remotata</i> .....	*	...	...	...	...	...	*		
<i>Zanclapteryx saponaria</i> .....	*	...	...	...	*	...	*	...	*
Fam. <i>Micronidæ</i> .									
<i>Micronia vagata</i> , n. sp.....	*								
— <i>obtusata</i> .....	*	...	...	*	...	...	...	...	*
— <i>obliquaria</i> , n. sp.....	*								
<i>Zomia pallida</i> , n. sp.....	*								
Fam. <i>Macaridæ</i> .									
<i>Macaria nora</i> .....	*	...	...	*	...	...	*	*	*
TORTRICES.									
<i>Grapholitha novarana</i> .....	...	*							
<i>Choreutes novaræ</i> .....	...	*							
TINEINES.									
<i>Binsitta niviferana</i> .....	*	...	...	...	...	...	*	*	
<i>Blabophanes insularis</i> .....	...	*							
<i>Syme orbicularis</i> .....	..	*							

## EXPLANATION OF THE PLATES.

## PLATE LVIII.

- Fig. 1. *Mycalesis radza*, n. sp. p., 583.  
 2. *Abisara bifasciata* ♀, n. sp., p. 587.  
 3. *Danaïs melanoleuca*, n. sp., p. 581.  
 4. *Neptis mananda*, n. sp., p. 586.  
 5. *Myrina prabha* ♀, n. sp., p. 589.  
 6. *Amblypodia zeta* ♀, n. sp., p. 590.  
 7. *Hesperia colaca*, n. sp., p. 594.  
 8. — *cahira* ♂, n. sp., p. 593.  
 9. *Pamphila gola* ♂, n. sp., p. 594.  
 10. — *purreea*, n. sp., p. 594.  
 11. *Tagiades alica* ♂, n. sp., p. 593.

## PLATE LIX.

- Fig. 1. *Lælia venosa* ♂, n. sp., p. 601.  
 2. *Bizone amabilis* ♂, n. sp., p. 597.  
 3. *Eressa affinis*, n. sp., p. 596.  
 4. *Mahasena andamana* ♂, n. sp., p. 602.  
 5. *Hypsa andamana*, n. sp., p. 598.  
 6. *Philona cinerascens*, n. sp., p. 598.  
 7. *Ramadasa pavo*, Walk., p. 603.  
 8. *Pitasila leucospilota*, n. sp., p. 599.  
 9. *Achæa nubifera* ♂, n. sp., p. 609.  
 10. *Thalpophila cuprea*, n. sp., p. 604.  
 11. *Leucania costalis*, n. sp., p. 603.

## PLATE LX.

- Fig. 1. *Blenina grisea*, n. sp., p. 607.  
 2. — *lichenosa*, n. sp., p. 607.  
 3. *Homodes crocea*, Guén., p. 605.  
 4. *Hypocala lativitta*, n. sp., p. 606.  
 5. *Mestleta duplexa*, n. sp., p. 611.  
 6. *Pleurona falcata*, Walk., p. 612.  
 7. *Hypena dentilinealis*, n. sp., p. 613.  
 8. *Hydrillodes subbasalis*, n. sp., p. 613.  
 9. *Pyralis trifascialis*, n. sp., p. 614.  
 10. *Rhodoneura tetraonalis*, n. sp., p. 617.  
 11. *Botys scinisalis*, Walk., p. 619.  
 12. *Oligostigma sexpunctalis*, n. sp., p. 616.  
 13. *Coptobasis cuprealis*, n. sp., p. 616.  
 14. — *andamanalis*, n. sp., p. 615.  
 15. *Glyphodes marginalis*, n. sp., p. 618.  
 16. *Botys thoasalis*, Walk., p. 619.  
 17. *Micronia obliquaria* ♂, n. sp., p. 622.  
 18. — *vagata*, n. sp., p. 622.

7. A Revision of the Lepidopterous Genus *Paphia*.

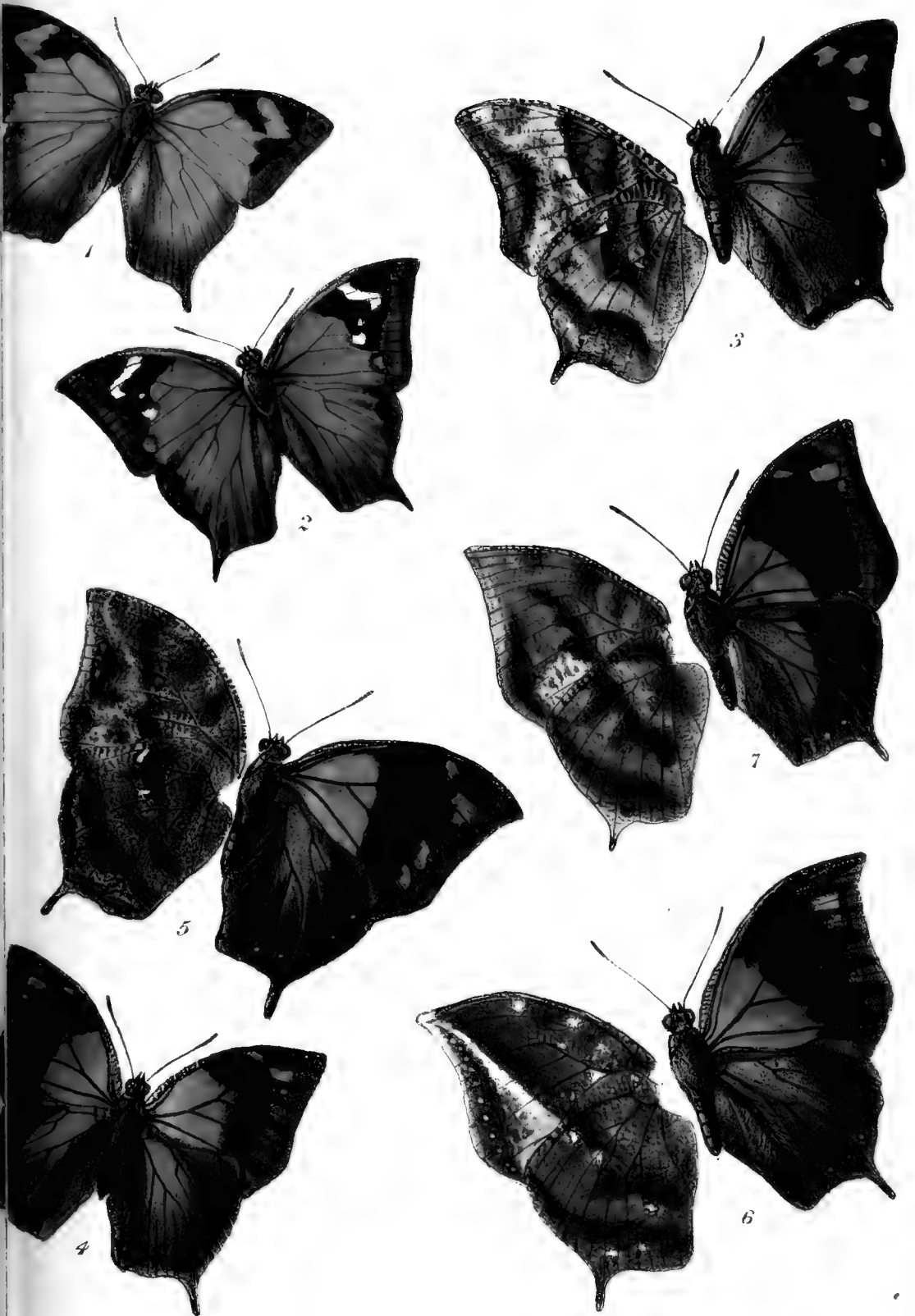
By HERBERT DRUCE, F.L.S., F.Z.S.

[Received June 7, 1877.]

(Plates LXI.—LXIV.)

The last synopsis of this genus was made in 1850, in the 'Genera of Diurnal Lepidoptera.' The number of species at that time amounted to twenty-six; and in Mr. Kirby's Catalogue, published in 1871, we find the number brought up to fifty-three. Since then a large number have been described; and in addition to them, in the present paper I add descriptions of twenty-one new species, bringing the total number described up to ninety-five—nearly four times the number named in the 'Genera.' I find that in several instances species have been described two or three times over, and that others have been overlooked on account of the localities where the specimens were obtained not having been marked upon them. I have endeavoured in the following list to correct, as far as possible, all these errors; but in some few instances I have not been able to examine the types or figures of them; therefore I do not feel certain that all the species are placed in their right position.



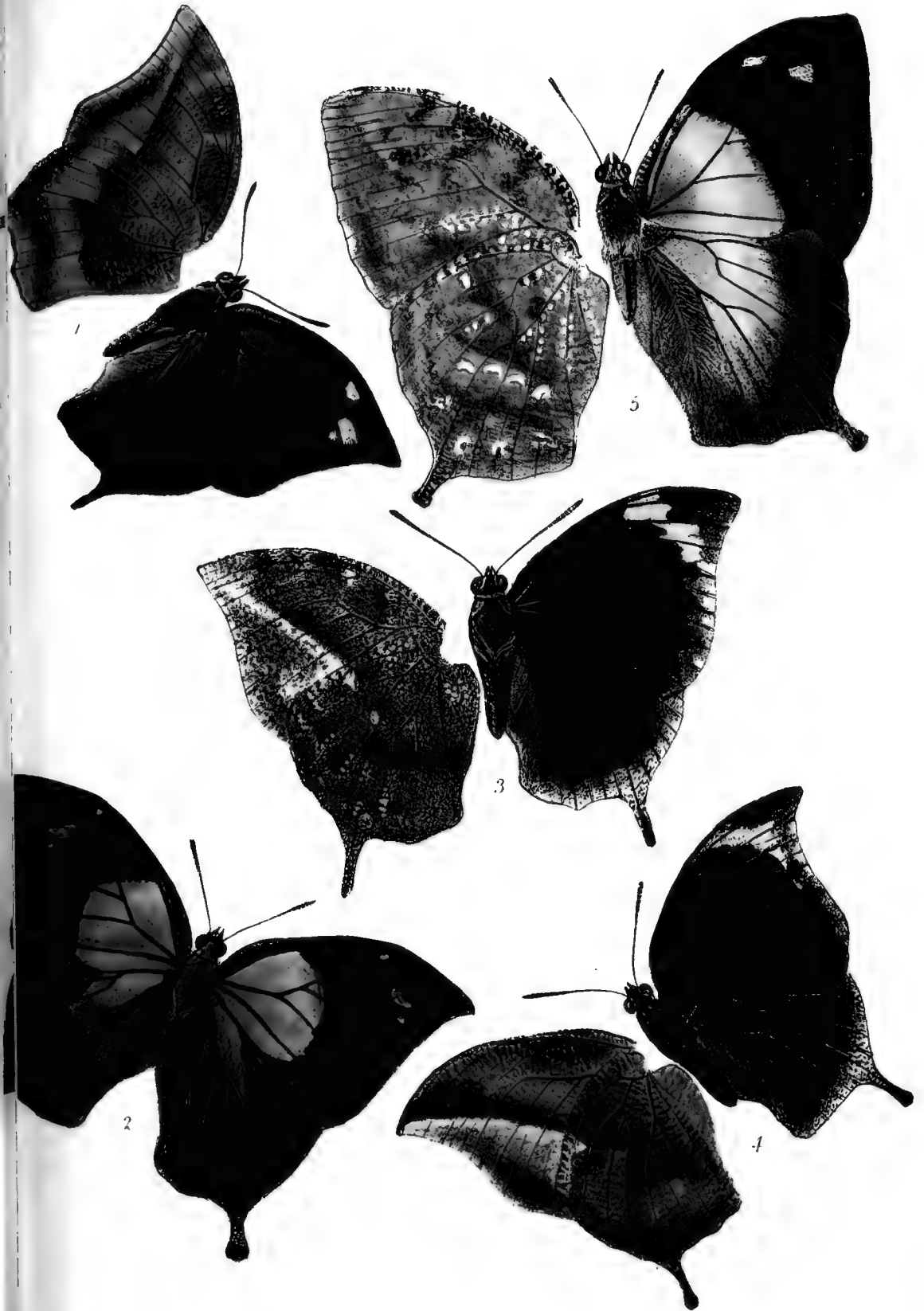


Rippon lith.

M&N Hannart imp

NEW SPECIES OF PAPHIA





2

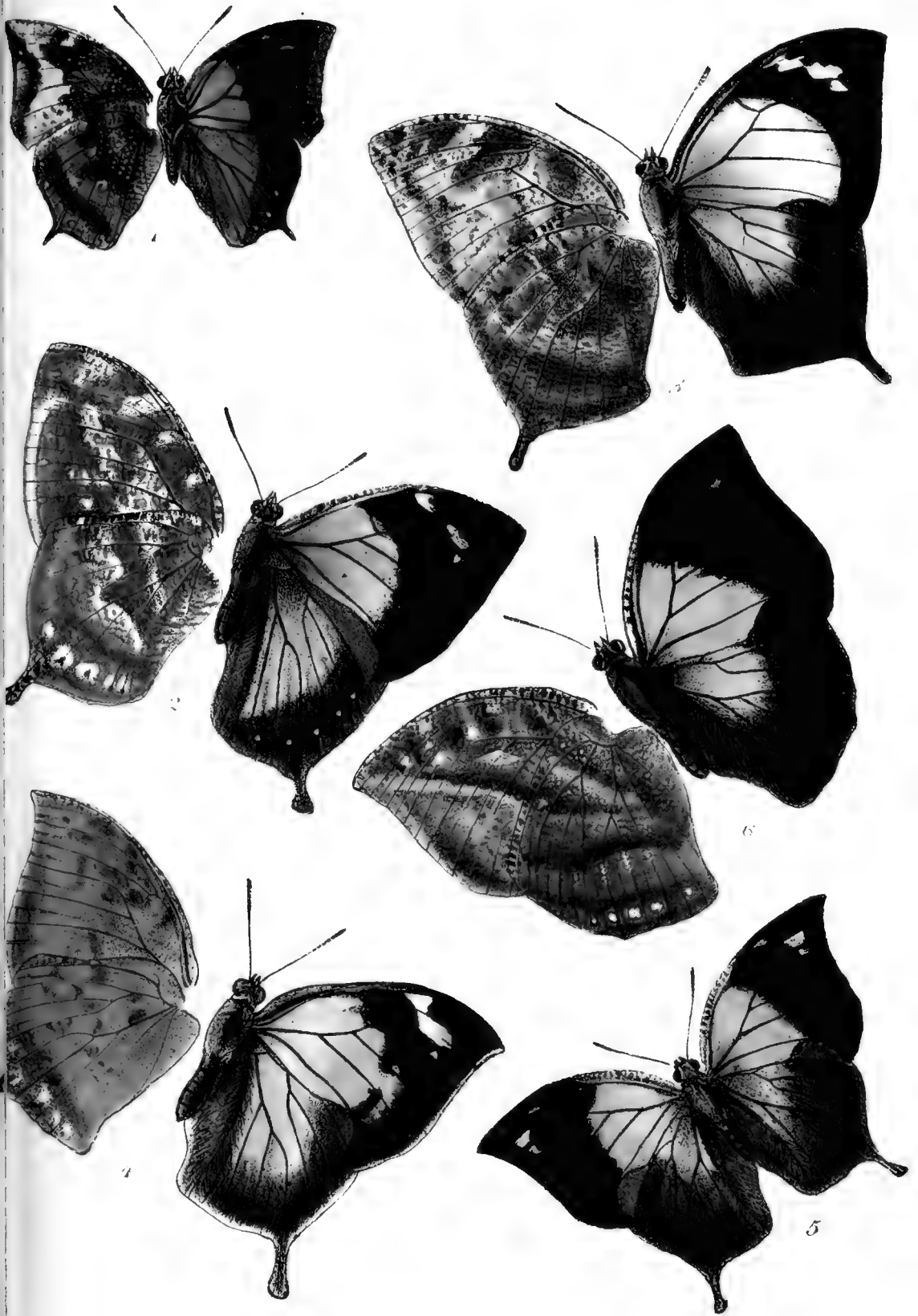
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5

4

NEW SPECIES OF PAPHIA





F. Rippon lith.

NEW SPECIES OF PAPHIA.

PLATE 11





Japan lith.

NEW SPECIES OF PAPHIA.

M & N. Hanhart inv.





The species of this genus are, with one exception, exclusively confined to the neotropical region, as defined by Mr. Sclater, the greatest number of species being found in the Brazilian subregion. They seem to take the place of the genus *Charaxes* of the Old World, and by some authors have been placed with them.

My best thanks are due to the following gentlemen—Messrs. Salvin and Godman, Dr. Staudinger, Mr. Hewitson, and Mr. Henley G. Smith, all of whom have allowed me free use of their extensive collections.

Subfamily NYMPHALINÆ.

Genus PAPHIA, Fab.

*Paphia*, Fabr. Ill. Mag. vi. p. 282 (1807); Westw. Gen. D. L. p. 317 (1850).

*Nymphalis paphia*, Latr. Enc. Méth. ix. p. 10 (1819); Feld. Neue Lep. p. 41 (1861).

1. *P. TROGLODYTA*, Fab. (*Pap. t.*) Syst. Ent. p. 502 (1775).

*P. astinax*, Cram. Pap. Ex. iv. t. 337. f. A, B (1782).

*P. astina*, Fab. Ent. Syst. iii. i. p. 81 (1793).

*Hamadryas undata*, Hübn. Samml. exot. Schmett. (1806–1816).

*Hab.* Haiti (*Tweedie*), Jamaica (*Cutter*). Mus. S. & G., D.

This species varies much in colour; some specimens are quite a deep red, others orange-red. It is peculiar to the West Indies.

2. *P. PORTIA*, Fab. (*Pap. p.*) Syst. Ent. p. 507 (1775).

*Nymphalis portia*, Godt. Enc. Méth. ix. p. 364 (1823).

*Hab.* Jamaica.

Mus. S. & G.

Closely allied to the preceding species, of which it may be only a variety. It differs from *P. troglodyta* in the following respects:—the anterior wing is straighter and not crossed by the broken brown line; the lower half of the posterior wing is thickly speckled with brown scales.

3. *PAPHIA OPS*, sp. n.

Form of *P. aidea*. Upperside bright orange-red, the outer margins of all the wings mottled with brown. Underside pale grey-brown mottled with darker brown.

*Hab.* Texas.

Mus. S. & G., D.

This is a rare species; I have only seen three specimens.

4. *P. AIDEA*, Guér. (*Thymetes? a.*) Icon. Règne Anim. Ins. texte, p. 478 (1829–1838).

The locality given for this species is Campeachy Bay. I have examined specimens from the following localities:—Oaxaca, Mexico (*Fenochio*); Mexico (*Boucard*), Guatemala (*Salvin & Godman*); Chontales Mines, Nicaragua (*T. Belt*). Mus. S. & G., D.

This species varies slightly; the Mexican specimens are darker-coloured than those from the other localities. In the central valleys of Guatemala this species is very common, but becomes scarce in Mexico and Nicaragua. I have not seen it from South America.

5. *P. HALICE*, Godt. (*Nymph. h.*) Enc. Méth. ix. p. 366 (1823).

*Anæa halice* Hübn. Zutr. Exot. Schmett. f. 967, 968 (1837).

Rio (*J. Youds*), Minas Geraes and St. Paulo (*Rogers*).

Mus. S. & G.

Matto Grosso (*Beske*), Rio (*Burmester*).

Mus. D.

The specimen from St. Paulo differs from all the others I have seen in having the whole of the wing suffused with a beautiful blue gloss. The range of this species seems confined to the southern part of Brazil.

6. *P. CHRYSOPHANA*, Bates, Ent. Mo. Mag. iii. p. 152 (1866).

*P. pyrrhothea*, Feld. Reise Nov. Lep. iii. p. 447, t. 60. f. 3 (1876).

*Hab.* Costa Rica (*Van Patten*); Veragua (*Arcé*); Panama.

Mus. S. & G., D.

New Granada; Bogota (*Lindig*).

Mus. Felder.

East Peru (*Bartlett*).

Mus. D.

The males of this species do not vary; but the female does, in the amount of yellowish-white markings on the anterior wing. This is a scarce species, Central America being its head quarters. I have only seen one specimen from Peru, which does not differ in any respect.

7. *P. MORETTA*, sp. n. (Plate LXI. figs. 1, 2.)

Form of *P. chrysophana*. Upperside—anterior wing of the male with the outer margin brownish black, not glossed with blue as in *chrysophana*, the basal part bright reddish brown, a black band from the costal margin to the end of the cell, from which a faint broken line crosses the wing to the anal angle; posterior wing brown, with the basal third reddish, slightly glossed with purple, three black spots between the base of the tail and the anal angle. Underside greyish, thickly irrorated with brown scales in some specimens, crossed beyond the middle by a waved brown band; both wings with a submarginal row of very minute white spots. The female is very like the female *P. halice* with all the white markings very small.

Exp. ♂  $1\frac{3}{4}$  inch, ♀ 2 inches.

*Hab.* Pernambuco.

Mus. D.

A very distinct and beautiful little species.

8. *P. RYPHEA*, Cram. (*Pap. r.*) Pap. Ex. t. 48. f. G, II (1779).

*Nymphalis ryphea*, Godt. Enc. Méth. ix. p. 365 (1823).

*Hab.* Mountains of Oaxaca, east side (*Fenochio*); Plochioic valley (*Hague*); Nicaragua (*T. Belt*); Costa Rica (*Van Patten*); Veragua (*Arcé*); Ecuador (*Simson*); Bolivia (*Buckley*); E. Peru (*Pearce* and *Whitely*); Venezuela (*Goering*).

Mus. S. G. & D.

This species has a very wide range; the largest specimens are from Ecuador and Bolivia. It does not show any variation worthy of note, except that the tails of the hind wing vary much in size

and length. One of the specimens sent by Dr. Staudinger is almost without tails, and the red band at the apex of the anterior wing is very much smaller than usual, also the posterior wing is slightly dentated on the outer margin. I think it quite likely, when we know the larva and can get bred specimens, we shall find that *P. ryphea* and *P. phidile* are the same.

9. *P. PHIDILE*, Hübn. Ex. Schmett. Zutr. f. 905, 906 (1837).

*P. erythema*, Bates, Journ. Ent. ii. p. 343 (1865).

*Hab.* Costa Rica (*Van Patten*); Veragua (*Arcé*); Panama, New Granada, East Peru (*Whitely*); Santarem (*H. H. Smith*); North Brazil (*Beske*); S. E. Brazil (*Rogers* and *Youds*). Mus. S. & G., D.

This species has a very wide range and varies to some extent. The specimens named by Mr. Bates I cannot distinguish in any way from Hübner's species. The specimens from Central America have the most colour on the posterior wing; in those from Peru and South Brazil the posterior wing is almost a dark brown. Some few specimens show indication of the tail on the posterior wing in the males, the same as *P. ryphea*. In fact it is difficult to say where one species stops and the other begins. I have a female from Pernambuco with a band of white spots across the underside of the posterior wing, but not differing in any other way.

10. *P. HELIE*, Linn. (*Pap. h.*) Syst. Nat. i. 2, p. 773 (1767); Clerck, Icones, t. 34. f. 3 (1764).

*Nymphalis helie*, Godt. Enc. Méth. ix. p. 365 (1823).

I know nothing exactly agreeing with the figure *Helie* in Clerck's Icones; I believe it to be a female either of *P. ryphea* or *P. phidile*; but for the present I think it better to keep them separate.

11. *P. EURYPHILE*, Feld. (*Nymphalis e.*) Wien. ent. Mon. vi. p. 119 (1862).

*Hab.* Cameta and Bahia.

Mus. S. & G.

A very distinct species.

12. *P. SOSIPPUS*, Hopff. Stett. ent. Zeit. 1874, p. 352.

*Hab.* E. Peru.

I have not seen this species.

13. *P. ANDRIA*, Scudd. (*Anæa, a.*) Bull. Buff. Soc. ii. p. 248. n. 59.

I have not seen this insect.

14. *P. CRATAIS*, Hew. Desc. Bolivian Butt. p. 9 (1874).

*Hab.* Bolivia (*Buckley*).

Mus. Hewitson.

This species is close to *P. glycerium*, but differs from it by its smaller size and by having a band of white spots across the underside of the posterior wing.

15. *P. GLYCERUM*, Doub. & Hew. Gen. D. L. t. 50. f. i. (1850); Morr. Syn. Lep. N. America, i. p. 67 (1862).

*Hab.* Mexico (*Boucard*); Guatemala (*Salvin*); Nicaragua (*Belt* and *Janson*); Costa Rica (*Van Patten*); Chiriqui and Veragua (*Arcé*); New Granada, Venezuela (*Goering*). Mus. S. & G., D.

The Mexican specimens are the smallest and darker-coloured, agreeing best with those from New Granada and Venezuela.

16. *P. ECHEMUS*, Doub. & Hew. (*Cymatogramma, e.*) Gen. D. L. t. 49. f. 4 (1850).

*Hab.* Honduras.

Mus. D.

This species is without doubt a *Paphia* closely allied to *P. verticordia*; it is still very rare in collections.

17. *P. VERTICORDIA*, Hubn. Zutr. Ex. Schmett. f. 559, 560 (1825).

*Hab.* Haiti (*Tweedie*).

Mus. S. & G.

This species is only found in Haiti.

18. *P. NOBILIS*, Bates, Ent. Mo. Mag. i. p. 162 (1864).

*Hab.* Guatemala, St. Geronimo, Plain of Salamá (*Salvin & Godman*). Mus. S. & G., D.

This splendid species is only found in the central valleys of Guatemala, where it entirely replaces *P. nessus*, its nearest South-American ally.

19. *P. NESSUS*, Latr. (*Nymph. n.*) Humb. & Bonpl. Obs. Zool. ii. p. 76, t. 35. f. 5, 6 (1811-1823).

♀ *Nymphalis cleodice*, Feld. Wien. ent. Mon. v. p. 109 (1861).

♂ *Nymph. tempe*, Feld. I. C. p. 110 (1861), vi. p. 111 (1862).

*Hab.* Bogota; Cosnipata valley, East Peru (*Whitely*); Ecuador and Bolivia (*Buckley*); Venezuela (*Moritz*). Mus. S. & G., D.

This species has a very wide range, but does not vary except in the red spot on the posterior wing; in some specimens it is entirely wanting, in others it is very distinct. This variation is not confined to specimens from one locality. It is a very common species throughout South America.

20. *P. NESEA*, Godt. (*Nymph. n.*) Enc. Méth. ix. p. 365 (1823).

*Nymphalis centaurus*, Feld. Reise Nov. Lep. iii. p. 447, t. 60. f. 5 (1867).

*Hab.* Bogota, New Granada (*Birchall*).

Mus. S. & G., D.

I have not seen a specimen of this species excepting from the above locality; it does not vary in the least. I have never seen the female, though the male is common and in most collections.

21. *P. TITAN*, Feld. (*Nymph. t.*) Reise Nov. Lep. iii. p. 447, t. 60. f. 4 (1867).

*Hab.* New Granada (*Birchell*); Costa Rica (*Van Patten*).

Mus. S. & G., D.

This is a rare species. A specimen from Costa Rica is larger, and much darker-coloured than those from New Granada.

22. *P. RUTILANS*, Butl. Ann. & Mag. N. Hist. ser. 4, vol. xv. p. 223 (1875).

*Hab.* E. Peru (*Whitely*).

Mus. B.

Very like *P. titan*, only smaller and without the tails to the hind wing.

23. *P. TYRIANTHINA*, Salv. & Godm. Ann. Nat. Hist. ser. 4. vol. ii. p. 148 (1868); Hew. Ex. Butl. iv. *Paph.* t. 2. f. 4, 1869.

*Hab.* Apolobamba, Bolivia (*Pearce*). Huasampilla, E. Peru (*Whitely*).

Mus. S. & G., D.

This beautiful species is still very rare; the female is unknown.

24. *P. CYANEA*, Salv. & Godm. Ann. Nat. Hist. ser. 4, vol. ii. p. 148 (1868); Hew. Ex. Butl. iv. *Paph.* t. 2. f. 5, 9 (1869).

*Hab.* Canelos, Ecuador (*Pearce*). Cosnipata, E. Peru (*Whitely*).

Mus. S. G.

Aguano, Ecuador (*Simson*).

Mus. D.

This species is quite unlike any other *Paphia* with which I am acquainted; it is still very rare. I have only seen the five specimens that are in our collections, all of which are males.

25. *P. ONOPHIS*, Feld. (*Nymph. o.*) Wien. ent. Mon. v. p. 110 (1861).

*P. onophis*, Bd. Lép. Guat. p. 50 (1870).

*Hab.* Tablelands of Guatemala (*Salvin*); Costa Rica (*Van Patten*), Veragua (*Arce*), New Granada (*Felder*), E. Peru (*Pearce*), Ecuador (*Buckley*).

Mus. S. & G., D.

This species is common throughout a very wide range of country, and does not vary to any extent; the specimens from New Granada are the largest and rather greener in colour. A specimen in Messrs. Salvin and Godman's collection from Guatemala is almost without the blue spots on the anterior wing.

26. *P. EUBÆNA*, Boisd. Lép. Guat. p. 50 (1870).

I have not seen this species, but doubt its being distinct from *P. onophis*.

27. *P. ARGINUSSA*, Hübn. (*Corycia, a.*) Zutr. Ex. Schmett. f. 705, 706 (1832).

*Hab.* Minas Geraes (*Rogers*).

Mus. S. & G.

This species is rare; I have only seen one specimen.

28. *P. AMENOPHIS*, Feld. (*Nymph. a.*) Reise Nov. Lep. iii. p. 449 (1867).

*Hab.* Guatemala (*Salvin*), New Granada (*Felder*), L. Amazons and E. Peru (*Whitely*).

Mus. S. & G., D.

This is a well-marked species, but varies much on the underside:

in some specimens the dark brown markings are very distinct ; in others they are almost wanting. A specimen in Dr. Staudinger's collection is much brighter blue than any I have seen. The type was from Bahia.

29. *P. PITHYUSA*, Feld. (*Nymph. p.*) Verh. zool.-bot. Ges. 1869, p. 473.

*P. œnomais*, Boisd. Lép. Guat. p. 51 (1870).

*Hab.* S. Mexico (*Boucard*), Guatemala (*Hague*), Veragua (*Arcé*, Costa Rica (*Van Patten*). Mus. S. & G., D.

The female of this species is much larger than the male, the base of the wings is bluer, and the spots on the anterior wing are larger and almost white. This is a scarce species, allied to *P. arginussa*, Hübn., of which I should consider it the Central-American representative.

30. *P. HERBACEA*, Butl. Cist. Ent. vol. i. p. 100 (1872).

*Hab.* Costa Rica (*Van Patten*).

Mus. D.

A well-marked species belonging to the *Arginussa* group.

31. *PAPHIA LEMNOS*, n. sp. (Plate LXI. fig. 3.)

Upperside blue-black : anterior wing the basal third dull blue, two blue spots near the apex, the first close to the margin, the second below and nearer the middle, followed by three spots in a straight line to the anal angle ; the third is minute : posterior wing dull, blue from the base to the middle of the outer margin, a small white spot just above the tail, which is short and blunt. Underside rich brown ; anterior wing crossed by two undulating bands of pale brown, thickly irrorated with dark brown, the first near the base quite narrow, the second beyond the middle extending to the apex and the anal angle, but not to the outer margin, which is dark brown ; posterior wing crossed by two dark brown bands, the first from the middle of the costal margin to nearly the inner margin, the second from the apex to the anal angle, two small silvery spots on the middle of the costal margin.

Exp. 2 inches.

*Hab.* Chanchamayo, E. Peru (*Thamm*).

Mus. Staudinger.

This is a well-marked species.

32. *P. APPIAS*, Hübn. (*Corycia a.*) Samml. ex. Schmett. (1816-1841).

*Hab.* Bogota (*Birchell*) S. Brazil (*Rogers*). Mus. S. & G., D.

The female of this species differs from the male in the same way as the sexes of *P. pithyusa* ; it is a rare species, but most common in S. Brazil.

33. *P. ARTACÆNA*, Hew. Exot. Butt. iv. *Paph.* t. 2. f. 6, 7 (1869).

*Hab.* Choctum, Vera Paz. (*Hague*); Nicaragua (*Belt and Janson*), Veragua (*Arcé*). Mus. S. & G., D.

The type was from New Granada, and differs from the five speci-

mens that I have before me in wanting the white spot near the apex of the anterior wing, also in the much blacker colour of the under-side. It is still a rare species, and in few collections.

34. *P. ERIBOTES*, Fab. (*Pap. e.*) Syst. Ent. p. 484 (1775); Don. Ins. Ind. t. 33. f. 3 (1800).

*Nymphalis eribotes*, Godt. Enc. Méth. ix. p. 356 (1823).

*Paphia eribotes*, Bates, Journ. Ent. ii. p. 340 (1865).

*P. leonida* ♀, Cram. Pap. Ex. iv. t. 388. f. E. F. (1782).

*Hab.* Para (*Bates*).

Mus. S. & G.

Santarem (*H. H. Smith*), Guiana (*Deyrolle*).

Mus. D.

There can be little doubt that Mr. Bates was quite correct in stating that the female is the species figured by Cramer; those sent by Mr. Smith agree with his specimens in every respect. This species is only found on the Lower Amazons.

35. *P. PORPHYRIO*, Bates, Journ. Ent. ii. p. 340 (1865).

*Hab.* Para, Santarem, Obydos, Tapajos (*Bates*). Mus. S. & G.

This is a very common species on the Lower Amazons; the specimen from Obydos differs from all the others by being much redder in colour on the outer margins of all the wings.

36. *P. XENOCLES*, Westw. Gen. D. L. p. 319, n. ii. note (1850).

*Hab.* Costa Rica (*Van Patten*), Chiriqui and Veragua (*Arcé*), New Granada (*Birchell*), Minas Geraes (*Rogers*), Venezuela (*Goering*).

Mus. S. & G., D.

This species has a very wide range, but does not show variation to any extent; the specimens from Chiriqui are almost identical with those from Minas Geraes, and are brighter blue than those from New Granada &c.

37. *P. OCTAVIUS*, Fabr. (*Pap. o.*) Ent. Syst. iii. 1, p. 73 (1793); Don. Ins. Ind. t. 29. f. 2 (1800).

I have never seen this insect, and do not know any species in the least like the figure; it is said to come from India, which must, of course, be a mistake.

38. *P. MORVUS*, Fab. (*Pap. m.*) Syst. Ent. p. 484 (1775).

*Nymphalis morvus*, Godt. Enc. Méth. ix. p. 367 (1823).

*Paphia morvus*, Bates, Journ. Ent. ii. p. 341 (1865).

*P. arachne*, Cram. Pap. Ex. i. t. 48. f. A, B. (1779).

*Anœa acidalia*, Hübn. Verz. bek. Schmett. p. 48 (1816).

♀ *Paphia laertes*, Cram. Pap. Ex. i. t. 73. f. C, D (1779).

*Nymphalis laertia*, Godt. Enc. Méth. ix. p. 367 (1823).

*Hab.* Amazons (*Bates*).

Mus. S. & G.

Chiriqui (*Ribbe*).

Mus. Staudinger.

The specimen sent me by Dr. Staudinger is a little smaller than those from the Amazons, but otherwise the same. This species has a wide range, and varies to some extent.

## 39. PAPHIA FLORITA, n. sp. (Plate LXI. fig. 4.)

Upperside brownish blue, brightest at the base of all the wings; anterior wing, the apical half blackish with two small blue spots near the costal margin. Underside pale brown irrorated with brown and white scales; anterior wing crossed from the apex to the middle of the inner margin by an ill-defined white line; posterior wing darkest from the base to beyond the middle, with a submarginal row of six indistinct white spots.

Exp.  $1\frac{3}{4}$  inch.

*Hab.* Chanchamayo (*Thamm*).

Mus. Staudinger.

This species is close to *P. morvus*, but much smaller. It may be the Peruvian form of that species.

40. P. GLAUCE, Feld. (*Nymph. g.*) Wien. ent. Mon. vi. p. 119 (1862).

*Paphia glauce*, Bates, Journ. Ent. ii. p. 342, t. 13\*. f. 2 (1865).

*Hab.* St. Paulo (*Bates*), E. Peru (*Whitely*), Santarem (*H. Smith*).

Mus. S. & G., D.

A well-marked species allied to *P. xenocles*, but varies to some extent in colour, some specimens being more blue than others, also in the size of the spots near the anal angle of the anterior wing. The female is quite a different-looking insect, and has not been described. The upperside is dark brown with the base of all the wings violet-blue; the anterior wing has four white spots, the first beyond the middle on the costal margin, the second and third (which is minute) near the apex, and one below near the middle; posterior wing with a submarginal row of six or seven white spots, black on their outer margin. Underside, like the male, but much paler in colour.

41. P. GLAUCONE, Feld. (*Nymph. g.*). Wien. ent. Mon. vi. p. 119 (1862).

*Hab.* St. Paulo (*Bates*); Aguano, Ecuador (*Simson*).

Mus. S. & G., D.

This species is still rare, and appears to be intermediate between *P. xenocles* and *glauce*.

42. P. CICLA, Moschl. (*Anœa c.*) Verh. z.-b. G. Wien, vol. xxvi. p. 319, t. 3. f. 10 (1876).

I have not seen this species, and do not feel sure I have put it in its right place.

43. P. HEDEMANNI, Feld. (*Nymph. h.*). Verh. zool.-bot. Ges. 1869, p. 473.

*Hab.* Potrero, Mexico (*Hedemann*).

Mus. Vindob.

I have not seen this species, and cannot make it out from the description.

## 44. P. ALBERTA, Druce, P. Z. S. 1876, p. 234, pl. xviii. f. 6.

*Hab.* E. Peru.

Mus. D.

I have only seen one specimen of this curious species; it is best



placed with the *Glauce* group, though in form it resembles *P. pasibula* without tails.

45. *P. PRAXIAS*, Hopff. Stell. ent. Zeit. vol. xxxiv. p. 355 (1874).

*Hab.* Peru.

I have not seen this species.

46. *P. MÆRIS*, Feld. (*Nymph. m.*) Reise Nov. Lep. iii. p. 449, t. 60. f. 2 (1867).

*Hab.* New Granada.

Mus. S. & G., D.

Also in the collection of Dr. Staudinger, from Columbia. This species is a well-marked one; and so far as we know, it only occurs in New Granada. It is allied to *P. iphis*, but very distinct.

47. *P. BEATRIX*, Druce, Cist. Ent. vol. i. p. 287 (1874).

*Hab.* Chiriqui (*Arcé*).

Mus. S. & G.

I have only seen a single specimen of this species; but it is very distinct from any other that I am acquainted with.

48. *P. CLEOMESTRA*, Hew. Ex. Butt. iv. *Paph.* t. 2. f. 8, 10 (1869).

*Hab.* Nicaragua (*T. Belt*), Veragua (*Arcé*). Mus. S. & G., D.

This fine species is still rare; I have only seen a few specimens.

49. *P. IPHIS*, Latr. (*Nymph. i.*). Humb. & Bonpl. Obs. Zool. ii. p. 80 (1833).

*Nymphalis thamyris*, Latr. l. c. t. 36. f. 3, 4 (1833).

*Hab.* Guatemala (*Salvin*), Nicaragua (*T. Belt*), Costa Rica (*Van Patten*), Chiriqui and Veragua (*Arcé*), Panama (*Boucard*), New Granada (*Birchell*), E. Peru (*Whitely*), Bolivia (*Pearce*), Upper and Lower Amazons (*Bates and Smith*). Mus. S. & G., D.

This species has a very wide range, and varies to some extent. I have examined a very large series from the above-given localities, and find that the specimens from Guatemala, Nicaragua, and Costa Rica are small, and in most instances the blue spots near the apex of the anterior wing are indistinct. Those from Chiriqui and Veragua are larger and become more like the typical form from New Granada, though they vary considerably in colour and the spots of the anterior wing. Three specimens in Dr. Staudinger's collection, labelled Columbia, are on the upperside much darker blue, and the spots almost gone; but on the underside they are the same. I do not consider this variation of any specific value; and, unless I were to make species by the score, which I do not think would be advisable, I must look upon them as differences caused by the influence of climate and food of the larva, &c.

50. *P. ATEs*, n. sp. (Plate LXI. fig. 5.)

Upperside black, the basal third of the anterior wing, a spot on the costal margin beyond the middle, two below, nearest the apex, and two near the anal angle bright green; posterior wing greenish black,

brightest at the base, a submarginal row of small greenish-white spots. Underside dark brown, thickly irrorated with grey scales.

Exp.  $2\frac{1}{3}$  inches.

*Hab.* Bolivia (*Buckley*), Rio (*Beske*). Mus. Hewitson & Druce.

Also in the collection of Dr. Staudinger: his specimen is rather more blue than ours on the upperside. This species is near *P. iphis*, but quite distinct.

51. *P. CEREALIA*, n. sp. (Plate LXI. fig. 6.)

Upperside dull greenish black, brightest at the base of the anterior wing, two green spots close to the apex, the first the largest. Underside bright chestnut-brown thickly speckled with white scales; anterior wing crossed from the apex to the middle of the inner margin by a whitish band, becoming wide and yellowish in colour near the anal angle; posterior wing with three white spots across the middle, all the wings with a submarginal row of minute white spots, and the outer margins greyish.

Exp.  $2\frac{1}{4}$  inches.

*Hab.* Chanchamayo (*Thamm*).

Mus. Staudinger.

52. *P. PHILA*, n. sp. (Plate LXI. fig. 7.)

On the upperside this species is like *P. ates*, but rather more blue; and on the underside it is the same as *P. odilia* with tails, but rather darker in colour.

Exp. 2 inches.

*Hab.* Bogota (*Nolcken*).

Mus. Staudinger.

A most curious species.

53. *P. BOLIVIANA*, n. sp. (Plate LXII. figs. 1, 2.)

Upperside (*male*) deep bluish black, palest at the base of the anterior wing, a band of three small spots crossing the wing near the apex from the costal to the inner margin. Underside dark shining brown irrorated with a few greyish scales. *Female*. Upperside dark brown, with the base of all the wings bright violet-blue, the spots near the apex the same as in the male. Underside, the same as the male, but much paler brown, with three greyish spots between the tail and the anal angle.

Exp. ♂  $2\frac{1}{2}$ , ♀ 3 inches.

*Hab.* Bolivia (*Buckley*).

Mus. Hewitson, Smith, and Druce.

A very distinct species; the spots on the anterior wing vary slightly in size.

54. *P. PSAMMIS*, Feld. (*Nymph. p.*) Reise Nov. Lep. iii. p. 448 (1867).

*Hab.* Amazons and New Granada.

Mus. Hewitson and B.M.

55. *P. STHENO*, Prittw. Stett. ent. Zeit. 1865, p. 142.

*Hab.* S.E. Brazil.

Mus. S. & G., D.

I am indebted to Dr. Staudinger for kindly sending me the type of this species to compare with our specimens. The specimens from

Paraguay, in Mr. Salvin's collection, I cannot separate from this species.

56. *P. OTRERE*, Hübn. Zutr. Ex. Schmett. f. 407, 408 (1825).

*Hab.* Rio (*J. Yonds*).

Mus. S. & G., D.

This is a very distinct and well-marked species.

57. *P. UZITA*, n. sp. (Plate LXIII. fig. 1.)

Upperside dark bluish black, glossed with dark blue, from the base of all the wings to beyond the middle. Underside dark brown irrorated with grey and white scales; anterior wing crossed from the apex to the anal angle by a band of reddish brown, narrow in the middle and broad at the anal angle; posterior wing crossed in the middle by a row of four reddish-brown spots.

*Exp.*  $1\frac{1}{2}$  inch.

*Hab.* Cayenne.

Mus. Staudinger.

This is the smallest species of *Paphia* that I have seen.

58. *P. PLEIONE*, Godt. (*Nymph. p.*), Enc. Méth. ix. p. 366 (1823).

I have never seen this species; it is said to have come from the Antilles.

59. *P. PHILUMENA*, Doub. & Hew. Gen. D. L. t. 50. f. 2 (1850).

*P. leuctra*, Feld. (*Nymph. l.*), Wien. ent. Mon. vi. p. 119 (1862).

*P. hauxwelli*, Druce, Trans. Ent. Soc. 1874, p. 158.

*Hab.* St. Paulo (*Bates*), U. Amazons (*Hauxwell*), E. Peru (*Whitely*).

Mus. S. & G., D.

This species varies much in size and colour; it is still rare in collections.

60. *P. LORNA*, n. sp. (Plate LXII. fig. 3.)

Upperside deep black; anterior wing greenish at the base, crossed near the apex from the costal to the outer margin, then nearly to the anal angle, by a broken grey-green band dentate on the inner margin; posterior wing with the outer margin and the tail grey-green, the fringe of all the wings white and brown. Underside dark glossy brown, thickly irrorated with grey scales, especially at the apex of the anterior wing.

*Exp.* 3 inches.

*Hab.* Bolivia (*Buckley*).

Mus. Hewitson.

A fine and distinct species.

61. *P. PLACIDA*, n. sp. (Plate LXII. fig. 4.)

Upperside deep black-greenish at the base of the anterior wing. On the upperside this species is very like *P. lorna*, but differs in the following respects: the band of the anterior wing is smaller and close to the apex, it does not extend beyond the middle of the outer margin, where it is very narrow; the posterior wing the same as *P.*

*lorna*, with the grey-green margin not half the width. On the underside this species is a very different-looking insect, it is dark brown thickly irrorated with black, the anterior wing is crossed by a pale brown band from the apex to the middle of the inner margin; the posterior wing crossed in the middle by a row of four pale brown spots, the first close to the costal margin, the second in the middle, and the third and fourth close to the anal angle.

Exp.  $2\frac{3}{4}$  inches.

*Hab.* Bolivia (*Buckley*).

Mus. Hewitson.

I am much inclined to think that this species will prove to be an extreme form of the last described, but for the present I think it better to give it a name.

62. *P. GRANDIS* ♀, n. sp. (Plate LXII. fig. 5.)

Upperside black; anterior wing, from the base to the middle, bright silvery blue, two small blue spots near the apex, the first close to the costal margin, the second below nearer the outer margin; posterior wing silvery blue from the base to beyond the middle, the tails with a few greyish scales. Underside bright ochreous yellow irrorated with white and brown scales; anterior wing, a dark brown band in the middle cell, and several dark spots between the end of the cell and the outer margin, which is whitish at the anal angle, and a submarginal row of minute white spots; posterior wing crossed beyond the middle by a waved indistinct silvery white line, a dark brown spot in the cell, and a submarginal row of white spots, the first two minute, the next three large, with black centres, the others minute, the tail dark brown.

Exp.  $3\frac{1}{4}$  inches.

*Hab.* ?

Mus. Staudinger.

A very fine species; the underside is more easily figured than described. It is allied to *P. proserpina*.

63. *P. OFFA*, n. sp. (Plate LXIII. fig. 2.)

Upperside brownish black, from the base to the middle of all the wings pale blue; anterior wing crossed nearly to the outer margin by a band of pale blue; posterior wing with a submarginal row of minute white spots, the tail greyish. Underside bright reddish brown, thickly irrorated with white scales.

Exp.  $2\frac{3}{4}$  inches.

*Hab.* Ecuador.

Mus. Hewitson.

A fine species allied to *P. grandis*.

64. *P. CLUVIA*, Hopff. Stett. ent. Zeit. vol. xxxiv. p. 354 (1874).

*Hab.* E. Peru.

I have not seen this species.

65. *P. CATINKA*, n. sp. (Plate LXIII. fig. 3.)

Upperside black; anterior wing from the base to beyond the middle bluish white, darkest at the base, a white band nearly

crossing the wing from the costal margin to the outer margin; posterior wing with the basal half bluish white. Underside brown, palest on the outer half of the anterior wing, thickly irrorated with brown scales.

Exp.  $2\frac{3}{4}$  inches.

Hab. ?

Mus. Hewitson.

A very distinct species, quite unlike any other with which I am acquainted.

66. *P. MORTA*, n. sp.

Upperside brownish black, the basal half of all the wings bright blue; on the upperside this species very closely resembles *P. offa* without the submarginal row of spots on the posterior wing. The underside is very different; it is pale greenish brown irrorated near the base of the anterior wing with a few white scales, both wings crossed beyond the middle from the apex to the abdominal margin by a waved band of pale ochreous colour.

Exp.  $2\frac{1}{2}$  inches.

Hab. Corosal, Honduras (*Roe*).

Mus. S. & G.

67. *P. VICTORIA*, n. sp. (Plate LXIII. figs. 4, 5.)

Upperside (*male*)—anterior wing black, from the base to the middle blue, two blue spots close to the apex; posterior wing glossy blue-black. Underside light olive-brown thickly irrorated with white scales. *Female* the same as the male, but larger, with the outer margin and the tails of the posterior wing greyish.

Exp. ♂  $2\frac{1}{4}$ , ♀  $2\frac{1}{2}$  inches.

Hab. Rio (*J. Youds*).

Mus. S. & G.

68. *P. CHÆRONEA*, Feld. (*Nymph. c.*) Wien. ent. Mon. v. p. 110 (1861); Reise Nov. Lep. iii. t. 60. f. 1 (1867).

Hab. New Granada (*Felder* and *Birchell*). Mus. S. & G., D.

This fine species is peculiar to New Granada. It does not vary in any way.

69. *P. PROSERPINA*, Salv. Ann. Nat. Hist. ser. 4, vol. iv. p. 181 (1869).

*P. pedile*, Druce, Cist. Ent. vol. i. p. 287 (1874).

Hab. Valley of the Polochic, Guatemala (*Hague*). Mus. S. & G.  
Costa Rica (*Van Patten*). Mus. D.

One of the largest described species of *Paphia*.

70. *P. INDIGOTICA* ♂, Salv. Ann. Nat. Hist. ser. 4, vol. iv. p. 180 (1869).

*P. zelica* ♀, Salv. Ann. Nat. Hist. ser. 4, vol. iv. p. 180 (1869).

Hab. Costa Rica, ♂ (*Van Patten*); Chiriqui, ♂ (*Arce*); Veragua, ♂ ♀ (*Arce*); Panama, ♂ (*Boucard*). Mus. S. & G., D.

This species is allied to *P. chæronea*, Feld., but quite distinct. I have little doubt that the specimen named *P. zelica* by Mr. Salvin is the

female of this species: the undersides are the same; but, above they are very different. Of the males we have a good series: but the female is very rare; I only know of three specimens.

71. *P. XENICA*, Bates, Ent. Mo. Mag. i. p. 163 (1864).

*Hab.* Polochic valley, Guatemala (*Salvin*).

Mus. S. & G.

I have not seen the male of this species, but should expect it to be black, very like the male of *P. indigotica*.

72. *P. BASILICA*, Cram. (*Pap. b.*) Pap. Exot. iv. t. 329. f. E, F (1782).

*Hab.* St. Paulo (*Bates*).

Mus. S. & G.

This is a rare species; I only know of the specimens taken by Mr. Bates.

73. *P. PHANTES*, Hopff. Stett. ent. Zeit. 1874, p. 353.

*Hab.* Chanchamayo, E. Peru (*Thamm*). Mus. Staudinger & Druce.  
This species is close to *P. basilica*, Cr.

74. *P. MEMPHIS*, Feld. (*Nymph. m.*), Reise Nov. Lep. p. 448 (1867).

*Hab.* New Granada.

Mus. Brit.

75. *P. MORA*, Druce, Cist. Ent. vol. i. p. 289 (1874).

*Hab.* Guatemala and New Granada. Mus. S. & G., Staudinger, D.

The Guatemala specimens are rather more purple in colour, but do not differ in any other respect.

76. *P. CAMBYSES*, n. sp.

Upperside deep black; anterior wing, the basal third bluish green, two small spots close to the apex green; posterior wing from the base to beyond the middle bluish green, a submarginal row of five indistinct green spots, the anal angle and the inner margin rufous brown. Underside dark rufous brown, thickly speckled on the anterior wing at the base, costal margin, and apex with greyish white scales; posterior wing, the base and inner margin irrorated with white, a submarginal row of minute white spots.

Exp. 3 inches.

*Hab.* Chanchamayo (*Thamm*), E. Peru (*Whitely*).

Mus. Staudinger and D.

77. *P. LYCEUS*, n. sp. (Plate LXIII. fig. 6.)

Upperside black; all the wings from the base to the middle bright azure-blue, a minute indistinct blue spot close to the apex. Underside rich brown thickly irrorated with greyish white scales; anterior wing crossed from the apex to the inner margin by a band of dark brown bordered outwardly with grey; posterior wing crossed by three indistinct bands of dark brown, the first close to the base, the second below the middle, and the third nearest the outer margin.

Exp.  $2\frac{3}{4}$  inches.

*Hab.* New Granada, Ecuador. Mus. Staudinger, Smith, Druce.  
A very distinct and beautiful species; the specimen in Mr. Smith's collection is the smallest I have seen.

78. *P. ODILIA*, Cram. (*Pap. o.*) Pap. Ex. iv. t. 329. f. C, D. (1782).

*Papilio polycarnes*, Fab. Syst. Ent. p. 484 (1775).

*Nymphalis polycarnes*, Godt. Enc. Méth. ix. p. 367 (1823).

*Nymphalis odilia*, Feld. Wien. ent. Mon. vi. p. 120 (1862).

*Hab.* Ega and St. Paulo (*Bates*).

Mus. S. & G.

Bolivia (*Buckley*).

Mus. Hewitson.

This is still a rare species.

79. *P. NENIA*, n. sp. (Plate LXIV. fig. 4.)

Upperside dull black, slightly shaded with purple at the base of the wings, and on the outer margin of the posterior wing. Underside glossy grey-brown, thickly irrorated with white scales.

Exp. 3 inches.

*Hab.* St. Paulo (*Rogers*).

Mus. Hewitson & Smith.

On the upperside this species closely resembles *P. odilia*; but its greater size and very different underside at once show that it is a distinct species.

80. *P. LAURA*, n. sp.

Upperside dark greenish black, brightest at the base of the anterior wing. Underside rich chestnut-brown irrorated with silvery white scales; a large silver-white spot on the costal margin of the posterior wing nearest the apex, from which a waved band of white scales crosses the wing to the inner margin, and a submarginal row of minute white spots.

Exp.  $2\frac{3}{4}$  inches.

*Hab.* Veragua (*Arcé*).

Mus. S. & G.

On the upperside this is the darkest-coloured species with which I am acquainted.

81. *P. ANASSA*, Feld. (*Nymph. a.*) Wien. ent. Mon. vi. p. 120 (1862).

*P. ada*, Butler, Ann. Nat. Hist. ser. 4, vol. xv. p. 222 (1875).

*Hab.* Veragua (*Arcé*), New Granada (*Chesterton* and *Birchell*).

Mus. S. & G., D.

A very distinct species.

82. *P. LINEATA*, Salv. Ann. Nat. Hist. ser. 4, vol. iv. p. 179 (Sept. 1869).

*P. vestina*, Hew. Equat. Lep. p. 31 (Dec. 1869).

*P. betillina*, Hopff. Stett. ent. Zeit. vol. xxxv. p. 354 (1874).

*Hab.* Apolobamba, N. Bolivia (*Pearce*).

Mus. S. & G.

Ecuador (*Buckley*).

Mus. Hewitson.

Chanchamayo (*Thamm*).

Mus. Staudinger.

This is still a rare and little-known species.

83. *P. AMBROSIA*, Druce, Cist. Ent. vol. i. p. 288 (1874).

*Hab.* Chiriqui (*Arcé*).

Mus. S. & G., D.

84. *P. PHŒBE*, n. sp. (Plate LXIV. fig. 1.)

This species is closely allied to *P. ambrosia*, but differs in the following respects:—The upperside is blacker and without the green scales at the base of the wings; the band near the apex and grey-green margin to the anterior and posterior wing is not broken into spots, as in *P. ambrosia*; the fringe is white instead of brown; the underside is much richer brown, with the markings as nearly as possible the same as *P. ambrosia*.

Exp.  $3\frac{1}{2}$  inches.

*Hab.* Bolivia (*Buckley*).

Mus. Hewitson.

A very fine species, sent by Mr. Buckley in his last collection.

85. *P. POLYXO*. (Plate LXIV. fig. 2.)

*P. polyxo*, Druce, Cist. Ent. vol. i. p. 288 (1874).

*Hab.* Rio (*Beske*).

Mus. D.

R. Ucayali.

Mus. S. & G.

E. Peru (*Thamm*).

Mus. Staudinger.

Bolivia (*Buckley*).

Mus. Hewitson and Smith.

86. *P. AUREOLA*, Bates, Ent. Mo. Mag. iii. p. 152 (1866).

*Hab.* Guatemala (*Salvin*).

Mus. S. & G., D.

New Granada (*Birchell*).

Mus. Smith.

This is a splendid species, quite unlike any other. The female is very curious, having a broad white band across the anterior wing. It is still very rare.

87. *P. PASIBULA*, Doubl. & Hew. Gen. D. L. t. 50. f. 3 (1850).

*Hab.* New Granada (*Crowther* and *Birchell*). Mus. S. & G., D.

This species does not seem to occur out of New Granada; it is a common insect from Bogota.

88. *P. FALCATA*. (Plate LXIV. fig. 5.)

*P. falcata*, Hopff. Stett. ent. Zeit. 1874, p. 353.

*Hab.* Chanchamayo, E. Peru (*Thamm*).

Mus. Staudinger.

Bolivia (*Buckley*).

Mus. Hewitson.

A most beautiful species; allied to *P. pasibula*, but very distinct. The specimen sent by Mr. Buckley is smaller than Dr. Staudinger's.

89. *P. XENOCRATES*, Westw. Gen. D. L. p. 319. no. 13, note (1850); Ménétr. Cat. Mus. Petersb. Lep. ii. t. 9. f. 5 (1857).

*Hab.* E. Peru (*Whitely*).

Mus. S. & G., D.

The four specimens of this species that I have examined are from Peru. The type is said to have come from Venezuela.



90. P. PANARISTE, Hew. Exot. Butt. i. *Paphia* & *Siderone*, f. 3 (1856).

New Granada (*Chesterton*).

Mus. S. & G., D.

A very beautiful species, very unlike any other, and belonging to a little group almost entirely Central-American.

91. P. BERTHA. (Plate LXIV. fig. 3.)

*P. berthæ*, Druce, Cist. Ent. vol. i. p. 359 (1875).

*Hab.* New Granada (*Chesterton*).

Mus. D.

I have only seen a single specimen of this fine species.

92. P. JANSONI, Salv. Ann. Nat. Hist. ser. 4, vol. vii. p. 175 (1871).

*Hab.* Nicaragua (*Belt* and *Junson*). Mus. S. & G. and Hewitson.

93. P. EXCELLENS, Bates, Ent. Mo. Mag. i. p. 162 (1864).

*Hab.* Guatemala, central valleys (*Godman* & *Salvin*).

Mus. S. & G., D.

This beautiful species is extremely rare; I only know of the specimens taken by Messrs. Salvin and Godman.

94. P. ELECTRA, Westw. Gen. D. L. p. 319. no. 12, note (1850); Hew. Ex. Butt. i. *Paphia* and *Siderone*, f. 1. 2. (1856).

*Hab.* Vera Paz (*Hague*); Polochic valley, Guatemala.

Corosal, Honduras (*Roe*); Costa Rica (*Van Patten*); Chiriqui (*Arcé*).

Mus. S. & G., D.

The Honduras specimen is the smallest I have seen. This species is the commonest of the group, and has a pretty wide range in Central America. I have not seen it from Mexico, Corosal being the most northern point from which we have received it.

95. P. CALLIDRYAS, Feld. (*Nymph. c.*) Verh. zool.-bot. Ges. 1869, p. 474.

*Hab.* Rio Polochic, Guatemala.

Mus. S. & G.

A very curious species, reminding one at first sight of a *Callidryas*. It is extremely rare; I have only seen the single specimen in Messrs. Godman and Salvin's collection.

The last six species are very different from all the other *Paphia*; the bodies are more slender, the anterior wing is much more arched, and the apex terminates in a hook; the posterior wing has two tails. In form they very closely resemble *Hypna huebneri*.

The subjoined Table will show at a glance the distribution of the species of this genus of Lepidoptera.



TABLE (continued).

	Central America.								South America.								West Indies.							
	N. America: Texas.	Mexico.	Guatemala.	Honduras.	Nicaragua.	Costa Rica.	Chiriqui.	Veragua.	Panama.	N. Granada.	Ecuador.	E. Peru.	Bolivia.	Chili.	Venezuela.	Guiana.	U. Amazons.	L. Amazons.	N. Brazil.	S.E. Brazil.	Cuba.	Jamaica.	Haiti.	
<i>Paphia</i>																								
<i>phila</i>										*														
<i>boliviana</i>												*												
<i>psammes</i>										*														
<i>sthenos</i>																								
<i>otrore</i>																								
<i>uzita</i>															*									
<i>pleione</i>																								
<i>philumena</i>											*						*							
<i>lorna</i>											*	*												
<i>placida</i>											*	*												
<i>grandis</i>												*												
<i>offa</i>											*													
<i>cluvia</i>											*													
<i>catinka</i>																								
<i>morta</i>				*																				
<i>victoria</i>																						*		
<i>charonea</i>										*														
<i>proserpina</i>			*			*																		
<i>indigotica</i>						*	*	*	*															
<i>xenica</i>			*																					
<i>basilica</i>																	*							
<i>phantos</i>											*													
<i>memphis</i>										*														
<i>mora</i>			*							*														
<i>cambyses</i>											*													
<i>lyceus</i>										*	*													
<i>odilia</i>												*					*							
<i>nenia</i>																								
<i>laura</i>								*												*				
<i>anassa</i>									*															
<i>lineata</i>									*	*	*	*												
<i>ambrosia</i>							*																	
<i>phoebe</i>											*	*	*	*	*	*	*	*	*	*	*	*	*	*
<i>polyxo</i>											*	*	*	*	*	*	*	*	*	*	*	*	*	*
<i>aureola</i>			*						*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
<i>pasibula</i>									*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
<i>falcata</i>									*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
<i>xenocrates</i>									*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
<i>panariste</i>									*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
<i>bertha</i>									*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
<i>jansoni</i>					*																			
<i>excellens</i>		*	*																					
<i>electra</i>	*	*	*		*	*																		
<i>callidryas</i>	*	*	*																					

EXPLANATION OF THE PLATES.

PLATE LXI.

- Fig. 1, 2. *Paphia moretta*, p. 634.
- 3. — *lemnos*, p. 638.
- 4. — *florita*, p. 640.

- Fig. 5. *Paphia ates*, p. 641.
- 6. — *cerealia*, p. 642.
- 7. — *phila*, p. 642.

PLATE LXII.

- Fig. 1, 2. *Paphia boliviana*, p. 642.
- 3. — *lorna*, p. 643.

- Fig. 4. *Paphia placida*, p. 643.
- 5. — *grandis*, p. 644.

## PLATE LXIII.

- Fig. 1. *Paphia uzita*, p. 643.  
 2. — *offa*, p. 644.  
 3. — *catinka*, p. 644.

- Fig. 4, 5. *Paphia victoria*, p. 645.  
 6. — *lyceus*, p. 646.

## PLATE LXIV.

- Fig. 1. *Paphia phæbe*, p. 648.  
 2. — *polyxo*, p. 648.  
 3. — *bertha*, p. 649.

- Fig. 4. *Paphia nenia*, p. 647.  
 5. — *falcata*, p. 648.

8. Description of a new Species of *Numida*. By A. D. BARTLETT, Superintendent of the Society's Gardens.

[Received June 19, 1877.]

(Plate LXV.)

Having had some correspondence with the owner of some Guinea-fowl (Mr. Gerald Waller) that were on their way to this country from East Africa, and having offered to take charge of them on their arrival, in order to restore them from the effects of the voyage, on the 4th of June I received five living birds, three Crested (*Numida cristata*) and two Vulturine (*N. vulturina*). Mr. Waller informed me that a sixth bird, which he believed to be a male, had died on the passage, and that the skin in a mutilated condition was then in his possession; and he kindly gave it to me upon my telling him it might prove to be a very interesting specimen.

On examining the skin, it struck me at once to be unlike any thing I had seen. I therefore examined the splendid work by Mr. Elliot, and came to the conclusion that I had found a new and hitherto undescribed species of *Numida*.

After a careful examination of Mr. Elliot's work, I wrote to Colonel Grant to ask if the figure of *Numida granti*, which came nearest to my bird, quite agreed with his original drawing. Colonel Grant has this day kindly shown me the original coloured drawing, and convinced me that the bird originally figured belonged to a species easily distinguished from the bird now before you, which, I have been informed by Mr. Waller, was obtained at Mombassa, on the east coast of Africa.

This bird differs from *Numida granti* (to which species it appears most nearly allied), by the entire absence of the *black ring* or *collur* and *black patch on front of the neck*. The whole of the *neck, breast, belly, back, upper and under tail-coverts* are finely and minutely spotted with white on a black ground.

The sketch (Plate LXV.) fairly shows the *colour of the face and wattles* at the time it came into my hands. I may state that the blue wattles differ considerably from the same parts in *N. cristata*, being *much longer* and falling *lower down*; the bird appears smaller than the last-named species.

It may be interesting to know that the three Crested birds that came, as Mr. Waller tells me, from Mozambique, differ from all the figures of *N. cristata* in having the throat up to the edge of the under mandible *covered with black feathers*. I consider them to be young birds, and that the throat will (as the birds become adult) lose these feathers and exhibit the naked red skin, so well marked in the figure in Mr. Elliot's work.

I propose the name of *Numida ellioti* for this new bird, after Mr. D. G. Elliot, F.Z.S., who has devoted so much time and attention to this interesting family.



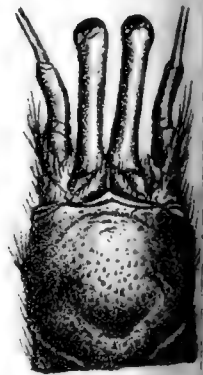
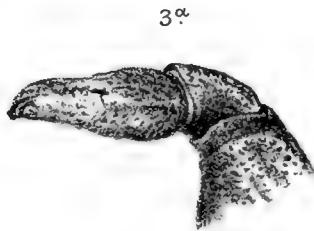
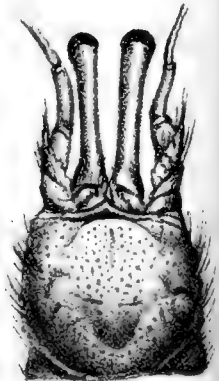
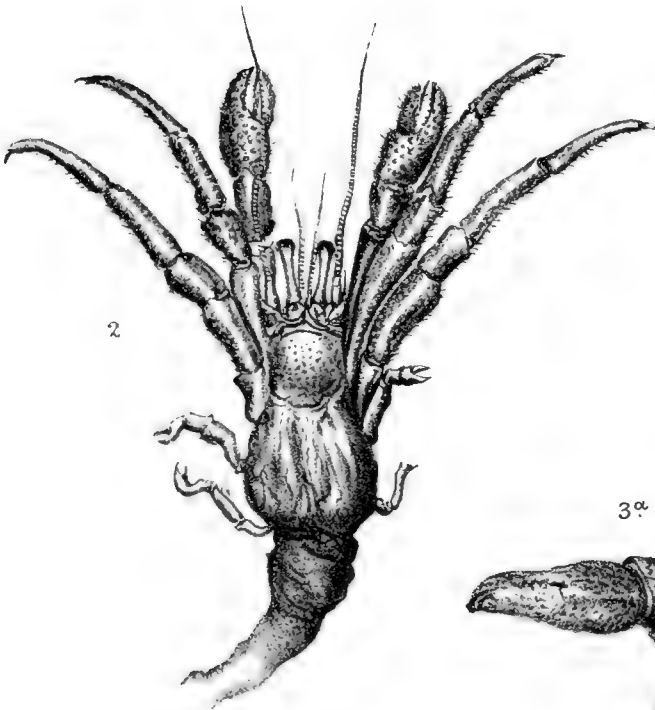
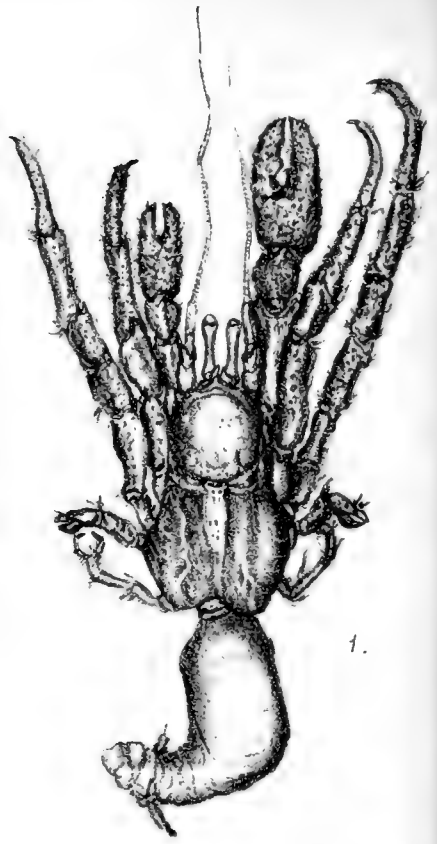
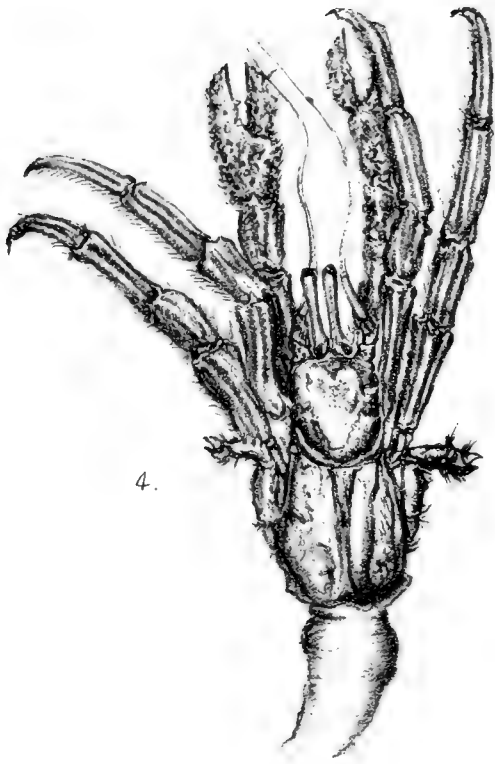
J.Smit lith

Hanhart imp

NUMIDA ELLIOTI







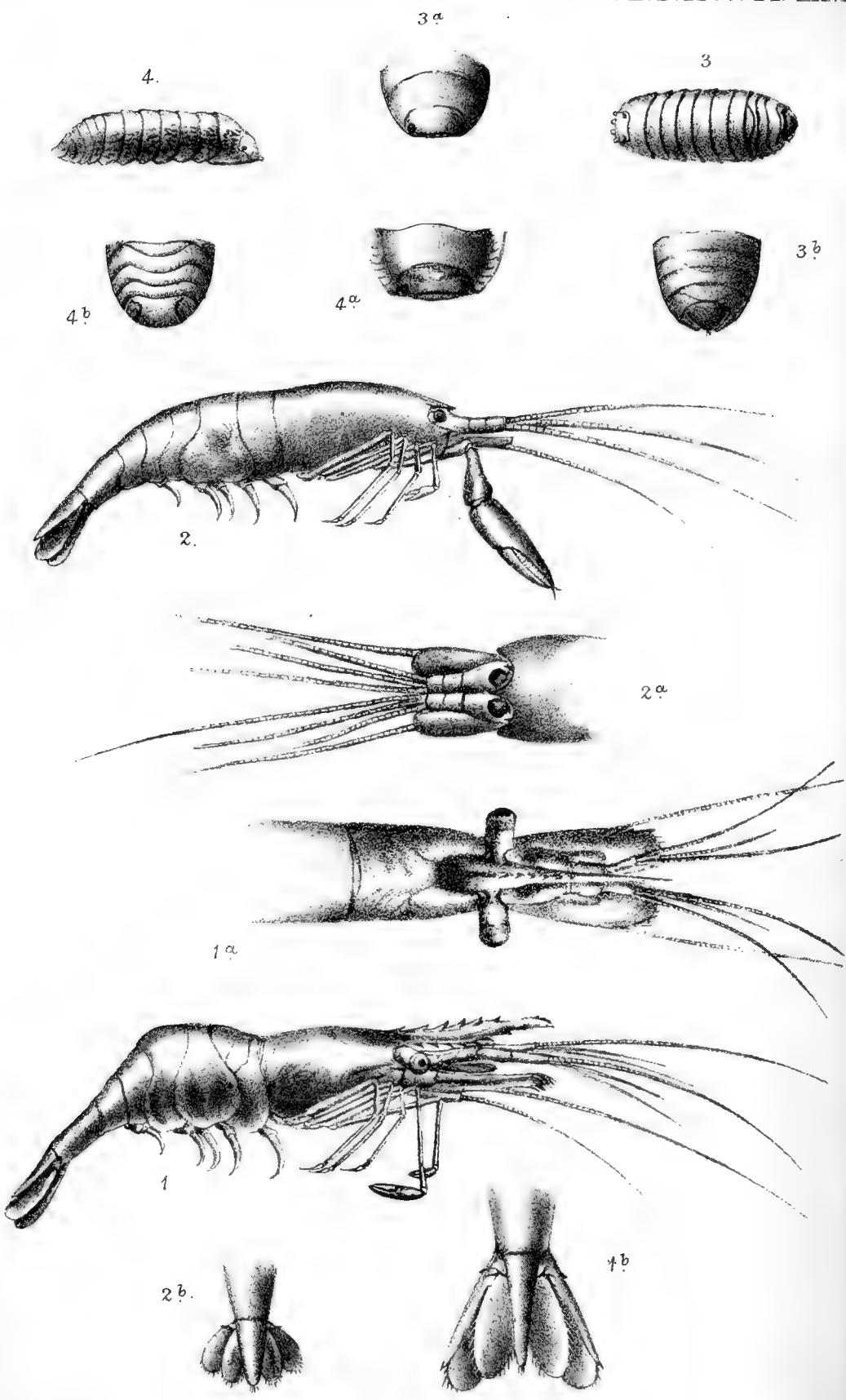
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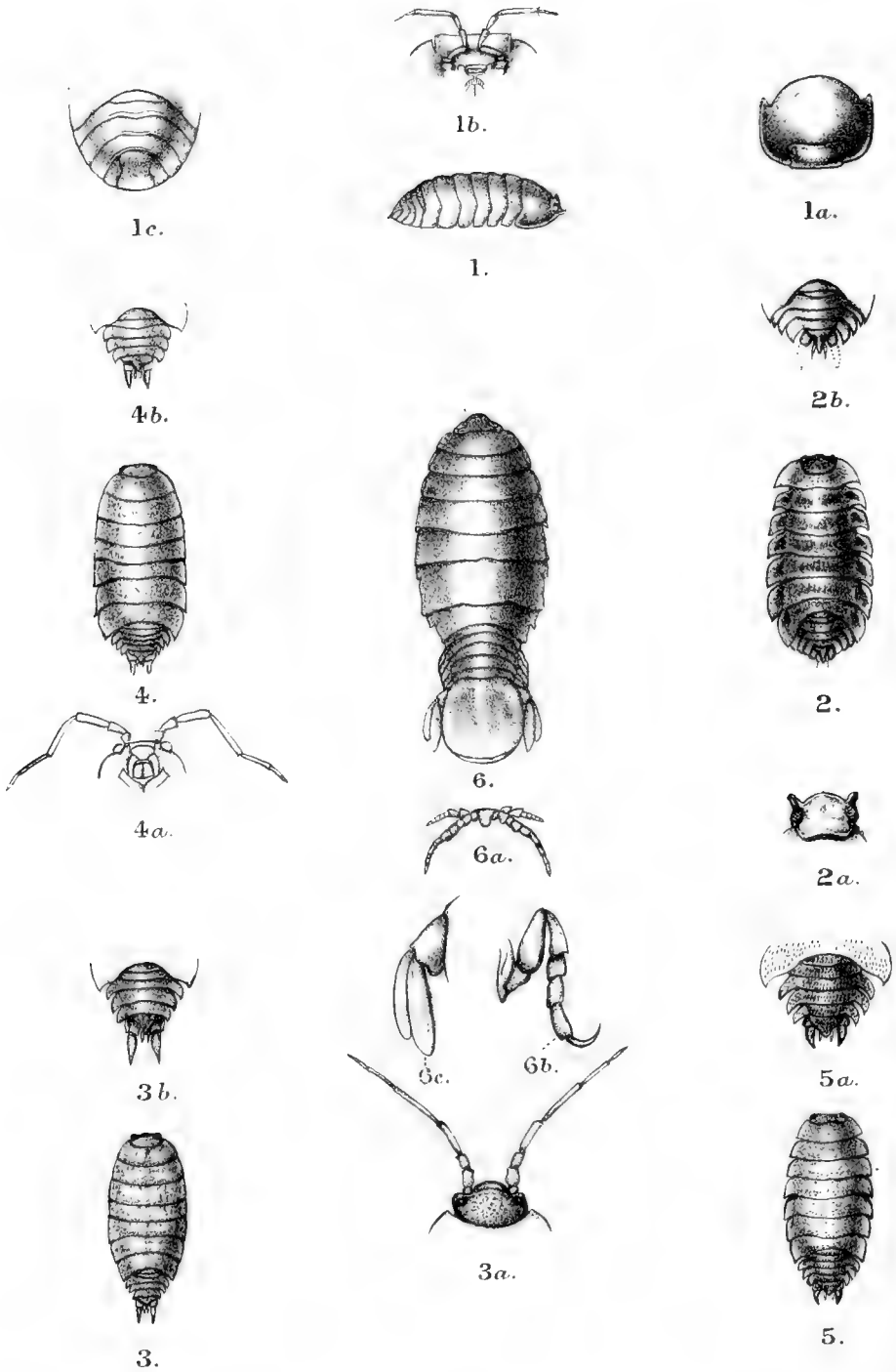
NEW SPECIES OF CLIBANARIUS.











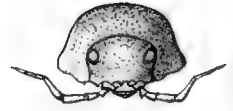




2b.



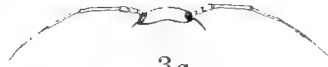
2.



2a.



6a.



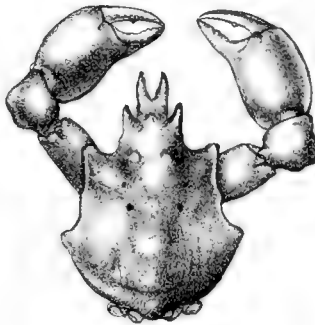
3a.



3b.



6.



1.



3.



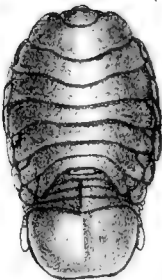
5b.



4a.



4b.



5.



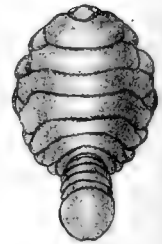
5c.



4c.



5a.



4.

9. On a Collection of Crustacea, Decapoda and Isopoda, chiefly from South America, with descriptions of new Genera and Species. By EDWARD J. MIERS, F.L.S., F.Z.S., Assistant in the Zoological Department, British Museum.

[Received June 13, 1877.]

(Plates LXVI.—LXIX.)

The greater number of the Crustacea described in the following paper were collected in Peru, Guiana, Cayenne and Martinique, and were sent by Professor A. Wrzesniowsky, of the University of Warsaw, to Dr. Günther, by whom they were intrusted to me for determination and description. The collection contained also a few Old-World species from various localities, which are described separately at the end of the paper. I have also added descriptions of species belonging to the same genera in the collection of the British Museum, which have hitherto been unrecorded, or known only from names without descriptions applied to them by A. White, in the 'List of Crustacea of the British Museum,' 1847.

In all, 37 species are noticed, of which 27 are from the New, and 10 from the Old World, viz. *Brachyura* 5 species, *Anomura* 7, *Macrura* 5, *Isopoda* 20. Of these 22 appear to have been hitherto undescribed, viz. *Brachyura* 1 species, *Anomura* 6, *Macrura* 2, *Isopoda* 13.

I have carefully noted such variations as I have observed between individuals of the same species—the nomenclature having often been needlessly encumbered by the description of nominal species, based only upon sexual or other differences, which the examination of a good series of specimens would have shown to be insufficient. I have also endeavoured to compare the species described with their allies, although in the case of the terrestrial and fluviatile Decapoda and terrestrial Isopoda this has generally been attempted only as far as their congeners inhabiting the same continent are concerned. Many, indeed, of the European Isopoda are only known to me by descriptions so short and superficial as to render their determination a matter of great difficulty, and their comparison with the New-World species described in the following paper impossible.

#### LIST OF THE SPECIES DESCRIBED.

The names of the species in the collection from Warsaw are in Roman type, those described from specimens in the collection of the British Museum are in italics.

#### *New-world Species.*

##### DECAPODA.

##### BRACHYURA.

*Acanthonyx petiverii*, *M.-Edw.*? Peru. *Hepatus chilensis*, *M.-Edw.* Peru.  
*Neptunus anceps*, *Saussure*. Marti- — *tuberculatus*, *Saussure* (adult).  
 nique. W. Indies, Cayenne.

## ANOMURA.

<i>Clibanarius cayennensis</i> , n.	Cayenne.	<i>Clibanarius lordii</i> , n.	Vancouver Island.
— <i>carlescens</i> , n.	"	— <i>isochirus</i> .	—?
— <i>speciosus</i> , n.	Brazil.	— <i>pilosimanus</i> .	—?

## MACRURA.

<i>Palæmon nattereri</i> , Heller.	Guiana.	<i>Palæmon gaudichaudii</i> , M.-Edw.	Peru.
— <i>brasiliensis</i> ,	"	<i>Euryrhynchus wrzesniowskii</i> , n.	
— <i>jelskii</i> , n.	"		Cayenne.

## ISOPODA.

<i>Armadillidium caelatum</i> , n.	Cayenne.	<i>Porcellio</i> ( <i>Porcelloides</i> ) <i>flavo-vittata</i> , n.	
<i>Armadillo vulgaris</i> , Latr.	"		Cayenne.
<i>Cubaris affinis</i> , n.	"	— (—) <i>aztecus</i> , Saussure.	Peru.
— <i>gigas</i> , n.	Nicaragua.	<i>Philougria nitida</i> , n.	Peru, Guiana.
<i>Porcellio cayennensis</i> , n.	Cayenne.	<i>Lygia baudiniana</i> , M.-Edw.	Cayenne.
— ( <i>Porcelloides</i> ) <i>jelskii</i> , n.	Peru,	<i>Cymothoa œstrum</i> , L.	Peru.
Guiana.		<i>Anilocra lævis</i> , n.	Martinique, Peru.

*Old-world Species.*

## DECAPODA.

## BRACHYURA.

*Acanthonyx elongatus*, Red Sea.

## ANOMURA.

*Clibanarius misanthropus*, Risso.

## ISOPODA.

<i>Tylos latreillei</i> , Audouin.	Odessa.	<i>Porcellio hispida</i> , n.	Mongolia.
— <i>granulatus</i> , n.	Japan, Borneo.	<i>Lironeca daurica</i> , n.	Dauria.
<i>Armadillidium pustulatum</i> , Dum.	Moldavia.	<i>Lironeca laticauda</i> , n.	Mantchuria.
<i>Porcellio swammerdamii</i> , Audouin,	Egypt.	<i>Anilocra trichiura</i> ,	Mauritius.

*New-world Species.*

## DECAPODA.

## BRACHYURA.

## ACANTHONYX, Latreille.

## ACANTHONYX PETIVERII?

*Cancer muricatus compressus*, Petiver, *Pterigraphia Americana*, pl. xx. fig. 8.

*Acanthonyx petiverii*, M.-Edw. Hist. Nat. Crust. i. p. 543 (1834); Dana, U.S. Expl. Exp. xiii. Crust. (part i.), p. 128, pl. v. fig. 6 (1852); Guérin-Ménéville in Ramon de la Sagra, Histoire de l'Isle de Cuba, Crust. p. xxvii (1857); v. Martens, Archiv f. Nat. xxxviii. p. 85 (1872).

*Hab.* Peru.

In all the specimens the teeth of the lateral margins are clothed with tufts of short hairs. In one or two specimens there are two small tufts upon the gastric region; in the others these are entirely absent. The median tooth of the lateral margin is always much nearer to the posterior than to the anterior tooth; the anterior tooth is somewhat less prominent in the youngest specimens. In the males



the hands are very large, compressed, and slightly cristate; in the females they are small but compressed.

There are eight males and three females in the collection. Length of adult male 1 inch 2 lines, breadth 9 lines.

This species, if the determinations of authors are correct, is one of the few that are common to the eastern and western shores of the American continent. It has been recorded by Milne-Edwards, Guérin-Méneville and v. Martens from the West Indies, by Professor Bell from the Galapagos and Brazil, and by Dana from the coast of Chili. Only a single young specimen from the West Indies is in the collection of the British Museum; but this does not seem to differ specifically from examples from the eastern coast.

The original specimen of Petiver was from the West Indies; but his figure is not sufficiently accurate to be available for specific comparison.

This species very closely resembles the European *A. lunulatus*, Risso, but may be distinguished from it by its narrower and less deeply emarginate front, the form of the hands, which are slightly cristate above, and by the shorter, broader, and more dilated penultimate joints of the ambulatory legs.

*Acanthonyx debilis*, Dana, U.S. Expl. Exp. xiii. Crust. i. p. 125, pl. v. fig. 5 (1852), from Valparaiso, differs in the non-cristate wrist and small hands of the males. *A. concamerata*, Kinahan, Journ. Roy. Dublin Soc. i. p. 334, pl. xiv. fig. 1 (1858), from the North Cinchas Island, Peru, has, if the figure be correct, the anterior lateral angles of the carapace rounded and far less prominent. *A. emarginatus*, M.-Edw. and Lucas, in D'Orbigny, Voy. Amér. Mérid. p. 9, pl. v. fig. 2, from Peru, has also the first tooth or antero-lateral lobe far less prominent, the anterior margin of the carapace straight, and the hands more strongly cristate.

#### NEPTUNUS, De Haan.

##### NEPTUNUS ANCEPS.

*Lupea anceps*, De Saussure, Rev. et Mag. Zool. (sér. 2) ix. p. 502 (1857); Mém. Soc. Phys. et Hist. Nat. Genève, xiv. (part 2) p. 434, pl. ii. fig. 11 (1858).

*Neptunus anceps*, A. M.-Edw. Nouv. Archiv. Mus. Hist. Nat. x. p. 328 (1861).

*Hab.* Martinique.

The length of the single specimen in the collection (a male), is 7 lines, the breadth at base of epibranchial spine 10 lines.

The specimen from Martinique differs in some few particulars from De Saussure's description, which was founded upon a very small example. He says that there *ten* spines upon the antero-lateral margin; only *nine* are shown in the figure, including the external orbital spine. In very young specimens of this genus, however, it is not uncommon to find one or two additional spines upon the antero-lateral margins. There is, according to De Saussure, a second spine at the distal extremity of the superior margin of the hand;

this is scarcely apparent in the larger specimen from Martinique, and may also be due to the immaturity of the specimen examined by him. *N. anceps* is nearly allied to *N. hastatus*, from the Mediterranean, from which it differs in the shorter, more obtuse median frontal teeth, &c., and to *N. laevis*, A. Milne-Edwards, from the Indian Ocean, in which the carapace is nearly smooth, and the median teeth of the front slightly prominent and acute.

*Lupea exasperata*, Gerstaecker, Archiv f. Nat. xxii. p. 129 (1856), from Puerto Cabello, has the median teeth of the front separated by a deeper fissure, and the last spine of the antero-lateral margins but little longer than the preceding. *L. pudica*, Gerst. l. c. p. 130, from the coast of Brazil, has the upper surface of the carapace nearly smooth, and glabrous; the arm blunt and without a spine at the distal extremity of its posterior margin.

This species has been united by von Martens, Archiv f. Nat. xxxviii. p. 95 (1872), with *Lupea forceps*, Fabricius, on the authority of a large series of specimens from Cuba, in which von Martens observed a great increase of length in the anterior legs as the animal increased in age. I believe it to be quite impossible that *L. anceps* can be identical with *L. forceps*, as described and figured by Leach, Zool. Miscell. i. pl. liv. (1814), and Alph. Milne-Edwards, Arch. Mus. Hist. Nat. x. p. 352, pl. xxviii. fig. 1 (1861). In Leach's typical specimen of *L. forceps* in the British-Museum collection, not only are the fingers very slender and more than three times the length of the palm, but the carapace is strongly granulated, the frontal teeth acute and separated at base by wide intervening spaces; there is a very deep fissure in the middle of the upper orbital margin (a mere notch in *L. anceps*), five spines upon the anterior margin of the arm in *N. anceps*, seven in *L. forceps*, the meros joint of the fifth pair of legs without spines in *L. anceps*, with two spines in *L. forceps*, &c.

*Lupa bellicosa*, Stimpson, quoted by M. A. Milne-Edwards, l. c., as a synonym of this species, is the *Callinectes bellicosus* of Ordway, and has probably nothing to do with *N. anceps*.

#### HEPATUS, Latreille.

##### HEPATUS CHILENSIS.

*Hepatus chiliensis*, M.-Edwards, Hist. Nat. Crust. ii. p. 117 (1837).

*Hepatus chilensis*, M.-Edwards and Lucas, in D'Orbigny, Voy. Amérique mérid. vi. part i. Crust. p. 28, pl. xiv. fig. 1 (1843); Nicolet, in Gay, Historia de Chile, Zool. iii. Crust. p. 174 (1849); Dana, U.S. Explor. Exped. xiii. Crust. part i. p. 395, pl. xxv. fig. 3 (1852); Kinahan, Journ. Roy. Dublin Soc. i. p. 345 (1858); Heller, Reise der Novara, Crust. p. 70 (1865).

*Hab.* Peru (*Jelski*).

Two specimens (male and female) are in the collection.

This species appears to be subject to considerable variation in the sculpture of the antero-lateral margins and the coloration of the

carapace. M. Milne-Edwards says of it, "*les bords latéro-antérieurs sont uniformément dentelés sans être crénelés; couleur rouge, uniforme.*" The remarks upon this species in Gay's 'Historia de Chile,' coincide with this description.

The specimens described by Dana, collected at Valparaiso, were of "a yellowish or ochreous base closely covered with a brownish-purple reticulation;" and this is nearly the colour of the figure of MM. Milne-Edwards and Lucas in D'Orbigny's 'Voyage dans l'Amérique méridionale,' and of a specimen (dry) in the collection of the British Museum. Other specimens (dry) in the Museum collection are of a nearly uniform pink colour, with narrow sinuated light-yellow spots and lines; and this also is the colour of the specimens from Peru, in spirits.

The broad truncate teeth of the antero-lateral margins are more or less crenulated in all the specimens that I have seen; and Milne-Edwards's description is certainly inaccurate in this respect, as was first noted by M. Herklots, in his comparison of this species with his *H. van benedeni* (itself the *H. decorus* of Herbst), Bijdragen tot Dierkundige. Abh. v. p. 35 (1852)<sup>1</sup>.

#### ANOMURA.

##### CLIBANARIUS, Dana.

##### CLIBANARIUS CAYENNENSIS, sp. n. (Plate LXVI. fig. 1).

Carapace flattened; anterior margin more prominent and straight at the bases of the eyes, oblique on each side at bases of external antennæ, with a small median frontal tubercle, and with a transverse nearly semicircular suture behind the anterior margin. Eye-peduncles very slender, and nearly as long as the anterior margin of the carapace, their basal scales short and denticulated on their antero-external margins; basal scale of the external antennæ about reaching to the extremity of the penultimate joint of the peduncle. Anterior legs stout, the right the largest, hands rather finely granulated and clothed towards the tips with short stiff hairs, the palms somewhat swollen at base, the fingers excavated, with black corneous tips, and opening horizontally (as in all the species of the genus). Tarsi of the second and third pairs of legs longer than the penultimate joint, subcylindrical, slightly curved, with a small, black, terminal nail, and thinly clothed with short brown hairs. Fifth pair of legs much more slender than the fourth. Colour uniform yellowish-brown.

*Hab.* Cayenne.

<sup>1</sup> *Hepatus tuberculatus* of Saussure, from Guadeloupe, is evidently founded upon an immature example; the transverse tuberculated ridges mentioned in his description are generally prominent in the young of other species, as for example, *H. angustatus*, Fabricius, of which there is a large series in the national collection, from Brazil. Specimens of a species from the West Indies and Cayenne, in the British-Museum collection, which I think may be the adult *H. tuberculatus*, are very closely allied to the *H. angustatus*, being in fact only distinguished from it by the coloration: in *H. angustatus* the markings form brownish-pink spots and blotches; in the specimens I refer to *H. tuberculatus* they consist of purplish-pink spots, usually forming more or less continuous transverse lines.

This species, of which unfortunately but a single specimen exists, in bad condition, is distinguished by the unequal-sized hands and the coloration (there being no trace whatever of banded markings on the legs) from the other American species of the genus. The abdomen is imperfect. In the form of the hands it most nearly resembles *C. vittatus*, Bosc, of which specimens from Charleston Bay, Carolina, are in the national collection, presented by the Smithsonian Institution.

The following American species of this genus in the collection of the British Museum are apparently undescribed.

*CLIBANARIUS CARNESCENS*, sp. n. (Plate LXVI. fig. 2.)

Carapace with the frontal median tooth very small, acute. Eye-peduncles slender, and a little shorter than the anterior margin of the carapace, their basal scales small, and denticulated on their external margins. External antennæ with their basal scales denticulated on their inner margins, and ciliated towards their apex, reaching very little beyond the extremity of the penultimate joint. Anterior legs with the hands very small, oblong-oval, and not broader than the wrists, with strong scattered granules, and tufts of short hairs. Ambulatory legs with the tarsi very long, curved, not compressed, much longer than the penultimate joints, with tufts of short hairs. Colour orange-pink, with 4 broad alternating vittæ of darker colour on the legs. Length to base of abdomen 9 lines.

*Hab.* Cayenne.

(Coll. Brit. Mus.)

*CLIBANARIUS SPECIOSUS*, sp. n. (Plate LXVI. fig. 3.)

Carapace with a very small acute median frontal tooth, and with the anterior margin but slightly oblique at the bases of the external antennæ, postfrontal suture nearly obsolete. Eye-peduncles slender, and about as long as the frontal margin of the carapace, with their basal scales small, narrow, and denticulated on their inner margins toward the apex. External antennæ with the last joint of the peduncle more than twice as long as the penultimate, and with the basal scale slender, reaching a little beyond the extremity of the penultimate joint. Anterior legs with the hands oblong-oval, equal, rather closely and finely granulated, and clothed with short hairs. Tarsi of the second and third pairs of legs longer than the penultimate joint, with longitudinally-seriate close-set tufts of rather long hairs. Colour grey, or chocolate-brown (in dried specimens); ambulatory legs with eight longitudinal whitish narrow vittæ. Length of carapace 1 inch.

*Hab.* Brazil.

(Coll. Brit. Mus.)

It differs from *C. brasiliensis*, Dana, U.S. Expl. Exp. Crust. p. 467, pl. xxix. fig. 7, in the much longer tarsi.

*CLIBANARIUS LORDI*, sp. n. (Plate LXVI. fig. 4.)

Resembles the preceding species in coloration &c. The ophthalmic scales, however, are very small, ovate-acute, and entire; the basal scales of the external antennæ very short, not reaching to the ex-

trernity of the penultimate joint of the peduncle; the hands narrow oblong-oval, with small spiniform tubercles. The sides of the carapace, legs, and basal scales of the external antennæ clothed with long light fulvous hairs. Length of carapace about 1 inch.

*Hab.* British Columbia, Vancouver Island. (Coll. Brit. Mus.)

A single specimen presented by J. K. Lord, Esq., is in the national collection. It is labelled "*Clibanarius lineatus*," but is certainly not the species described under that name by Milne-Edwards, Ann. Sci. Nat. (ser. 3) v. p. 62 (1848), and figured by Dana, U.S. Expl. Exp. Crust. i. p. 462, pl. xxix. fig. 2 (1852), from the Samoan Islands<sup>1</sup>.

#### PAGURUS? sp.

With *C. cayennensis* a specimen was sent that, I think, must be referred to the restricted genus *Pagurus*, on account of the short, thick eye-peduncles; but as the anterior legs are both wanting, it cannot be referred with absolute certainty to any one of the genera of the family Paguridæ. I cannot identify it at present with any species known to me, and refrain from giving it a distinct specific designation, on account of its mutilated condition. The eye-peduncles are much shorter than the anterior margin of the carapace, their basal scales small, ovate-acute, and entire. The basal scale of the external antennæ is long, slender, nearly as long as the peduncle of the external antennæ, and longer than the eyes. The second and third legs have the antepenultimate and penultimate joints short, subequal, shorter than than the tarsi, granulous or even spinose on their upper margin, tarsi long, twisted and channelled. This species somewhat resembles *Eupagurus obesocarpus*, Dana (U.S. Expl. Exp. xiii. Crust. i. p. 445, pl. xxvii. fig. 5), from Valparaiso (?), but differs in the shorter eyes and much longer acicle of the external antennæ.

*Hab.* Cayenne.

### MACRURA.

#### PALEMÓN, Fabricius.

The species of this genus are very numerous and are found in all parts of the world, inhabiting both salt, brackish, and fresh water. Their determination is a matter of great difficulty, on account of the changes which the animal undergoes as it increases in age. The

<sup>1</sup> The *Pagurus isochirus*, named but not described by White (List Crust. Brit. Mus. p. 59, 1847), belongs to this genus, and is founded upon a single specimen of unknown locality in the British-Museum collection. This specimen generally resembles *C. carnescens*, but is of a uniform light-yellow colour, without spots or vittæ, inclining to orange at the extremity of the tarsi. Length nearly 1 inch.

*Pagurus pilosimanus*, White (*l. c.* p. 60), also founded upon a single specimen of unknown habitat, belongs, I think, to this genus, but is in too mutilated a condition for detailed description. It is, however, remarkable for the great length of the eye-peduncles, which are about once and a half the length of the anterior margin of the carapace, with a small spiniform basal scale, and a broad crimson vitta. The anterior legs are now wanting in this specimen. Length about 1 inch.

teeth of the rostrum are variable in number in different examples of the same species; and even the comparative length of the joints of the second pair of legs (which affords excellent specific characters when taken from adult animals) is less trustworthy in younger specimens.

After having examined a considerable number of species of this genus, I may express my belief that some of them—perhaps some even of those included in the present paper—will, upon comparison of larger series of specimens than we at present possess, be found to represent merely different stages of growth of the same animal. Dr. von Martens, in two papers in the *Archiv f. Naturgeschichte*, xxxiv. p. 34 (1868), and xxxv. p. 32 (1869), has done good service toward elucidating this difficult genus by exhibiting in a tabulated form the diagnostic characters of the species inhabiting the Eastern-Asiatic Region, and South Brazil.

#### PALEMON NATTERERI.

*Palæmon nattereri*, Heller, Kais. Akad. Wissensch. Sitzungsber. xiv. Abth. i. p. 414, pl. ii. fig. 36, 37 (1862); von Martens, *Archiv f. Naturg.* xxxv. p. 32 (1869).

*Hab.* Guiana (river St. Laurent) (*Jelski*).

This species was described by Heller from specimens collected by Natterer in the Rio Negro, Brazil. It is distinguished from its congeners from the American continent by the elongated, strong, second pair of legs, which are closely spinulose, and of rather unequal size; the palm is much longer than the wrist; the upper (mobile) finger has two, the lower a single strong tooth on its inner margin. The sides of the carapace below the hepatic spine are very rough and scabrous to the touch. Two specimens are in the collection, which I refer to this species: in the larger (length to anterior margin of carapace 2 inches) the rostrum is imperfect; in the smaller the rostrum  $\frac{1}{4}$  is toothed. In the smaller specimens; as is always the case in the species of the genus *Palæmon*, the distinctive characters are far less strongly marked.

#### PALEMON BRASILIENSIS.

*Palæmon brasiliensis*, Heller, Kais. Akad. Wissensch. Sitzungsber. xiv. Abth. i. p. 419, pl. ii. fig. 46 (1862); von Martens, *Archiv f. Naturg.* xxxv. p. 32 (1869).

*Hab.* Guiana (R. St. Laurent) (*Jelski*).

Three specimens of this species are in the collection; the length of the largest is 1 inch 10 lines to tip of rostrum. Two specimens agree well with the figure and description of Dr. Heller, whose specimens were collected by Natterer in a brook at Camaroës, in Brazil. It is to be noted, however, that the second pair of legs, which he describes as unequal, are, in the specimens from Guiana, very nearly of equal length.

This species was found *in the same stream with the preceding*. The legs are not so robust, and more minutely spinulose, the palm

but little longer than the wrist; fingers slender, without strong teeth on their inner margins; the sides of the carapace, below the lateral hepatic spine, are nearly smooth.

The third and smallest specimen (length to tip of rostrum 1 inch 5 lines) differs from the preceding in having thirteen teeth on the upper margin of the rostrum, the three apical teeth being somewhat smaller and more crowded, as in *P. montezumæ*, Saussure, from the Gulf of Mexico; the wrist of the second pair of legs is not, however, shorter than the palm, as in that species. This I regard merely as a variety of *P. brasiliensis*.

Although it may be well, in the present state of our knowledge, to maintain *P. nattereri* and *P. brasiliensis* as distinct species, the differences existing between them are very slight, scarcely sufficient for specific distinction, if regard be had to the identity of locality and the variations that are known to exist in individuals of a single species.

This and the preceding species are omitted by Smith in his list of the known species of Brazilian Decapoda (Trans. Conn. Acad. ii. p. 40, 1870).

*PALEMÓN JELSKII*, sp. n. (Plate LXVII. fig. 1.)

Slender, smooth, with the lateral margins of the segments of the abdomen straight. Rostrum very long and slender, reaching beyond the end of the basal scale of the external antennæ, at base rising considerably above the dorsal surface of the carapace, apex slightly directed upward; upper margin with 6-7 teeth towards the base, and three small and crowded at apex, lower margin with 7 teeth. Eyes large. Antennules with the peduncles reaching considerably beyond their basal scales, but not to the extremity of the basal scale of the antennæ; longest flagella very slender, about as long as the animal; antennæ with the peduncles short, not reaching halfway to extremity of basal scale; flagella extremely long and slender, longer than the animal. Second pair of legs filiform, no thicker than the rest, and not much longer than the carapace and rostrum; wrist very long and slender, about twice as long as the hand, which has the palm and fingers equal, fingers hairy. Length about 1 inch 8 lines.

*Hab.* Guiana (Oyapok) (*Jelski*).

This species is evidently very nearly allied to *P. amazonicus*, Heller, Sitzungsber. l. c. p. 418, pl. ii. fig. 4, 5 (1862); but it differs in the fewer teeth upon the lower margin of the rostrum, which is less raised at the extremity, and the far longer wrist of the second pair of legs.

In the form of the rostrum it slightly resembles *Palæmon ensiculus*, Smith, Trans. Connect. Acad. ii. p. 26, pl. i. fig. 2 (1869), but differs in the number of the teeth and in the form and proportion of the joints of the second pair of legs.

Two specimens are in the collection.

*PALEMÓN GAUDICHAUDII*.

*Palæmon gaudichaudii*, M.-Edwards, Hist. Nat. Crust. ii. p. 400

(1837); Nicolet, in Gay, *Historia de Chile*, Zool. tom. iii. Crust. p. 218 (1849); Semper, *P. Z. S.* p. 586 (1868).

*Macrobrachium africanum*, Spence Bate, *P. Z. S.* p. 366, pl. xxxi. fig. 3 (1868).

*Hab.* Peru (Lima) (*Jelski*). Also found in Chili.

Dr. Semper is undoubtedly right in quoting *M. africanum*, S. Bate, as a synonym of this common American species. The rostrum has generally two or three teeth on the lower margin; but in the variety described by Poëppig under the name of *P. cæmentarius* the rostrum is *entire below*. The synonyms of this variety will run as follows:—

**Var. CÆMENTARIUS.**

*Palæmon cæmentarius*, Pöppig, *Archiv f. Naturg.* ii. p. 143 (1836); Nicolet, in Gay, *Historia de Chile*, Zool. iii. Crust. p. 219 (1849).

*Palæmon gaudichaudii*, M.-Edw. & Lucas, in D'Orbigny, *Voy. Amér. Mérid.* Zool. vi. Crust. p. 37, pl. xvii. fig. 2 (1843).

*Bithynis longimana*, Philippi, *Wiegmann Arch. f. Nat.* xxvi. p. 161 (1860).

*Hab.* Chili.

**EURYRHYNCHUS, gen. nov.**

Body not depressed. Rostrum triangular, broad at base, acute, very short, barely reaching the extremity of the eyes. Anterior margin of the carapace with a small spine between the eyes and the rostrum, and another below the point of insertion of the peduncle of the antennæ. Antennæ with a small basal scale. Antennules with three flagella. Outer maxillipeds slender. Second pair of legs nearly as in *Anchistia*. Tarsi of the last three pairs of legs nearly straight, acute.

This genus is distinguished from others of the family *Palæmonidæ* with three flagella to the antennules by the very short broad rostrum. It is perhaps most nearly allied to the genus *Harpilius*, Dana, but differs in the form of the rostrum, and the basal scale of the antennæ is much shorter.

**EURYRHYNCHUS WRZESNIEWSKII, sp. n.** (Plate LXVII. fig. 2.)

Slender; second segment of the abdomen considerably dilated on the sides; third to fifth segments with the postero-lateral angles subacute, directed backward; terminal segment longer than broad, with the sides straight, rounded at the end, and, as well as the appendages of the penultimate segment, ciliated at the extremity. Antennules with the first exposed joint of the peduncle as long as the two succeeding. Antennæ with basal scale acute, rather longer than the peduncle; flagellum very slender. Anterior legs very slender; hand not as long as wrist, palm about equalling fingers in length. Second pair of legs about twice as long as carapace; arm about as long as wrist, hand about twice as long as wrist, palm compressed, fingers about as long as palm, straight, and closely meeting along their inner edges. Length about  $7\frac{1}{2}$  lines.

*Hab.* Cayenne.



Of this small species but two specimens, in an imperfect condition, are in the collection; and although I dissected the mouth-organs of one specimen, I failed to extract them in a sufficiently perfect condition to admit of their description. The specimens were found in a well.

### ISOPODA.

The species of Isopoda described in the present paper belong to the terrestrial or subaquatic *Armadillidæ* and *Oniscidæ*, and the parasitic *Cymothoidæ*. The species of the two former families have been comparatively neglected by modern carcinologists, and many of the continental species are known only from the short and insufficient descriptions of Brandt, Koch, and other authors, based mainly upon differences of colour, which is often a very variable characteristic in individuals of a single species, and, taken alone, will not always suffice to identify the animals of this group. Probably better characters are to be found in the punctulation and granulation of the body, and the form of the antero-lateral lobes of the head and of the segments of the body, and uropoda.

On account of the brevity of many of the earlier descriptions, it is very difficult, or even impossible, to institute comparisons between the different species; and, as stated above, I have only attempted to do this, in the case of the American species, with others of the same genera inhabiting the American continent.

The mouth-organs, which in the *Amphipoda* afford very valuable characters for the distinction of genera, in the Isopoda (at least in the terrestrial members of the order) do not present any marked peculiarities of structure. M. Lereboullet, one of the best authorities on the subject, has, in the abstract of his valuable memoir on the *Oniscidæ* of the environs of Strasbourg (*Comptes Rendus*, xx. p. 346, 1849), even stated it as his opinion that they are in no case available for characterizing the genera and species.

#### Family ARMADILLIDÆ.

##### Subfamily ARMADILLINÆ.

Professor Brandt, in his subdivisions of this family, which are very natural, and were adopted almost without modification by M. Milne-Edwards in the 'Histoire naturelle des Crustacés,' makes two subfamilies—(a) *Armadillidia*, containing only his genus *Armadillidium*, and (b) *Cubaridea*, including the genera *Cubaris*, *Armadillo*, and *Diploexochus*. Unfortunately he restricts the genus *Armadillo* to the single species *A. officinalis*, Duméril, which had not been described when Latreille founded the genus, and does not mention at all the earlier *A. vulgaris* of Latreille, which, as described by Milne-Edwards, Lereboullet, and other authors, belongs to his genus *Armadillidium*.

I therefore retain the name of *Armadillo* for those species in which the terminal segment of the abdomen is *truncate at the ex-*

*tremity, with the posterior margin straight, transverse.* The genus, thus restricted, will correspond to the section  $\beta$  of Brandt, and § 2 of Milne-Edwards in the genus *Armadillidium*, and will include the *Armadillo vulgaris*<sup>1</sup> of Latreille. The genus *Armadillidium* will then be restricted to section  $\alpha$  of Brandt, and § 1 of Milne-Edwards in the same genus; while the *A. officinalis*, Duméril, and allied species will constitute a distinct genus, which I propose to designate *Orthonus*<sup>2</sup>, characterized by the straight posterior margins of the segments, which are never revolute.

The following is a tabulated arrangement of the genera to which the species described in the present paper are referred:—

#### I. ARMADILLIDIA.

*Armadillidia*, Brandt, Bull. Soc. Nat. Mosc. vi. p. 184 (1833).

Apical joint of the uropoda usually large, inserted at the apex of the basal joint.

ARMADILLIDIUM, Brandt (section  $\alpha$ ), Bull. Soc. Nat. Mosc. vi. p. 185 (1833); Milne-Edwards (§ 1), Hist. Nat. Crust. iii. p. 181 (1840).

Terminal segment triangular, acute at the extremity.

ARMADILLO, Latr. (part), Hist. Nat. Crust. et Ins. vii. p. 47 (1804).

Terminal segment quadrangular, truncate at the extremity.

#### II. CUBARIDEA.

*Cubaridea*, Brandt, Bull. Soc. Nat. Mosc. vi. p. 189 (1833).

Apical joint of the uropoda very small, inserted in the middle of the inner lateral margin of the produced basal joint.

CUBARIS, Brandt, Bull. Soc. Nat. Mosc. Hist. vi. p. 189 (1833).

*Armadillo* (§ 2), Milne-Edwards, Hist. Nat. Crust. iii. p. 179 (1840).

Posterior margins of the first two or three, or even of all the segments of the body with the posterior margins angulate-excavate on the sides; lateral margins often somewhat revolute. Terminal segment with the posterior margin straight.

#### ORTHONUS<sup>3</sup>, gen. nov.

*Armadillo*, Brandt, *l. c.* p. 191 (1833); nec Latr.

*Armadillo* (§ 1), M.-Edwards, Hist. Nat. Crust. iii. p. 178 (1840).

Posterior margins of all the segments straight. Lateral margins never revolute.

<sup>1</sup> Messrs. S. Bate and Westwood, in the 'British Sessile-eyed Crustacea,' also use the name *Armadillo* for *A. vulgaris*.

<sup>2</sup> ὀρθός, straight; ὄνος, wood-louse.

<sup>3</sup> The *Armadillo inconspicuus*, from New Zealand, described by me (Cat. New-Zeal. Crust. p. 95, pl. ii. fig. 4, 1876) belongs to this genus.

## ARMADILLIDIUM, Brandt.

ARMADILLIDIUM CÆLATUM, sp. n. (Plate LXVII. fig. 3.)

Convex, very finely and closely punctulated and pubescent. Head transverse-oblong, closely encased in the first segment of the body, with the anterior margin reflexed, more prominent in the centre, and slightly sinuated toward the antero-lateral angles, which are not prominent. Eyes minute, placed close to the antero-lateral angles. First segment of the body somewhat larger on the sides than the rest, with the postero-lateral angles acute, the posterior margin slightly excavate; following segments with the posterior margins nearly straight. Segments of the tail short; third to fifth bent backward on the sides; terminal segment broader than long, triangular. Terminal joints of the uropoda transverse when viewed from above. External antennæ with the last two joints (flagellum) together about as long as, but more slender than, the preceding joint, the penultimate much shorter than the terminal joint. Colour generally dark brown. Length about 4 lines, breadth 2 lines.

*Hab.* Cayenne.

## ARMADILLO, Latr.

ARMADILLO VULGARIS.

*Oniscus armadillo*, Linn. Syst. Nat. (ed. xii.) p. 1062 (1766).

*Armadillo vulgaris*, Latr. Hist. Nat. Crust. et Ins. vii. p. 48 (1804); Leach, Trans. Linn. Soc. xi. p. 376 (1815); Spence Bate and Westwood, Hist. Brit. Sessile-eyed Crust. ii. p. 492 (1868).

*Armadillidium vulgare*, M.-Edw. Hist. Nat. Crust. iii. p. 184 (1840); Kinahan, Nat.-Hist. Rev. iv. p. 276, pl. xxi. figs. 3, 9-13 (1857).

*Hab.* Cayenne.

There are in the collection several examples of a species of *Armadillo* purporting to have been collected at Cayenne, in which, after a careful comparison with specimens of the common British *Armadillo vulgaris*, in the British-Museum collection, I am unable to detect any distinctive peculiarity whatever. They agree in size, punctulation of the body, coloration, &c. With these specimens was sent a single example of a Myriopod, which to the inexperienced eye of a collector might, upon mere superficial examination, be easily mistaken for the same species as the *Armadillo*. My friend and colleague in the Zoological Department, Mr. A. G. Butler, informs me that this is certainly the European *Glomeris marginata*, Olivier. It appears very probable that here (as in the case of *Cymothoa œstrum*) the locality of the specimen has been wrongly given. It is difficult to see how, in the case of the *Armadillidium* (terrestrial Isopoda living under stones, in moist earth, &c.), the same species could inhabit Europe and South America.

This species is evidently very closely allied to the *Armadillo pilularis* of Say (Journ. Acad. Nat. Sci. Phil. i. p. 432, 1818), from North America, of which a single specimen, presented by Say, is in the British-Museum collection. In this specimen the terminal

segment is imperfect, and cannot be compared with that of *A. vulgaris*; it is, however, rather more coarsely punctulated, and of a darker colour, variegated with bright yellow markings.

### CUBARIS, Brandt.

#### CUBARIS AFFINIS, sp. n. (Plate LXVII. fig. 4.)

Oblong-oval, convex, with the segments very finely and closely granulated, with a transverse series of much larger granules on each segment of the body, on each side of the middle line. Head transverse-oblong, anterior margin straight, reflexed, and level with the strongly reflexed lateral margins of the first segment of the body. Eyes small, granulated, and placed close to the lateral margins of the head. First three segments of the body with the segments angularly bent backwards on the sides, the angulation being most conspicuous in the first segment. Segments of the tail short, with the upper surface plane, or even slightly concave on the sides, towards the lateral margin. Terminal segment concave above, and with the lateral margins excavated, very nearly as wide at the straight posterior as at the anterior margin. Antennæ with the two terminal joints (flagellum) short, together not as long as the antepenultimate joint; penultimate about one third the length of terminal joint. Inner (terminal) joint of the uropoda minute, inserted upon the inner margin of the longitudinal oblong penultimate joint. Colour dark-brown in spirit; when dry the specimens are white. Length  $\frac{1}{3}$  inch, breadth  $\frac{1}{8}$  inch.

*Hab.* Cayenne.

Specimens from Jamaica belonging to this species are in the British-Museum collection.

*C. affinis* is very nearly allied to *C. cubensis* (*Armadillo cubensis*, De Saussure, Mém. Soc. Phys. et Hist. Nat. Genève, xiv. (2) pl. 481, pl. v. fig. 42, 1858), which, however, has the terminal segment longer in proportion to its width, and the posterior margin of each segment of the body is marked with a transverse groove, which is reflexed and continued along the latero-inferior margin, and is strongly marked on the anterior segments. *A. cacahuamilpensis*, Bilimek (Verh. zool.-bot. Gesellsch. xvii. p. 907, 1867) from Mexico, which is also, I believe, a *Cubaris*, is distinguished by the great breadth of the first segment of the body, &c.

Another American species of this genus, in the British-Museum collection, may be characterized as follows:—

#### CUBARIS GIGAS, sp. n. (Plate LXVIII. fig. 1.)

Convex oblong-oval, nearly smooth, surface only very minutely granulated, and with only obscure indications of larger tubercles on each side of the middle line. Head transverse, with the anterior margin straight, reflexed at a right angle (as seen in a lateral view) with the upper surface of the head, and (as seen in a dorsal view) also forming a right angle with the lateral margins; antero-lateral lobes wanting. First segment of the body very concave on the sides, with the lateral margins strongly reflexed; all the segments distinctly

flexed backward on the sides, with the posterior margins angulate-excavate. Terminal segment of the tail about as broad as long, with the sides excavated; upper surface flat, with a shallow depression on each side, and a small median pit near the base. Antennæ with the flagellum much shorter than the last joint of the peduncle, with the first joint the shortest. Basal joint of the uropoda (viewed from above) oblong, terminal (apparent lateral) joint quite minute. Colour light grey. Length  $10\frac{1}{2}$  lines.

*Hab.* Nicaragua, S. Juan (*Sallé*). (Coll. Brit. Mus.)

This species is remarkable for its large size; it is larger than any other species of the genus in the British-Museum collection. In the prominent anterior margin of the head, beneath which the antennæ are partly concealed, it resembles the genus *Pyrgoniscus*, Kinahan, which, I may add, is wrongly referred by Dr. Kinahan to the *Porcellionidæ*, and belongs certainly to the *Armadillidæ*, and is nearly allied to *Cubaris*.

### Family ONISCIDÆ.

#### Subfamily ONISCINÆ.

#### PORCELLIO, Latreille.

De Saussure (*Mém. Soc. Phys. et Hist. Nat. Genève*, xiv. pp. 477, 480), has based the characters of his primary sections of this genus on the form of the segments of the body. These appear to me at once so natural and characteristic, that I adopt them as subgeneric divisions.

#### Subgenus PORCELLIO.

Postero-lateral angles of all the segments of the body acute, and produced backward.

#### PORCELLIO CAYENNENSIS, sp. n. (Plate LXVIII. fig. 2.)

Moderately convex, with the segments somewhat laterally produced, and separated from one another toward the lateral margins, everywhere closely and finely granulated, with larger granules, not extending far toward the lateral margins on each segment. Head small, transverse-oblong, deeply encased in the first segment, strongly granulated, with the antero-lateral lobes very prominent, concave above, and subacute at the extremity. Eyes small. All the segments of the body with the antero-lateral angles rounded; the posterior margins excavated on the sides towards the postero-lateral angle, which is acute and produced backward; seventh segment with the posterior margin regularly excavate. Segments of the tail short, with the lateral portion angularly flexed backward, the laterally flexed portion in the third segment equalling one third the width of the segment; terminal segment somewhat T-shaped, longer than broad, subacute at the extremity, and produced beyond the extremity of the basal joint of the uropoda. Antennæ wanting. Colour light-yellow and brown variegated. Length  $\frac{1}{2}$  inch, breadth  $\frac{1}{4}$  inch.

*Hab.* Cayenne.

In neither of the two specimens in the collection is the terminal

joint of the uropoda *in situ*. One, which is loose in the tube, and almost certainly belongs to this species, is short, barely twice the length of the basal joint.

As the external antennæ are wanting, it must be a matter of uncertainty whether this species is to be referred to this genus or *Oniscus*.

The *Porcellio spinicornis* and *Porcellio nigra* of Say (Journ. Ac Nat. Sci. Phil. i. pp. 431, 432, 1818), from the United States, belong to this subgenus, as specimens in the British-Museum collection presented by Say, prove. In both species the body is more closely articulated, and the terminal segment more triangular and shorter than in *P. cayennensis*.

#### Subgenus PORCELLIONIDES.

Postero-lateral angles of the first four segments of the body not acute and not produced backward.

a. *Depressed, with the antero-lateral portion of the head small.*

PORCELLIO JELSKII, sp. n. (Plate LXVIII. fig. 3.)

Oblong-oval, depressed, very finely and closely punctulated, and with scattered but faintly indicated granules, tending to a transverse arrangement on each segment. Head small, transverse; antero-lateral lobes very small, nearly obsolete. Eyes small, black. First four segments of the body with the posterior margins straight, and forming nearly a right angle with the lateral margins; remaining segments with the posterior margins becoming successively slightly more excavated and with the postero-lateral angles subacute. Tail short; third to fifth segments with the posterior margins straight to within a short distance of the postero-lateral angle, which is acute, and directed backwards; terminal segment triangular, rather broader than long, with a slight depression above, with the lateral margins a little excavated, subacute at the extremity, and projecting but very slightly beyond the basal joint of the uropoda. Antennæ slender, with the two terminal joints (flagellum) together about as long as the preceding, the terminal a very little shorter than the penultimate joint. Uropoda with the terminal joint two or three times as long as the preceding, narrow-lanceolate, acute at the extremity. Colour light purplish-brown, variegated with irregular narrow pale markings; lateral margins of the segments without broad yellow bands. Length 5 lines, breadth 2 lines.

*Hab.* Peru; Guiana.

A large series of specimens of this species, which appears to be common, is in the collection.

This species differs from *P. chilensis*, Dana (nec Gay), in the joints of the flagellum of the external antennæ (in that species the first is nearly twice the length of the second joint), the more deeply concave seventh segment of the body, and the longer rami of the uropoda—from *P. cubensis* and *P. sumichrasti*, De Saussure, from Cuba (which it somewhat resembles in the form of the terminal

segment), in the much smaller antero-lateral lobes of the head—from *P. granarus* and *P. liliputanus*, Gay, from Chili, in the nearly equal joints of the flagellum of the external antennæ, &c.

In a single specimen from Peru, the terminal segment is transverse-triangular, nearly of the form of that of *P. poeyi*, De Saussure, from Cuba; but as this exactly agrees with the other specimens of the same series in other particulars, I do not regard this as more than an individual peculiarity.

**PORCELLIO FLAVO-VITTATA, sp. n.** (Plate LXVIII. fig. 4.)

More oblong in form, and a little more convex than the preceding species, with the granulations upon the body more distinctly marked, the sides of the body straighter. Colour blackish brown, variegated as in the preceding species. Lateral margins of the segments of the body with a marginal yellow band. Length 4 lines, breadth nearly 2 lines.

*Hab.* Cayenne.

This species is very nearly allied to the preceding; yet the differences above mentioned appear generally constant. In one specimen only, without antennæ and uropoda, and which might, if in better condition, have proved distinct, is the lateral marginal yellow band entirely absent.

All the specimens are unfortunately much mutilated.

*b. Convex, with the antero-lateral lobes of the head prominent.*

**PORCELLIO AZTECUS.**

*Porcellio aztecus*, De Saussure, Mém. Soc. Phys. et Hist. Nat. Genève, xiv. (part 2) p. 479, pl. v. fig. 38 (1858).

*Porcellio mexicanus*, De Saussure, *l. c.* p. 479, pl. v. figs. 39, 40 (1858).

*Hab.* Peru (Lima).

In the good series of specimens of this species in the collection, I have observed between younger and fully-matured animals just the differences that are instanced by De Saussure as existing between *P. aztecus* and *P. mexicanus*, which I am therefore inclined to consider different ages of one and the same species, well characterized by its large size, convex, finely and uniformly granulated body, the prominent antero-lateral lobes of the head, the form of the terminal segment, uropoda, etc.

*Porcellio interruptus*, Heller (Reise der Novara, Crust. p. 136, 1865) from Chili, which, on account of the prominent antero-lateral lobes of the head, probably belongs to this section, differs in having the four anterior segments of the body much narrower than the preceding.

**PHILOUGRIA, Kinahan<sup>1</sup>.**

To this genus I refer a species obtained in Peru and Guiana, and always occurring in the collection in the same tubes with *Porcellio*

<sup>1</sup> According to Messrs. Spence Bate and Westwood = *Itea*, Koch, a name employed by Linnæus for a genus of plants. I regret that I have not myself had

*jeiskii*. It agrees well with *Philougria* in the transverse front, in which the median and antero-lateral lobes are obsolete, the subulated flagella of the external antennæ, and the exposed uropoda, which have the inner ramus long, more than half the length of the outer.

*PHILOUGRIA NITIDA*, sp. n. (Plate LXIX. fig. 3.)

Oblong-oval, shining, very convex; segments closely articulated, with minute scattered granules. Head transverse, with the anterior margin straight, without antero-lateral lobes. Eyes black, granulated, and extending along the whole length of the lateral margins. Segments of the body subequal, lateral margins with a raised marginal line; posterior margins of the first three segments straight, and forming a right angle with the lateral margins; last four segments slightly excavate on the sides, postero-lateral angles acute. Third, fourth, and fifth (exposed) segments of the tail with the lateral part bent backward, almost at a right angle to the median portion of the segment. Terminal segment much broader than long, obtusely triangular, with a well-marked depression between the bases of the uropoda (which, however, is more conspicuous in some specimens than in others). Antennæ shorter than the body, very slender; flagellum three-jointed, and terminating in a long slender transparent filament. Legs very slender, with short hairs on the last three joints. Basal joints of the uropoda very short, terminal joint more than three times as long as the basal joint, acute. Colour purplish-brown; with irregular yellow spots and patches. Length  $\frac{1}{3}$  inch, breadth  $\frac{1}{6}$  inch.

*Hab.* Peru, Guiana.

Distinguished by its convex, shining appearance, the form of the head and of the terminal segment, and of the far longer slender terminal filament of the flagella of the external antennæ, from the known species of the genus.

The specimens from Guiana generally appear rather more coarsely granulated.

Subfamily LIGIINÆ.

LIGIA, Fabricius.

LIGIA BAUDINIANA?

? *Ligia baudiniana*, Milne-Edw. Hist. Nat. Crust. iii. p. 155 (1840).

*Hab.* Cayenne.

As this species is only known to me by the short description of Milne-Edwards in the 'Histoire naturelle des Crustacés,' I subjoin the following description of the specimens from Cayenne.

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an opportunity of consulting Koch's account of the German species of *Oniscidæ*, either in his 'Continuation' of Panzer's 'Deutschlands Insecten,' or in his 'Deutschlands Crustaceen.'

Dr. von Martens (Zool. Record for 1868, p. 522), points out that the name *Philougria* should be spelt *Philygria*. As, however, the term *Philygria* was used in 1843 by Stenhammar for a genus of Dipterous insects, I retain the designation *Philougria*, albeit etymologically incorrect.



Body narrow-oblong, or slightly oblong-oval, with scattered granules, which are disposed in transverse series, only upon the posterior margin of each segment. Head transverse. Eyes large, black, of considerable width, and occupying the whole length of the lateral margin. First three or four segments of the body with the posterior margins straight, the succeeding segments with the posterior margins becoming gradually more concave, and the postero-lateral angles more acute. Segments of the tail with the postero-lateral angles long, narrow, acute, and flexed backwards; terminal segment transverse-oblong, posterior margin tridentate, nearly straight to within a short distance of the postero-lateral angle, then slightly sinuated, postero-lateral angle prominent, triangular, acute. Peduncle of the external antennæ with the terminal very little longer than the penultimate joint, flagellum 32-36-jointed. Rami of the uropoda a little unequal, longer than the peduncle, inner with a small slender terminal appendage. Length nearly 1 inch, breadth 5 lines.

The specimens in the collection have longer antennæ than those described by Milne-Edwards, reaching in one nearly, in another quite, to the extremity of the body. The length of the antennæ cannot, however, always be depended upon as a constant specific character; and the number of joints is sometimes variable. The slender styli-form appendage to the inner ramus of the uropoda is found in other species of the genus, as, for example, the typical *L. aquatica*, where it is quite minute. It is absent in many specimens, and is probably very easily disarticulated and lost.

This species resembles the Californian *L. occidentalis*, Dana, U.S. Expl. Exp. xiv. Crust. ii. p. 742, pl. xlix. f. 7 (1853); but the teeth of the terminal segment are more prominent; the antennæ are also much longer.

The *Ligia stimpsoni*<sup>1</sup>, from California, is at once distinguished by its very broad flat body.

De Saussure (Mém. Soc. Phys. et Hist. Nat. Genève, p. 476) found specimens in Cuba which, he says, are not to be distinguished from *L. baudiniana*; and specimens collected at Rio Janeiro by Dr. Cunningham are referred by Mr. Spence Bate to this species (Ann. & Mag. Nat. Hist. i. p. 443, 446, 1868). Specimens from Rio de Janeiro are also in the British-Museum collection.

#### Family CYMOTHOIDÆ,

#### CYMOTHOA, Fabricius.

##### CYMOTHOA ÆSTRUM.

? *Oniscus æstrum*, Linn. Syst. Nat. ed. xii. p. 1059 (1766); Fab. Syst. Ent. p. 294 (1775).

*Cymothoa æstrum*, Fab. Ent. Syst. ii. p. 505 (1793)?; Leach, Trans. Linn. Soc. xi. p. 372 (1815); Desm. Consid. Crust. p. 307,

<sup>1</sup> I propose this name for the *Ligia dilatata* of Stimpson (Proc. Boston Soc. Nat. Hist. vi. p. 88, 1856-59; and Journ. Boston Soc. Nat. Hist. vi. p. 507, pl. xxii. fig. 8, 1857), the name *Ligia dilatata* having been preoccupied by Brandt for a South-African species of the genus (Bull. Mosc. vi. p. 172, 1833).

pl. xlvii. figs. 6, 7 (1825); M.-Edw. Hist. Nat. Crust. iii. p. 269 (1840); Règne Animal de Cuvier (éd. Crochard), Crust. pl. lxxv. fig. 1; Spence Bate and Westwood, Hist. Brit. Sessile-eyed Crust. ii. p. 274, footnote (1868).

*Hab.* Peru.

To this species I refer two specimens in the collection, numbered as coming from Peru (the largest an adult female, length 1 inch 5 lines), which agree in every respect with the specimens in the British-Museum collection, described by Leach as *Cymothoa æstrum*, from European seas. Like these specimens they have the anterior lobes of the first segment of the body broad, subtruncate, and produced to a level with the anterior margin of the head, which appears straight in a dorsal view, but is inflexed, and conceals the bases of the superior antennæ; the joints of the peduncle slender, not dilated; the thigh-joint of the fourth pair of legs produced in the form of an acute tubercle, which is most prominent in the younger animal, the same joint of the following legs greatly dilated posteriorly; the terminal segment transverse, the rami of the uropoda very small, subequal, &c. It is very improbable that the same species should inhabit the seas of Peru and Europe; and I think it safer to conclude, as there are some species in the collection avowedly from the Mediterranean, that the label in this instance, as in the case of *Armadillo vulgaris*, has been misplaced, and that the true habitat of these specimens is European. No particulars are given of the fish on which they were parasitic.

The West-Indian *C. dufresnii*, Leach, is very nearly allied to this species; but the anterior lobes of the first segment of the body are not quite so squarely truncate, and the lobe of the thigh-joint of the fourth pair of legs is somewhat less prominent and acute.

ANILOCRA, Leach.

ANILOCRA LÆVIS, sp. n. (Plate LXVIII. fig. 6.)

Body regularly convex, oval; first six segments of the tail of equal width, terminal segment considerably broader. Head small, narrowed anteriorly, front narrowed, rounded, inflexed, and concealing the bases of the inner antennæ. Eyes black, oblong. First segment of the body with the antero-lateral angles not at all prominent, postero-lateral angles rounded and entire; second to sixth segments with the posterior margins nearly straight; seventh segment with the posterior margin regularly excavate, the postero-lateral angle broad, obtuse and rounded. Segments of the tail rounded on the sides, terminal segment with the posterior margin rounded. Epimeræ or coxæ small, of the second, third, and fourth segments obtuse, of the fifth to seventh segments subacute and somewhat spiniform. Superior (inner) antennæ nearly reaching to the anterior margin of the first segment of the body, eight-jointed; first three joints (peduncle) larger than the succeeding. Inferior antennæ 9-jointed, nearly reaching to the posterior margin of the first segment of the body, peduncle five-jointed, the fifth joint the longest. Rami of the

uropoda lamellate, compressed, oval, the inner slightly the larger. Length 1 inch 7 lines, breadth  $7\frac{1}{2}$  lines.

*Hab.* Martinique; Peru.

A specimen from each locality is in the collection.

This species appears to be nearly allied to, but distinct from *A. laticauda*, Milne-Edwards (Hist. Nat. Crust. iii. p. 259, 1840), from the West Indies, and *A. mexicana*, De Saussure (Mém. Soc. Phys. et Hist. Nat. Genève, xiv. part 2, p. 484, 1858), from the Gulf of Mexico. From the latter species it differs in the form of the first segment of the body, which in *A. mexicana* has the latero-anterior margins provided with a small tubercle, and the latero-posterior margins notched (the epimeræ also, in this species are uniform), from *A. laticauda* in the much longer internal antennæ and in the length of the rami of the uropoda, the inner being equal to or shorter than the outer in *A. laticauda*.

### Old-world Species.

#### DECAPODA.

##### ACANTHONYX, Latr.

The following is a species hitherto only known by the name (without description) applied to it by White in the 'List of Crustacea in the Collection of the British Museum,' p. 11 (1847).

##### ACANTHONYX ELONGATUS. (Plate LXIX. fig. 1.)

Carapace smooth, without hairs. Gastric and genital regions convex, gastric region with two strong tubercles, lateral margins slightly excavated, with the median tooth obscure and nearly equidistant from the prominent obtuse anterior and the obtusely triangular posterior tooth. Front and rostrum obliquely deflexed, with the supraocular and rostral spines prominent. Anterior legs (in the male) very much enlarged, wrist obscurely ridged, hand compressed, fingers, when closed, meeting only at tips. Ambulatory legs wanting. Abdomen (of male) narrow, six-jointed, the fourth and fifth joints coalescent. Length to end of rostrum, 1 inch 1 line.

*Hab.* Red Sea.

A single specimen is in the British-Museum collection.

#### ANOMURA.

##### CLIBANARIUS, Dana.

##### CLIBANARIUS MISANTHROPUS.

*Pagurus misanthropus*, Risso, Crust. des Environs de Nice, p. 56 (1816); Hist. Nat. Eur. mérid. v. p. 41 (1826); Roux, Crust. de la Méditerranée, 3<sup>e</sup> livr. pl. xiv. fig. 1, 2 (1828); M.-Edw. Hist. Nat. Crust. ii. p. 228 (1837).

*Pagurus labillardieri*, Audouin, Expl. d. Planches de Savigny, Egypte, Crust. pl. ix. fig. 2, p. 89 (1809).

*Hab.* —?

A good series of specimens is in the collection.

I am in some doubt whether this species be the *C. misanthropus* of Risso and of M. Milne-Edwards, who apparently copied Risso's description; but it is almost certainly the species figured under this name by Roux. It differs only in having the tarsi striped with red upon a white instead of a blue ground; but this latter colour is in all probability evanescent; indeed in one or two specimens from the Spanish coast in the collection of the British Museum, some very faint traces of the blue coloration are still discernible.

*Clibanarius oculatus*, Fabricius, as described by M. Milne-Edwards, appears to differ in having the tarsi much shorter than the penultimate joint. They are coloured with longitudinal red and yellow lines.

## ISOPODA.

### ARMADILLIDÆ.

#### Subfamily TYLOSINÆ.

#### TYLOS, Latreille.

##### TYLOS LATREILLEI.

*Tylos latreillei*, Audouin, Expl. d. planches de Savigny, Egypte, Crust. pl. xiii. fig. 1, p. 96 (1809); M.-Edw. Hist. Crust. iii. p. 188 (1840); Règne Animal de Cuvier, Crust. pl. lxx. bis, fig. 2; Heller, Reise der Novara, Crust. p. 137 (1865); Verh. zool.-bot. Gesellsch. Wien, xvi. p. 732 (1866).

*Tylos armadillo*, Latr. Règne Animal de Cuvier, iv. p. 142 (1829); Guérin-Ménéville, Iconogr. Règne Animal, Crust. p. 35. pl. xxxvi. fig. 4.

##### *Hab.* Odessa.

The colour of the specimens in the collection is light brown, length  $6\frac{1}{2}$  lines, breadth 3 lines. The lateral margins of the coxæ and segments of the tail are fringed with very short hairs. This species appears to be common in the Mediterranean region, having been recorded from Egypt, Algeria, Gibraltar, Lesina, &c.

The specimens I refer to *Tylos latreillei* differ from specimens of *T. capensis*, Krauss, in the British-Museum collection, from Simon's Bay, South Africa, in their much smaller size (the largest specimen of *T. capensis* is one inch in length), and in the form of the epimeral piece or coxa of the sixth pair of legs; in *T. latreillei* the postero-lateral angle of this joint is rounded; in *T. capensis* the posterior margin is straight, and forms a right angle with the posterior margin. Moreover in *T. capensis* the segments are nearly smooth, or only very finely granulated; in *T. latreillei* they are rather strongly punctulated and rugose. In both species the postero-lateral angle of the coxa of the last pair of legs is acute.

##### TYLOS GRANULATUS, sp. n. (Plate LXIX. fig. 2.)

Convex, coarsely granulated, the granules on the dorsal surface of the body separated by linear smooth intervening spaces; the process of the epistoma separating the basal joints of the antennæ, and the peduncles of the antennæ themselves, very strongly granulated. Postero-lateral angles of the first segment of the body strongly flexed backward and acute. Terminal segment of the tail trans-

versely oblong, very much broader than long, and with a slightly reflexed posterior margin. Last four joints of the legs clothed with very stiff short hairs; the epimeral piece or coxa of the last pair of legs with the postero-lateral angle obtuse. Length of largest specimen about  $\frac{3}{4}$  inch.

*Hab.* Kiogo, Japan; and Borneo. (Coll. Brit. Mus.)

This species is distinguished by the granulated body and the obtuse postero-lateral angle of the epimera of the last pair of legs.

*Tylos spinulosus*, Dana, from Fuegia, differs, as its name imports, in its spinulous body from all the foregoing species.

#### Subfamily ARMADILLINÆ.

#### ARMADILLIDIUM, Brandt.

##### ARMADILLIDIUM PUSTULATUM.

*Armadillo pustulatus*, Duméril, Dict. Sci. Nat. iii. p. 117 (1816); Desmarest, Consid. gén. des Crust. p. 325, pl. xlix. fig. 6 (1825).

*Armadillidium pustulatum*, M.-Edw. Hist. Nat. des Crust. iii. p. 181 (1840).

*Armadillidium brunneum*, Brandt, Conspect. Monogr. Onisc. p. 185 (1832).

? *Armadillidium zenckeri*, Brandt, *l. c.* p. 185 (1832).

? *Armadillidium pictum*, Brandt, *l. c.* p. 186 (1832).

*Hab.* Moldavia.

The two specimens in the collection which I refer to this species are convex, oblong-oval, very closely and finely punctulated, and with distinct scattered granules, of which there is a transverse series on the posterior margin of each segment, the granules showing elsewhere a tendency to a similar arrangement. Head transverse-oblong; eyes small, black, granulated; channels for the reception of the bases of the external antennæ deep and well defined. First two segments of the body with the posterior margins angulated on the sides; first segment with the postero-lateral angles subacute. Segments of the tail short, lateral margins straight and forming nearly a right angle with the posterior margins; terminal segment longer than broad, triangular, with the sides straight, subacute at the extremity, flat above. Antennæ with the two terminal joints (flagellum) together not as long as the antepenultimate joint, subequal. Uropoda, when viewed from above, with the basal joint very small, scarcely visible; terminal joint almost completely filling the space between the terminal and penultimate segments. Colour steel gray, variegated with yellowish white; all the segments with narrow pale margins. Length  $10\frac{1}{2}$  lines, breadth about 5 lines.

This species is distinguished by its large size, closely punctulated and distinctly granulated body, and by the form of the terminal segment. Specimens, between which I cannot find differences sufficient to warrant their specific separation, are in the British Museum, from France, Tunis, Tangiers, Malta, and Sardinia.

The species figured by Guérin-Méneville as *A. pustulatum* (Iconogr. R. A. pl. xxxi. fig. 9) is a species of the restricted genus *Armadillo*, perhaps *A. vulgaris*.

## PORCELLIO, Latr.

## PORCELLIO SWAMMERDAMII.

*Porcellio swammerdamii*, Audouin, Explic. des Planches de Savigny, Egypte, Crust. pl. xiii. fig. 6, p. 98 (1809).

*Porcellio alexandrinus*, Brandt, Conspectus Monogr. Onisc. p. 180 (1832); M.-Edw. Hist. Nat. Crust. iii. p. 172 (1840).

*Hab.* Egypt.

In the single adult example (length nearly 5 lines) the colour is deep blackish-brown; in this specimen the flagella of the external antennæ are missing. The other specimens are much smaller, and of a much lighter brown colour. They agree well with Savigny's figure of the species, except that the granules are less strongly marked.

## Subgenus PORCELLIONIDES.

## PORCELLIO HISPIDA, sp. n. (Plate LXVIII. fig. 5.)

Convex, elongate, oval-oblong, everywhere closely covered with minute stiff hairs (which under a low magnifying-power might be mistaken for granules). Head small, transverse, antero-lateral lobes broad, prominent, rounded, and obtuse. Segments of the body all rounded at the junction of the anterior and lateral margins, postero-lateral angles of the first three segments of the body obtuse and rounded, of the remaining segments subacute; posterior margin of the seventh segment concave, and slightly sinuated on the sides. Segments of the tail short and bent backwards on the sides, postero-lateral angles acute; terminal segment triangular, with the sides slightly concave, subacute at the extremity. Antennæ short, the last two joints (flagellum) together shorter than the antepenultimate joint, the terminal joint a little longer than the penultimate joint. Uropoda short; the terminal about twice the length of the penultimate joint, and projecting for about half its length beyond the terminal segment. Colour light brown and light yellow variegated. Length  $5\frac{1}{2}$  lines, breadth  $2\frac{1}{2}$  lines.

*Hab.* Mongolia.

This species is remarkable for the minute stiff hairs which clothe the narrow oblong body, the small size of the rami of the uropoda, &c.

## Family CYMOTHOIDÆ.

## LIRONECA, Leach.

## LIRONECA DAURICA, sp. n. (Plate LXIX. fig. 4.)

Broadly ovate, depressed. Head very small; front prominent, rounded, and concealing the bases of the antennæ, but not inflexed. Eyes small, red. First segment of the body rather the longest, anterior margin concave, with scarcely any trace of antero-lateral lobes. Following segments with the coxæ small, and inserted in front of the antero-lateral angle of the segment, postero-lateral angles of all the segments rounded; last segment very short, and almost semicircularly excavated. Tail small, of equal width throughout, not half the width of the third segment of the body; terminal segment but little broader than long, smooth, with the posterior margin

rounded. Rami of the uropoda subequal, narrow, oblong-oval, and about reaching to the posterior margin of the terminal segment. Antennæ very slender; superior about half as long as the inferior, which just reach to the anterior margin of the first segment of the body. These latter are eight-jointed, the third joint appearing twice as long as the preceding, as if consisting of two coalescent joints, superior antennæ eight-jointed. All the legs with the thigh-joints oblong, and very little dilated posteriorly, the last four pairs with the postero-superior margins slightly produced and carinated. Length about 1 inch, breadth  $7\frac{1}{2}$  lines.

*Hab.* Dauria, R. Onon.

A single specimen (female with ova) is in the collection.

In this species the coxæ are inserted in the angles between the segments of the body, in front of the anterior margin of each segment, not exterior to the lateral margin of the segment, as is usually the case.

It is at once distinguished from the *Cymothoa amurensis*, Gerstaecker, Mém. Acad. Imp. Sci. St.-Pétersbourg, viii. p. 278 (1859) by the slender femora, non-inflexed front, &c.

*LIRONECA LATICAUDA*, sp. n. (Plate LXIX. fig. 5.)

Ovate, slightly gibbous, moderately convex. Head small, front inflexed, and concealing the bases of the antennæ. First segment of the body with the anterior margin deeply excavate, antero-lateral lobes prominent and obtuse. Coxæ of the following segments oblong and inserted externally to the lateral margin of the segment; in the first, second, and third segments the lateral margin is straight; in the fourth to seventh it is excavated. Terminal segment transverse, with the posterior margin rounded. Rami of the uropoda short, ovate, the outer twice as large as the inner, but not reaching halfway to the posterior margin of the segment. Length nearly 1 inch 3 lines.

*Hab.* Manchuria.

(Coll. Brit. Mus.)

This species cannot be confounded with the foregoing. It is far more closely allied to the *Lironeca novæ-zealandiæ*, described by me (Cat. New-Zeal Crust. p. 106, pl. iii. fig. 2, 1876), which it altogether resembles in external appearance; in that species, however, the epimeræ are longer in proportion to their width, and the rami of the uropoda subequal. In both *L. laticauda* and *L. novæ-zealandiæ* the posterior margin of the thigh-joint of the last four pairs of legs is produced at its proximal extremity and forms a strong tubercle. In *L. emarginata*, Bleeker, Act. Soc. Indo-Néerl. ii. p. 27, pl. i. fig. 5 (1857), from Batavia, another nearly allied species, the front is produced beyond the bases of the antennæ, and the posterior margin of the thigh-joints of the legs is straight.

*ANILOCRA*, Leach.

*ANILOCRA TRICHIURA*. (Plate LXIX. fig. 6.)

*Anilocra trichiura*, List Crust. Brit. Mus. p. 108 (1847), sine descr. Narrow-oblong, oval, convex. Head small, with the anterior

margin inflexed, appearing nearly straight in a dorsal view; posterior margin with a small, median, rounded lobe received into a corresponding emargination in the anterior margin of the first segment of the body. First segment of the body longer than the succeeding. Last segment of the tail longer than broad, narrowed to its extremity, which is subacute. Coxæ transverse and obtuse at their posterior extremity. Legs short, with the thigh-joints not dilated. Uropoda very slender; outer ramus very long, more than twice the length of the inner. Length 1 inch.

*Hab.* Mauritius (*R. Templeton*). (Coll. Brit. Mus.)

This species is at once distinguished by the form of the rami of the uropoda. The habitat, which is given as "Indian Ocean," in the 'List of Crustacea,' *l. c.*, is marked "Mauritius" on the label attached to the specimen.

#### EXPLANATION OF THE PLATES.

##### PLATE LXVI.

- Fig. 1. *Clibanarius cayennensis*, p. 657, natural size.  
 2. ——— *carnescens*, p. 658, natural size.  
 3. Carapace, frontal region, eyes and antennæ of *Clibanarius speciosus*, p. 658, magnified about twice the natural size.  
 3 a. Hand of the same, magnified twice natural size.  
 4. *Clibanarius lordi*, p. 658, natural size.  
 4 a. Carapace, frontal region, eyes and antennæ of the same, magnified twice the natural size.

##### PLATE LXVII.

- Fig. 1. *Palæmon jelskii*, p. 661, lateral view, magnified about twice the natural size.  
 1 a. Carapace, frontal and antennal region of the same, dorsal view, magnified twice the natural size.  
 1 b. Terminal segment and uropoda, magnified.  
 2. *Euryrhynchus wrzesniowskii*, p. 662, lateral view, magnified four times the natural size.  
 2 a. Carapace, frontal and antennal region of the same, magnified four times the natural size.  
 2 b. Terminal segment and uropoda, magnified.  
 3. *Armadillidium cælatum*, p. 665, dorsal view, magnified twice the natural size.  
 3 a. Dorsal view of head.  
 3 b. Dorsal view of tail-segments of the same, further magnified.  
 4. *Cubaris affinis*, p. 666, lateral view, magnified twice the natural size.  
 4 a. Dorsal view of head.  
 4 b. Dorsal view of tail-segments of the same, further magnified.

##### PLATE LXVIII.

- Fig. 1. *Cubaris gigas*, p. 666, lateral view, natural size.  
 1 a. Head viewed from above.  
 1 b. Head viewed from below, showing position of the antennæ.  
 1 c. Segments of the tail, dorsal view, all further magnified.  
 2. *Porcellio cayennensis*, p. 667, dorsal view, magnified twice the natural size.  
 2 a. Front view of head.  
 2 b. Segments of the tail, dorsal view, further magnified.  
 3. *Porcellio jelskii*, p. 668, dorsal view, magnified twice the natural size.



- Fig. 3 *a*. Head and antennæ of the same, dorsal view.  
 3 *b*. Tail-segments of the same, dorsal view, both further magnified.  
 4. *Porcellio flavo-vittata*, p. 669, dorsal view, magnified twice the natural size.  
 4 *a*. Head and antennæ of the same, inferior view.  
 4 *b*. Segments of the tail, dorsal view, both further magnified.  
 5. *Porcellio hispidus*, p. 676, dorsal view, magnified twice the natural size.  
 5 *a*. Tail-segments of the same, further magnified.  
 6. *Anilocra lævis*, p. 672, natural size.  
 6 *a*. Front and antennæ, magnified.  
 6 *b*. One of the legs of the last pair.  
 6 *c*. Uropoda, further magnified.

## PLATE LXIX.

- Fig. 1. *Acanthonyx elongatus*, p. 673, natural size.  
 2. *Tylos granulatus*, p. 674, lateral view, natural size.  
 2 *a*. Head and antennæ, dorsal view.  
 2 *b*. Segments of the tail, dorsal view, both further magnified.  
 3. *Philougria nitida*, p. 670, dorsal view, magnified twice the natural size.  
 3 *a*. Head and antennæ, dorsal view.  
 3 *b*. Tail-segments, dorsal view, both further magnified.  
 4. *Lironeca daurica*, p. 676, dorsal view, natural size.  
 4 *a*. Head and antennæ, dorsal view.  
 4 *b*. One of the legs of the first pair.  
 4 *c*. Uropod: all further magnified.  
 5. *Lironeca laticauda*, p. 677, dorsal view, natural size.  
 5 *a*. Head and antennæ, inferior view.  
 5 *b*. One of the legs of the first pair.  
 5 *c*. Uropod: all further magnified.  
 6. *Anilocra trichiura*, p. 677, dorsal view, natural size.  
 6 *a*. One of the legs of the first pair, magnified.

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November 6th, 1877.

Arthur Grote, Esq., V.P., in the Chair.

The Secretary read the following reports on the additions to the Society's Menagerie during the months of June, July, August, and September 1877:—

The total number of registered additions to the Society's Menagerie during the month of June was 166, of which 87 were by birth, 35 by presentation, 25 by purchase, 1 by exchange, and 18 were received on deposit. The total number of departures during the same period by death and removals was 92.

The most noticeable additions during the month of June were as follows:—

1. A White-cheeked Gibbon (*Hylobates leucogenys*), presented by W. H. Newman, Esq., H.B.M. Consul, Siam, Bangkok, June 2nd, and kindly brought to this country under the care of Mr. A. R. Houghton in the steamship 'Agamemnon.' The White-cheeked Gibbon was described many years ago in the Society's 'Proceedings' (P. Z. S. 1840, p. 20) by the late Mr. Ogilby, upon an animal which had been living in the Society's Menagerie, and of which the exact habitat was unknown. The typical specimen is now in the British

Museum. So far as I know, no second individual of this well-marked species of *Hylobates* has since occurred; it is therefore of the greatest interest to have obtained a specimen from a distinct locality<sup>1</sup>. Our present individual, which is a young male, seems to agree in every respect with Mr. Martin's description and figure (Nat. Hist. of Man and Monk. p. 445).

Mr. Smit's figure (Plate LXX.) will, I trust, serve to make this interesting species better known.

2. A Tibetan Partridge (*Perdix hodgsoniae*, Gould)<sup>2</sup>, presented by Monsieur J. M. Cornély, of Tours, C.M.Z.S., on the 16th June, being, so far as I am aware, the first example of this fine representative of this well-known species that has been received by the Society. A second specimen of the same bird has since been purchased from Mr. W. Jamrach, from whom, I believe, M. Cornély obtained his specimen.

3. A young male Hippopotamus, received June 20th, having been purchased of the Royal Zoological Society of Amsterdam for the sum of £800.

The original pair of Hippopotamuses, obtained from the Viceroy of Egypt (the male in 1851, and the female in 1854), being both now well advanced in years and having ceased to breed, the Council thought that it would not be right to miss an opportunity of obtaining a mate for the Society's young female of this species, born in the Gardens on the 5th November, 1872.

The Council accordingly entered into an agreement with the sister Society at Amsterdam for the acquisition of the young male Hippopotamus, which was born in their gardens on the 3rd of August, 1876, and which arrived safely in this country under the care of Mr. Hegt, the subdirector of their Gardens, on the 20th June last. The young animal, which now measures about 2 feet 6 inches in height, has hitherto been fed nearly exclusively on Goat's milk, but is now beginning to take more substantial diet, and appears to be in every way thriving.

4. A fine example of the black variety of the common Leopard (*Felis pardus*), from Lahore, Malay peninsula, presented by Sir Harry St. George Ord, C.B., F.Z.S.

5. Twenty Common Boas (*Boa constrictor*), produced alive by one of the Boas in the Society's Gardens on the 30th June. This is the first occasion in which this Serpent has bred in the Society's Gardens; and, so far as I am aware, the fact of the Boa producing living ones was not certainly known. The young Boas are about 15 inches in length, and are lively and active, threatening to bite if touched. They are already beginning to feed; and we have good hopes that some of them, at least, may be reared<sup>3</sup>.

<sup>1</sup> The notice given by Mr. Blyth (P. Z. S. 1841, p. 63) of the supposed occurrence of this species on the Ghauts of Malabar is, no doubt, founded on some error.

<sup>2</sup> See Gould's 'Birds of Asia,' pt. ix. May 1, 1857, for a figure of this species.

<sup>3</sup> P.S. (November 6th).—All of these Boas, except one, are still alive and in good condition.



J.Smit lith.

J. Smit

Hanhart imp

HYLOBATES LEUCOGENYS







J. S. Smit lith

Hanhart imp.

PARACONURUS PREHENSILIS.

The total number of registered additions to the Society's Menagerie during the month of July was 145; of these, 54 were acquired by presentation, 48 by purchase, 5 by exchange, 22 by birth, and 16 were received on deposit. The total number of departures during the same period, by death and removal, was 102.

The most noticeable additions during the month were:—

1. A Prehensile Paradoxure (*Paradoxurus prehensilis*)<sup>1</sup>, from Assoum, on the Houndraw river, about 90 miles from Moulmein, Burmah, presented July 13th, by W. H. Pattison, Esq.

This Paradoxure (Plate LXXI.) is of a well-marked and peculiar species, quite new to us, and appears to be little known except from the figure in Hardwicke and Gray's 'Indian Zoology' (ii. pl. 9), taken from a drawing of Buchanan-Hamilton. Its tail is very long and slender, and appears to be slightly prehensile.

2. A Urumutum Curassow (*Nothocrax urumutum*), from the Upper Amazons, purchased July 16th. When I communicated to the Society my memoir on the Curassows in 1873 (see Trans. Zool. Soc. ix. p. 273) I was unable to figure this rare species from a living example. As will be seen by the coloured sketch now exhibited, the bare skin over the eye was, in consequence, coloured wrongly, the upper portion over the eye being bright yellow instead of blue.

3. A Crane, obtained from Chantung, in Northern China, and kindly transmitted to the Society by Mr. Theodore Hance, of Chingkiang. It appears to belong to the eastern form of the Common Crane, called *Grus longirostris* in the 'Fauna Japonica.'

Comparing this bird (of which I exhibit a sketch by Mr. Smit) with the Common Crane of Europe, *Grus cinerea*, it seems to differ in its lighter colour, and in the uropygial plumes being cinereous with black terminations, instead of being altogether black as in the common species; but I doubt its being specifically different.

The total number of registered additions to the Society's Menagerie during the month of August were 116 in number; of these, 67 were acquired by presentation, 19 by purchase, 4 by birth, 8 by exchange, and 18 received on deposit. The total number of departures during the same period by death and removals were 110.

The most noticeable additions during the month were:—

1. A Cape Hedgehog (*Erinaceus frontalis*), purchased August 13th, being the first example of this southern representative of our familiar British species that has reached us.

2. A young example of the American Tantalus (*Tantalus loculator*), purchased August 30th.

3. A Brazilian Motmot (*Momotus brasiliensis*), purchased on the same day. Both these birds belong to species hitherto unrepresented in the Society's Aviaries.

I may take this opportunity of pointing out that, as suggested to me by Prof. Garrod, the male Deer, which we have had for some

<sup>1</sup> *Viverra prehensilis*, Desm. See Horsf. Cat. Mamm. E.I. C. p. 63.

years in the Gardens under the name of *Cervus duvaucelli*<sup>1</sup>, appears to belong to the allied species *Cervus schomburgki* of Siam.

The animal in question was received in exchange from the Zoological Gardens of Hamburg on the 1st of November, 1873. On in-



Head of *Cervus schomburgki*.

quiry, Dr. Bolau, the Secretary of the Zoological Society of Hamburg, has kindly informed me that it was born in the Gardens on July 15th of the same year, having been bred between a male, said to have come from Bangkok in 1862, and a female received from Berlin, which is also believed to have come from Siam.

The total number of registered additions to the Society's Menagerie during the month of September was 81; of these, 31 were acquired by presentation, 25 by purchase, 7 by birth, and 18 were received on deposit. The total number of departures during the same period by death and removals was 101.

<sup>1</sup> See 'List of Vert.' (sixth edition) p. 134. sp. 484 f.



The most noticeable additions during the month were as follows :—

1. Two Guilding's Amazons (*Chrysotis guildingi*), from St. Vincent's, West Indies, purchased September 15th. These fine Parrots are now said to be very scarce in their native Island of St. Vincent, to which they are peculiar.

2. Two Slaty Coots (*Fulica ardesiaca*) from Western Peru, purchased September 18th, being the first examples of this interesting representative of our Common Coot that have reached us.

The Secretary read the following extract from a letter addressed to him by Mr. R. Trimen, C.M.Z.S., dated South-African Museum, Cape Town, July 27th, 1877 :—

“With reference to your note on the species of *Sarcidiornis* (P. Z. S. 1876, pp. 694, 695), I think it may be useful to offer a few remarks on two specimens of the African form contained in the collection of this Museum, one of which was received from the Zambesi, and the other obtained in exchange from the late Mr. C. J. Andersson, who brought it from Damara Land.

“I have no Indian specimens with which to compare these African birds; but, taking Mr. Smit's figure (P. Z. S. 1876, pl. lxxvii.) as an accurate representation of *S. melanonota*, the two birds to which I refer differ in the following particulars from the Indian form, viz. :—

“(1) The white of the neck encroaches considerably on the back between the shoulders.

“(2) The curved black streak from the shoulder downward is much more attenuated.

“(3) The under tail-coverts are pure white, without the slightest trace of the bright yellow shown in the figure. (Is it possible that the yellow may have been present in the living specimens, but have faded out in course of time, like that of *Chalcites smaragdineus*?)

“(4) The secondaries and greater coverts are not of the coppery-brown hue depicted in the plate, but mixed metallic-green and bronze with violet reflexions.

“(5) The caruncle on the bill is higher in proportion to its base; it is more vertically elevated anteriorly, and more rounded and sloping posteriorly than is shown in the figure. (This difference may, however, be the effect of shrinking or some defect in mounting our specimens.)

“I should also mention that the lower part of the back is dirty whitish-grey, shading into the metallic-glossed black of the rump.

“You will be better able than myself to judge whether the differences mentioned are of specific value; my own impression is that they are.”

A letter was read from Mr. A. O. Hume, C.B., containing some criticisms on Mr. Howard Saunders's review of the Sterninæ, published in the Society's 'Proceedings' for 1876 (p. 638). Mr. Hume was of opinion that the bird figured (plate lxi. fig. 2) as *Anous melanogenys*, was not that species, but *A. leucocapillus*.

The Secretary exhibited, on the part of Mr. G. Dawson Rowley, F.Z.S., an egg of *Pauwis galeata*, and read the following note by Mr. Rowley on the subject:—

“This egg of *Pauwis galeata* was laid June 30, 1877, by a *black* female, exactly like the male, except that in size she is a trifle smaller. The two birds have been kept by themselves for several years in a large aviary. The brown form of female<sup>1</sup> is also here in a different cage; and no communication has been allowed. The black female lays eggs every year; but they have been previously always broken. All the birds have been in my possession about eight or nine years.

Prof. Flower, F.R.S., V.P., read “A further Contribution to our Knowledge of the existing Ziphioid Whales, of the Genus *Mesoplodon*.”

This communication contained a description of two skeletons and several skulls of Cetaceans of the genus *Mesoplodon* from New Zealand, sent to England by Dr. Hector and Dr. J. v. Haast, preceded by a review of the species of the genus at present ascertained to exist. These appeared to be the following:—

1. *M. bidens* (Sowerby) = *M. sowerbiensis* of Blainville and most other authors.

*Hab.* European Seas.

2. *M. europæus*, Gervais.

*Hab.* North coast of France.

One example only known.

3. *M. densirostris* (Blainville) = *M. seychellensis* (Gray).

*Hab.* Indian Ocean, Australia.

4. *M. layardi* (Gray) = *M. longirostris*, Kreffl = *M. floweri*, Haast = *Callidon guentheri*, Gray = *Dolichodon traversii*, Gray.

*Hab.* Indian Ocean, Australia, New Zealand.

5. *M. hectori* (Gray) = *M. knoxi*, Hector.

*Hab.* New Zealand.

Known only by a single individual, of which the skull, now in the British Museum, is described in the present communication.

6. *M. grayi*, Haast = *Oulodon grayi*, Haast.

*Hab.* New Zealand.

A complete skeleton, in the Museum of the Royal College of Surgeons, is described in the present memoir.

7. *M. haasti*, n. sp., = *M. hectori* (Gray), Hector, Trans. N.Z. Inst. vol. vi. p. 86, and vol. vii. p. 362.

*Hab.* New Zealand.

A complete skeleton, now in the British Museum, described in the present memoir.

This memoir will be published entire in the Society's ‘Transactions.’

<sup>1</sup> Cf. Sclater, Trans. Zool. Soc. vol. ix. p. 285, pl. liii. et P. Z. S. 1870, p. 669.

The following papers were read:—

1. Descriptions of new Reptiles from the Madras Presidency.  
By Lieut.-Colonel R. H. BEDDOME, C.M.Z.S.

[Received June 25, 1877.]

*OLIGODON TRAVANCORICUM*, n. sp.

Belly with quadrangular black spots. Scales in seventeen rows; labials seven (the sixth does not enter the labial margin), one loreal, one anteorcular, two postoculars; temporals 1+2. Head with symmetrical black markings; a black band over the postfrontals and vertical, descending through the eye; and another black band descends to corner of mouth. Body brown, with about twenty-nine nearly regular cross bars of black edged with white, each being the breadth of two scales.

*Hab.* South-Travancore mountains, 3000 feet elevation.

A single specimen only was found; the position of the sixth labial away from the labial margin is probably not constant. Dr. Günther states that it occurs in *Simotes venustus*; but in two specimens of that Snake now in my collection it is excluded in one but not in the other.

*GYMNODACTYLUS JEYPORENSIS*, n. sp.

Of stout form. Body covered with large hexagonal or nearly square scales in only about eighteen rows across, a few about the vertical line being a little reduced in size; scales of the belly smaller and rounded behind, in about thirty series across. Head covered with small, bead-like, rounded scales; upper labials ten, the last two very small; lower labials seven, the last minute; median lower labial large, pointed behind, with a large pair of chin-shields behind it; subcaudals larger than the scales of the belly. Tail with two tubercles on each side close to the vent; pupil elliptic; opening of the ear subhorizontal. Colour of a light grey, irregularly blotched with dark brown; head with small blotches; nape with two large lunate blotches, one behind the other; body with three 8-shaped blotches, which, however, do not meet, and smaller intermediate markings; tail irregularly blotched.

Length  $3\frac{1}{2}$  inches; no femoral nor præanal pores.

*Hab.* Jeypore hills.

A single example was captured in a wood on the top of the Patinghe hill, 4200 feet elevation. In coloration somewhat like *G. collegalensis* (mihi); but that species has fine granular scales, in about fifty series across the back. This is a larger and stouter species, with more the facies of a *Eublepharis*, but without eyelids.

*BUFO TRAVANCORICUS*, n. sp.

Crown flat, without any bony enlargement; snout triangular, projecting; canthus rostralis not very distinct; first, second, and third

fingers of about equal length; third nearly double as long; carpus with a very large smooth tubercle; toes webbed; metatarsus with two small tubercles; no fold on the tarsus; tympanum very small; parotoid elongate, rather indistinct, four times as long as broad. Body and belly covered with warty tubercles; the arms and legs quite spiny. Colour blackish brown; the thighs, arms, and legs beautifully marbled with carmine; the tubercles of the body often tipped with the same colour; those of the belly often whitish.

Length of body  $1\frac{3}{4}$  inches, hind legs 2 inches.

*Hab.* Travancore.

A single specimen was captured, under an old rotten log, in dense moist forests, above the Ayen-Coil pass (Travancore), at about 2500 feet elevation; its nearest ally is the *B. kelaartii*, a Ceylonese species.

In the same forest was captured a fine large species of *Dendrophis*, with almost exactly the coloration of *Ptyas mucosa*, and no trace of a yellowish lateral band; the scales in fifteen rows, the vertical row very much enlarged and hexagonal, and the two next rows rather enlarged; but as the plates of the head are in every way quite similar to those of *Dendrophis pictus*, and it does not seem to differ from that species in any thing but coloration; I do not like to consider it a new species; it is, however, a new variety, I think.

2. Contributions to the Ornithology of the Philippines.—  
No. I. On the Collection made by Mr. A. H. Everett  
in the Island of Luzon. By ARTHUR, Marquis of  
TWEEDDALE, F.R.S., President of the Society.

[Received July 16, 1877.]

(Plates LXXII. and LXXIII.)

Mr. Everett, so favourably known as an able, energetic and zealous field-naturalist, and as one of the foremost explorers of the fauna of Borneo, arrived in the Island of Luzon in the beginning of this year, and, after overcoming the official difficulties which sometimes obstruct scientific investigations in the Philippine Islands, commenced collecting zoological specimens at Monte Alban and San Mateo, stations not far from Manilla. Among other objects Mr. Everett secured some 361 specimens of birds in part of the month of January, in February, and in the beginning of March, 1877. These he has kindly consigned to me; and I propose to give an account of them, adding in each instance the original notes on the labels made by Mr. Everett. Eighty-five species are represented in the collection; and although the neighbourhood of Manilla might with justice be considered as having been exhausted by former collectors, Mr. Everett has discovered three undescribed species, besides adding many more to the already known Luzon, and a few to the Philippine avifauna.

In my memoir on the Birds inhabiting the Philippine Archi-

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1865

1865

MEGALURUS RUFICEPS.



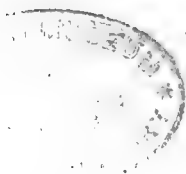


2

Smith lith

Hanhart imp

1. DICÆUM XANTHOPYGIUM.  
2. OXYCERCA EVERETTI.





pelago<sup>1</sup> I enumerated 218 species. This number must be diminished by one, *Circus æruginosus*, Mr. H. Cuming's Philippine specimen, catalogued under that title by Mr. Sharpe (Cat. Accipitres B. Mus. p. 71), my only authority, being now considered by Mr. Sharpe to be *C. spilonorotus*, jr. (see Ibis, 1876, p. 31). Further, I have reason to doubt the Philippine habitat of so-called *Crateropus caudatus* (no. 97). To the net total of 216 species Mr. Sharpe has been able to add some 66 species, for the most part obtained by Dr. Steere<sup>2</sup>. This total is partly arrived at by including 23 species from the island of Palawan, 4 from that of Balabac, and 4 from the Sooloo Islands. In a footnote (*t. c.* p. 126) I excluded the Sooloo archipelago from the Philippine area; and as we have only the evidence of four known Sooloo species of birds to guide us, I am disinclined as yet to concur in Mr. Sharpe's opinion that these islands ought to be included. Nor am I quite certain that Palawan and still more Balabac should not be excluded. That Palawan certainly is a border region, intervening between Borneo and the Philippine Islands, is made evident by Dr. Steere's remarkable discoveries; but the Malayan character of its ornithology overpowers the Philippine element; and until its fauna and that of the Sooloo Islands shall have been more completely investigated, I purpose to exclude them from what I consider to be the strictly Philippine area. Deducting, therefore, the 23 Palawan, the 4 Balabac, and the 4 Sooloo species (not known in the Philippine archipelago as restricted by me) from Mr. Sharpe's list (*t. c.* p. 350), in all we have a total of 35 purely Philippine birds added by Dr. Steere to my amended number of 216, making 251 in all. The naturalists of the 'Challenger' Expedition added 11 more (see my paper above, p. 537), making an amended total of 262 Philippine species; and to this number Mr. Everett has enabled me to add 6 from Luzon, namely three new species,

*Megulurus ruficeps*,

*Oxyerces everetti*,

*Dicaeum xanthopygium*,

two not hitherto recorded,

*Motacilla ocularis*,

*Anthus maculatus*,

and one previously supposed to be a Malayan species,

*Turnix fasciatus*.

So 268 species of birds may at this date be considered the total number known to occur in the Philippine Islands, exclusive of Palawan, Balabac, and the Sooloos.

<sup>1</sup> Trans. Zool. Soc. 1875, ix. pp. 125-252.

<sup>2</sup> Sharpe, Trans. Linn. Soc. ser. 2, Zool. i. p. 307. This number is less by two than Mr. Sharpe's estimate (*t. c.* p. 308), in consequence of my not being able to recognize *Chysocalaptes maculiceps*, Sharpe, as being distinct from *C. lucidus* (Scop.), and *Hirundo rustica* of the Islands as differing from *H. gutturalis*, *Brachyurus propinquus*, Sharpe, ex Mindanao, does not appear to be distinct from *Erythropitta erythrogastra*, ex Luzon, though the Balabac type may be different. Perhaps the Zebu *Cyornis*, *C. banyumas* of my list (no. 84), may have to be added as constituting a distinct species; for it appears to differ specifically from *C. philippensis*, Sharpe, ex Luzon and Panay.

In the Table showing the geographical distribution of the Philippine birds (*t. c.* pp. 249, 252) I enumerated 57 the exact habitat of which had not been established. From this, one species (the so-called *Crateropus caudatus*) must be deducted. Mr. Sharpe has been able most satisfactorily to reduce the number by 8 (*t. c.* p. 308); and Mr. Everett's discoveries enable me to still further diminish the number by 9.

Philippine species of which the exact habitat has been determined by Mr. Everett:—

<i>Caprimulgus griseatus.</i>	<i>Parus elegans.</i>
<i>Calliope camtschatkensis.</i>	<i>Geopelia striata.</i>
<i>Phylloscopus borealis</i> (olim <i>magnirostris</i> ).	<i>Turnix ocellata.</i>
<i>Orthotomus derbianus.</i>	<i>Hypotaenidia philippensis.</i>
	<i>Ardetta cinnamomea.</i>

So the precise habitats of only 39 species now remain undetermined.

The total number of species known to be resident in the island of Luzon I estimated (*t. c.*) at 133<sup>1</sup>; but Mr. Sharpe has correctly pointed out that Cataguan, which I had treated as a separate island, forms, in reality, part of the island of Luzon. *Puffinus leucomelas*, which I recorded from there, must be added to the number of Luzon birds; and to this Mr. Sharpe adds *Zeocephus rufus* and *Penelopides panini*<sup>2</sup>, obtained by Mr. Cuming at Cataguan, and *Erythropitta erythrogastra*, on the faith of a Manilla example so labelled in Mr. Gould's collection. To this amended total of 137 Luzon species Mr. Everett has enabled me to add the 9 species already removed above from the general Philippine list, the 3 undescribed species and the 3 other species new to the fauna above mentioned, besides the following 8 residents of other Philippine islands:—

<i>Eudynamis mindanensis.</i>	<i>Copsychus mindanensis.</i>
<i>Lanius nasutus.</i>	<i>Corydalla lugubris.</i>
<i>Lalage dominica.</i>	<i>Arachnechthra jugularis.</i>
<i>Hirundo gutturalis.</i>	<i>Rhynchæa capensis.</i>

The exact total of known Luzon residents will therefore now amount to 160.

#### 1. PRIONITURUS DISCURUS (2)<sup>3</sup>.

[Monte Alban. *a*, ♂: iris brown; bill lead-grey; feet bluish grey; nails dark grey. *b*, ♂: iris chocolate-brown; bill lead-grey; feet bluish grey; claws dark grey.]

A series of seven examples, ♂ and shot in February, is sent by Mr. Everett, all being in bright green plumage without a trace of blue on the head. The elongated naked shafts of the middle pair of rectrices greatly vary in length, some being only half an inch, others two inches in length. In two examples these feathers are prolonged for about half an inch, but the shafts are webbed.

<sup>1</sup> Conf. Sharpe, *t. c.* p. 309.

<sup>2</sup> Is it not *P. manillæ*?

<sup>3</sup> The numbers following the titles are the same as those of my memoir (*t. c.*).

2. *CYCLOPSITTA LUNULATA* (4).

[San Mateo. ♂ : iris dark brown ; bill black, base pale lead-grey ; feet greenish grey ; nails dark grey.]

The male example is in full dress and in *P.-loxia* plumage. The female has a few verditer-blue chin-, chest-, and throat-plumes, and some of the rump-feathers obscurely lunated—seemingly an immature specimen.

3. *MICROHIERAX ERYTHROGENYS*.

*Hierax erythrogenys* (10).

[Monte Alban. ♀ : iris brown ; bill black ; feet dull bluish ; claws black.]

Obtained in February. In black and white dress ; and as Mr. Everett has ascertained the sex to be female, it would seem that the *erythrogenys* plumage is significant of nonage and not of sex.

4. *SPILORNIS HOLOSPILUS* (16).

[Monte Alban. *a*, ♂ : iris golden-yellow ; bill dark grey ; orbital skin and lores bright yellow-green ; cere ditto ; claws black ; legs yellow.

San Mateo. *b*, ♀ : iris golden-yellow ; bill dark plumbeous ; orbital skin and lores bright greenish-yellow ; cere ditto, but greener ; legs light chrome-yellow ; claws black.]

5. *HALIASTUR INTERMEDIUS* (17).

[San Mateo. ♂ *juv.* : iris warm brown ; bill greenish-lead, cere darker ; feet greenish yellow, almost white.]

6. *BUTASTUR INDICUS* (20).

[San Mateo. *a*, ♂ : iris golden yellow ; bill chrome-yellow at the base, rest black ; cere chrome ; legs dull chrome-yellow ; claws black. *b*, ♂ : iris bright yellow ; cere chrome-yellow ; bill black ; legs dull chrome ; claws black.]

7. *THRIPONAX JAVENSIS* (28).

[Monte Alban. ♂ : bill black ; feet and claws lead-grey.]

8. *CHRYSOCOLAPTES HÆMATRIBON* (30).

[San Mateo. *a*, ♂ : iris Indian red ; bill greenish black ; feet pale dull greenish ; claws very dark grey.

Monte Alban. *b*, ♂ : iris deep crimson ; bill greenish black ; feet greenish grey.]

9. *YUNGIPICUS MACULATUS* (33).

[Monte Alban. *a*, ♂ : iris brown ; bill black ; legs greenish. *b*, ♀ : iris light brown ; bill lead-grey ; legs greenish lead-grey.]

Sonnerat's type was obtained in Panay ; but these Luzon individuals agree well with his description. He mentions that his example "n'a point de rouge," but that perhaps he had only seen a female. The male sent by Mr. Everett possesses a crimson tuft springing from behind the eye. The species is nearly allied to *Y. fusco-*

*albidus*, Salvad., ex Java, Sumatra, and Malacca, but is larger, has a more powerful bill, has the white markings on the tertiaries transversely linear rather than rounded, and has the white gular feathers terminated by brown spots.

10. *MEROPS PHILIPPINUS* (35).

[San Mateo. *a*, ♂ : iris blood-red ; bill black ; feet purple-brown. *b*, ♂ : iris crimson ; bill black ; feet light greenish. *c*, ♀ : iris blood-red ; bill black ; legs purple-brown ; claws black. *d*, ♀ : iris blood-red ; bill black ; feet sooty brown ; claws black.

Monte Alban. *e*, ♀ : iris crimson ; bill black ; nails ditto ; legs greenish.]

A series of seven examples, all obtained in the month of February.

11. *MEROPS BICOLOR* (36).

[Monte Alban. ♂ : bill black ; legs purplish-brown.]

12. *EURYSTOMUS ORIENTALIS* (37).

[San Mateo. ♂ : iris brown ; bill orange-red ; feet coral-red ; claws black.]

13. *ALCEDO BENGALENSIS* (38).

[Monte Alban. *a*, ♂ : iris brown ; feet scarlet ; claws sienna-brown ; bill black.]

Identical with Bengal examples.

14. *ENTOMOBIA GULARIS* (44).

[San Mateo. *a*, ♂ : iris dark brown ; bill and legs coral-red ; claws sepia-brown. *b*, ♂ : iris dark brown ; bill and legs coral-red ; claws dark brown. *c* : a frog in the gizzard. *d*, ♂ : iris chocolate ; bill and feet coral-red.

Monte Alban. *e*, ♂ : iris dark brown ; bill bright red ; feet coral-red ; nails very dark brown. *f*, ♂ : iris dark brown ; bill bright red ; feet coral-red.]

The plumage of the two sexes does not differ.

15. *SAUROPATIS CHLORIS* (47).

[Monte Alban. ♀ : iris and feet dark brown ; bill black, lower half whitish.]

16. *ACTENOIDES LINDSAYI* (49).

[Monte Alban. *a*, ♂ : iris brown ; bill black, the mandible and culmen yellow ; legs light green. *b*, ♀ : iris brown ; upper half of beak black, culmen and lower half chrome-yellow ; feet light green, claws horn-yellow.]

17. *XANTHOLEMA HEMACEPHALA* (50).

[Monte Alban. ♂ : iris dark hazel-brown ; orbital skin crimson ; bill black ; legs and feet coral-red ; nails greyish black.]

18. *CAPRIMULGUS GRISEATUS* (56).

[San Mateo. *a*, ♂ : iris dark brown ; tip of bill ditto ; legs light

purple-brown; nails black. *b*, ♂: iris dark chocolate; feet purple-grey.]

Seen from above, this Nightjar is difficult to distinguish from five examples of *C. affinis*, ex Lombock. Underneath it conspicuously differs in having the ventral plumage and the thigh-coverts transversely banded with narrow brown lines, instead of being uniform pale rufo-fulvous. The two outer pairs of rectrices in *C. affinis* are throughout pure white; in these examples of *C. griseatus* the inner webs of the basal third are pale ferruginous banded with brown.

♂. Wing 6.37 inches, tail 4.0, middle toe 0.75.

#### 19. CACOMANTIS MERULINUS (57).

[San Mateo. *a*, ♂: iris yellow?; beak very dark brown; feet dirty ochreous; claws black. *b*, ♂: iris pale reddish; legs light chrome-yellow; claws black. *c*, ♂: iris pale reddish; bill black; legs ochreous yellow; nails black; interior of gape red.]

#### 20. EUDYNAMIS MINDANENSIS (61).

[Monte Alban. ♂: iris crimson; bill greyish-green; legs dark lead-grey; nails black.]

#### 21. DASYLOPHUS SUPERCILIOSUS (62).

[Monte Alban. *a*, ♂: iris pure chrome-yellow; orbital skin and base of beak fiery orange; bill pale green; legs greenish chrome; claws dark grey. *b*, ♀: iris chrome-yellow; orbital skin orange; bill pale green, deep orange at base; legs yellow, tinged green on tarsus; nails grey.]

Sexes alike.

#### 22. LEPIDOGRAMMUS CUMINGI (63).

[Monte Alban. *a*, ♂: iris crimson; orbital patch ditto; bill horn-yellow; legs grey. *b*, ♂: iris and orbital skin crimson; bill horn-yellow; legs and feet light grey. *c*, ♂: iris and orbital skin crimson; bill horn-yellow; legs dark lead-grey. *d*, ♀: iris and orbital skin crimson; bill horn-yellow; legs and feet grey.]

Sexes alike.

#### 23. CENTROCOCCYX VIRIDIS (64).

[Monte Alban. *a*, ♂: iris crimson; bill black; legs dark lead-grey. *b*, ♂ *juv.*: iris crimson; bill and claws black; legs darkest shade of lead-grey.

San Mateo. *c*, ♀: iris bright crimson; bill black; legs lead-grey; claws grey-brown. *d*, ♀ *juv.*: iris brown; legs dark-grey; beak lead-colour.]

Mr. Everett sends a series of seven individuals, four in adult and three in immature plumage. The dimensions of the male and female are alike; and this is the case in a larger series obtained by Dr. B. Meyer (*l. c.*). Count Salvadori (*Ucc. Borneo*, p. 70) has united the larger *C. affinis* (Horsf.) with the smaller *C. javanensis* (Dumont), on the ground that they respectively represent the two sexes of the

same species. If this is correct, *C. affinis* is an exception to the rule of equality in size which prevails among all the other known Asiatic species of this genus. Moreover Bernstein has shown that the two Javan birds differ in their anatomical structure (*conf.* Walden, *Trans. Zool. Soc.* viii. pp. 56, 60).

24. *BUCEROS HYDROCORAX* (66).

[Monte Alban. ♂: iris red; bill red; nails dull black; orbital skin yellow; feet brownish red.]

The whole of the back and shoulders of the two examples obtained by Mr. Everett are smeared with an olive-yellow powder, seemingly taken from the oil-glands at the root of the tail. Mr. Elliot (*Monogr. Bucerotidæ*, pt. ii.) countenances the erroneous statement of the older authors that this Hornbill also inhabits the Moluccas.

25. *PENELOPIDES MANILLÆ* (69).

[Monte Alban. ♂. iris crimson; orbital skin and base of mandible white; bill dark brown; the casque transparent horn-brown; the oblique bars on the maxilla ochre-yellow; feet and nails dull black; fruit in the gizzard.]

Mr. Sharpe (*t. c.* p. 309) identifies a Cataguan example of this genus in the British Museum with *P. panini*. If the identification and locality are correct, both species inhabit the island of Luzon.

26. *LANIUS NASUTUS* (70).

[San Mateo. *a*, ♂: iris orange-brown; bill, legs, and nails black. *b*, ♂: iris pale orange-brown; bill, legs, claws black. *c*, ♀: iris warm brown; bill and legs black.]

The four examples sent by Mr. Everett are in mature plumage. They are difficult to separate from the grey-backed form of India, *L. nigriceps*. The only apparent difference is, that in the Luzon bird the rufous of the uropygium and upper-tail coverts is not so bright, and that the grey on the back extends lower down. Dimensions about equal.

27. *LANIUS LUCIONENSIS* (72).

[San Mateo. *a*, ♂: iris dark-brown; bill purplish leaden; legs dark bluish grey; claws black. *b*, ♂: iris dark brown; bill purplish leaden; legs bluish; claws dark brown. *c*, ♀: iris dark brown; legs dark lead; claws black; bill purplish brown.]

The two examples marked ♀ have the cheek-stripe brown, not black; and the pectoral feathers and upper tail-coverts are edged with brown.

28. *ARTAMUS LEUCORHYNUS* (73).

[San Mateo. *a*, ♂: iris dark brown; bill whitish blue, tipped black; legs darkest lead-grey. *b*, ♂: iris chocolate; bill pale bluish; feet and claws black. *c*, ♂: iris dark brown; bill pale-bluish-grey, tipped black; legs darkest lead-grey; claws black. *d*, ♀: iris dark brown; bill pale whitish blue, tip black; legs dark leaden.]

29. *GRAUCALUS STRIATUS* (74).

[Monte Alban. *a*, ♂: iris pale lemon-yellow; bill, legs, and claws black.]

San Mateo. *b*, ♂: iris pure lemon-yellow; bill, legs, and claws black.]

Two examples in uniform plumbeous plumage.

30. *VOLVOCIVORA?* *CÆRULESCENS* (75).

[Monte Alban. ♂: iris dark brown; bill, legs, and claws jet-black.]  
In full jet-black plumage.

31. *LALAGE DOMINICA* (76).

[San Mateo. *a*, ♂. iris dark brown; bill black. *b*, ♀: iris dark brown; bill and nails black; legs blackish-grey. *c*, ♀: iris dark brown; legs plumbeous.]

32. *DICRURUS BALICASSIUS* (80).

[Monte Alban. *a*, ♂: iris crimson; bill, legs, and nails, black. *b*, ♀: iris crimson; bill, legs, and claws, black.]

33. *PHILENTOMA CYANICEPS* (82).

[Monte Alban. *a*, ♂: iris rich dark brown; bill black; legs purplish brown. *b*, ♂: iris crimson; bill black; legs and feet brown.]

34. *LEUCOCERCA NIGRITORQUIS* (83).

[San Mateo. ♂: iris very dark brown; legs black; claws black.]

35. *CYORNIS PHILIPPINENSIS*.

*Cyornis philippinensis*, Sharpe, *t. c.* p. 325.

*Cyornis banyumas* (84 partim).

[Monte Alban. ♂: iris dark chocolate-brown; bill black; legs light brown.]

Five examples of a species of the genus *Cyornis* obtained at Monte Alban by Mr. Everett are distinguishable from *C. banyumas*, ex Java, by having the abdomen, vent, and under tail-coverts white and not rufous, and the rufous of the breast paler. Above no difference is discernible. A Zebu bird collected by Dr. B. Meyer (*t. c.* no. 84) differs from the Luzon in being of a darker shade of blue above, especially on the head, and in having the frontal and superciliary feathers and the wing-coverts darker blue. The Luzon examples are not separable from the type of *C. philippinensis* in the British Museum.

36. *HYPOTHYMIS AZUREA* (85).

[Monte Alban. *a*, ♂: iris chocolate-brown; bill blue, tip black; interior of gape pale yellow-green; legs lead-blue; nails black. *b*, ♂: iris dark brown; bill blue, tip black; legs lead-blue; nails black. *c*, ♂: iris dark brown; blackish blue; legs lead-blue. *d*, ♀: iris dark chocolate-brown; bill and nails black; legs dark grey.]

37. *BUTALIS MANILLENSIS* (86)?

[Monte Alban. ♂: iris dark brown; legs and claws black; bill dark vandyke brown, nearly black.]

A single example of a species of grey Flycatcher is sent by Mr. Everett, which, while resembling *B. griseosticta*, Swinh., still cannot be said to belong to that species. It is a larger bird with a wing measuring 3.56. The bill is narrower and longer, more like that of *B. grisola*. Above the plumage is of a paler purer grey and not grey-brown. The wing-lining and axillaries are grey rather than pale rufous. With doubt I refer this bird to *B. manillensis*, Bp.; for he states that the Manilla race is smaller than *B. grisola*, while this Luzon bird exceeds the European species in its dimensions. Mr. Sharpe (*t. c. p.* 326) identifies an example obtained in Panay by Dr. Steere with *B. griseosticta*<sup>1</sup>.

38. *HIRUNDO GUTTURALIS* (88).

[San Mateo. *a*, ♂: iris and feet dark brown. *b*, ♀: iris brown; bill, feet and nails black.]

39. *BRODERIPUS ACORRHYNCHUS* (90).

[San Mateo. *a*, ♂: iris pale purplish-brown; bill dull pale crimson; legs dark lead-grey; claws black. *b*, ♂: iris white; bill dull pale crimson; feet bluish-lead; claws black. *c*, ♂: iris yellow; bill pale dull crimson; feet dark grey. *d*, ♂: iris purple-grey, outer ring white; bill pale crimson; legs lead-grey. *e*, ♀: iris purple grey; bill pale dull crimson; legs lead-grey.]

Monte Alban. *f*, ♂: iris purple-grey; bill white, tinged crimson; legs lead-grey; claws blackish.]

Ten adult examples were obtained by Mr. Everett, seven males and three females. All the males have the middle pairs of rectrices jet-black, tipped with yellow. The same feathers in the females are washed with yellow; and the body plumage is not of so golden a tint.

40. *MEGALURUS PALUSTRIS* (96).

[San Mateo. ♂: iris orange-brown; bill black; mandible lead-grey; legs horn-brown; claws dark ditto.]

Identical with individuals from Burma, Assam, Sylhet, Manipur &c.; but I have not been able to compare it with typical examples. The Bengal (Philippine?) example, described by Pucheran (*Archives du Mus.* vii. p. 342) as being one of the types of *Gracula caudata*, Cuvier, must belong to this bird and not to the *Timalia chataræa*, Frankl., of India; and, judging from Pucheran's remarks, the Javan bird, *Malurus marginalis*, Reinw. (= *Megalurus palustris*, Horsf.), although very close, appears to differ from the Indian bird. There is good reason to doubt the occurrence of *Timalia chataræa*, Frankl.

<sup>1</sup> Since these remarks were in print, I have had the advantage of perusing M. Oustalet's observations on the type specimen of *B. manillensis*, Bp., in the Paris Museum (*Ois. de la Chine*, p. 123), whereby it appears that that gentleman is also of opinion that *B. manillensis* is distinct from *B. griseosticta*.



(= *Gracula caudata*, Cuv., apud Blyth), in the Philippines. Both Jerdon and Blyth appear to have been misled into identifying Franklin's bird with the Cuvieran type by some remarks of Lafresnaye's (Mag. Zool. 1st series, *Timalia*). Lafresnaye gave Franklin's diagnosis (P. Z. S. 1830-31, p. 118) and wrote that *T. chataræa* "nous a paru être le même oiseau que celui intitulé au Musée, *Gracula caudata* (Cuvier)." Lafresnaye described a bird in his collection and identified it with the type in the Paris Museum (said to have been obtained in Bengal by Dussumier in October 1820, but having, when Pucheran examined it, "Manilla" written on its label). And Lafresnaye's description (*l. c.*), and certainly Pucheran's of the type (already alluded to), will not apply to Franklin's bird. Blyth (*Ibis*, 1867, p. 6), in the belief that *T. chataræa*, Franklin = *G. caudata*, Cuvier, mentioned, on Pucheran's authority, that it was found in the Philippines; and I inadvertently gave Franklin's species a place in my list of Philippine birds (*t. c.* no. 97) although I stated that Indian authors seemed to have been somewhat hasty in identifying *T. chataræa* with *G. caudata*, Cuvier. *T. chataræa* may, for the present, be safely eliminated from our lists of the Philippine fauna.

#### 41. MEGALURUS RUFICEPS. (Plate LXXII.)

*Megalurus ruficeps*, Tweeddale, Ann. & Mag. N. H. ser. iv. vol. xx. p. 94 (1877).

♀. Lower surface white, faintly tinged with cream-colour on the breast. Flanks pale earthy brown. Under tail-coverts pale dingy isabelline rufous; thigh-coverts of a more decided rufous. Space before the eye and supercilium, passing well behind the eye, greyish white. Forehead, head, and nape, pure bright uniform rufous. Back olive-grey, each feather broadly centred by a longitudinal stripe of brown. Uropygium and upper tail-coverts uniform olive-grey. The base of the long and lax uropygial feathers pure dark grey, the tips only being olive-grey. Rectrices above dull ruddy brown, obsoletely barred with narrow brown lines. Quills brown, externally margined with ferruginous olive. Lesser wing-coverts olive-grey; greater tinged with ferruginous.

Wing 2·75 inches, tail 5·25, tarsus 1·0, culmen 0·56.

[Monte Alban. ♀: light clay-brown; bill brown, lower half grey; legs and feet whitish.]

#### 42. IXUS GOIAVIER (99).

Monte Alban. *a*, ♂: iris bright brown; bill black; legs dark brown. *b*, ♂: bill, legs, and nails black. *c*, ♀: bill and legs black; iris brown.

San Mateo. *d*, ♀: iris dark brown; bill black; legs dark grey, almost black.]

All Mr. Everett's specimens (a series of eight) of this species have the ear-coverts dark brown, the only character apparently which separates it from *I. analis*. The plumage of the two sexes does not differ.

43. *HYSIPETES PHILIPPINENSIS* (102).

[San Mateo. *a*, ♂: iris burnt-sienna brown; bill black; legs dark sepia-brown. *b*, ♀: iris burnt-sienna brown; bill black; legs dark plumbeous.

Monte Alban. *c*, ♂: iris burnt-sienna brown; bill black; legs and nails blackish grey.]

44. *MONTICOLA SOLITARIUS* (103).

[Monte Alban. *a*, ♂: iris chocolate; bill, legs, and claws black; *b*, ♂: iris dark brown; bill and nails black; legs blackish brown.]

Lower breast and abdomen almost pure dark rufous, a few of the blue and rufous feathers with albescent tips. Above with albescent tips and subterminal black marks.

45. *PRATINCOLA CAPRATA* (104).

[Monte Alban. ♀: iris dark brown; bill, legs, and claws black.]

46. *COPSYCHUS MINDANENSIS* (106).

[San Mateo. *a*, ♂: iris chocolate; bill, legs, and claws black. *b*, ♂: iris dark brown; bill black; legs and claws very dark brown.

Monte Alban. *d*, ♀: iris chocolate-brown.]

The adult female is dark glossy bluish-grey above. The chin, cheeks, throat, and breast a purer dead grey. The white of the abdomen somewhat sullied with rufescent.

47. *CORYDALLA LUGUBRIS* (117).

[San Mateo. *a*, ♂: iris dark chocolate-brown; bill vandyke brown, lower half yellowish; legs ochreous yellow; claws pale grey brown. *b*, ♀: ? iris dark chocolate; bill sepia-brown; mandible yellow-brown; legs and feet brownish ochre-yellow; claws pale brown.]

48. *ANTHUS MACULATUS*.

*Anthus arboreus*, var. *japonicus*, Schlegel, Faun. Jap. pp. 58, 139, t. xxiii., "Japan" (1842).

*Anthus maculatus*, Hodgs. Gray's Zool. Misc. p. 83 (1844); Blyth, J. A. S. B. 1847, p. 433: conf. Brooks, Str. F. 1876, p. 278.

*Dendromanthus maculatus* (Hodgs.), Blyth, Cat. Calc. Mus. p. 135. no. 753.

*Pipastes agilis* (Sykes), Gould, B. of As. pt. xvii. t. — (April 1, 1865).

*Pipastes maculatus* (Hodgs.), Blyth, B. Burm. no. 224.

[Monte Alban. ♂, shot on the ground in the forest.]

49. *PARUS ELEGANS*.

*Machlolophus elegans* (118).

[Monte Alban. ♂: iris dark brown; bill black; legs grey.]

This is a true *Parus* and not a *Machlolophus* as was suggested by Mr. Blyth.

## 50. CALLIOPE CAMTSCHATKENSIS (107).

[Monte Alban. ♂: iris dark brown; bill black, grey at base; legs and feet purplish grey.]

## 51. PHYLLOSCOPUS BOREALIS.

*Phyllopneuste borealis*, Blasius, Naumannia, 1858, p. 313.

*Phylloscopus magnirostris*, Blyth, apud Blyth, Ibis, 1870, p. 168; Walden, *t. c.* no. 109.

[Monte Alban. *a*, ♂: iris brown; maxilla dark brown; mandible yellow; legs and claws pale clear brown.

San Mateo. *b*, ♂: iris dark brown; legs raw-sienna brown; maxilla dark horn-brown; mandible horn yellow. *c*, ♀: iris brown; legs yellow-brown; bill brown; lower half yellow.]

As I anticipated (*t. c.*), the *Phylloscopus* from the Philippines, identified by Mr. Blyth with *P. magnirostris*, proves to belong to *P. borealis*. Four examples were obtained by Mr. Everett, in the month of February. The first alar bar is almost obsolete; but Mr. Dresser has no doubt that they belong to *P. borealis*, and they agree well with my own series of that species.

## 52. ORTHOTOMUS DERBIANUS (112).

[Monte Alban. *a*, ♂: iris bright clay-brown; bill sepia; the mandible pale grey; legs and nails pale clear brown. *b*, ♂: iris bright clay-brown; bill dark brown; mandible grey; legs very pale transparent brown.]

Moore accurately described this species of *Orthotomus*; but in the figure the wings are coloured of too vivid a green. The wings are yellow-green.

## 53. BUDYTES VIRIDIS (114).

[Monte Alban in February.]

## 54. CALOBATES MELANOPE (115).

[Monte Alban. *a*, ♂: iris brown; bill light vandyke brown; legs and feet pale transparent brown; nails vandyke brown. *b*, ♀: iris brown; bill dark lead-grey; legs pale transparent brownish grey. *c*, ♀: iris brown; bill dark brownish grey; legs very pale clear brown; claws vandyke.]

Average length of rectrices in five examples, 3.87.

## 55. MOTACILLA OCULARIS.

*Motacilla ocularis*, Swinhoe, Ibis, 1860, p. 55; P. Z. S. 1870, pp. 129, 130, woodcuts.

[Monte Alban. ♀, March: iris, bill, and legs dark brown.]

A single example with a grey back, a few dark feathers on the vertex, and a black pectoral plastron; forehead and a broad space over the eye white; a line passing from base of bill through the eye black.

56. *DICÆUM RUBRIVENTER.*

*Pipra papuensis*, Gm. S. N. i. p. 1004. no. 21 (1788).

*Dicæum rubriventer*, Lesson, Tr. p. 303 (1831).

*Dicæum retrocinctum*, Gould, B. As. xxvii. t.—, inf. ; Walden, *t. c.* no. 120. partim ; conf. Salvadori, Ann. Mus. Civ. Genoa, viii. p. 509.

[Monte Alban. ♂: iris bright brown ; bill glossy black ; legs and nails dark brown.]

Not to be distinguished from Zebu examples.

57. *DICÆUM XANTHOPYGIUM.* (Plate LXXIII, fig. 1.)

*Dicæum xanthopygium*, Tweeddale, Ann. & M. N. H. ser. iv. vol. xx. p. 96 (1877).

♂. Above, cheeks and wing-coverts dark bluish slate-grey. An isolated dorsal patch crimson. Uropygium yellow. Chin, throat, and upper part of breast yellow. Remainder of breast, abdomen, and flanks orange. Ventral region, thigh-coverts, and under tail-coverts yellow tinged with green. Rectrices and quills dark brown ; the primaries narrowly margined with white, the secondaries with olive-green.

Wing 1·96 inch, tail 1·06, tarsus 0·50, culmen 0·38.

[Monte Alban. ♂: iris dark brown ; legs dark greyish-brown ; bill black.]

This is a second Philippine representative form of *D. trigonostigma*, and, as an example of progress in the variation of a species, is interesting. It, together with *D. dorsale*, Sharpe, and the Malayan species form a small subgroup, the Luzon bird being hardly distinguishable from *D. trigonostigma*, as seen from above, and from the Panay species when seen from below. Is the Negros habitat of *D. trigonostigma* of Mr. Sharpe's list (*t. c.* p. 352. no. 171) reliable ?

58. *MYZANTHE PYGMÆA* (121).

[Monte Alban. *a*, ♂: iris dark brown ; bill and legs black. *b*, ♂: testes greatly enlarged.]

59. *ARACHNECHTHRA JUGULARIS* (123).

[Monte Alban. ♂: iris light brown ; bill, legs, and nails jet-black.]

60. *CORVUS PHILIPPINUS* (125).

[San Mateo. *a*, ♂: iris dark brown ; bill and legs black. *b*, ♀: iris pale wood-brown ; bill, legs, and claws black.]

Three of the four examples sent by Mr. Everett have the wing an inch and a quarter to a half shorter than that of the fourth individual. This last is in full glossy purple-black plumage, while the three with short wings are in a state of transition from brownish unglossed black to purple-black. They belong to *C. brevipennis*, Schlegel.

61. *ACRIDOTHERES CRISTATELLUS* (126).

[Monte Alban. *a*, ♂: iris yellow ; bill pale yellowish ; legs dark brownish ochre-yellow ; nails black.

San Mateo. *b*, ♂: iris golden yellow ; bill yellow-white ; legs

chrome; claws horn-brown. *c*, ♀: iris Indian yellow; bill light greenish-yellow; legs dull orange; claws brown.]

62. *SARCOPS CALVUS* (129).

[Monte Alban. *a*, ♂: iris bright brown; bill and legs black; bare skin white tinged with pink.

San Mateo. *b*, ♂: iris rich chocolate-brown; bill, legs, and claws black. *c*, ♀: iris rich warm brown; bill black; feet and claws sooty brown; bare skin white tinged dull crimson.]

63. *MUNIA JAGORI* (132).

[San Mateo. ♀: iris red-brown; bill pale bluish-grey; legs darker grey.]

64. *OXYCERCA JAGORI* (134).

[San Mateo. ♂: ?, iris Indian red; bill dull blue; legs blue-grey.]

65. *OXYCERCA EVERETTI*. (Plate LXXIII. fig. 2.)

*Oxyerca everetti*, Tweeddale, Ann. & Mag. N. H. ser. iv. vol. xx. p. 96 (1877).

♂ and ♀. Chin and throat dark brown; breast, flanks, and thigh-coverts warm nutmeg-brown. Abdomen and vent pure white, some of the lower breast-feathers being marked with brown, and some of the flank-feathers being white on their inner webs, brown on their outer, and with white shafts. Under tail-coverts very dark brown or black. Above, wings and coverts brown, each feather, except the frontal and upper tail-coverts, having a conspicuous pure white central line along the shaft, very prominent on the wing-coverts; some of the upper tail-coverts tipped with ochre. Rectrices brown, the middle pair broadly margined, the laterals less so, with yellow and greyish yellow. Inner edges of the quills pale rufous seen from underneath.

Wing 1·87 inch, tail 1·75, tarsus 0·56, culmen 0·38.

[Monte Alban. *a*, ♂: iris Indian red; bill black; mandible lead-grey; legs dark grey. *b*, ♀: iris Indian red; bill black; mandible and legs grey.]

This is a representative form of *Munia leucogastra*, Blyth, but quite distinct, being of a warm nutmeg-brown colour, and not dark sooty-brown, and having the white striæ of the upper plumage much more boldly defined.

66. *OSMOTRERON AXILLARIS* (136).

[Monte Alban. *a*, ♂: iris bluish green; feet greyish green; nails grey; bill light green, base dark red. *b*, ♀: iris pale sea-green; bill green; base of maxilla red; feet whitish green; nails grey. *c*, ♀: iris light bluish-green; bill green; base of maxilla red; feet greyish green; nails grey.]

67. *PHABOTRERON LEUCOTIS* (140).

[San Mateo. *a*, ♀: iris grey; bill black; feet dull crimson;

claws brown. *b*, ♀: iris purplish-grey; bill black; orbital skin dull bluish; feet dull crimson. *c*, ♀: iris purplish grey; bill black; feet crimson; nails horn-grey.

Monte Alban. *d*, ♂: iris purple-grey; bill black; feet bright carmine; claws brown. *e*, ♂: iris brown; bill black; feet carmine.]

#### 68. TURTUR DUSSUMIERI (147).

[Monte Alban. *a*, ♂ *juv.*: iris dark ochre-yellow; bill greyish black; feet dull crimson. *b*, ♂ *juv.*: iris dark ochre-yellow; bill greyish-black; legs purple-brown. *c*, ♂, pairing: iris ochreous orange; bill greyish-black; feet dull crimson. *d*, ♀: iris brownish orange; bill black; nails brown; feet carmine; paddy and maize in the crop.]

The example marked a ♀ differs from the males, and agrees with the description given (*l. c.*) of a female ex Luzon obtained by Dr. B. Meyer. Two of the males are immature, the nuchal band not being completed, and all traces of the vinous colouring of the nape being wanting.

#### 69. PHLOGÆNAS LUZONICA (149).

[Monte Alban. *a*, ♂: iris greyish violet; bill black; legs dull crimson; nails grey. *b*, ♀: iris light greenish-brown; bill black; legs carmine. *c*, ♀: iris pale greyish-violet; bill greyish black; feet dull crimson; nails dark grey.]

The female is slightly smaller; and the pinkish-red colouring of the abdomen is much deeper in the male.

#### 70. CHALCOPHAPS INDICA (150).

[San Mateo. *a*, ♂: iris dark brown; legs dull crimson; bill orange-red.

Monte Alban. *b*, ♀: iris dark brown; bill orange-red; feet dull crimson. *c*, ♂: iris chocolate-brown; bill orange-red, base crimson; feet dull crimson.]

#### 71. GEOPELIA STRIATA (152).

[San Mateo. *a*, ♂: iris white; bill dull bluish; orbital skin white tinged blue; legs dull crimson. *b*, ♀: iris white; legs dull purple; bill dull blue; orbital skin ultramarine. *c*, ♀: iris whitish-yellow; bill blue, almost black; legs dull crimson; orbital skin pale ultramarine.]

These examples in no respect differ from Malaccan and Javan individuals and others from the island of Madura. Neither by their dimensions nor colouring can the sexes be distinguished.

#### 72. TURNIX OCELLATA (156).

[Monte Alban. *a*, ♂: iris yellowish white; bill greenish; legs greenish-yellow; nails grey. *b*, ♀: iris pale yellow; bill light greenish-yellow; legs the same. *c*, ♀: iris white; bill grey tinged greenish; legs light yellow; nails grey.]

A very fine species. The female is fairly depicted by Meyen; the

male, besides being much smaller, differs in having the throat almost white, each feather being but slightly tipped with brown.

	Wing.	Tarsus.	Culmen.
♂	3·87	1·00	0·75
♀	4·25	1·06	0·81

### 73. TURNIX FASCIATA.

*Hemipodius fasciatus*, Temm., Fig. & Gallin. iii. pp. 634, 757, "Philippines" (1815); Walden, *t. c.* p. 225.

[Monte Alban. *a*, ♂: iris white; bill blackish, base yellow; legs light greenish-yellow. *b*, ♂: iris white; bill greenish yellow; culmen black; legs and feet light greenish-yellow; nails grey. *c*, ♂: iris white; bill greenish yellow; legs yellowish-green; nails brown. *d*, ♀: iris ochreous yellow; bill and legs yellow tinged green, the bill clouded with blackish green. *e*, ♀: iris white; bill greenish chrome, the culmen clouded; legs greenish chrome.]

Mr. Everett has sent six specimens of a species of *Turnix* which agree well with Temminck's description. They are at once distinguishable from *T. pugnax*, ex Java, by the uniform broad light rufous patch on the nape, and by being much smaller, but otherwise are nearly allied. The abdomen in both sexes is white. From *T. rosstrata* they differ still more.

	Wing.	Tarsus.	Culmen.
♂	3·00	0·87	0·50
♀	3·25	0·93	0·60

### 74. CHARADRIUS FULVUS (159).

[San Mateo. *a*, ♂: iris chocolate-brown; bill black; legs pale lead-grey. *b*, ♀: iris brown; legs light lead-grey.]

### 75. ÆGIALITIS DUBIA (162).

[Monte Alban. *a*, ♂: iris warm chocolate-brown; orbital ring pure orange; bill black, base orange; legs grey; nails black. *b*, ♂: iris brown; bill black; legs ochreous yellow; nails black. *c*, ♀: iris dark brown; bill black, base yellowish; legs purplish grey; breeding. *d*, ♀: iris dark brown; bill and nails black; legs ochreous yellow.]

Seven examples, in various stages of plumage, of what is undoubtedly typical *Æ. dubia* (Scop.) have been sent by Mr. Everett. A comparison made with these Luzon individuals and others of so-called *Æ. curonica* (Gm.) and *Æ. minuta* (Pall.), apud Jerd., from Europe and Asia (*conf.* Walden, Tr. Z. S. viii. p. 89), leaves me no other conclusion than that they all belong to one species. In dimensions examples vary considerably; but intermediate links occur uniting the smaller with the larger races. In markings and colouring there is little difference, and the proportionate length of the tertiaries to the first primary is very variable in birds even from the same locality. The species described by Mr. Blyth (*Ibis*, 1867, p. 164, no. 849) as *Æ. philippensis*, vera, is *Æ. peronii* (Tem.).

*Dimensions.*

	Wing.	Tarsus.	Bill.	
	in.	in.	in.	
1. Luzon. Feb. ♂ ...	4.37	0.95	0.75	Full dress: tertiaries shorter than 1st primary.
2. " " " ...	4.37	0.95	0.75	Not quite full dress: tertiaries equal to 1st primary.
3. " " " ...	4.50	0.88	0.68	Immature: tertiaries nearly equal to 1st primary.
4. " " " ...	4.37	0.93	0.75	Immature: tertiaries equal to 1st primary.
5. " " ♀ ...	4.25	0.95	0.75	Full dress: identical with No. 1; tertiaries worn, nearly equal to 1st primary. "Breeding."
6. " " " ...	4.25	0.95	0.82	Ditto.
7. " " " ...	4.25	0.82	0.75	Immature: tertiaries equal to 1st primary.

76. *GALLINULA CHLOROPUS* (169).

[Monte Alban. ♂: iris bright blood-red; bill bright greenish-yellow; legs and feet grass-green.]

77. *AMAURORNIS OLIVACEA* (176).

[Monte Alban. *a*, ♂: iris bright blood-red; bill dark green; feet and legs yellow-brown. *b*, ♀: iris bright blood-red; bill light green; legs and feet light brown.]

78. *HYPOTENIDIA TORQUATA* (177).

[Monte Alban. *a*, ♂: iris bright blood-red; bill black; feet and legs brown. *b*, ♀: iris bright Indian-red; bill black; legs sepia-brown. *c*, ♀: iris bright red; bill black; legs very dark lead-grey.]

The sexes do not differ in their dimensions or plumage. The pectoral band appears when the bird is reaching maturity. The black-barred pectoral feathers become first suffused with olive-green or with rufous, the black and white bands showing through. These bars then become obliterated and the feathers become uniform olive-green, dashed with dark rufous. Ultimately the pectoral band becomes uniform chocolate-brown.

79. *HYPOTENIDIA PHILIPPENSIS* (178).

[Monte Alban. ♂: iris Indian red; bill warm brown; legs, feet, claws, light greyish-brown. February.]

The specimens sent by Mr. Everett, three males, are typical. In all, the black bands of the breast and abdomen are not very decidedly pronounced, though well marked on the flanks. In two the pectoral band is just indicated by the tips of some of the feathers being tinged with pale rusty-fulvous. In the third the white bands are coloured with rusty fulvous, but the black bands show through. In the ex-



ample which has the pectoral band least developed the nape is most rufous, and this is the case in a Celebean individual without a trace of a pectoral band, the nape being pure bright rufous, and in others from Queensland. The dimensions of birds from all three localities hardly vary.

80. *RHYACOPHILUS GLAREOLA* (182).

Shot in February and March.

81. *TRINGOIDES HYPOLEUCUS* (183).

[Monte Alban. *a*, ♂: iris brown; bill dark vandyke brown; legs greenish grey; nails black. *b*, ♂: iris brown; bill and nails black; legs greenish lead-grey.]

Shot in February and March.

82. *GALLINAGO SCOLOPACINA* (187).

[Monte Alban. *a*, ♂, February: iris brown; legs greenish grey; nails black.]

83. *RHYNCHÆA CAPENSIS* (189).

[Monte Alban. ♂, February.]

84. *ARDETTA CINNAMOMEA* (192).

[San Mateo. *a*, ♂ (adult): iris bright yellow; legs and feet bright olive-green; bill yellow shaded with olive-brown on the culmen; February. *b*, ♂ (not mature): iris bright yellow; bill greenish yellow, culmen to apex darkened with greenish brown; legs yellow-green; soles of feet yellow; claws light brown. *c*, ♀ (immature); iris golden yellow; legs and feet bright olive-green; bill greenish-yellow at base; culmen dark olive-brown; February.]

85. *HERODIAS GARZETTA* (195).

[Monte Alban. ♀, March: iris bright yellow; bill black, base yellow; legs black; feet greenish-yellow dotted with black; claws dark brown.]

Two examples are sent by Mr. Everett shot in March, and both marked ♀. One is in full breeding-plumage with two long occipital plumes, a fully developed pectoral tuft, and a long dorsal train. In the other these appendages are absent, the bill being black in both. In dimensions they agree; and they belong strictly to the race named *Ardea nigripes* by Temminck.

Wing 10·25 inches, tarsus 3·50, culmen 3·0.

86. *BUTORIDES JAVANICA* (197).

[Monte Alban. ♀: iris golden; bill black; lower half, cere, and orbital skin light yellow; legs green; soles orange; nails brown. March.]

Immature.

3. Remarks on *Felis tigrina*, Erxl., and its Synonymy.

By D. G. ELLIOT, F.R.S.E. &amp;c.

[Received June 28, 1877.]

Erxleben, in his 'Systema Regni Animalis,' published in 1777, described a Cat from Guiana, Cayenne, &c. as *Felis tigrina*, characterized as having a long tail, fulvous fur on the body spotted and striped with black, beneath white. This animal is much smaller than *F. pardalis*, and differs also in style of its marking, rather difficult to explain in words; but generally the black is more inclined to take the form of spots than lines or stripes. There is no doubt whatever that the two belong to very different and distinct species.

In 1820, in the 'Histoire Naturelle des Mammifères,' MM. Cuvier and Geoffroy St.-Hilaire described another Cat of this form as *Felis mitis*, from Brazil, characterized by having a tail about half the length of the body and head, with a general buff colour, and spotted irregularly with black, the centres of the spots of light buff.

In 1826 Prince Maximilian of Neu-Wied, in his 'Beiträge zur Naturgeschichte von Brasilien,' also described a species of *Felis*, distinguished by having the tail as long as the body. In other respects, such as the general colour of the fur, together with the shape, disposition, and hue of the spots, it does not vary more from the two animals mentioned above than do individuals of any species of Spotted Cats from each other. With the exception of Erxleben, who gives a general habitat for his animal, such as "America Australis," citing the Cayenne Cat of Pennant, and the Tiger Cat of Guiana, Bauer, as synonymous, the authors mentioned ascribe Brazil as the habitat of their respective species. For a long time the animals called by these different names, bestowed upon them by their describers, gave me a great deal of trouble, as I strove to find recognizable and permanent differences by which the species, if they really were such, could be discriminated.

The late Dr. J. E. Gray, in his papers on the Felidæ, especially in his 'Catalogue of the Carnivorous, Pachydermatous, and Edentate Mammalia,' although he states that the three species vary greatly in the size, form, and disposition of the spots (to which he might have added colour), endeavoured to keep the three apart by the "kind" and colour of the fur and the colour and length of the tail. Thus *F. macroura* and *F. mitis* have soft bright fulvous fur and tail distinctly ringed; and *F. tigrina* has a harsher grizzled fur, and the tail marked with a series of dark spots, not forming distinct rings. In regard to the distinction given to the fur as it feels to the touch, I may not have the sensitiveness necessary to enable me to appreciate the character; but the fur of all the animals belonging to this particular type of *Felis* appears to me to have a similar texture, and I hardly consider that the softness or harshness of the hair will be sufficient to render the animals specifically distinct or to enable them to be recognized by that character.

*F. macroura*, as its name implies, has for the most part relied upon the length of its tail to establish its claim to a distinctive rank ; and so far as I can discover, leaving aside some slight differences of colour, *F. mitis* must be recognized by having a tail intermediate in length between *F. macroura* and *F. tigrina*. Although I have carefully examined and compared specimens of the alleged species in most of the large collections in Europe and also in that of the Smithsonian Institution at Washington, I had been utterly unable to find any reliable character to distinguish them from each other. On a recent visit to London (one of the chief objects of making which was to further investigate this subject) in company with my friend Mr. E. R. Alston, who was occupied with the Felidæ inhabiting Central America, I examined anew the entire collection of these so-called three species, consisting of skins, mounted specimens, and skulls, contained in the British Museum. These are, in all, nineteen specimens, coming from various localities between Honduras on the north, and Paraguay on the south.

As the length of tail was a principal character, especially for *F. macroura*, this member was our first consideration ; and it very soon proved to be, as I had always found was the case, thoroughly unreliable ; for the tails were of all possible lengths, irrespective of locality, and if arranged in a series would exhibit a gradual progression from the shortest to the longest and most pretentious. The next step was the arrangement of the spots or rings, mindful of Dr. Gray's descriptions of rings distinct and rings indistinct. Both kinds were found ; in fact a third style was discovered ; for, while some had tails incompletely ringed, and others tails with some perfect rings, others, again, had spotted tails without any tendency at all to form any kind of ring. No two were exactly alike, even from the same place, while others from far distant localities bore a more general resemblance to each other than some that had the same habitat. As to colour, one had but to choose the shades of buff or grey that pleased him best ; for apparently all were represented, and it was difficult to find the same hue on two individuals.

The tails proving to be miserable failures in every way for specific distinction, we next turned our attention to the bodies and heads, and were at once met with the same difficulties ; for the animals had as great a disregard for uniformity in the colour of their fur and in the patterns of the markings on their bodies as they evidently had for that on their tails. All hues of grey and buff were exhibited, every shape and size of spots were there, some solidly black, others with light centres and black edges, scattered about separately or coalescing and forming stripes, but without regularity of pattern, and no two examples exactly alike from any or all localities. It was very evident that if there really did exist three species there must be some other means to distinguish them ; for of all the characters that had been given of the colour and style of markings, it was very evident that none were of any value whatever ; and as a last resort we turned to the skulls.

Here, also, our efforts met with no better success ; for variations

also existed in these, mainly, however, in size: no two were precisely alike from any locality; and there did not exist any single reliable character that could be given by which more than one species could be established and recognized. I therefore feel no hesitation in stating that there exists but one species of Spotted Cat, commonly known as the Margay, belonging to the New World, and that the animals generally known as *F. macroura*, Pr. Max., and *F. mitis*, Cuv., are identical with it, and that these names must become synonyms of *Felis tigrina*. I have always found it unsafe to decide upon any species of Spotted Cat from a single specimen, unless accompanied by some trenchant character exhibited in the skull which would permit it readily to be distinguished; and this, I may remark, is very rarely to be found among the Felidæ.

All the species of *Felis* from both the Old and New Worlds vary so greatly in different examples that one is often tempted to believe a distinct species, perhaps a new one, is before him; and it is only in a series of examples that it can be seen how the so-called species run into each other, and that what may have appeared a strong specific character becomes of no real value whatever. The same species frequently ranges over many degrees of latitude; and the individuals of northern regions are observed to be clothed with long thick fur as a protection against the severity of the climate, and, although presenting outwardly a very different appearance from their smooth short-coated brethren of the tropics, should not, on that account, be elevated into distinct species.

The following synonymy shows the more prominent names that should be placed under the head of *F. tigrina*.

*Felis tigrina*, Erxl. Syst. Regn. Anim. (1777) p. 517, sp. 11; Gmel. Syst. Nat. (1788) vol. i. pt. 1, p. 80, sp. 13; F. Cuv. Hist. Nat. Mamm. (1826) vol. ii. pl. 144; Temm. Mon. Mamm. (1827) vol. i. p. 153; Fisch. Syn. Mamm. (1829) p. 204, sp. 16; J. E. Gray, Proc. Zool. Soc. (1867) pp. 271, 404; id. Cat. Carn. Mamm. (1869) p. 22.

*Cayenne Cat*, Penn. Hist. Quad. (1781) p. 271, sp. 163.

*Guigña Cat*, id. ibid. (1793) p. 299, sp. 198.

*Felis guigña*, Molina, Sagg. Stor. Nat. Chili, (1810) p. 244, sp. 6; Desm. Dict. Hist. Nat. (1816) p. 114; Philippi, Wieg. Arch. (1873) p. 8, tab. ii. & iii. figs. 2 & 3.

*Felis margay*, Azara, Nat. Hist. Quad. Parag. (1838) p. 237.

*Felis (Noctifelis) guigña*, Severtz. Rev. & Mag. Zool. (1858) p. 386.

*Felis mitis*, F. Cuv. Nat. Hist. Mamm. (1820) vol. ii. pl. 137; Azara, Nat. Hist. Parag. (1838) p. 226; Burm. Syst. Uebers. Thier. (1854) p. 86; J. E. Gray, Proc. Zool. Soc. (1867) pp. 271, 404; id. Cat. Carn. Mamm. (1869) p. 22.

*Felis chati*, Griff. Anim. King. (1827) vol. ii. p. 479, pl.

*Felis smithii*, Swains. Anim. in Menag. (1838) p. 120.

*Leopardus mitis*, J. E. Gray, List Mamm. Brit. Mus. (1843) p. 42.

*Felis macroura*, Pr. Max. Beitr. z. Naturg. Bras. Band ii.

(1826) p. 371; Fisch. Syn. Mamm. (1829) p. 203, sp. 12; Less. Suppl. Buff. (1847) p. 113; Burm. Syst. Uebers. Thier. Bras. (1854) p. 87; J. E. Gray, Proc. Zool. Soc. (1867) p. 271; id. Cat. Carn. Mamm. (1869) p. 22.

*Felis brasiliensis*, F. Cuv. Hist. Nat. Mamm. (1828) vol. ii. pl. 139.

*Felis elegans*, Less. Cent. Zool. p. 69, pl. 21.

*Leopardus tigrinoides*, J. E. Gray, List Mamm. Brit. Mus. (1843) p. 42.

*Panthera brasiliensis*, Fitz. Sitzungsab. Akad. Wiss. Wien, (1869) lix. p. 236.

*Panthera macrura*, id. ibid. p. 242.

*Panthera venusta*, id. ibid. p. 244.

*Hab.* Central America southwards to Paraguay.

4. On some Points in the Visceral Anatomy of the Rhinoceros of the Sunderbunds (*Rhinoceros sondaicus*). By A. H. GARROD, M.A., F.R.S., Prosector to the Society.

[Received October 1, 1877.]

Our present knowledge of the visceral anatomy of the Rhinocerotidæ is confined to that of the two species *Rhinoceros unicornis* and *Ceratorhinus sumatrensis*. Professor Owen has given us, in the 'Transactions' of this Society (vol. iv. pp. 31 *et seq.*) an exhaustive account of the former of these animals; and in the 'Proceedings' (1873, pp. 92 *et seq.*) it has been my endeavour to indicate most of the important features in the latter, which, as Prof. Flower has kindly pointed out to me, were briefly described by Sir E. Home in the 'Philosophical Transactions' (1821, p. 271). On the present occasion I bring before the Society my notes on a young female of the Sondaic Rhinoceros (*Rhinoceros sondaicus*), which died in the menagerie of Mr. C. Jamrach, after having been in this country for a little more than half a year. It was only the skinned trunk which came into my possession. It is the nature of the mucous membrane of the small intestine which was certain to be of greatest interest; and this I am able to describe in detail.

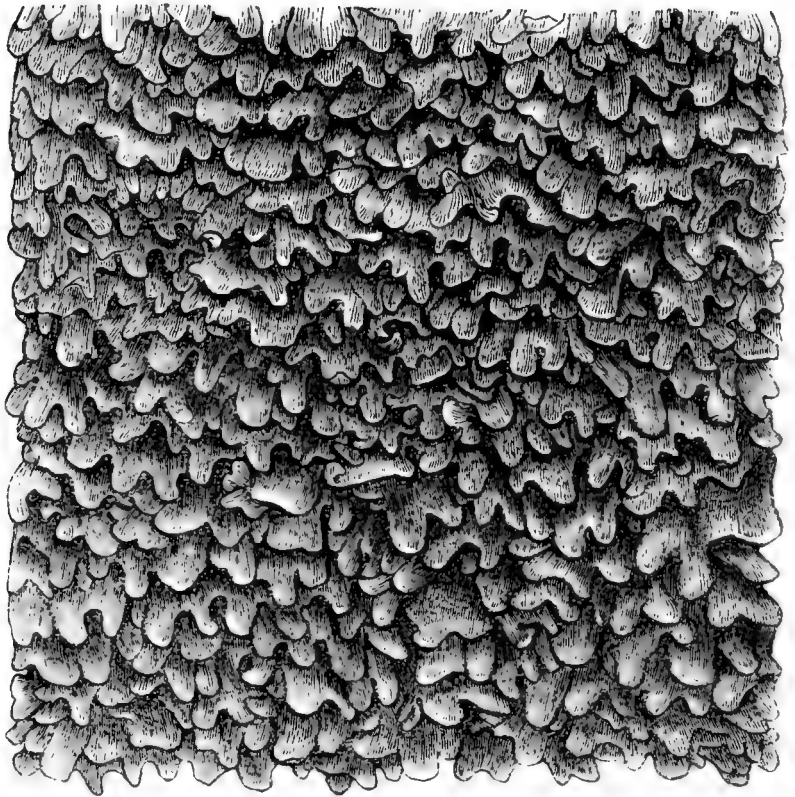
The individual under consideration measures, stuffed, six feet two inches from the tip of the nose to the base of the tail. The tail itself is a foot long, whilst the height of the animal at the shoulder is three feet. From the middle of the occipital crest, along the curve of the superior surface of the skull, to the tips of the nasal bones is thirteen and a half inches, the same measurement in adult animals being twenty-two inches.

The single milk-incisor on each side of each jaw is still in place, as are all the milk-molars. The first true molar has not cut the gum; but its cap is seen within the bony alveolus. No traces of the other molars are visible.

Mr. E. Gerrard has kindly lent me the skull for examination. In its base it exhibits the characteristic peculiarities of the species so clearly enunciated by Prof. Flower<sup>1</sup>, the vomer being free behind and developed into a tongue-shaped process; the mesopterygoid fossa being expanded, and the free ends of the pterygoids everted at the same time that they are broad. No second combing-plate is present on the uncut first upper molar tooth.

The animal is too young to be contrasted advantageously with Prof. Peters's drawing<sup>2</sup> of *Rhinoceros inermis*, Lesson. I have, however, taken the opportunity of comparing that figure with the skulls of *R. sondaicus* in the College-of-Surgeons' Museum, and fail to see

Fig. 1.



Mucous surface of duodenum of *Rhinoceros sondaicus*.

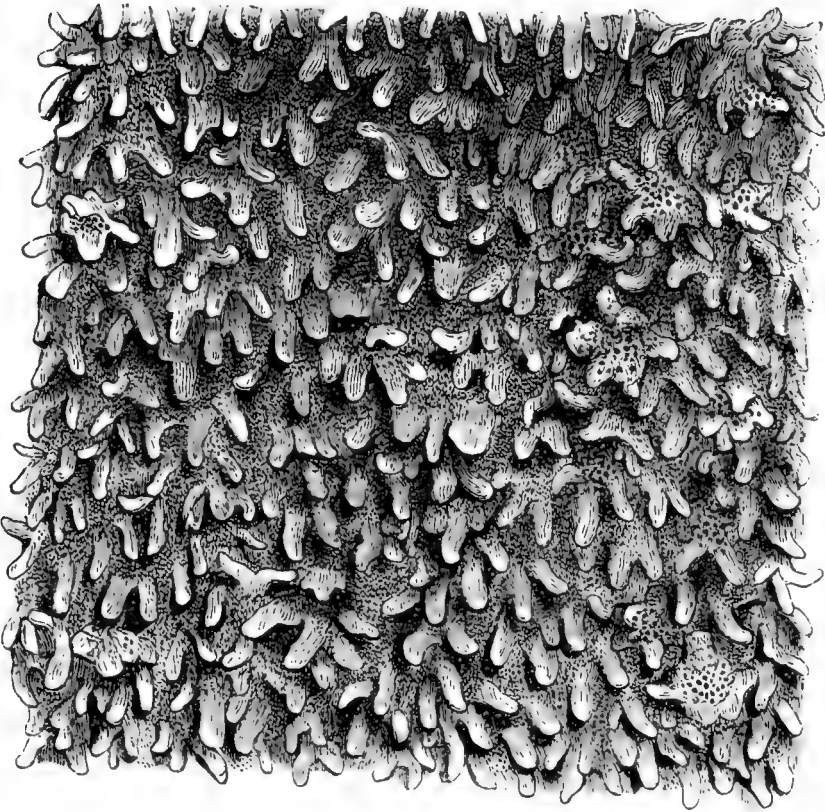
that there are sufficient differences to justify specific differentiation. Prof. Flower had previously done the same, and had arrived at a similar conclusion, as he found that even greater differences than those pointed out by Prof. Peters are to be detected in individuals which are all undoubtedly of Indo-Malay origin.

<sup>1</sup> P. Z. S. 1876, p. 447.

<sup>2</sup> Monatsb. der königl. Akad. zu Berlin, 1877, p. 68, pl. ii.

In skin-folding and surface-texture the Sunderbund and Javan specimens agree exactly; the young Sunderbund animal presenting a most striking uniformity in the size of the epidermic tuberculation, except in the gluteal region, where the boiler-bolt-shaped tubercles are somewhat larger than elsewhere. Along the back the scattered brown hairs, which spring from the yielding linear intertubercular surfaces, are also well developed.

Fig. 2.



Mucous surface of ileum of *Rhinoceros sondaicus*.

The following are the lengths of the alimentary viscera:—

Small intestine, 26 feet 2 inches.

Large intestine, 9 feet 10 inches.

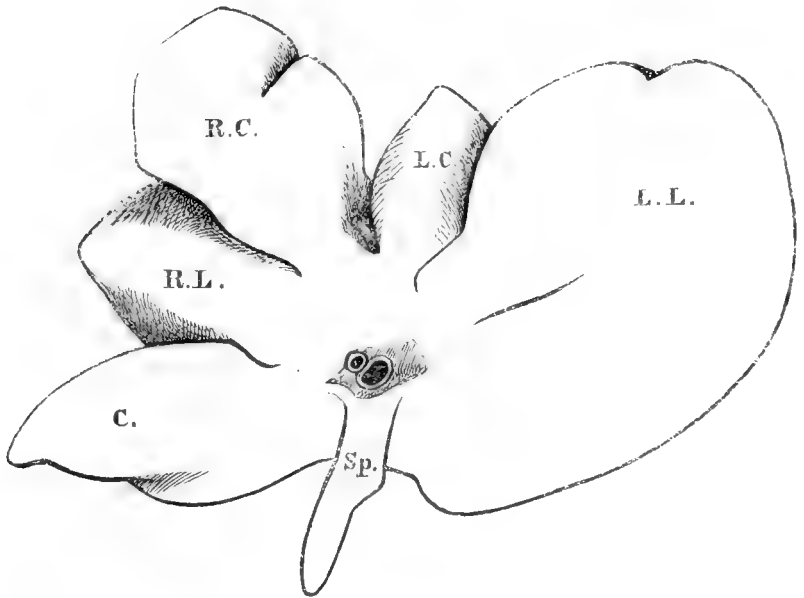
Cæcum, 1 foot 3 inches.

The stomach, in shape, is very much like that of *R. unicornis* as figured by Prof. Owen. Its cardiac surface is lined with the smooth white squamous epithelium found in all the Perissodactyla. This occupied about one third of the total gastric area, extending along most of the lesser curvature, the rest being covered with a smooth

and thick digestive coat. There is no trace of any œsophageal valve like that found in the Horse.

The small intestine is somewhat larger in the duodenal region than elsewhere. Its first three inches are destitute of the flattened papillæ found elsewhere; but here, as all along the small intestines, minute villi are present everywhere. Three inches from the pylorus the papillæ commence, and resemble those similarly situated in *Rhinoceros unicornis*<sup>1</sup>, except that they are not quite so long. They are re-

Fig. 3.

Liver of *Rhinoceros sondaicus*. Visceral surface.

*L.L.* Left lateral. *L.C.* Left central. *R.C.* Right central. *R.L.* Right lateral. *C.* Caudate. *Sp.* Spigelian lobe.

presented in fig. 1 (p. 708), where they are seen to consist of flattened, round-tipped processes of the mucous membrane, several of which are blended at their bases, in transverse lines. None are more than .3 of an inch in length, and most about .6 inch broad where they first become free. They give the impression of being incomplete valvulæ conniventes which have been cut and deeply jagged at their free edges. The opening of the bile-duct is 7 inches from the pylorus, being a nipple-like tubular projection, nearly an inch long, among the papillæ. From the spot where they commence, all the way to the ileo-cæcal valve, these papillæ are found—those near the last-named situation differing from those in the duodenum in being more scattered and freer from one another, many in the ileum springing independently from the mucous membrane. Nowhere,

<sup>1</sup> *Vide* Prof. Owen's figure, Trans. Zool. Soc. vol. iv. pl. xii. fig. 1.



however, are they otherwise than flattened, broad, and blunt-tipped, none anywhere being circular and slender like those in the ileum of *R. unicornis*<sup>1</sup>, the existence of which I have had the opportunity of verifying. They never exceed .3 of an inch in length. Numerous Peyer's patches exist in the ileum, as may be inferred from fig. 2 (p. 709) which is a representation of a portion of the inner surface of the small intestine quite close to the ileo-cæcal valve.

Such being the case, *R. sondaicus* differs from *R. indicus* in that the papillæ of the ileum are short, flat, and broad, instead of long, cylindrical and narrow, "like tags of worsted" (Owen).

The cæcum coli is a short blunt cone, with the diameter of its base as great as its length (1 foot 3 inches); and comparing the disposition of the colic flexures and proportionate diameter, I found them identical with those of the Sumatran species as I have figured them<sup>2</sup>.

The liver wants the gall-bladder, and differs but little from that of the Sumatran species. Fig. 3 (p. 710) is an outline-sketch of its abdominal surface, which, when compared with that of *Ceratorhinus sumatrensis* (P. Z. S. 1873, p. 102), shows that the right central lobe is larger than the right lateral, instead of smaller. The spigelian lobe is equally long and slender.

The pancreas is of good size and fairly concentrated.

The uterus is bicorn, each cornu measuring 8 inches, at the same time that the corpus uteri is 3 inches long. Each ovary is situated in a pocket of the peritoneum.

##### 5. Note on an Anatomical Peculiarity in certain Storks.

By A. H. GARROD, M.A., F.R.S., Prosector to the Society.

[Received October 1, 1877.]

The Ciconiidae, whilst presenting great uniformity in their myology, differ among themselves in one feature which seems to me to be of sufficient interest to deserve special record, as it may aid those who study their external characters to arrive at a more satisfactory determination of their affinities among themselves.

The following are the species I have had the opportunity of dissecting:—

*Ciconia nigra*.

— *alba*.

— *boyciana*.

— *maguari*.

*Abdimia sphenorhyncha*.

*Xenorhynchus australis*.

— *senegalensis*.

*Leptoptilus crumeniferus*.

— *argala*.

*Tantalus ibis*.

In all these birds, with the exception of *Abdimia sphenorhyncha* and *Xenorhynchus senegalensis*, I have found the ambiens muscle, which courses obliquely through the front of the capsule of the knee,

<sup>1</sup> Trans. Zool. Soc. vol. iv. pl. xii. fig. 3.

<sup>2</sup> P. Z. S. 1873, pp. 99, 100.

present, although never large; whilst in the two last-named birds, both from Africa, it is absent on both sides of the body. Such being the case, it seems to me highly probable that the relationship between *Abdimia sphenorhyncha* and *Xenorhynchus senegalensis* is more intimate than that between *X. senegalensis* and *X. australis*; and this view is favoured by their geographical distribution.

The tendency of the ambiens muscle to vanish in certain of the birds so closely allied as the Storks under consideration, in certain Psittaci, as well as in some of the Columbæ, is one which our knowledge of their habits does not enable us to explain. It can have no relation to the habits or bulk of the species; for this muscle is present in the Ostrich as well as in the smallest Cuckoo, whilst it is absent in the Cassowaries and the Passeres. The fact that it is not found in certain Storks makes its total loss in the Ardeidæ less surprising than it would otherwise be.

## 6. On the Shells of Lake Nyassa, and on a few Marine Species from Mozambique. By EDGAR A. SMITH.

[Received September 29, 1877.]

(Plates LXXIV. & LXXV.)

The British Museum has recently acquired a small series of shells collected by Mr. F. A. Simons at Lake Nyassa, and a few obtained by him at the mouth of the Macusi river, near Quilimane, on the east coast of Africa.

Among the former are several very interesting though small species, which, as far as I have been able to ascertain, are undescribed.

As complete lists of species from restricted localities are very useful, I have brought together all those which are known inhabitants of the lake. Fourteen, collected by Dr. Kirk, are all that have as yet been recorded; and now I am enabled to add eleven others to that number.

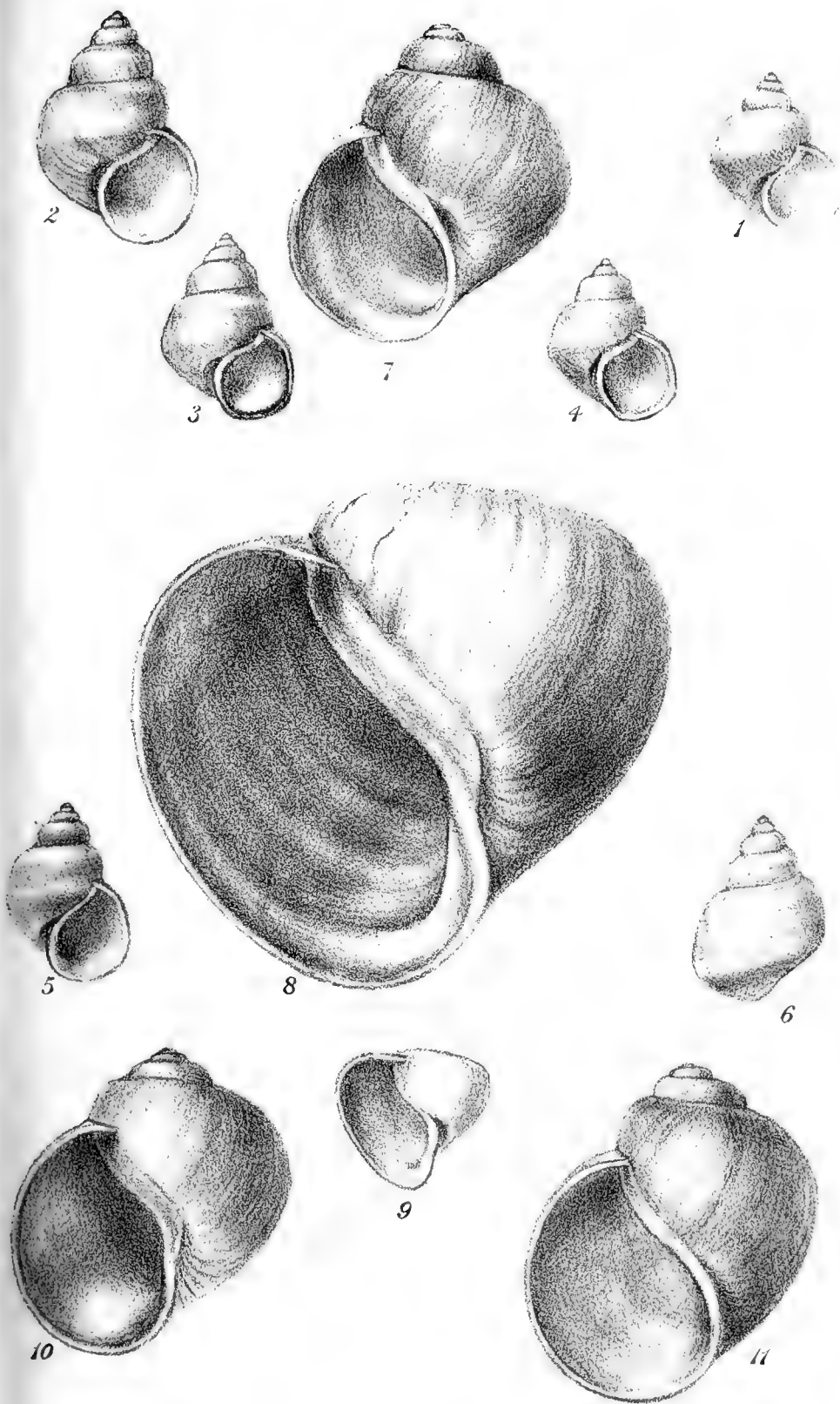
Of these the *Melania polymorpha* is very remarkable, as showing the great variation to which some *Melanixæ* are subject; and, indeed, I do not feel at all certain that the two forms, *M. pupiformis* and *M. turritospira* are not very abnormal growths of the same shell.

### I. LAKE-SHELLS.

#### 1. MELANIA TUBERCULATA, Müller.

*Hab.* Lake Nyassa (*Simons* and *Dr. Kirk*).

Four specimens of this variable species from the lake differ from the normal and usual form in having the whorls less convex. There is a narrow white zone at the top of the whorls next the suture; and beneath a pale-olive epidermis the shell is semitransparent, whitish, and ornamented with series of minute red dots. The longitudinal ribs

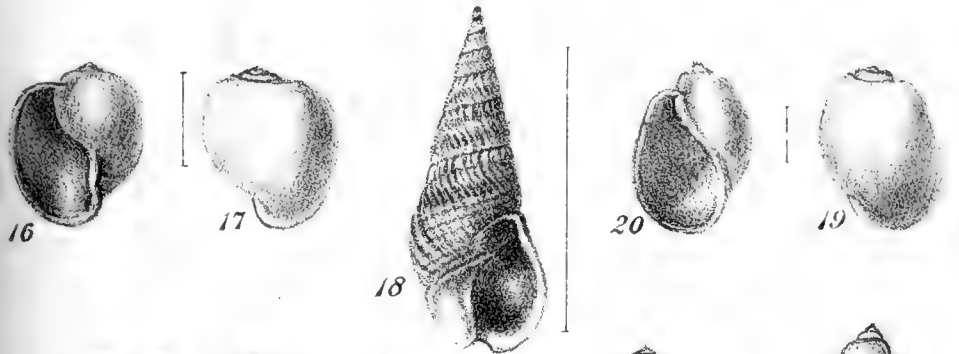
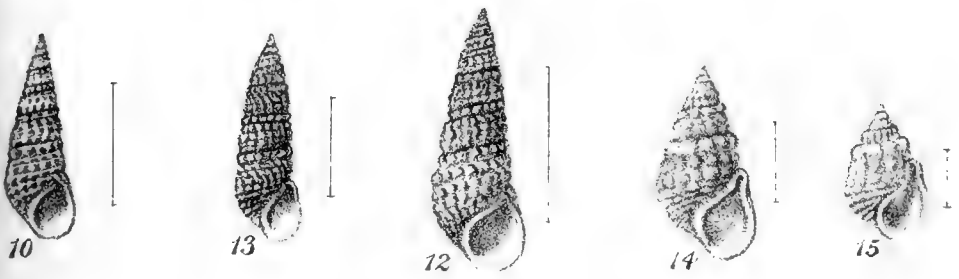
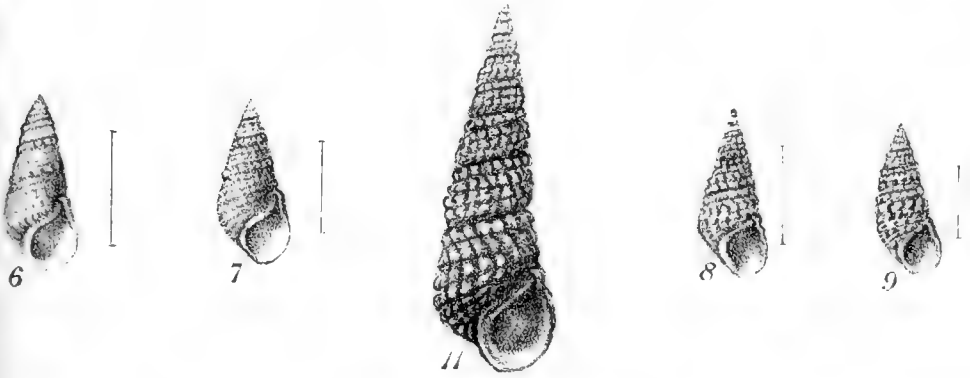


G. Sowerby lith.

Hanhart imp.

NEW SHELLS FROM LAKE NYASSA & MOZAMBIQUE.





G.Sowerby lith.

Hanhart imp.



are fine, and about eighteen on a whorl, those on the penultimate volution bearing about eight nodules.

2. *MELANIA TURRITISPIRA*. (Plate LXXV. figs. 14, 15.)

Shell small, turreted, ovately fusiform, pale olive; whorls seven or eight, flat, with a raised infrasutural belt, furnished with coarse ribs, and sculptured with a few spiral striæ, nearly obsolete on the upper whorls, except the one which marks off the raised band at the suture; on the body-whorl the ribs become obsolete at the middle, where it is angulated, and the transverse striæ are about eight in number; the three or four upper ones crossing the costæ give them a somewhat nodose appearance; aperture small, subovate, acuminate above.

Length 8 millims., diam.  $3\frac{1}{2}$ . Aperture 3 long.

This curiously short stunted-looking species is remarkable for its peculiar form, the turreted spire, and the strongly developed nodulous upper extremities of the longitudinal ribs forming an infrasutural belt.

Certain varieties of *M. polymorpha* approach the present species in the style of sculpture; but the very different form of the latter and the absence of spotting easily distinguish it.

The specimens now described may not be full-grown; but it is to be presumed that larger examples would still exhibit the same short stunted form.

3. *MELANIA PUPIFORMIS*. (Plate LXXV. fig. 13.)

Shell cylindrical, subpupiform, covered by a greyish epidermis; whorls nine, flattish, constricted just beneath a raised belt at the suture, somewhat turreted, separated by a deep suture, furnished with coarse flexuous ribs, which are nodulous at the upper extremities through being crossed or intersected by a spiral furrow a little beneath the suture; below this there are faint indications of one or two other transverse striæ, giving the ribs a subnodose appearance. On the body-volution the ribs are almost obsolete; but around the middle two or three spiral sulci are more distinct than those on the upper portion of it. Aperture small, acutely ovate, occupying less than one third of the whole length of the shell.

Length 11 millims., diam.  $3\frac{1}{2}$ . Aperture  $3\frac{1}{2}$  long.

The cylindrical pupoid form of this little species is very remarkable. The last three whorls are of about the same diameter; and above these the spire rapidly diminishes, forming a short cone at the apex. The ribbing is very strong for so small a shell.

Only two examples of this species have come under my observation; but Mr. Simons informs me that he has seen several others, and among them some which were larger than that now described.

4. *MELANIA SIMONSI*. (Plate LXXV. fig. 3.)

Shell acutely pyramidal, thinnish, whitish spotted with red; whorls 9-10, divided by a deep, slightly oblique suture, but little convex, furnished with obliquely arcuate granulous ribs, which num-

ber about sixteen in the last whorl; the granules are produced by transverse sulci, which cut the ribs at right angles; they are squarish and four or five in number on the ribs of the upper whorls, and the same on the body-whorl, where they terminate about its middle, beneath which the spiral ridges between the sulci are simple, and rather finer than those at the upper part of the volution; aperture acuminately ovate, occupying rather more than one third of the entire length of the shell.

Length 18 millims., diam.  $6\frac{1}{2}$ .

This species must not be confounded with *M. nodicincta*, Dohrn, also found at Lake Nyassa. Although in sculpture there is certainly much resemblance, the very different form and proportion of the whorls indicate the specific distinctness of this pretty shell. The spire is produced to quite an acute apex; and its outlines are rectilinear. The nodules on the ribs are large for the size of the species, squarish, and in oblique curves. The red dots are for the most part situated in the interstices between the ribs, at the base of each nodule, thus forming both longitudinal and transverse series.

##### 5. MELANIA POLYMORPHA. (Plate LXXV. figs. 4-10.)

Shell elongate, pyramidal, thin, under a pale-olive epidermis, whitish, spotted with reddish brown; whorls 8-9, almost flat, sometimes somewhat convex, margined above at the suture, which is deep and subcanaliculate, either with or without longitudinal plicæ, nodulous through being intersected by a few transverse striæ; the plicæ are usually only on the upper whorls, but in some specimens there are traces of them on the last, or they are well developed; the body-whorl is generally sculptured with 3-4 spiral sulci at the periphery, and by other less distinct striæ above and below it; aperture ovate-acuminate above, varying in length, occupying either a little more or less than half the entire shell, pale horn-colour, spotted with reddish brown.

Length 16 millims., diam.  $5\frac{1}{2}$ . Another specimen 14 millims. long, and  $4\frac{1}{2}$  wide.

The form of this species is subject to great variation; and the extremes, taken apart from intermediate varieties, have decidedly the aspect of distinct species. The sculpture is also very different in certain specimens, some being almost smooth, with the exception of the spiral sulci on the body-whorl, and a few less distinct striæ on this and the upper volutions. Others are distinctly ribbed, the ribs being cut across by two spiral striæ in the upper whorls, thus producing three granules on each rib, the uppermost situated at the suture on the thickened margin. This incrassation is constant in all specimens; and so is the deep suture, which gives the spire a turreted aspect. Six small examples have the thickened margin very strongly developed, the longitudinal ribs particularly granulous, and present on the body-whorl, terminating at the periphery, where they are limited by a few distinct spiral sulci.

The disposition of the reddish-brown spotting and markings is not constantly the same. Generally a series of dots, short, rounded,



or elongate, becoming a short line, is situated on the raised infra-sutural thickening, and beneath this two transverse series, sometimes coalescing and forming a short line. On the body-whorl there are other series below the middle, which also in some shells unite and form short flames.

6. *MELANIA NYASSANA*. (Plate LXXV. figs. 1, 2.)

Shell acutely pyramidal, dark madder-brown, thin, somewhat shining; whorls nine, margined beneath the suture by a distinct raised band, which is marked off by a spiral striation, convex inferiorly, and somewhat constricted above; the few upper whorls with faint longitudinal ribbing, the rest smooth, with a few distant impressed spiral lines, only faintly visible on most of the whorls, but well defined around the base of the last; aperture rather small, madder-brown, oval, acuminate above, occupying about one third the entire length of the shell; columella arcuate, joined to the outer lip by a thin callosity overspreading the body-whorl.

Length 14 millims., diam.  $4\frac{1}{2}$ .

*Var.* Shell narrower, more cylindrical and elongated, the mouth occupying about one fourth of the entire length. Length 20 millims., diam.  $5\frac{1}{2}$  (fig. 2).

This species is very distinct, on account of its dark madder-brown colour, which is almost uniform, except that the raised band beneath the suture is generally paler brown. The spiral striæ are very indistinct on the upper whorls, especially near the middle; but just below the periphery, and at the base of the ultimate whorl, they become well defined.

The variety is represented by a single shell, and in all probability is an abnormal growth; for in all respects, with the exception of its greater length and more cylindrical form, it is identical.

7. *MELANIA NODICINCTA*, Dohrn. (Plate LXXV. figs. 11, 12.)

*Melania nodicincta*, Dohrn, P. Z. S. 1865, p. 234.

*Hab.* Lake Nyassa (*Dr. Kirk*).

8. *LANISTES OVUM*, Peters.

"*Lanistes ovum*, Peters," Troschel, Wiegmann's Archiv, Jahrg. xi. Bd. i. (1845) p. 215; Philippi, in Kuster's Con. Cat. p. 22, pl. 6. f. 2, pl. 7. f. 7; Martens, in Pfeiffer's Novitates Conchol. (not seen by me).

*Hab.* Mozambique (*Peters*), Lake Nyassa (*Kirk*), *teste* Dohrn.

9. *LANISTES NYASSANUS*, Dohrn. (Plate LXXIV. figs. 8, 9.)

*Lanistes nyassanus*, Dohrn, P. Z. S. 1865, p. 233.

Two young shells, one about an inch in length, and the other half that size, were the only ones collected by Mr. Simons. Both have the spire completely flattened, and a distinct though rather narrow umbilicus, which, in the adult state, becomes closed by the reflexion of the columellar callosity.

10. *LANISTES SOLIDUS*, sp. nov. (Plate LXXIV. figs. 10, 11.)

Shell thick, solid, imperforate when adult, globosely ovate, yellowish olive, with the faintest indication of spiral linear bands, smooth with the exception of roughish lines of growth and most minute (almost obsolete) spiral striæ not visible to the naked eye; whorls  $4\frac{1}{2}$ , with a broad shallow depression or excavation above, then very convex; last whorl large, ventricose, rapidly enlarging towards the aperture, the latter pyriformly ovate, purplish, or golden and iridescent within, golden towards the lip and on the columella, which is thickened and reflexed over the umbilical fissure; operculum horn-colour, concave exteriorly, with the internal scar roughly corrugated.

Length 42 millims.; diam. of last whorl, above the aperture, 30. Length of aperture 30, diam. 20.

Another specimen is 39 millims. long, 28 wide, and its aperture 30 in length and  $18\frac{1}{2}$  in width.

*L. nyassanus* of Dohrn is very like the present species in some respects. In solidity, in the absence of an open umbilicus, and in texture it is similar. But the vast difference of form is of itself quite sufficient to separate the two varieties. Neither can *L. solida* be the young state of Dohrn's shell, because the specimens before me have all the appearance of being mature, being solid and very heavy for their size; and on comparison with young examples of that species also obtained by Mr. Simons, the specific distinctness is at once observable.

11. *LANISTES AFFINIS*, sp. nov. (Plate LXXIV. fig. 7.)

Shell ovate, thin, widely umbilicated, greenish olive, with a narrow yellow line winding around the top of the whorls at the suture, smooth, shining, sculptured with oblique lines of increase and most minute spiral striæ, which are only visible under a lens; whorls five, convex; aperture ovately pyriform, purplish, and iridescent within, becoming yellow at the lips and columella, which is very slightly reflexed.

Length 38 millims., diam.  $27\frac{1}{2}$ . Length of aperture 26, width  $16\frac{1}{2}$ .

This species may be known from *L. solida* by its more prolonged spire, which consists of half a whorl more than in that species, and by its open umbilicus, which gives the last whorl a very different form.

*L. ovum*, Peters, is another closely allied form, and at first sight might easily be confused with this species. The latter has a shorter and less conical spire, consists of half a whorl less, and its body-whorl and aperture are longer.

12. *PALUDINA JEFFREYSI*, Frauenfeld. (Plate LXXIV. figs. 1, 2.)

*Vivipara jeffreysi*, Frfld. P. Z. S. 1865, p. 659.

This species was first found at Lake Nyassa by Dr. Kirk. The specimens collected by Mr. Simons do not quite accord with Frauenfeld's diagnosis. This author has omitted to mention that the en-

ture surface is covered with faint spiral striæ, which are distinctly visible to the naked eye. The very shallow depression around the middle of the body-whorl in the type specimen I am inclined to regard as an individual peculiarity, and not a specific character; for there is no trace of such a furrow in any of the shells just received. These, for the most part, have the spire rather more elongated than the type, and the umbilicus a trifle narrower.

13. *PALUDINA CAPILLATA*, Frauenfeld. (Plate LXXIV. figs. 3, 4.)

*Vivipara capillata*, Frfld. P. Z. S. 1865, p. 659.

*Hab.* Lake Nyassa (*Dr. Kirk*).

14. *PALUDINA ROBERTSONI*, Frauenfeld. (Plate LXXIV. figs. 5, 6.)

*Vivipara capillata*, Frfld. *l. c.*

*Hab.* Same as preceding species.

15. *PALUDINA POLITA*, Frauenfeld.

*Paludina polita*, Frfld.; Reeve, Conch. Icon. xiv. sp. 73, fig. 73; Dohrn, P. Z. S. 1865, p. 233.

*Hab.* South Africa (?). Lake Nyassa (*Dr. Kirk*).

16. *BYTHINIA STANLEYI*, sp. nov. (Plate LXXV. figs. 21, 22.)

Shell small, ovate, rather solid, subimate, dirty white or yellowish, obliquely striated by the lines of growth; whorls four, slowly increasing, very convex; suture simple, rather deep; mouth sub-circular, occupying about half the whole length of the shell; peristome stout, thickened.

Length 5 millims., diam.  $3\frac{1}{2}$ .

*Hab.* Lake Nyassa.

The solidity, very convex whorls, and subcircular aperture, are the chief distinguishing characteristics of this little shell. The operculum, of course, takes the form of the mouth, and has the lines of increment rather coarse near the margins.

I dedicate this little shell to Mr. Henry M. Stanley, as a mark of admiration of his undaunted perseverance and achievements in African exploration.

17. *PHYSA NYASSANA*, sp. nov. (Plate LXXV. figs. 16, 17.)

Shell solid, pale olive-brown, narrowly perforate, somewhat triangular, roundly angulated above, and with a very short depressed spire; whorls five, convex, separated by a deep channelled suture, and sculptured by fine lines of growth; last whorl very large, occupying almost the entire length of the shell, since the spire is very shortly conical and only slightly elevated; aperture large, only a trifle shorter than the whorl, subauriform; columella thickened and a little reflexed, subtortuous, and connected with the upper extremity of the outer lip by a thin callous deposit upon the whorl.

Length 10 millims.; diam., with aperture,  $8\frac{1}{2}$ ; length of aperture 9, diam. 4.

*Hab.* Lake Nyassa.

This species is remarkable on account of its solidity, the short subtriangular form, and the small spire, which rises but very little above the rounded angle or shoulder of the last whorl.

The columella is nearly perpendicular, with a slight sinuosity inferiorly.

18. *PHYSA SUCCINOIDES*, sp. nov. (Plate LXXV. figs. 19, 20.)

Shell small, ovate, moderately solid, imperforate, pale greyish brown; whorls three, convex; suture deep; spire very small, scarcely exerted above the body-whorl; the latter very large, rather strongly striated by the oblique lines of growth; aperture ovately auriform, occupying about  $\frac{2}{11}$  of the entire length of the shell; columella oblique, sinuated in the middle.

Length  $5\frac{1}{2}$  millims.; diam., with aperture, 4.

*Hab.* Lake Nyassa.

This little species is peculiar in its form, which reminds one of a small sinistral *Succinea*. The shortness of the spire, and the fewness of the volutions are the most prominent features.

19. *PHYSOPSIS AFRICANA*, Krauss.

*Physopsis africana*, Krauss, Südafrik. Moll. p. 85, pl. v. f. 14; Küster, Conch. Cab. p. 72, pl. 12. f. 29, 30; Adams, Gen. Rec. Moll. iii. pl. 83. f. 10.

*Physa africana*, Krauss, Sowerby, Con. Icon. xix. pl. 1. f. 2a-b.

*Hab.* Port Natal (*Krauss*). Lake Nyassa (*Kirk*), teste Dohrn, P. Z. S. 1865, p. 233.

20. *LIMNÆA NATALENSIS*, Krauss.

*Limnæa natalensis*, Krauss, Südafrik. Moll. p. 85, pl. v. f. 15; Kuster's Con. Cat., No. 42, pl. 6, f. 1, 2, 3; Sowerby, Conch. Icon. xviii. pl. 7, f. 46a-b.

*Hab.* Natal (*Krauss*). Lake Nyassa (*Kirk*). Dohrn, *l. c.*

21. *CYRENA ASTARTINA*, Martens.

*Cyrena astartina*, Martens, Malak. Blätt. vi. (1859) p. 219, pl. 3. f. 6, 7; Prime, Cat. Corbiculidæ, American Journ. Conchol. v. no. 7 (*Corbicula*); Dohrn, P. Z. S. 1865, p. 234.

*Hab.* Tette, Zambezi River (*Martens*); Lake Nyassa (*Dohrn* and *Prime*).

22. *CYRENA (CORBICULA) RADIATA*, Parreyss.

*Cyrena radiata*, Parr. Philippi, Abbild. ii. p. 4, pl. i. f. 8.

*C. africana*, Krauss, part, Südafrik. Moll. p. 8.

Three specimens of this Nilotic species were obtained by Mr. Simons in the Lake. One of them is rather more inequilateral than normal examples, having the posterior end somewhat the longer. The concentric sulcation, too, in all three shells, is a little finer, and the violet rays somewhat obscure.

## 23. UNIO NYASSAËNSIS, Lea.

*Unio nyassaënsis*, Lea, Proc. Acad. Nat. Sci. Philad. 1864, p. 108 ; Journ. Acad. Nat. Sci. Philad. (1866), vol. vi. p. 33, pl. 12. f. 32.

*U. nyassæ*, Sowerby, Conch. Icon. sp. 224, f. 224, *a, b*.

*U. nyassensis*, Lea, Sowerb. *op. cit.* Errata and Index.

Var.=*U. kirkii*, Lea, *l. c.* p. 108 ; Journal, p. 32, pl. 12. f. 30.

Var.=*U. aferula*, Lea, *l. c.* p. 109 ; Journal, p. 34, pl. 13. f. 34.

*Hab.* Lake Nyassa (*Dr. Kirk*).

This species, like many others of this genus, is subject to considerable variation in form and sculpture. The three forms described by Lea are evidently nothing more than mere varieties of one and the same shell.

## 24. SPATHA ALATA, Lea.

*Spatha alata*, Lea, Proc. Acad. Nat. Sci. Philad. 1864, p. 109 ; Journ. Acad. Nat. Sci. (1866) vol. vi. p. 35, pl. 12. f. 31.

*Hab.* Lake Nyassa (*Dr. Kirk*).

## 25. SPATHA NYASSAËNSIS, Lea.

*Spatha nyassaënsis*, Lea, *l. c.* p. 109 ; Journal Acad. Nat. Sci. Philad. p. 36, pl. 13. f. 33.

*Hab.* Same as the preceding.

## II. MARINE SPECIES.

## 1. BULLIA MOZAMBICENSIS, sp. nov. (Plate LXXV. fig. 18.)

Shell elongate, acuminate spired, more or less livid in colour ; whorls nine, the two apical ones smooth and shining, the rest but slightly convex, separated by an oblique suture, sculptured with oblique, somewhat flexuous, fine and close-set plicæ, which extend from suture to suture in the upper whorls, and gradually become obsolete about the middle of the last volution ; these riblets or plications, which are about equal in thickness to the spaces between them, give the upper margins of the whorls a finely crenulated appearance, and are subgranulous, through being intersected by spiral striæ, which gradually become wider apart as the shell increases ; they are about nine in number on the penultimate whorl ; the last is encircled by about 13 ; and the keel which winds around its base is of a brown colour, and the portion of the whorl below it whitish ; mouth ovate-acuminate above, occupying a little more than  $\frac{3}{8}$  of the entire length of the shell, olive-brown or purplish-brown margined with white within the labrum and at the base ; labrum thickened, acute at the edge, and inconspicuously sinuated above ; columella arcuate in the middle, thinly coated with a white enamel, which, extending above the lip and winding along the suture, gradually vanishes as it proceeds up the spire.

Length 32 millims. ; diam. of last whorl 11 ; length of mouth  $12\frac{1}{2}$ , width nearly 6. Operculum unguiculate, concentrically and transversely striated.

*Hab.* Mouth of the Macusi River, Quilimane, E. Africa.

This species is remarkable for the subgranose plications on the whorls, and the brown carina of the body-whorl. It is difficult to describe in a few words the colour of this interesting form. The general appearance is livid, inclining to yellow or very pale olive; one shell is livid, with the upper margin of the whorls reddish. The callous band is quite conspicuous only about halfway around the body-whorl, and then gradually fades away, and is only noticeable further up the spire by slightly obliterating the lower extremities of the longitudinal ribs.

Two not quite adult specimens were collected by Dr. Kirk at the delta of the Zambesi River, and were placed in the British Museum by Earl Russell.

## 2. NATICA ANTONI, Philippi.

*Natica antoni*, Philippi, Zeitschrift für Malakozool. 1851, p. 48; Küster's Conch. Cab. p. 144, pl. 19. f. 18.

*Hab.* Mouth of the Macusi River, near Quilimane, E. Africa.

Nothing can be added to Philippi's excellent description of this interesting species; but I may mention that a young specimen has a distinct pale zone around the middle of the last whorl, between the two series of brown spots, which are more or less obsolete in the adult shell, and that its umbilicus is quite filled up with the callosity, even in the immature condition. The operculum is shelly, white exteriorly, except near the nucleus, where there is a small pale brownish callous deposit. The surface is smooth and shining, sculptured with the lines of growth, and a single distinct striation parallel with the outer edge, thus marking off a separate margin. From the nucleus a short ridge or rib extends itself towards the centre. The inner or under surface is clothed with a thin, pale yellow epidermis.

## 3. TELLINA OPALINA, Chemnitz.

*Tellina opalina*, Chemnitz, Küster's Conch. Cab. p. 172, pl. 35. f. 8.

*Tellinides rosea*, Sowerby, Gen. Rec. and Foss. Shells, f. 1.

*Tellina planissima*, Anton; Philippi, Abbild. i. pl. 2. f. 2; Thesaurus Conch. f. 197; Conchol. Icon. pl. 13. f. 58 *a*, *b*.

(Non *T. opalina*, Sowerby, Conch. Icon. sp. 258, f. 258 *a*, *b*.)

*Hab.* Mouth of the Macusi River, near Quilimane, E. Africa.

Only a single specimen, which apparently belongs to this species, was collected. It differs from the normal form in being rather more equilateral. It is pale rose-colour, almost white at the umbones, and at the ligamental area; and the internal raised radiating ribs are well defined. The name *opalina*, proposed by Sowerby for a species in the collection of Mr. Hanley, must be changed should it prove to be a well-defined species.

## 4. TIVELA DOLABELLA, Sowerby.

*Cytheræa dolabella*, Sowerby, Thesaurus Conch. iii. p. 619, pl. 127. f. 15; Reeve, Conch. Icon. xiv. sp. 2.

*Hab.* Mouth of the Macusi River, Quilimane, East Africa.

This species was originally described from a specimen in Cum-

ing's collection, said to have been from the Red Sea. The shell from Mozambique agrees perfectly with the type, except that the posterior end is rather less produced. I should add that the figure in the 'Conch. Icon.' considerably exaggerates the beaked appearance of this portion of the type shell. The lunule is elongate, narrow, and defined by a simple striation on each valve.

5. *DONAX MADAGASCARIENSIS*, Wood.

*Donax madagascariensis*, Wood, Index Testaceolog. Suppl. p. 5, pl. 2. f. 3; Sowerby, Thesaurus, iii. pl. 280. f. 16; Reeve, Conch. Icon. viii. sp. 50.

*D. Keyii*, A. Adams, P. Z. S. 1854, p. 87.

*Hab.* Macusi River, near Quilimane, East Africa.

The radiating striæ and the ridges between them are much more strongly developed on the posterior cordiform area than on the anterior surface. On the other hand the oblique ridges on the latter portion of the shell are much stronger than on the former, where they become thin lamellæ. The lines of growth are curiously present on the oblique costæ, near the anterior ventral margin of the valves, but not visible in the interstices between them.

. 6. *DONAX ÆMULUS*. (Plate LXXV. figs. 23-25.)

Shell small, triangular, somewhat elongate, very inequilateral, produced anteriorly, compressed and narrowly rounded, posterior area cordiform, not very acute at the margins, slightly sinuated at the middle; radiately striate, except for a narrow space at the anterior dorsal slope; the striæ are very fine, equidistant, those on the posterior area deeper and wider, with distinct intermediate lirulæ, which are decussated by still more prominent obliquely ascending ones, which do not pass beyond the rounded carina; umbones acute, but little incurved; interior dorsal slope rectilinearly sloping, posterior very suddenly inclined; ventral margin straightish; lunule linear; ligament small, prominent.

Colour yellow, purplish, or cinereous, generally varied with darker concentric bands and purplish radiating rays, most distinct within the valves, which are more or less purple, generally white at the crenulated margins.

Length  $9\frac{1}{2}$  millims., height 6, thickness 4.

*Hab.* Mouth of the Macusi River, near Quilimane.

This pretty species reminds one very much of the West-African *D. elongatus*. However, it is a trifle shorter, has not the rugose line on the posterior area, nor the flatness in the centre of that part.

EXPLANATION OF PLATES LXXIV. & LXXV.

PLATE LXXIV.

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| Fig. 1, 2. <i>Paludina jeffreysi</i> , p. 716. | Fig. 7. <i>Lanistes affinis</i> , p. 716. |
| 3, 4. — <i>capillata</i> , p. 717.             | 8, 9. — <i>nyassanus</i> , p. 715.        |
| 5, 6. — <i>robertsoni</i> , p. 717.            | 10, 11. — <i>solidus</i> , p. 716.        |

## PLATE LXXV.

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| Figs. 1, 2. <i>Melania nyassana</i> , p. 715.<br>3. — <i>simonsi</i> , p. 713.<br>4-10. — <i>polymorpha</i> , p. 714.<br>11, 12. — <i>nodicincta</i> , p. 715.<br>13. — <i>pupiformis</i> , p. 713.<br>14, 15. — <i>turritispira</i> , p. 713. | Fig. 16, 17. <i>Physa nyassana</i> , p. 717.<br>18. <i>Bullia mozambicensis</i> ,<br>p. 719.<br>19, 20. <i>Physa succinoides</i> , p. 718.<br>21, 22. <i>Bythinia stanleyi</i> , p. 717.<br>23-25. <i>Donax œmulus</i> , p. 721. |
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7. On a new Species of Petrel from the Feejee Islands. By  
 Dr. OTTO FINSCH, C.M.Z.S., Director of the Bremen  
 Museum.

[Received July 2, 1877.]

PROCELLARIA ALBIGULARIS, sp. nov.

Head, quills, and tail sooty black; back, shoulders, and wing-coverts lighter, more of a sooty brown; the largest row of the upper wing-coverts at the tips washed with light brown, forming an ill-defined narrow cross band; the black of the head covers the sides and the chin-margin; below the latter is a semilunar white space, extending laterally to below the ear-region and bounded below by a very broad sooty black cross band, which commences at the junction of the wing; below this the remaining undersurface is white, as is the hind portion of the rump and upper tail-coverts; the longest under tail-coverts are sooty black, as are the under wing-coverts along the carpal and hind margins; the middle row of under wing-coverts white, as the axillaries; the greater under wing-coverts ashy, with white tips; the feathers of the sides of the vent and flanks with black shafts, forming very narrow dark striæ; tail-feathers on base of inner web white, passing into brown. Bill and feet black. Tail forked, its feathers very broad and truncated at the apex; the wings reach a little beyond the tail.

Long tot.	al.	rectr. intern.	rectr. extern.	culm.	tars.	tib.	dig. med.
9"	7"4"	3"1"	3"11"	7"	21"	12"	14"

*Hab.* Feejee Islands, South Pacific.

The above description is taken from a female specimen from Kandavu, Feejee Islands, taken on the nest on the 10th of September, 1876, and sent over by Mr. Theodor Kleinschmidt to the Museum Godeffroy.

The large size, the deeply forked tail, and the singular coloration distinguish this species at once from any other member of this group.



8. Reports on the Collection of Birds made during the Voyage of H.M.S. 'Challenger.' No. IV. On the Birds of Tongatabu, the Fiji Islands, Api (New Hebrides), and Tahiti. By Dr. O. FINSCH, C.M.Z.S.

[Received October 3, 1877.]

A. BIRDS OF TONGATABU, FRIENDLY GROUP.

These are 30 in number. They were collected on July 20, 21, and 22, 1874. Only nine species are represented in the series.

1. COLLOCALIA SPODIOPTYGIA, Peale.

*Collocalia spodiopygia*, F. & H. Ornith. Central-Polyn. p. 48; Layard, P. Z. S. 1876, p. 501 (Tonga); Finsch, Journ. Mus. Godeffr. Heft xii. 1876, p. 26.

*Collocalia*, sp.? F. & H. Journ. f. Orn. 1870, p. 125 (nest, Tonga).

No. 11. Tongatabu.

"These little Swallows were seen flying about in numbers on every part of the island at which we were. Shot July 20."—*J. M.*

Judging from the difference in the structure of the nests obtained by Dr. Gräffe from Tongatabu (*l. s. c.*) and those from the Fijis (Orn. Central-Polyn. p. 276, t. xiv.), I expected to find a different species of *Collocalia* inhabiting the Friendly group; but on examining the specimens before me, I find them exactly like those from the Fijis and Navigators'. The structure of the nests seems to vary individually. (Cf. Finsch, Journ. f. Ornith. 1872, p. 35, Upolu.)

Long. in. lin.	alk. in. lin.	rectr. intern. lin.	rectr. ext. lin.	
	4 1	18	21	Tongatabu.
3 7	4 2	15-18	19-20	Fiji (6 specimens).
	4 1-4 5	18-20	21-23	Navigators' (3 specimens).

Mr. Layard enumerates also *C. vanicorensis* among the birds of Tonga, although it was not detected by him. On this latter species compare Finsch, Journ. Mus. Godeff. Heft xii. 1876, p. 23. Its occurrence in the Fijis, which has been alleged by us (Orn. Central-Polyn. p. 47) upon the faith of a specimen sent us by Dr. Gräffe, the only one we saw said to be from thence, is very doubtful.

2. HALCYON SACRA (Gm.).

*Halcyon sacra*, F. & H. Ornith. Central-Polyn. p. 32; P. Z. S. 1869, p. 545 (Tonga); Journ. f. Orn. 1870, p. 1241 (Tonga); Layard, P. Z. S. 1876, p. 501.

No. 2.	Tongatabu.	Male.
3.	"	Male.
4.	"	Female.
5.	"	Female.

“Shot July 20; eyes black. These birds were in considerable numbers near the houses of the natives.”—*J. M.*

- |         |            |         |
|---------|------------|---------|
| No. 23. | Tongatabu. | Female. |
| 24.     | „          | Male.   |
| 27.     | „          | Female. |
| 28.     | „          | Male.   |

“Shot July 21.”

No. 27 (female) has a pure white superciliary stripe; in the other specimens this is washed more or less with cinnamon-rusty, very strongly and broadly in No. 4 (female). Nos. 2, 3, and 4 show narrow rusty margins to the upper wing-coverts, which seem not peculiar to the young birds. That both sexes are precisely alike, I can state from dissection of specimens in alcohol. Generally Tonga specimens show a more greenish tinge on the back; but in some specimens (as 5, male, 23, female, and 24, male) the blue is as dark and pronounced as in Fiji specimens, and in some of the latter (as 95, male and 61, male) as greenish as in Tonga specimens. The under wing-coverts and sides in the Tonga bird are mostly pure white; but Nos. 3 and 4 show a rusty tinge.

### 3. PTILOTTIS CARUNCULATA (Gm.).

*Ptilotis carunculata*, F. & H. Ornith. Central-Polyn. p. 58; P. Z. S. 1869, p. 545 (Tonga); Journ. f. Orn. 1870, p. 125 (Tonga); Gräffe, ib. p. 404 (habits); Layard, P. Z. S. 1876, p. 501 (Tonga).

- |         |            |         |
|---------|------------|---------|
| No. 12. | Tongatabu. | Male.   |
| 13.     | „          | Male.   |
| 14.     | „          | Female. |
| 15.     | „          | Female. |

“Shot July 20. These are the most abundant birds on the island. They have a very clear bell-like note. Eyes black; wattle yellow.”—*J. M.*

### 4. LALAGE MACULOSA (Peale).

*Colluricincla maculosa*, Peale, U.S. Expl. Exped. 1st edit. (1848), p. 81, pl. 23. f. 10.

*Lalage terat*, Cass. (nec Bodd.), ibid. 2nd edit. (1858), p. 143; F. & H. Ornith. Central-Polyn. p. 80; P. Z. S. 1869, p. 546 (Tonga); Journ. f. Orn. 1870, p. 149 (Tonga); Finsch, ibid. 1872, p. 41 (Samoa); Layard, P. Z. S. 1875, p. 433 (Fiji), 1876, p. 494 (Navigators') and p. 502 (Tonga).

*Campephaga maculosa*, Gray, Hand-l. i. p. 339. no. 5124.

- |         |            |       |
|---------|------------|-------|
| No. 16. | Tongatabu. | Male. |
| 17.     | „          | Male. |

“Eyes white. Common on the island; shot July 20.”

- |         |            |         |                 |
|---------|------------|---------|-----------------|
| No. 29. | Tongatabu. | Female. | “Shot July 21.” |
| 32.     | „          | Male.   |                 |

No.	Long. alæ.		caud.		rostr. a front.		rostr.	latit.	tars.		
	in.	lin.	in.	lin.	in.	lin.	lin.	lin.	lin.	lin.	
16.	3	6	2	4	6	4	11½				
17.	3	7	2	4	5	3½	11½				
29.	3	6	2	4	6	3¼	11				
32.	3	8	2	5	5¼	3½	11				
49.	3	6	2	4	6	3¼	11				
50.	3	5½	2	6	c. 6	3	10				
113.	3	3	2	2	5½	3	10				
	3	1-3	5	2	0-2	2	5¼-6	—	9½-10		Fiji (4 specimens).
	3	2-3	7	2	0-2	6	6	—	10-11½		Upolu (5 " ).
	3	6-3	9	2	3-2	5	6-6¼	—	10-12		Tonga (9 " ).
		3	4		2	5	5½	—	9½		<i>L. terat.</i> Java.

Among the specimens before me Nos. 17, 32, and 49 (Fiji) are adult and fully coloured, which are very rare in collections, and give me a good opportunity of making a close comparison of them with Javan specimens of the true *Lalage terat* (Bodd.), with which the Central-Polynesian bird has hitherto been confounded. I have myself stated (J. f. Orn. 1872, p. 130) their undoubted identity; but having then seen only young and a few old specimens in bad condition, I was misled. The series before me seems to confirm the views of Mr. G. R. Gray, who keeps the Polynesian bird separate.

The latter may be distinguished from *L. terat* by the grey or brownish-grey rump and upper tail-coverts being always barred by irregular but distinct cross lines, the rump being of a uniform grey with faint darker traces in *L. terat*—by the black shaft-stripe on the white middle row of the upper wing-coverts, which is wanting in *L. terat*—and by the narrow brownish external margin of the primaries and first secondaries, which in the old *L. terat* are white. The latter besides shows a distinct greyish tinge on the breast and sides, whereas in *L. maculosa* the whole undersurface is pure white. The young bird, although much more like *L. terat*, may be distinguished by the much broader cross bands on the sides of the under-surface and on the rump.

The distribution of *L. maculosa* seems confined to the Central-Polynesian Islands, Fiji, Tonga, and the Navigators'.

##### 5. APLONIS TABUENSIS (Gm.).

*A. marginata*, Gould, P. Z. S. 1836, p. 73.

No. 8. Tongatabu. Male.

9. „ Female.

25. „ Male.

“Shot July 20 and 21. Eyes dark red.”—*J. M.*

##### 6. PTILINOPUS PORPHYRACEUS (Forst.).

*Ptilinopus porphyraceus*, F. & H. Orn. Central-Polyn. p. 119; P. Z. S. 1869, p. 547 (Tonga); Journ. f. Orn. 1870, p. 131 (Tonga); Layard, P. Z. S. 1876, p. 502 (Tonga).

No. 6. Tongatabu. Male. “Eyes yellow.”

7. „ Male.

"Shot July 21 and 22. These birds were very shy; though we heard them frequently, it was very difficult to get a shot at them."  
—*J. M.*

Of this species, which is peculiar to the Friendly group, a full description and characters of distinction from the Fijian and Navigators' *Pt. fasciatus* are given as cited above.

7. *CARPOPHAGA PACIFICA* (Gm.).

*Carpophaga pacifica*, F. & H. Orn. Central-Polyn. p. 142; Journ. f. Ornith. 1870, p. 134 (Tonga); Layard, P. Z. S. 1875, p. 503 (Tonga).

No. 18. Tongatabu. Male. Shot July 21.

"This large pigeon 'coos' very like our pigeon at home. It appears to be common but shy. Eyes red."—*J. M.*

No. 26. Tongatabu. Male. "Eyes red."

31. „ Female.

79. Samoa. Female.

"Eyes and legs red. Presented alive by the Rev. George Brown."

The sexes are alike in plumage; but the female is without the knob on the base of the bill, and exactly agrees with specimens from the Navigators' and the Fijis; the vinaceous tinge in the male birds seems to be more strongly developed during time of incubation.

In our 'Ornithology of Central Polynesia,' Dr. Hartlaub and I erroneously united *C. oceanica*, Less., with this species; but since then we have shown (P. Z. S. 1872, p. 101, and Journ. Mus. Godeffr. Heft viii. 1875, p. 26) that the latter is a distinct species, occurring in the islands of the Western Pacific. *C. pacifica* is confined to the Central-Polynesian Islands.

8. *ARDEA SACRA*, Gm.

*Ardea sacra*, F. & H. Ornith. Central-Polyn. p. 201, Journ. f. Orn. 1870, p. 136 (Tonga); Layard, P. Z. S. 1875, p. 503 (Tonga).

No. 19. Tongatabu. Female. "Eyes yellow."

20. „ Female, young.

"Common on the reefs at low water; also met with in the woods through the island. Shot July 21."—*J. M.*

No. 22. Tongatabu. Male. Shot July 22.

No. 19 is white, assuming the slate-coloured dress from below and on the back; slate-blue appanage in full development.

No. 20. Slate-blue, with white chin-stripe; the scapular appanage in beginning of development.

No. 22. White, sprinkled on the neck, back, and below with single slate-blue feathers; no development of scapular appanage visible.

On several occasions I have shown that the white dress in this Heron is not dependent upon age or sex, and that at present we are not able to explain the causes of these interesting differences in coloration satisfactorily.

9. *PORPHYRIO SAMOËNSIS*, Peale.

*P. samoënsis* et *P. vitiensis*, Peale.

- P. vitiensis*, F. & H. Ornith. Central-Polyn. p. 172, t. xii. f. 3.  
*P. indicus*, Cass. (nec Hors., nec F. & H.).  
*P. vitiensis*, F. & H., Journ. f. Orn. 1870, p. 135 (Tonga); H. & F., P. Z. S. 1871, p. 27 (Savai).  
*P. samoënsis*, F., Journ. f. Orn. 1872, p. 55.  
*P. vitiensis*, Layard, P. Z. S. 1875, p. 439 (Fiji); *ibid.* 1876, p. 497 (Navigators'), and 1876, p. 503 (Tonga).  
*P. indicus*, Whitmee (nec Horsf.), Ibis 1875, p. 446 (Samoa).  
 No. 21. Tongatabu. Female. "Eyes red; the only specimen seen; shot July 22."—*J. M.*

Long.	caud.	rostr. a	rostr.	latit.	long.	tib.	dig.
alæ.	in.	riçt.	scut. incl.	scut.	tars.	lin.	med.
in. lin.	in.	lin.	in. lin.	lin.	in. lin.	lin.	in. lin.
8 6	3	16½	2 3	9	2 10	15	2 9

I have already explained (P. Z. S. 1871, p. 27) that *P. indicus*, Horsf., does not occur in Polynesia, as has been stated by Mr. Cassin, but that the Central-Polynesian Islands (Fiji, Navigators' and Friendly group) possess only one species; *P. samoënsis*, Peale. The description in the 'Ornithology of Central Polynesia' (p. 170) taken from a Javan specimen of the true *P. indicus*, Horsf., must therefore be cancelled altogether.

Specimens from the Fijis and Tonga group look apparently somewhat larger than those from the Navigators'; but on comparing the series of measurements given, it will be easy to see that in respect to size no specific distinction can be made out. In coloration there is also no difference.

## B. BIRDS OF THE FIJI ISLANDS.

These birds were shot on the island of Matuka on July 24, 1874, on the island of Kandavu on July 25 and from August 3 to 6, 1874, and on the island of Levuka from July 28 to August 1, 1874. They are 82 in number and represent 25 species.

### 1. ASTUR RUFITORQUES, Peale.

- Nisus cruentus*, Schleg. (nec Gould), Mus. P.-B. Astures, p. 40.  
*Astur cruentus*, F. & H. (nec Gould), Ornith. Central-Polyn. pp. 3 and 273; Layard, P. Z. S. 1875, p. 424.  
*A. rufitorques*, Sharpe, Cat. Brit. Mus. i. p. 121.  
*Nisus rufitorques*, Schleg. Mus. P.-B. Accip., Revue, p. 80 (1873).  
 No. 34. Matuka. Female. "Eyes brown; several of these were seen, only two shot."  
 No. 35. Matuka. Female.  
 36. " Male. "Eyes yellow."  
 62. Kandavu. Female. "Eyes yellow; shot July 27."  
 80. " Female. "Eyes yellow, cere yellow, legs yellow; the stomach contained a portion of a lizard. Shot Aug. 5."

No.	Long.		caud.	rostr.		tars.		dig.	
	alæ.	in. lin.		a. cer.	lin.	in. lin.	med.		
34.	8	9	6	0	8	2	3	17	
35.	8	6	6	2	8	2	3	17	
36.	7	3	5	2	7	1	11	13	
62.	8	10	6	4	8½	2	1	16	
80.	8	9	5	10	9	2	1	16	
	8	9	6	2	...	2	1	16	♀ jun. Ovalau.
	7	3	5	0	7	2	0	13½	♂ Viti Levu.
	8	2	6	0	8	2	1	15	♂ Ternate.
	10	2	8	0	...	...	3	...	♀
	8	6	6	9	8½	2	3	16	jun. Halmahera.

In our 'Ornithology of Central Polynesia' we followed Professor Schlegel in uniting the Hawk of the Fijis with *Astur cruentus* of Australia; but, as on some other occasions, we depended too much on Prof. Schlegel's authority, and Prof. Schlegel has since declared himself to have been in error. Not having access to specimens, I cannot myself judge of the correctness of Prof. Schlegel's new view; but the fine series now before me inclines me to believe that *A. rufitorques* is most probably peculiar to the Fiji group, and not the same species as is distributed widely in the Malay archipelago and usually known as *A. griseigularis* and *A. henicogrammus*, Gray (= *A. æquatorialis*, Wall.).

In coloration the Fiji specimens are pretty constant, all showing above a beautiful ashy-blue, beneath a fine vinaceous rufous, which latter forms also a broad neck-collar. This is less developed in No. 35, and looks rather imperfect. The under-surface in No. 62 shows a nearly obsolete undulation of narrow darker lines on the ventral region; the under wing-coverts in all the specimens before me are not "uniform white" as noted in his specific diagnosis by Mr. Sharpe (*l. c.* p. 95); but the white is washed with delicate pale vinaceous, which shows in Nos. 34 and 80 faint darker undulations. An old specimen of *A. griseigularis* is generally conspicuously darker, slaty-brownish on the back, wings, and tail, the underparts also dark vinaceous-rufous with perceptible narrow light cross bands (agreeing exactly with figs. 3, 4, taf. 14, in Schleg. 'Vog. van Nederl. Indië'). A young bird of *A. griseigularis* hardly shows any difference from our young male (No. 36), except that the lores, cheeks, and a median stripe on the chin are decidedly ashy.

## 2. PLATYCERCUS SPLENDENS, Peale.

*Platycercus splendens*, Finsch, Mon. Papag. ii. p. 237; Layard, P. Z. S. 1875, p. 425; Ibis, 1876, p. 143 (first race only).

No. 52. Kandavu. Male. "Eyes red."

53. " " "

63. " " "

112. " " "Eyes orange, feet and bill black."

64. " Female. "Eyes yellow."

All the specimens agree among themselves; all show a blue neck-collar, but which differs in extent, in one (No. 112) being interrupted

by green; none of them have red spots on the rump, such as are sometimes shown in *P. tabuensis*. The size varies a good deal; wings 8" to 8" 8".

Mr. Layard (Ibis, 1876, p. 141) points out the characters of four different races of this Parrot occurring in the Fijis:—

(1) the bright crimson-bellied race, with broad blue collar, from Viti-Levu and Kandavu, being the true *Platycercus splendens*, Peale;

(2) the Mathuata race, "maroon-bellied," with broad blue nuchal collar;

(3) the Koro race, maroon-bellied with the faintest trace of the blue collar; and

(4) the Taviuni race (*P. taviunensis*, Layard), "maroon-coloured and without a trace of the blue collar."

Of these I have before me only one specimen from Taviuni, which, indeed, differs strongly from *P. splendens*. It has the same dark maroon-purplish coloration as *P. tabuensis*, and wants the blue neck-collar; besides it is considerably smaller (wings 7" 8"). As I have become convinced by a large series of *A. tabuensis* that in this species the blue collar is also sometimes almost wanting, I think this cannot form a specific character, even less than the purplish-red spots on the rump, which vary individually. If the smaller size should turn out to be constant, this dark form ought to be separated from the nearest-allied *A. tabuensis* under the name of *A. annæ*, Bourj. (*P. taviunensis*, Layard).

### 3. PLATYCERCUS PERSONATUS, G. R. Gray.

*Platycercus personatus*, Finsch, Mon. Pap. ii. p. 239; Layard, P. Z. S. 1875, p. 425.

No. 78. Levuka. Female. "Eyes orange, with streaks of red; bill and legs black. This bird was purchased alive."

### 4. DOMICELLA SOLITARIA (Gm.).

*Domicella solitaria*, Finsch, Mon. Papag. ii. p. 760.

*Lorius solitarius*, F. & H. Orn. Central-Polyn. p. 23; Layard, P. Z. S. 1875, p. 426.

No. 37. Matuka. Female.

38. " Female.

39. " Female.

40. " Male.

"These birds were not common, although when they were seen a good number were in company. Eyes red and yellow."

No. 89. Kandavu. Male. "Eyes red; bill and legs yellow; stomach contained fruit."

No. 99. Kandavu. Female. "Shot August 6."

100. " Male " "

### 5. CUCULUS SIMUS, Peale.

*Cuculus simus*, F. & H. Ornith. Central-Polyn. p. 28; Layard, P. Z. S. 1875, p. 426.

No. 90. Kandavu. "Upper mandible and margin of lower black,

base of the under flesh-colour or reddish; eyes dull orange; feet yellow; stomach contained parts of beetles and caterpillars. Shot August 6."—*J. M.*

Long. alæ. in. lin.	rectr. intern. in. lin.	rectr. ext. in. lin.	rostr. a front. lin.	latit. rostr. lin.	tars. lin.	
4 7	4 6	3 0	7	4	8½	No. 90.
4 8	4 6	2 9	8	4½	—	♂, Taviuni.
4 7	4 10	2 4	7½	4	8	Fiji.
5 2	4 11	3 10	8½	3		( <i>C. bronzinus</i> ).

As this Cuckoo is only a migratory visitor to the Fiji group, it would be of interest to ascertain whither it resorts after leaving the islands, which at present are the only locality known for the species. Prof. Schlegel seems wrong in uniting it with the Australian *C. flabelliformis*, Lath., which seems to be a rather larger bird, as is also *C. bronzinus*, Gray, of New Caledonia, which otherwise agrees nearly in coloration. Mr. Gould has since described a Cuckoo (*Cacomantis castaneiventris*, B. of Austr. Suppl. Part iv. 1867) from Queensland, which, judging from the plate (apparently a little exaggerated in colour), comes very near to *C. simus*, but is smaller (wings 4" 2").

Our *C. infuscatus* (Orn. Central-Polyn. p. 31, t. v. f. 1), corresponding in size exactly with *C. simus*, will probably turn out to be a melanistic phase of the latter.

#### 6. HIRUNDO TAHITICA, Gm.

*Hirundo tahitica*, F. & H. Ornith. Central-Polyn. p. 51; Layard, P. Z. S. 1875, p. 430.

*H. subfusca*, Gould.

No. 45. Matuka. Female.

46. „ Female.

“Eyes black.”

No. 104. Kandavu. Female. “Eyes, bill, and legs black; stomach contained insects.”—*J. M.*

This short-tailed Swallow comes nearest to *H. javanica*, Sparrm. (*H. domicola*, Jerd.), but has a rather broader bill; the underparts below the ferruginous throat-portion are darker brownish; and the tail-feathers want the white spot on the inner web. I must mention, however, that in No. 45 the second right-hand tail-feather shows a very small pale spot on the inner web. The sexes are alike.

#### 7. COLLOCALIA SPODIOPYGIA, Peale.

*Collocalia spodiopygia*, Layard, P. Z. S. 1875, p. 428 (Fiji; habits).

No. 93. Kandavu. Female.

94. „ Male.

“Eyes, feet, and bill black; stomach contained parts of insects. Shot August 6.”



The Fiji specimens look a little lighter from below than those from Tonga and the Navigators'.

8. HALCYON SACRA (Gm.).

*Todirhamphus vitiensis*, Cass.

*Halcyon cassini*, F. & H. Orn. Central-Polyn. p. 40.

*H. sacra* and *H. cassini*, Layard, P. Z. S. 1875, p. 427.

No. 61. Kandavu. Male. "Eyes and bill black."

95. ,, Male. "Eyes black, feet greyish; upper mandible black and margin of the under, rest of lower mandible pale red. Stomach contained a wasp and parts of other insects. Shot August 6."—*J. M.*

No. 109. Kandavu. Male.

110. ,, Male.

The Fiji specimens are generally darker and of a more brilliant blue, the neck-collar is washed with rufous, as are the sides of the vent and flanks, which in the Tonga birds are, like the neck-collar, almost pure white. But these differences are in certain specimens so indistinct that thereupon no specific characters can be based. *H. cassini*, Finsch & Hartl., with an ill-defined superciliary stripe, rests on individual differences which are of no specific value. But I may remark that among a very large number of specimens examined by me from the Friendly and Fiji Islands, I never met with one having a white head showing only a blue vertical spot, as is represented in the right-hand figure of Sharpe's plate of *H. sacra*, which I think must still be kept separate as *H. peali*, F. & H., from the Navigators'. In size the Fiji specimens are exactly the same as those from Tonga, and have not a longer bill, as has been stated by Mr. Layard (P. Z. S. 1876, p. 501).

9. MYZOMELA JUGULARIS, Peale.

*Myzomela jugularis*, F. & H. Orn. Central-Polyn. p. 54, t. vii. f. 1, 2; Layard, P. Z. S. 1875, p. 431.

No. 43. Matuka. Male.

44. ,, Female.

"Eyes black. These little birds were flying in considerable numbers about a large tree covered with red blossom; only a few, however, were brought on board."—*J. M.*

No. 59. Kandavu. Male. "Eyes and legs black."

60. ,, Female.

85. ,, Male.

86. ,, Female.

"Eyes and bill black; legs a bluish tinge with soles yellow. Stomach contained portions of insects. Shot August 5."

No. 70. Kandavu. Male.

In the female (No. 60) the red on the vertex or chin is more restricted; on the rump it is wanting in all; in No. 60 also on the vertex. No. 86 shows some red feathers on the rump but none on the vertex.

10. *PTILOTIS CARUNCULATA* (Gm.).*Ptilotis carunculata*, Layard, P. Z. S. 1875, p. 432.

No. 47. Matuka. Male.

48. „ Female.

“These birds (the same as Nos. 12, 13, 14 and 15 from Tongatabu) did not appear so common as in Tongatabu, and seem to be rather smaller.”—*J. M.*

alæ.		caud.		rostr. a	
in. lin.		in. lin.		front.	
				lin.	
3	3	2	8	7½	♂ No. 47.
3	3	2	5	7	♀ 48.

On comparing the measurements above given with those of the Tongatabu specimens, Mr. Murray's opinion as to the smaller size of the Fiji birds seems to be confirmed; but a reference to the table of measurements published by me (Journ. f. Orn. 1870, p. 126), taken from 29 specimens from the Navigators' and Tonga groups (those of the latter series having been sent over in spirits and mostly dissected by myself), will show all gradations of size, and the impossibility of separating the Fiji bird on account of its smaller size. In coloration specimens from the Fijis, Tonga, and Navigators' are precisely alike.

The occurrence of the true *Pt. carunculata* on the Fijis (doubted by me, Journ. f. Orn. 1872, p. 36) has been already established by Mr. Layard. According to this gentleman the species is confined to the island of Loma Loma. He endeavours also to introduce a new species (*Pt. similis*), said to be peculiar to the island of Vanua Levu; but the short diagnosis (Ibis, 1876, p. 148), “having pale yellowish grey ear-tufts instead of bright golden yellow,” seems to me insufficient to distinguish it. Perhaps it will turn out to be *P. procerior*.

Mr. Layard also remarks that in our ‘Ornithology of Central Polynesia’ we wrongly describe the iris to be white, as it is in fact brown or ashy-brown. As we never had an opportunity of seeing the bird alive, we could follow only the notice of Dr. Gräffe, who gave the iris as “white;” but we also noticed “brown” (Peale), “ashy-grey” (Latham), and “blue-black” (Forster).

11. *PTILOTIS PROCERIOR*, F. & H.*Ptilotis procerior*, Orn. Central-Polyn. p. 62, t. v. f. 3; Layard, P. Z. S. 1875, p. 431.

Nos. 73 and 74. Male. Levuka.

This species is well distinguished from the former (*P. carunculata*) by having no true wattle, but a naked space below the ear-region, surrounded by a blackish line, and by the absence of the yellow moustache, which is always visible in *P. carunculata*.

Through the Museum Godeffroy I have received many specimens for inspection from the following localities:—Ovalau, Vatu Lele, Vanua Levu, and Lavu-savu.

Young birds are of a sombre olive, without the yellowish tinge on

the throat and breast. The size is also very variable, as is shown by the following table of measurements:—

	Long. al. in. lin.	caud. in. lin.	rostr. a front. lin.		
	3 9	3 0	10 $\frac{1}{2}$		Ovalau. Type of <i>P. procerior</i> .
	3 10	2 11	9 $\frac{1}{2}$		„
No. 74.	3 5	2 8	10	♂	„ (Levuka). ‘Challenger,’
73.	3 6	2 11	9	♂	„
	3 10	—	10	♂	Vatu Lele. Mus. Godeffr.
	3 4	2 7	8 $\frac{1}{4}$	♂	„
	3 8	2 11	8 $\frac{3}{4}$	♂	Vanua Levu. „
	3 3	2 7	8 $\frac{1}{4}$		Viti. „
	3 1	2 6	7 $\frac{3}{4}$	♀	Vanua Levu. „
	2 10	—	c. 8	♀	Savu-savu. „
	2 11	—	8	♀	Viti. „

Valuable notices on the habits of this species as observed by Mr. Th. Kleinschmidt, are published in the Journ. Mus. Godeffr. Heft xii. 1876, p. 13.

## 12. PTILOTIS PROVOCATOR, Layard.

*Ptilotis provocator*, Layard, P. Z. S. 1875, p. 28.

*P. xanthophrys*, Finsch, Journ. Mus. Godeffr. Heft xii. 1876, p. 5.

No. 65. Kandavu. Male. “Eyes brown.” July 25.

66. „ Female.

67. „ Male.

68. „ Male.

83. „ Male.

84. „ Female.

“Eyes brown; legs a greenish tinge; bill black. Stomach contained ants, spiders, grasshoppers.”

No. 106. Kandavu. Female. Shot August 6.

111. „ Male. “Eyes brown; bill black; legs a greenish tinge.”

The specimen I described as *P. xanthophrys* was labelled “Navigators’;” but this was a mistake, as this bird, which must bear Mr. Layard’s previous name, is confined to the Fijis.

This is a well-marked, excellent species, always characterized by the yellow patch surrounding the eye, extending to the ear-region. Even the young bird (No. 84) shows this character, but differs otherwise in being underneath strongly tinged with olive-yellow, showing no whitish shafts, which form such conspicuous striæ even on the back of the old birds. The sexes are alike. The size, as usual in this genus, varies considerably individually.

## 13. ZOSTEROPS FLAVICEPS, Peale.

*Zosterops flaviceps*, F. & H. Orn. Central-Polyn. p. 52, t. vi.; Layard, P. Z. S. 1875, p. 430.

No. 71. Levuka. Female.

72. „ Male. “Eyes black.”

In coloration this species is so like *Z. westernensis* (Quoy & Gaim.) of Australia, that Dr. Hartlaub and Mr. Gould could find only in the somewhat stronger bill a ground of distinction; but as the specimens now before me show only a difference of half a millimetre, this character can no longer stand. However, I now observe that the Fiji bird has the under tail-coverts of a deeper yellowish; so that I think *Z. flaviceps* may be kept separate until more specimens show this difference also to be of no constant value.

14. *ZOSTEROPS EXPLORATOR*, Layard.

*Zosterops explorator*, Layard, P. Z. S. 1875, p. 431.

No. 57. Kandavu. Female.

58. " " " " " Eyes black."

The discovery of this species is due to Mr. John Murray, of the 'Challenger' Expedition. As Mr. Layard has published only a short diagnosis, I think a full description will be necessary—the more so as the specimens now before me are the types.

Upper surface yellow olive-green, more yellow on the top and sides of the head and neck, changing into pure citron-yellow on the lores; chin, throat, and breast the same as the under tail-coverts; lower part of breast and remaining under surface yellowish white; flanks distinctly washed with pale brownish grey; under wing-coverts white; wing- and tail-feathers brown-black, narrowly margined externally with olive-green; remiges margined on their inner webs with white; there seems to be a narrow white eye-ring, surrounded by a narrower blackish one; bill blackish, lower mandible pale at base; legs plumbeous.

Long. tot.	al.		caud.	rostr.	tars.
in.	in.	lin.	lin.	lin.	lin.
c. 4	2	2½	16	5	7½

Both specimens are precisely alike.

This species comes nearest to *Z. xanthochroa*, Gray, from New Caledonia; but the olive-green of the upper parts inclines decidedly to yellow, and the yellow on the throat and breast is purer and brighter.

15. *MONARCHA LESSONI* (Quoy & Gaim.).

*Monarcha lessoni*, F. & H. Orn. Central-Polyn. p. 88, t. vii. f. 5; Layard, P. Z. S. 1875, p. 434.

No. 87. Kandavu. Male. "Bill light blue, darker at the base; legs bluish; eyes black. Stomach was crammed with broken parts of insects."—*J. M.*

No. 103. Kandavu. Male. Shot August 6.

116. " " " "

16. *MYIAGRA CASTANEIVENTRIS* (J. Verr.)

*Myiagra castaneiventris*, F. & H. Orn. Central-Polyn. p. 95, taf. ix. f. 2, 3; Layard, P. Z. S. 1875, p. 435.

No. 51. Matuka. Male. "Eyes black. Frequents chiefly the mangrove trees."

- No. 75. Levuka. Male. "Eyes black." Shot July 30.  
 76. " " "  
 101. Kandavu. Male. Shot August 6.  
 102. " Female. "  
 114. " "  
 115. " Male.

I am surprised to find the specimen No. 101 marked "male;" for it agrees with No. 114, marked "female," whereas the female, No. 102, shows the very different plumage of the black-throated males. If these statements are based on dissection, they would tend to prove a uniformity of both sexes—a fact very strange, and opposite to all we know at present of the members of this genus.

This species is confined to the Fijis, and does not occur on the Navigators', as stated wrongly in our 'Polynesian Ornithology.' The specimens described by us from Samoa were wrongly labelled. The representative species in the latter islands is *M. albiventris*, Peale (= *M. rufiventris*, Elliot, Ibis, 1859, p. 393).

#### 17. PACHYCEPHALA VITIENSIS, Gray.

*Pachycephala vitiensis*, Layard, P. Z. S. 1875, p. 433, et Ibis, 1876, p. 154.

- No. 69. Kandavu. Female. "Eyes red." July 24.  
 82. " " " " "Eyes hazel; legs a bluish tinge; bill brown." Shot August 5."

Without having male specimens also on hand it is not possible to determine these specimens satisfactorily, as there has arisen a great confusion since Mr. Layard pointed out the existence of 5 or 6 species in the Fijis. As the specimens are collected in Kandavu they ought to be "*P. vitiensis*," which, according to Mr. Layard, is confined to this island; and, judging from Mr. Gray's short description, they would belong to this species. But I may mention that the female specimen described and figured by us s. n. *P. vitiensis* (Orn. Central-Polyn. p. 73, t. viii. f. 3), apparently belongs to the species described since as *P. torquata*, Layard (P. Z. S. 1875, p. 433).

#### 18. LALAGE MACULOSA (Peale).

No. 49. Matuka. Female.

50. " "

113. Kandavu. Male. "Eyes hazel; bill blackish; legs a greenish tinge."

On this species see above, p. 724.

#### 19. APLONIS VITIENSIS, Layard.

*Aplonis vitiensis*, Layard, P. Z. S. 1876. p. 502.

*A. tabuensis*, F. & Hartl. (nec Gm.), Ornithol. Central-Polyn. p. 103, t. x. f. 2.

No. 41. Matuka. Male.

42. " Female.

"Eyes dark red or brown. This is the same bird as Nos. 8, 9,

25 (i. e. *A. tabuensis*), from Tongatabu, and appeared to be not at all common: only two specimens were obtained. These seem smaller, and altogether a variety when compared with those from Tongatabu."—*J. M.*

The distinctive characters of this species (which, following Peale, we formerly erroneously described as the true *A. tabuensis*) I have explained in my paper on the birds of Eua (see below).

	Long. al. in. lin.	caud. in. lin.	rost. a front. lin.	
No. 41.	3 8	2 1	7	<i>A. vitiensis.</i>
42.	3 5	2 0	6½	
8.	4 0	2 3	8	<i>A. tabuensis.</i>
25.	4 3	2 6	7	"
9.	4 1	2 5	7½	"

The comparison of the dimensions between the Fiji and Tonga specimens, given above, will show a considerable difference: but I must remark that they cannot stand as of specific value; for I have measured specimens from Tonga as small as those from Fiji, and also large specimens from Fiji.

#### 20. CHRYSÆNA VICTOR, Gould.

*Chrysæna victor*, Finsch, P. Z. S. 1873, p. 733, et 1875, 557; id. Journ. Museum Godeffroy, Heft xii. (1876) p. 10; Layard, P. Z. S. 1875, p. 437.

An old specimen in full plumage from Taviuni.

#### 21. CHRYSÆNA VIRIDIS, Layard.

*Chrysæna viridis*, P. Z. S. 1875, pp. 151 et 437.

No. 55. Kandavu. "Sex not certain. Eyes yellow; legs violet; bill green."

No. 56. Kandavu.

No. 81. Kandavu. "Male. Bill green; legs violet; eyes white. Stomach contained green fruit with stones."

No. 91. Kandavu. "Male. Eyes white; bill green; legs violet."

No. 92. Kandavu. "Male. Stomach contained a fruit about the size of a cherry, with a large hard stone. Shot August 6."—*J. M.*

This well-marked species, distinguished by the yellow head and under tail-coverts, is not the young of *C. luteovirens*, as erroneously supposed by me (Journ. Mus. Godeffr. Heft xii. p. 10). It seems to be confined to the island of Kandavu, and was first discovered, as Mr. Layard notices, by the 'Challenger' Expedition.

#### 22. COLUMBA VITIENSIS, Quoy & Gaimard.

*Columba vitiensis*, F. & H. Ornith. Central-Polyn. p. 137, t. xi. f. 2; Layard, P. Z. S. 1875, p. 437, et 1876, p. 496.

No. 54. Male. Kandavu. "Eyes yellow; legs and upper part reddish, and beak, except tip, red."

No. 97. Male. Kandavu. "Legs and eyes red, eyelid red; bill, base red, tip green. The stomach contained the seeds of the

little red pepper so common on shore (chili). The gizzard was quite ordinary, and contained nothing of the nature of that in Nos. 88, 96 (*Carpophaga latrans*). The first specimen we have taken of this pigeon. Shot August 6."

No. 107. Male. Kandavu.

This pigeon seems also peculiar to the Viti group, although assigned in our book and by Mr. Layard also to the Navigators' Islands. On the specific distinctness of the representative form in the latter group (*C. castaneiceps*, Peale), conf. Finsch, Journ. f. Ornith. 1872, p. 47.

### 23. CARPOPHAGA LATRANS, Peale.

*Carpophaga latrans*, F. & H. Ornith. Central-Polyn. p. 140; Layard, P. Z. S. 1875, p. 438.

No. 88. Kandavu. Female. "Cere and eyes red; legs red or purplish; bill black. The stomach contained the fruit of some tree unknown to me<sup>1</sup>. The coat of the stomach had hard pupilla-like ossifications of a circular form, in two or three rows. These indurations are composed of a horny substance. Shot August 5."

No. 96. Kandavu. Female. "Eyes red; bill black; cere red; legs purple. Stomach contained a large green fruit. Same as No. 88. Shot August 6."—*J. M.*

These examples agree with specimens from Viti-Levu. The species is peculiar to the Fiji group, and, according to Mr. Layard, is found on nearly all of the islands.

### 24. ARDEA SACRA, Gm.

*Ardea sacra*, Layard, P. Z. S. 1875, p. 440 (Fiji).

No. 33. Matuka. Female. July 24.

A uniform slate-coloured specimen, with white chin-stripe.

### 25. ANAS SUPERCILIOSA, Gm.

*Anas superciliosa*, F. & H. Orn. Central-Polyn. p. 213; Layard, P. Z. S. 1875, p. 440.

*A. pelewensis*, H. & F. Journ. Mus. Godeffr. Heft viii. 1875, p. 40.

No. 98. Kandavu. Male. "Eyes dull pink; bill black; legs flesh-colour with a salmon tinge. Stomach contained worms and mud. Shot August 6."—*J. M.*

No. 108. Kandavu. Male.

	Long. al.		caud.		rostr. a front.		rostr.	Altit.	Latit.	Long.	dig.
	in.	lin.	in.	lin.	lin.	lin.	lin.	lin.	lin.	lin.	lin.
No. 108. Fiji	8	10	2	7	19½	7½	8½	17	20		
98. Fiji	8	6	—	—	19	8	8½	17	21		
Tonga.....	8	9	—	—	19	9	9	17	21		
Navigators'..	8	3	2	7	23	—	—	18	21		
Pelew.....	7	8-8	6	2 6-3 0	17-19½	6½-7	8-8½	14-17	18-20	(7 spec.)	
New Zealand	9	0-9	6	3 1-3 4	20½-22	8-8½	9-9½	17-18	21-23	(4 spec.)	

I have already repeatedly noticed the smaller size of Central-

<sup>1</sup> *Oncocarpus vitiensis*. See Prof. Garrod's paper in P. Z. S. 1878 (Jan. 15th).—ED.





The tips of the wings extend beyond the end of the tail about 14 lines; the tail is entire.

The New-Caledonian bird (*C. leucopygia*, Wall. P. Z. S. 1863, p. 384) seems to differ, as we learn from M. Verreaux's original description (*C. linchi*, Verr. & Des Murs, Rev. et Mag. Zool, 1862, p. 129), specifically in the rhachis of the rump-feathers being black, and in the want of the white spot on the inner web of the second and third tail-feathers.

### 3. HALCYON JULIÆ (Heine).

*Halcyon juliæ*, Sharpe, Mon. Kingf. p. 227, tab. 86; Tristram, Ibis, 1876, p. 260.

*Dacelo grayi*, Schleg. Mus. P. B. Alced. (1863), p. 37.

*H. sacra*, F. & H. Orn. Central-Polyn. p. 32 (spec. ex New Hebrides and New Ireland? p. 34).

No. 117. Api. Female. "Eyes black; upper mandible black, lower flesh-colour; legs greyish; the stomach contained insects, and a small molluscous shell"—*J. M.*

When placed among an extensive series of *H. sacra*, this specimen seemed to be nothing more than a dull-coloured specimen of that species, having the greenish shine of the back exactly the same as in No. 7 (from Tongatabu); but the same dull green also prevails on the head; and this would form the only mark of distinction. The rufous band round the head is not so developed as in Sharpe's plate; there is only a buff supercilium; and the head-band is only indicated by some buff feathers; the neck-collar is white, not buff; the black band which runs from beneath the eyes round the hind neck is very narrow.

A specimen in the Bremen Museum, said to be from New Ireland (procured from Mr. Frank), and described by us (*l. c.*) as *H. sacra*, agrees perfectly with Sharpe's plate, and may be considered to be also *H. juliæ*.

### 4. ARTAMUS MELALEUCUS, Forst.

*Loxia melaleuca*, Forst., Licht. Descr. Anim. 1844, p. 272.

No. 119. Api. Male. "Bill light blue, the tip black; eyes hazel; legs black; the stomach contained insects, chiefly beetles."—*J. M.*

Exactly like specimens from New Caledonia; the wing a trifle shorter.

Long. al.	caud.	rostr. a front.	Latit.		Long.
			rostr. a basi.	rostr. a tars.	
in. lin.	in. lin.	in.	in.	in.	in.
4 9	2 3	7½	4½	7	New Hebrides.
4 11-5 2	2 5	7½	4½	8	New Caledonia.

The New Hebrides seems to be a new locality for this species. On its differences from the nearly allied *A. pelewensis*, Finsch, cf. Journ. Mus. Godeffr. Heft xii. 1876, p. 41.

## 5. CARPOPHAGA PACIFICA (Gm.)

No. 118. Api. "Male, young. This bird was in poor condition, and had nothing in the stomach. Bill blackish-blue; legs dull red eyes brown."—*J. M.*

This is a young bird, with not full-grown wings and tail-feathers (wings only 6" 11"', tail 4"), but in coloration exactly like older ones from the Tongas. Some of the tail-feathers and secondaries show the singular hairy filaments which denote a young bird still unable to fly.

## D. BIRDS OF TAHITI, SOCIETY GROUP.

The 'Challenger' remained at Tahiti from the 18th of September till the 2nd of October, 1875. Sixteen specimens of birds were collected, which I refer to four species.

## 1. CALLOCALIA FUCIPHAGA (Thunb.).

*Callocalia cinerea*, Finsch, Journ. Mus. Godeffr. Heft xii. 1876, p. 25.

*C. fuciphaga*, Wall. P. Z. S. 1863, p. 384; Sclat. P. Z. S. 1865, p. 616.

No. 559. Tahiti. Male.

No. 560. " "

No. 561. " Female. Eyes black.

Long. al. in. lin.	rectr. interm. lin.	rectr. extern. lin.	
4 7	21	26	No. 559. Tahiti.
4 6½	22	26	560. "
4 7	22	26	561. "
4 9	25	27	<i>teste</i> Pelzeln.
4 5	19	23	<i>fuciphaga</i> , Java.
3 11	18	20	} <i>vanicorensis</i> , Ponapé (8 ex.).
4 2	20	22	
4 0	19	21	<i>francica</i> , Bourbon.

Having now, for the first time, the opportunity of examining specimens of the *Callocalia* of Tahiti, I find no specific distinctions from the well-known *C. fuciphaga*, so widely distributed in the Indian and Malay archipelagos. The specimens before me are not of so light a greyish-brown as one would expect from the descriptions sent me by Herr von Pelzeln; on the contrary, the whole under-surface is a little darker than in Javan specimens; but the difference is so slight that no character can be based on it.

*C. vanicorensis* corresponds in coloration exactly, but may perhaps be kept separate on account of the smaller size. From the latter, *C. francica*, Gm. (from Bourbon and Madagascar), seems scarcely separable; only the under tail-coverts show a more intense green gloss. Mr. Wallace (*l. c.*) is perhaps right in uniting also these two latter species under *C. fuciphaga*.

## 2. HALCYON VENERATUS, Gm.

*Halcyon veneratus*, Sharpe, Mon. Kingf. p. 245, t.

No. 548. Tahiti. Male.

549. „ „

550. „ „

551. „ „

552. „ „

— 553. „ Female.

554. „ „

555. „ „

556. „ „

The excellent series before me does not confirm the view that either the dark band across the breast, or the more bluish green, or the duller brown coloration of the upper parts is peculiar to a certain state of age or sex. All are apparently old specimens, and show every gradation in these characters.

The dull brownish tone passing into verdigris prevails in most of the specimens; only No. 5, 548 (male), and 554 (female), are more of a greenish-blue, especially on the head and wings; these specimens have no dark breast-band, this being only faintly shown by rusty tips of the feathers. No. 551 (male) has scarcely any indication of a breast-band (resembling, therefore, the right-hand figure on Sharpe's plate). In No. 5, 550 (male) and 552 (male) the breast-band is on a rusty ground-colour, speckled with blackish, in the remaining specimens more or less of a brownish black.

The length of "wings," varies from 3" 3''' to 3" 7'''.

Mr. Layard enumerates *H. veneratus*, from Tonga (P. Z. S. 1876, p. 501), but probably obtained the specimen here.

## 3. PTILONOPUS PURPURATUS (Gm.)

*Ptilonopus purpuratus*, F. & H. Orn. Central-Polyn. p. 122.

No. 557. Tahiti. Male,

558. „ Female.

"Feet violet; eyes orange; bill green at the base, tip yellow."

—J. M.

I am pleased to have an opportunity of examining the *Ptilonopus* of the Tahiti group, which is so rare in collections; and as the description given in the 'Ornithology of Central Polynesia' (being copied from Peale) turns out to be incorrect in some points, I think it necessary to give a new one.

*Male.* Front and vertex delicate purplish-lilac, forming a pale and, not as usual in the members of this genus, circumscribed head-cap; remainder of head, neck, and under surface ashy-grey with only a very faint greenish tinge, more visible on the middle of the breast and vent; throat-feathers bifurcate in the centre tinged with pale dull yellow-greenish; lower vent whitish, under tail-feathers citron-yellow; tarsal feathers ashy-grey; back, wings, and tail bright grass-green; on the mantle and shoulders with a bronzy shine under certain lights; remiges slaty black on the outer webs, tips dark

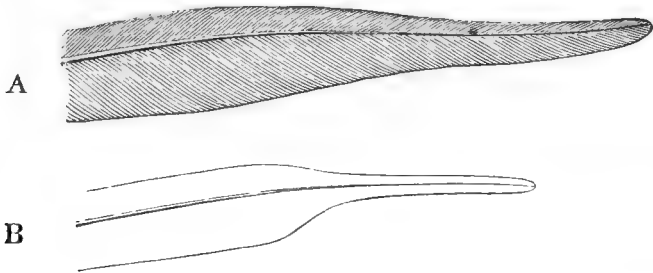
green; secondaries margined externally very narrowly with yellow; under wing-coverts ashy grey, the under-surface of wings darker; tail-feathers with a grey cross band above the ends, scarcely visible on the outer web; tail from below ashy grey, with an ill-defined white cross band above the end.

Female like the male.

Long. tot. lin.	al.		caud.		rostr. a front.	tars.	dig. med.	
	in.	lin.	in.	lin.	in.	lin.	lin.	
c. 8	5	5	2	9	5	12	9½	♂
	5	7	2	9	4½	12		♀

Peale's figure is somewhat incorrect; the head appears too blue, and has no purplish-red margin; the remiges are not coloured blue.

The very interesting fact of the very localized distribution of the numerous species of the genus *Ptilonopus* in the Pacific archipelago is most strongly exemplified by this species, peculiar to the Tahiti group. The pale purplish-lilac cap and the want of the usual dark vent-spot, distinguish this species at once as regards coloration. But, besides, it is very well characterized by the



form of the first primary, which is shown in figure A, whereas in the other Polynesian species before me (*Pt. fasciatus*, *porphyraceus*, *pelewensis*, *ponapensis*, *perousei*, and *dupetit-thouarsi*) this feather is much attenuated in the apical half (see fig. B.).

#### 4. ARDEA SACRA, Gm.

No. 562. Tahiti. Female.

563. " " Young.

"Eyes orange; feet and legs greenish in the adult."—*J.M.*

No. 562 is white, strongly developing slate-blue feathers; No. 563 is slate-coloured, with a broad white chin-stripe.

9. Supplementary Note on Rodents and Marsupials from Duke-of-York Island and New Ireland. By EDWARD R. ALSTON, F.L.S., F.Z.S., &c.

[Received October 6, 1877.]

In the first part of our 'Proceedings' for this year<sup>1</sup> I described the Rodents and Marsupials sent by the Rev. G. Brown from Duke-of-York Island and the vicinity. Mr. E. Pierson-Ramsay, F.L.S., Curator of the Australian Museum at Sydney, has, it appears, described the same species in the 'Proceedings of the Linnean Society of New South Wales;' and, as our works have thus clashed, it seems advisable to prevent any future confusion as to synonymy.

The parts of the New South Wales 'Proceedings' bear no date; but 'vol. i. pt. 4' reached England early in June, and therefore has clearly priority of our first part, published on the first of that month. Here Mr. Pierson-Ramsay describes the Kangaroo and *Perameles* of New Ireland under the names *Halmaturus brownii* and *Perameles cockerelli*. The former is, of course, my *Macropus lugens*; and I unhesitatingly withdraw the specific title in favour of Mr. Ramsay's name. The latter is the species which I identified with *P. doreyanus*, an opinion which I see no reason to change.

The third of Mr. Pierson-Ramsay's papers appears in "vol. ii. pt. 1" of the same periodical, which is clearly subsequent in date of publication to our first part; for it contains papers read at a meeting of the Society on the 25th June. Consequently Mr. Ramsay's *Mus? echimyoides* and *Mus musavora* must be regarded as synonyms of my *Mus browni* and *Uromys rufescens* respectively.

The following, therefore, is the synonymy of the new species described by both Mr. Pierson-Ramsay and myself, with the more exact information as to locality &c. which is afforded by his papers.

1. MUS BROWNI.

*Mus browni*, Alston, P. Z. S. 1877, p. 123.

*Mus? echimyoides*, Pierson-Ramsay, P. Linn. Soc. N. S. W., ii. p. 15.

*Hab.* Duke-of-York Island. "The young do not differ in coloration from the adults; sexes are alike in colour."

2. UROMYS RUFESCENS.

*Uromys rufescens*, Alston, *tom. cit.* p. 124, pl. xviii.

*Mus musavora*, Pierson-Ramsay, *tom. cit.* p. 16.

*Hab.* Duke-of-York Island, where it is found plentifully, feeding on the plantain. "It is known to the missionaries as the *Banana Rat*."

3. MACROPUS BROWNI.

*Halmaturus brownii*, Pierson-Ramsay, *op. cit.* i. p. 307.

*Macropus lugens*, Alston, *tom. cit.* p. 126, pl. xix.

*Hab.* New Ireland. Unfortunately Mr. Ramsay's specimen, like

<sup>1</sup> *Antcà*, pp. 123-126.

mine, was immature; and he does not appear to have examined the dentition of a larger example which he saw in Mr. Brown's own collection. This last measured, head and body, 41 inches, tail 16 in., and was presumably adult.

It may be well to add that the Mammals described by Mr. Dobson and myself from this collection are now in the British Museum.

10. Supplément à la Liste des Oiseaux recueillis au nord du Pérou occidental par MM. Jelski et Stolzmann. Par L. TACZANOWSKI, C.M.Z.S.

[Received Sept. 20, 1877.]

Un séjour prolongé aux environs de Tumbez a procuré à nos voyageurs plusieurs espèces d'oiseaux qui n'avaient pas été fournies dans les envois précédents<sup>1</sup>, surtout des échassiers et des palmipèdes recueillis à Santa-Luzia. J'indique donc ici ces espèces pour compléter la liste des captures ornithologiques dans cette contrée.

MNIOTILTIDÆ.

4. DENDRÆCA AUREOLA (Gould).

Un mâle, tué à Santa Luzia le 10 février, et une femelle tuée le 27 janvier 1877. Iris brun foncé.

Mr. Sclater, qui a eu la complaisance de déterminer nos oiseaux, dit qu'ils sont identiques avec l'exemplaire de l'île Puna, qui se trouve dans la collection de Mr. Salvin.

HIRUNDINIDÆ.

2. STELGIDOPTERYX UROPYGIALIS, Lawr.

Un mâle tué à Lechugal le 5 octobre, 1876. Iris brun foncé.

TANAGRIDÆ.

4. EUPHONIA SATURATA, Cab.

Deux mâles et une femelle, tués à Tumbez le 19 septembre. Iris brun foncé.

5. NEMOSIA GUIRA (L.).

Une femelle, tuée à Santa Luzia le 13 janvier. Iris brun foncé.

6. ARREMON ABEILLÆI, Less.

Un mâle de Lechugal, tué le 5 octobre. Iris brun foncé.

TYRANNIDÆ.

19. CONTOPUS PUNENSIS, Lawr.

Une femelle, tuée à Lechugal le 5 octobre. Iris brun foncé. Comparé avec l'exemplaire de l'île Puna.

<sup>1</sup> Vide P. Z. S. 1877, p. 319.

## TROCHILIDÆ.

## 3. LAMPORNIS IRIDESCENS, Gould.

Une paire, tuée à Lechugal, le 5 octobre.

## 4. HELIOMASTER ALBICRISSA, Gould.

Deux mâles, tués à Lechugal le 5 octobre.

## FALCONIDÆ.

## 7. PANDION HALIAËTUS (L.).

Une femelle, tuée à Santa Luzia le 5 janvier, complètement identique aux oiseaux d'Europe. Iris jaune ; pattes cendrées claires.

## 8. BUTEO ERYTHRONOTUS (King).

Une femelle adulte, tuée à Tumbez le 10 septembre, et un jeune mâle de la même localité tué le 18 septembre. Iris de l'adulte et du jeune brun-noisette.

## 9. URUBITINGA SCHISTACEA (Sund.).

Deux mâles et une femelle de Santa Luzia, tués le 23 octobre et le 17 décembre. Iris brun foncé.

## 10. GERANOËTUS AGUIA (Temm.).

Un jeune mâle, tué à Tumbez le 20 octobre. Iris gris ; la cire grise verdâtre.

## 11. GAMPSONYX SWAINSONI, Vig.

Deux femelles, tuées à Tumbez le 15 septembre. Iris rouge-cérise.

## 12. POLYBORUS THARUS, Molina.

Un mâle adulte, tué à Tumbez le 5 février. Iris gris brunâtre, assez clair ; la cire, les parties nues du visage et les pattes orangées.

## PHALACROCORACIDÆ.

## 1. PHALACROCORAX BRASILIANUS (Gm.).

Un jeune oiseau, tué sur le fleuve Tumbez le 11 janvier. Iris gris.

## ARDEIDÆ.

## 2. ARDEA CANDIDISSIMA, Gm.

Une paire de Santa Luzia, dont le mâle a été tué le 6 janvier, et la femelle le 15 novembre. Iris du mâle est jaune uniforme ; celui de la femelle aussi jaune, mais d'une nuance plus foncée vers le bord externe.

## 3. ARDEA CÆRULEA, L.

Deux femelles de Santa Luzia, tuées le 17 novembre et le 12 décembre. Iris jaune de paille.

## 4. BUTORIDES VIRESCENS (L.).

Une paire de Santa Luzia, tuée le 17 septembre et le 25 octobre. Iris jaune.

## 5. NYCTICORAX VIOLACEUS (L.).

Une paire de Santa Luzia, tuée le 3 et le 22 novembre. Iris du mâle est rouge orangé à l'intérieur, et orangé à l'extérieur; celui de la femelle est jaune à l'intérieur et orange foncé à l'extérieur.

## PLATALEIDÆ.

## 1. PLATATEA AJAJA, L.

Un mâle, tué à Santa Luzia le 1 décembre. Iris est rouge brunâtre, avec une bordure externe grise; le passage entre ces deux couleurs est graduel, s'effectuant par des taches. Le tour dénudé des yeux est d'une couleur chair-pâle, variée çà et là de taches bleues.

## IBIDINÆ.

## 1. IBIS ALBA (L.).

Quatre adultes et un jeune, de Santa Luzia, tués depuis le 25 septembre, jusqu'au 20 décembre. Tous les adultes ont dans cette saison plus ou moins de plumes grises au cou. Iris des adultes est bleu, avec une bordure externe blanche; celui du jeune bleu clair uniforme.

## ANATIDÆ.

## 1. QUERQUEDULA CYANOPTERA (Vieill.).

Une paire et un poussin de Santa Luzia.

## 1. PENELOPE ALBIPENNIS, sp. nov.

*Fusco olivacea, dorso, alis caudaque virescente nitentibus; pileo et collo albido striatis; primariis albis fusco terminatis; facie nuda obscure violaceo-livida; gula nuda aurantiaca; iride pallide brunnea.*

Un mâle, fourni par M. Stolzmann de Santa Luzia, tué le 18 décembre 1876, paraît être jeune, prenant sa deuxième livrée. La couleur générale des parties supérieures est olive foncée, avec un éclat verdâtre métallique assez fort, à peu près comme celui de la *P. marail* de la Guyane; les plumes du dessus de la tête sont entourées d'une fine bordure cendrée blanchâtre, celles de la gorge, de la poitrine et de la partie inférieure du cou liserées des deux côtés d'une bordure blanche; les plumes du ventre, du croupion, des couvertures sup. et les sous-caudales, appartenant à la deuxième livrée, sont aussi olives foncées, un peu luisantes, et finement ondulées de roussâtre, tandis que celles du plumage précédent sont brunâtres, un peu moins foncées avec l'ondulation rousse plus distincte. Les huit remiges primaires sont blanches avec la base et l'extrémité foncée, la neuvième est un peu blanchie vers le milieu; les autres remiges sont un peu plus foncées que le manteau, et les rectrices sont noires, avec un éclat verdâtre un peu plus fort que celui du dos. Les côtés du visage parfaitement nus, sont d'une couleur bleuâtre violacée foncée, excepté une



moustache emplumée noire, commençant vis-à-vis du milieu de l'œil ; le sac guttural est orangé ; l'iris est brun clair, les pattes rougeâtres, bec noirâtre.

	millim.
Longueur de l'aile pliée . . . . .	32·5
„ de la queue . . . . .	32·5
„ du bec depuis la commissure . . . . .	51
„ du bec depuis les narines . . . . .	17
„ du tarse . . . . .	85
„ du doigt du milieu, avec l'ongle . . . . .	91

La couleur blanche des remiges primaires de cet oiseau fait l'effet de l'albinisme, mais M. Stolzmann avant de se procurer l'exemplaire a répété plusieurs fois dans ses lettres, que toutes les Pénélopes qu'il a vues au vol dans cette localité avaient l'extrémité des ailes blanches, ce qui m'a décidé à le considérer comme forme distincte. Il dit ensuite que cette Pénélope se trouvait autrefois tout près de la ville de Tumbes, et qu'elle y est exterminée depuis une trentaine d'années. Actuellement il ne reste qu'une trentaine de paires dans la partie boisée de la delte de Tumbes, près de Santa Luzia, où elles disparaîtront bientôt à cause des persecutions. Il serait intéressant de savoir si cette forme, voisine de la *P. ortonii*, Salvin, se trouve aussi dans les forêts voisines sur le territoire de l'Equateur.

#### RALLIDÆ.

##### 2. RALLUS CYPERETI, Stolzmann. MS.

*Supra olivaceo-griseus fusco maculatus ; collo, pectore et striga superciliari flavis ; gula abdomineque medio albis ; alis caudaque olivaceo-griseis ; hypochondriis subalaribusque albo et olivaceo transfasciatis. Rostri brunnei mandibula inferior flavida ; pedes olivaceo-carnei ; iris rubro-brunnea.*

Forme très-voisine du *R. longirostris*, Vieill. La couleur générale des parties supérieures du corps est d'un gris olivâtre pâle ; le dessus de la tête et la nuque sont d'une teinte plus foncée avec des bordures des plumes claires, très-fines et peu distinctes ; tout le dos est varié de grosses taches foncées, qui occupent largement le milieu de chaque plume. La gorge est blanche, ainsi que le milieu du ventre ; le bas des côtés de la tête, le devant du cou, et la poitrine, ainsi qu'une strie entre la naissance du bec et le bord antérieur de l'œil sont d'une couleur fauve roussâtre claire ; un croissant blanc se trouve sur la paupière inférieure dans toute la longueur de l'œil ; les côtés du ventre et le bas-ventre sont olive-foncé, striées transversalement de blanc. Les ailes et la queue sont de la couleur du dos ; les sus-alaires lavées de roussâtre, les sous-alaires olive-foncé, variées transversalement de raies blanches, fines et peu nombreuses ; les plus grandes couvertures inférieures de la queue sont blanches rayées en travers d'olive foncé, les autres blanches en entier. Le bec est brun corné, avec la mandibule inférieure jaunâtre dans sa plus grande moitié basale, ainsi que le bord de la mandibule supérieure ; les pattes sont d'une couleur carnée olivâtre ; l'iris brun rougeâtre.

Dans les deux sexes la coloration ne présente aucune différence.

	♂ millim.	♀ millim.
Longueur de l'aile pliée.....	137	125
„ de la queue .....	60	60
„ du bec, depuis la commissure ..	52	51
„ du tarse .....	44	40
„ du doigt du milieu .....	40	37
„ de l'ongle .....	9	8
„ du pouce .....	11	10
„ de l'ongle .....	5	4

Trois exemplaires de Santa Luzia, tués dans la deuxième moitié de janvier.

Selon la communication de M. Stolzmann l'oiseau est très-commun dans la partie marécageuse de la delta de Tumbez, aux environs de Santa Luzia.

### 3. PORZANA CAROLINA (L.)?

Une paire, tuée à Santa Luzia le 12 et le 15 janvier. Iris gris au milieu, et brun rougâtre à l'extérieur.

## HÆMATOPODINÆ.

### 1. HÆMATOPUS PALLIATUS, Temm.

Un mâle, tué à Santa Luzia le 25 octobre. Iris orangé.

## SCOLOPACIDÆ.

### 6. MACRORHAMPHUS GRISEUS (Gm.).

Une paire, en plumage d'hiver, tuée à Santa Luzia le 28 octobre et le 22 novembre. Iris brun foncé.

### 7. TRINGA CANUTUS, L.

Une paire, en plumage d'hiver, tuée à Santa Luzia le 31 octobre. Iris presque noir.

### 8. SYMPHEMIA SEMIPALMATA (Gm.).

Trois exemplaires, en plumage d'hiver, tués à Santa Luzia le 27 novembre et le 13 décembre.

### 9. LIMOSA FEDOA (Lath.)

Une paire, en plumage d'hiver frais, tuée à Santa Luzia le 27 octobre et le 23 novembre.

### 10. HIMANTOPUS NIGRICOLLIS (Vieill.).

Trois exemplaires, tués à Santa Luzia le 28 octobre et le 27 novembre. Iris brun, avec un anneau externe rouge.

## LARIDÆ.

## 1. STERNA MAXIMA, Bodd.

Un squelette, de Santa Luzia.

2. STERNA MACRURA, Naum. (*S. arctica*, Temm.).

Un exemplaire, tué à Tumblez, le 19 septembre 1876. Déterminé par M. Howard Saunders.

## 3. LARUS ATRICILLA, L.

Une jeune femelle, prenant sa deuxième livrée, tuée le 20 décembre 1876, à Santa Luzia. Déterminé par M. Howard Saunders.

Sur les 34 espèces de ce supplément il y a 31 qui n'ont pas été fournies par M. Jelski de ses excursions précédentes, ce qui joint à 72 espèces de la même catégorie de la liste précédente, fait en tout 103 espèces des environs de Tumblez, qui n'ont pas été trouvées dans les contrées du Pérou central, visitées par le même voyageur.

## MIMUS LONGICAUDATUS, Tsch.

Les nombreuses pontes de cet oiseau ont été recueillies depuis le 4 jusqu'au 25 février. Dans toutes on trouvait trois ou quatre œufs, une seule ponte du 25 février contenait cinq. Ces œufs ressemblent beaucoup à ceux du *Turdus merula* d'Europe, mais en général ils sont un peu plus petits et moins atténués au petit bout. En coloration ils présentent des variétés aussi nombreuses comme parmi les œufs du merle d'Europe. Le fond est également vert, d'une nuance plus ou moins intense; les taches sont d'une couleur brun roussâtre (rouille), qui sur les uns sont très-petites et nombreuses sur toute la surface, également distribuées partout, ou plus denses et plus grandes au gros bout. Dans les autres les taches sont plus grandes, plus foncées, beaucoup moins nombreuses et le plus souvent plus denses au gros bout. Il y a aussi une ponte bien différente des autres en ce que le fond est fort barbouillé, de sorte que la couleur de la coquille est effacée en grande partie. Les œufs de chaque ponte sont plus ou moins également colorés. Dimensions :

(1)	(2)	(3)	(4)	(5)
millim.	millim.	millim.	millim.	millim.
25, 20	26·7, 19·8	26·2, 20	25·7, 20	28·8, 20·2
25, 20	27, 20	26·2, 19·8	25·8, 20	29, 21
25, 20·2	28·5, 20·7	27, 20	26, 20	29·2, 20·2
			27, 20	

CAMPYLORHYNCHUS BALTEATUS (Baird), *antèa*, p. 319.

Un nid, trouvé le 19 février 1877, contenait trois œufs d'un blanc pur et mat, ovés allongés, à petit bout aigu. Dimensions : 23·3, 16 ; 23·3, 16·5 ; 23·8, 16·5 millim.

THRYOTHORUS SUPERCILIARIS, Lawr., *antèa*, p. 319.

Les œufs, trouvés le 29 janvier et le 20 février, sont blancs, légèrement verdâtres, surtout en transparence, avec un lustre très-faible. Le premier contenait trois œufs, le deuxième un. Dimensions de ceux de la première ponte : 20, 14·5 ; 20·4, 15 ; 20·6, 14·8 millim.

POLIOPTILA ALBILORA, Scl., *anted*, p. 319.

Le nid de cet oiseau, appliqué à une grosse branche à peu près comme celui du Pinson, est petit et soigneusement construit. Il a la forme d'un cylindre bas, assez régulier, à parois minces, d'une texture solide et très-serrée. Il est construit d'un mélange de brins d'herbes sèches fines, de duvets végétaux et des différentes autres matières, comme des brins d'*Usnea*, des fils, de petits morceaux de papier, etc. L'intérieur est assez profond et nettement tapissé dans les uns de crin de cheval mélangé avec un peu de plumes, dans d'autres de duvets végétaux avec un peu de brins de plantes très-déliés. Leur surface externe ressemble à celle des nids de *Hypolais*. Diamètre du nid, 50-60; hauteur, 30-40; diamètre de l'intérieur, 40; profondeur, 25 millim. Les nids trouvés entre le 7 et le 25 février contenaient 2-4 œufs frais.

Les œufs par leur forme et le mode de la coloration ressemblent à ceux de la *Muscicapa grisola*, leur fond est vert pale ou blanc verdâtre, avec des taches d'un brun rougeâtre, plus ou moins rares sur toute la surface et réunies en un anneau assez dense près du gros bout. D'autres ressemblent plutôt aux œufs du Chardonneret; leurs taches sont petites et peu nombreuses sur toute la surface, avec la couronne beaucoup moins fournie que dans les précédents. En général les taches de la gamme inférieure sont pâles, les superficielles beaucoup plus foncées. La surface est presque mate. Dimensions des œufs de trois pontes :

millim.	millim.	millim.
(1) {	(2) {	(3) {
13·3, 10·6	13·5, 10·7	15·3, 11·6
13·8, 10·8	13·8, 11	15·3, 11·7
14, 11		
14, 12·2		

GNATHOSPIZA RAIMONDII, Tacz., *anted*, p. 320, pl. xxxvi. fig. 1.

M. Stolzmann communique "qu'en février cet oiseau est très nombreux dans la contrée, au mois de mars il disparaît des environs de Tumbes, et se rend ailleurs pour nicher, mais nous ne savons pas où. En mai il revient. Quelquefois il se mêle aux troupes de *Sycalis flaveola* pour se nourrir ensemble de sémences de graminés. Il se tient seulement sur les steppes et sur les lomas (monticules arides). On ne le trouve jamais au voisinage des cours d'eau, où la végétation est plus forte."

HÆMOPHILA STOLZMANNI, Tacz., *anted*, p. 322, pl. xxxvi. fig. 2.

"L'oiseau n'est pas trop commun dans la contrée, mais en connaissant les endroits dans lesquels il séjourne, et sa voix fine, semblable à celle des Tanagrides, chaque jour on pourrait tuer quelques uns."

APHOBUS CHOPi (Vieill.), *anted*, p. 323.

Les nids, recueillis entre le 19 et le 23 février, contenaient deux, trois ou quatre œufs frais. La forme des œufs est ovée, plus ou moins oblongue. La coquille est verte, à peu près de la nuance des

œufs du *Carpodacus erythrinus*, avec un lustre assez fort. La maculature est composée de veines entortillées, assez fines et assez courtes, mêlées à quelques petites taches et quelques petits points noirs, et d'autres d'un gris violacé pâle. Ces veines sont rassemblées au gros bout pour y former une couronne peu fournie, tandis que sur le reste de la surface il y a seulement quelques points et rarement une petite veine. Un œuf a le sommet barbouillé d'un réseau de veines, et quelques points sur le reste de la surface. Sur d'autres, au lieu de veines il y a des taches et quelques stries rassemblées aussi au gros bout. Dans une ponte les œufs sont sans maculature, ils n'ont que quelques taches rougeâtres, très-pâles, à peine distinctes; ces œufs étaient accompagnés d'un œuf de *Molothrus*, dont la moucheture, composée de points pâles est beaucoup plus nombreuse, et beaucoup plus distincte; le vert du fond de cet œuf est d'une nuance un peu plus pâle que celui des œufs de l'*Aphobus*.  
Dimensions :

	millim.	millim.	millim.	millim.			
(1)	{ 26, 20 27, 20	(2)	{ 27.2, 20.3 27.3, 20	(3)	{ 28.6, 20 30, 20.2	(4)	{ 29.8, 18 30.5, 18.6

*QUISCALUS ASSIMILIS*, Scl., *antèa*, p. 323.

M. Stolzmann dit qu'il est assez commun aux environs de Santa Luzia, et qu'il se nourrit de crustacés marins. En volant il a l'habitude d'étendre sa queue de sorte qu'observé de côté il paraît la porter en travers.

Deux nids de cet oiseau, trouvés à la fin de janvier et au commencement de février, contenaient chacun deux œufs. Ces œufs sont ovés allongés, à petit bout plus ou moins obtus; leur fond est d'un vert pâle, à peu près comme celui du Pinson d'Europe, varié de quelques veines noires foncées et d'autres grises violettes pâles, grosses et plus ou moins fines, fort entortillées et mêlées avec quelques taches de la même couleur; les veines sont rassemblées en une sorte de couronne, très-irrégulière, dans une des extrémités ou au milieu de l'œuf; quelques autres veines, ordinairement plus courtes, quelques points et quelques taches sont éparses sur le reste de la surface. Les bords de ces grosses veines et des grosses taches sont lavées en une couleur rose, qui colore une grande partie de la surface du fond, comme cela a souvent lieu sur les œufs mentionnés plus haut. Le lustre est très-faible. Dimensions :

	millim.	millim.	
(1)	{ 31.6, 24 31.6, 24.6	(2)	{ 32, 22.4 37.6, 23

*SYNALLAXIS STICTOTHORAX*, Scl., *antèa*, p. 323.

Un œuf trouvé le 25 janvier, et trois le 18 février, à Santa Luzia, sont d'un blanc mat, de forme ovée, médiocrement allongée. Dimensions : 16.2, 13.5; 18.2, 13.3; 18.4, 13 millim.

*FURNARIUS CINNAMOMEUS*, Lafr., *antèa*, p. 323.

Les œufs frais se trouvaient dans la deuxième moitié de février.

Leur forme est ovée, plus ou moins oblongue, il y avait aussi des œufs exceptionnels presque elliptiques. Ils sont blancs purs, avec un lustre assez fort ; blancs aussi en transparence. Leur surface est pour la plupart barbouillée de boue, en différents degrés. Dimensions : 26, 19·8 ; 26·2, 20 ; 27, 21 ; 28·3, 19·8 ; 28·5, 21 ; 29·5, 21·2 ; 30, 20·3 millim.

*OCHTHÆCA SALVINI*, Tacz., *anteà*, p. 324.

M. Stolzmann dit : " Assez commune aux environs de Tumbez, et je pouvais la rencontrer à chaque excursion en me dirigeant par sa voix, qui m'est bien connue. Elle se tient dans des petits fourrés et jamais je ne l'ai pas vue dans les endroits découverts. Elle se perche sur les branches peu élevées au dessus du terrain (environ 1-1½ mètres), et jamais je ne l'ai pas rencontrée par terre. Sa voix consiste en un sifflement monotone plaintif, assez rarement répété. Ses mouvements ressemblent à ceux du *Pyrocephalus rubineus* ; en se lançant sur les insectes elle claque avec les ailes comme beaucoup d'autres Tyrans, mais pas aussi fort que le *Pyrocephalus*."

*PHYLLOMYIAS TUMBEZANA*, Tacz., *anteà*, p. 325.

M. Stolzmann dit : " Il est si commun aux environs de Tumbez, que presque sur chaque arbre de la contrée on rencontre au moins une paire, et à Santa Luzia il est certainement le plus commun oiseau ; dans une journée je pourrais me charger de tuer 60-100 exemplaires. Sa ponte se compose constamment de deux œufs, qui ont été recueillis entre le 8 et le 25 janvier." Ensuite nos voyageurs ont trouvé aussi cet oiseau aux environs de Pacasmayo.

Les œufs sont blancs jaunâtres unicolores, sans aucun lustre. Dimensions des deux pontes :

millim.	millim.
(1) { 17·4, 13·3 17·6, 12·7	(2) { 17·6, 13·6 17·6, 13·8

*PYROCEPHALUS RUBINEUS* (Bodd.), *anteà*, p. 326.

Oiseau commun dans la contrée. Les œufs ont été recueillis en novembre et en février ; il y avait deux ou trois dans la ponte. Ils sont ovés médiocrement allongés, variant beaucoup entre eux sous le rapport de l'amincissement du petit bout, qui dans les uns est fort aminci et aigu, tandis que dans les autres il est beaucoup plus gros et plus obtus à l'extrémité. La coquille est sans aucun lustre, jaune verdâtre pâle, ou jaunâtre pâle, sans nuance verdâtre, variée de grosses taches cendrées pâles et olives foncées, réunies en un anneau près du gros bout, outre lequel il n'y a presque point de taches sur le reste de la surface, ou quelques petites, peu significantes ; la couronne est très-dense et presque continué ; sur d'autres elle est moins fournie et composée de taches plus petites, alors le reste de la surface est beaucoup plus tacheté qu'ordinairement. Dimensions

millim.	millim.	millim.	millim.
(1) { 17, 13·5 17·2, 13·7 18, 14	(2) { 17, 13·6 18, 13·8	(3) { 18·4, 14·2 18·8, 13·8	(4) { 18·8, 13·6 18·8, 13·8

**MYIODYNASTES ATRIFRONS**, Scl., *antèa*, p. 326.

Les œufs recueillis depuis le 18 jusqu'au 25 février étaient frais, et pour la plupart en pontes incomplètes, deux nids seulement renfermaient trois œufs. Ils sont d'une forme ovée assez allongée; la coquille est d'un blanc pur, délicat, d'un lustre très-faible. Les taches sont des deux gammes: les unes cendrées violâtres assez pâles, les autres rouges brunâtres foncées, elles sont en général petites et peu nombreuses sur toute la surface; plus grandes et réunies en une couronne plus ou moins dense près du gros bout; sur quelques-uns cependant la couronne est peu signifiante; la forme des taches est pour la plupart longitudinale dans le sens de la longueur de l'œuf. Ce mode de la coloration ressemble à celui des œufs du *Lanius colurio*, variété tachetée de rouge. Dimensions:

	millim.	millim.	millim.		
(1)	$\left\{ \begin{array}{l} 26.3, 19 \\ 25.5, 19.6 \\ 27.2, 19 \end{array} \right.$	(2)	$\left\{ \begin{array}{l} 26.3, 20 \\ 27, 20.6 \end{array} \right.$	(3)	$\left\{ \begin{array}{l} 27, 20 \\ 27.3, 20.2 \end{array} \right.$

**TYRANNUS NIVEIGULARIS**, Scl., *antèa*, p. 326.

Trois nids ont été trouvés le 18, le 20, et le 29 février, avec des œufs frais; deux en avaient trois œufs chacun. Ces œufs ressemblent beaucoup à ceux du *Myiodynastes atrifrons*, mais ils sont beaucoup plus petits, à coquille d'une teinte légèrement jaunâtre et le lustre plus fort. Les taches sont comme dans l'espèce citée, la teinte cependant des superficielles est brunâtre sans nuance rouge. Dimensions:

	millim.	millim.	millim.		
(1)	$\left\{ \begin{array}{l} 22.8, 17 \\ 23, 17.3 \\ 23.8, 17.4 \end{array} \right.$	(2)	$\left\{ \begin{array}{l} 23, 17.2 \\ 23.6, 16.6 \\ 24, 17 \end{array} \right.$	(3)	$\left\{ \begin{array}{l} 25, 17.6 \\ 25.6, 17.2 \end{array} \right.$

**CROTOPHAGA SULCIROSTRIS**, Sw., *antèa*, p. 328.

Les œufs ont été recueillis en grand nombre à la fin de février; les pontes se composaient de trois ou de quatre exemplaires. Ils sont beaucoup plus petits que ceux du *C. ani*. Dimensions:

	millim.	millim.	millim.	millim.			
(1)	$\left\{ \begin{array}{l} 29, 23 \\ 28.8, 22.6 \\ 30.4, 23 \end{array} \right.$	(2)	$\left\{ \begin{array}{l} 29.3, 21.3 \\ 30, 21.8 \\ 30, 22.7 \end{array} \right.$	(3)	$\left\{ \begin{array}{l} 29.6, 24.4 \\ 30, 24.4 \\ 30, 23.5 \\ 30, 24.8 \end{array} \right.$	(4)	$\left\{ \begin{array}{l} 30.2, 21.5 \\ 32.2, 22.8 \\ 32.8, 23.3 \end{array} \right.$

**PSITTACULA CÆLESTIS**, Less., *antèa*, p. 329.

Les œufs recueillis dans la deuxième moitié de février. Dimensions des œufs des différentes pontes: 17.6, 15; 18.7, 16; 19.6, 17.3; 18.7, 14.2; 19.2, 15.6; 21, 16.2 millim.

**CHORDEILES PRUINOSUS**, Tsch.

Les œufs ont été recueillis à Santa Luzia depuis le 23 janvier, jusqu'au 19 février; dans une seule ponte on a trouvé deux œufs, dans toutes les autres un seul. Les œufs ressemblent beaucoup à

ceux du *Caprimulgus europæus* ; mais ils sont beaucoup plus petits, à maculature composée généralement de taches petites et nombreuses, parmi lesquelles il y a souvent des stries. Les taches pâles sont en général beaucoup plus nombreuses que celles de la gamme superficielle. Dimensions : 26, 19·2 ; 26·2, 20·2 ; 26·2, 19·5 ; 27·2, 20 ; 28·2, 20·3 ; 28·2, 19·5 millim.

COLUMBULA CRUZIANA (Knip et Prév.).

Les œufs d'une ponte présentent les dimensions suivantes : 23, 17 ; 23, 18·8 millim.

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November 20, 1877.

Prof. W. H. Flower, F.R.S., V.P., in the Chair.

The Secretary read the following report on the additions to the Society's Menagerie during the month of October 1877.

The total number of registered additions to the Society's Menagerie during the month of October was 93, of which 37 were by presentation, 29 by purchase, 1 by exchange, 9 by birth, and 17 were received on deposit. The total number of departures during the same period, by death and removals, was 127.

The most noticeable additions during the month of October were as follows :—

1. A Layard's Flying Squirrel (*Sciuropterus layardi*<sup>1</sup>), presented by Sir Charles Peter Layard, October 8th. This is the first example of this elegant little Ceylonese animal that has reached our collection.

2. A pair of East-African Buffalos (*Bubalus æquinoctialis*), purchased 27th October.

This is the animal lately described in our 'Proceedings' by Sir Victor Brooke (P. Z. S. 1875, p. 457), from a specimen living in the Zoological Gardens at Berlin, and there first well distinguished by him from the allied South-African species (*Bubalus caffer*), of which we have likewise living examples.

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Mr. Howard Saunders exhibited a skin of the rare Aleutian Tern (*Sterna aleutica*), from Alaska, and made some remarks on its intermediate position between the true Terns (*Sterna*) and the Sooty Terns (*Onychoprion*).

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The following papers were read :—

<sup>1</sup> *Sciuropterus layardi*, Kelaart, 'Prodromus Faunæ Zeylanicæ,' p. 56 : Tennent's Ceylon, vol. i. p. 148.











2

J. Smit

J Smit lith

Hanhar

1. PHYLLORNIS FLAVIPENNIS.

2. PRIONOCHILUS QUADRICOLOR.





J. S. G. lith

$\frac{1}{2}$

Hanhart imp.

MEGAPODIUS PUSILLUS

I. Contributions to the Ornithology of the Philippines.—  
 No. II. On the Collection made by Mr. A. H. Everett in  
 the Island of Zebu. By ARTHUR, Marquis of TWEED-  
 DALE, F.R.S., President of the Society.

[Received November 2, 1877.]

(Plates LXXVI.-LXXVIII.)

In the month of March last Mr. Everett, with the intention of extending his exploration of the Philippines, quitted Luzon<sup>1</sup>, and proceeded to the island of Zebu, where he remained during April and the first few days of May engaged in collecting zoological specimens. Since 1872, when Zebu was visited for the first time by a zoological collector (Dr. A. B. Meyer<sup>2</sup>, who then obtained eighteen species of birds), only two parties of naturalists (Dr. Steere and those attached to the 'Challenger' Expedition) have landed there; and they increased the number of known Zebu species to twenty-three. Of the important collection made by Mr. Everett during the few weeks he remained on the island I now propose to offer an account. Most of the birds collected in March were obtained by him near some coal-mines situated about 12 miles to the north of the port of Zebu, and some 6 miles inland. Mr. Everett writes, "The station is not very favourable for birds as compared with Luzon. Both the species and the number of individual birds seem less numerous. . . . *Tanygnathus luzonensis* and *Catua hæmaturopygia* are very abundant here, both flying wild in flocks. I saw neither of these birds in the neighbourhood of Manila. I am told of another Cockatoo, similar to *C. hæmaturopygia*, but with a red splash on the breast; but I have been unable to secure a specimen."

The birds collected in April were, I presume, obtained in the vicinity of the port of Zebu itself. Mr. Everett expresses himself dissatisfied with the results of his labours in the island, an attack of fever having confined him for some time to the house. Notwithstanding this, he has very considerably extended our knowledge of the avifauna of Zebu, having succeeded in securing 282 specimens of birds, representing 75 species.

When Mr. Everett commenced his researches in Zebu, only 23<sup>3</sup> species of birds had been recorded as being inhabitants of that island. Yet he was able during the short period of his stay to add 54 species to our lists of its avifauna. These 54 species include 6 hitherto undescribed, viz. :—

*Oriolus assimilis.*

*Phyllornis flavipennis.*

*Zosterops everetti.*

*Prionochilus quadricolor.*

*Turnix nigrescens.*

*Megapodius pusillus.*

<sup>1</sup> *Antea*, p. 686.

<sup>2</sup> *Trans. Zool. Soc.* ix. p. 125.

<sup>3</sup> 18 given in my memoir (*l. c.*), 1 obtained by Dr. Steere (*Sharpe, Tr. L. S. ser. 2, Zool. i. p. 309*), and 4 by the 'Challenger' Expedition (*Antea*, p. 538). I enumerated (*l. c.*) only 3 additional Zebu species, having through an oversight omitted *Numenius phaeopus*.

Two known species, though new to the Philippine fauna—

*Hirundo javanica*,

*Rallina eurizonoides*.

and two typical Indo-Malayan genera are added to the Philippine area, as restricted by me<sup>1</sup>—

*Phyllornis*,

*Prionochilus*.

The known species of Zebu birds therefore now number 78, of which no less than 75 are represented in Mr. Everett's collection. The grand total of species inhabiting the Philippine area (as restricted by me, *l. c.*) Mr. Everett has increased by 8, and it now amounts to 276. Several of the species discovered by Mr. Everett in Zebu possess a peculiar interest. Such are:—*Oriolus assimilis*, a representative form of the remarkable *O. steerei* of Negros and Basilan<sup>2</sup>; *Xantholæma rosea*, hitherto, beyond Java and Sumatra, only known from Negros; *Dicrurus mirabilis*, *Æthopyga magnifica*, *Anthothreptes chlorogastra*, *Dendrophila œnochlamys*, all four hitherto only known from Negros, but which reappear in Zebu. Four Passerine species, of which the only previously known habitat was Luzon—*Volvocivora* (?) *cærulescens*, *Parus elegans*, *Oxyerca everetti*, and *Megalurus ruficeps*—have their range extended to Zebu.

### 1. CACATUA HÆMATUROPYGIA (1)<sup>3</sup>.

[Cebu, male, March, "pairing." Iris dull carmine, bill light lead-grey, feet and nails dark lead-grey. *b.* Female, March, "breeding." Orbital skin white, rest as in male.]

Another example of a female is marked "breeding in April." The dimensions of the male somewhat exceed those of the female.

### 2. PRIONITURUS DISCURUS (2).

The crown of the head in six examples of both sexes, belonging to a series of seven obtained in April, is bright verditer-blue. In the seventh the blue crown is less distinct. The elongated spatulate shafts of the middle rectrices vary in length in each specimen. The plumage of the two sexes is alike.

### 3. TANYGNATHUS LUZONENSIS (3).

[Cebu, female, April, "pairing." Iris, outer ring yellowish white, inner ring yellow-brown; maxilla scarlet, tip yellow; mandible orange, tip yellow; feet dirty greenish, nails dark grey.]

Not to be distinguished from Luzon, Negros, and Guimaras examples. The "pairing" male has the forehead verditer-green, the crown and nape verditer-green, each feather tipped with turquoise-blue. The cheeks are green; and there is no blue on the back or uropygium. Females (sex ascertained by Mr. Everett) are somewhat smaller, but in plumage and colouring do not differ from males.

<sup>1</sup> *Antea*, p. 687.

<sup>2</sup> The Basilan form will probably prove to be a third representative species.

<sup>3</sup> The numbers following the titles are the same as those of my *Memoir*, *Trans. Zool. Soc.* ix, pp. 125-252.



4. *LORICULUS CHRYSONOTUS* (8).

[Cebu, male, April. Iris brown, bill orange-red, legs orange, nails brown.]

5. *MICROHIERAX ERYTHROGENYS* (10).

A single example (female) is in the collection, shot in April, and in full black and white plumage. The wing measures 4·87.

6. *SPILORNIS HOLOSPIIUS* (16).

[Cebu, male, March. Iris deep golden yellow, orbital skin yellow, cere the same, but tinged with green; bill leaden grey, culmen and tip black; legs and feet dirty light yellow, the feet darkest, claws black. *b.* Female. Iris green-yellow, orbital and loreal regions bright yellow, with a slight green tinge; cere dull greenish, bill lead-grey, tip and culmen black; legs and feet dirty light yellow, claws black.]

7. *HALIASTUR INTERMEDIUS* (17).

[Cebu, male and female, April. Iris warm chocolate, bill grey tinged greenish yellow; cere light chrome, legs and feet light yellow, nails black. *b.* Female, April, "breeding." *c.* Immature. Iris cold brown, bill black, legs and feet light green-yellow, claws black.]

The immature bird is in brown and tawny dress, without any traces of white or deep chestnut.

8. *ELANUS HYPOLEUCUS* (18).

[Cebu, male, March. Iris crimson, cere greenish yellow, gape yellow, bill black, feet light chrome, nails black. Snake and small mammal in the gizzard.]

Mr. Gurney has been good enough to compare this example with the type.

9. *BUTASTUR INDICUS* (20).

[Cebu, female, March. Iris golden yellow, bill black, cere and base of bill deep chestnut, legs deep chrome-yellow, claws black.]

10. *SCELOSTRIX CANDIDA* (27).

[Cebu, male, April. Iris dark brown, bill white, nails dark brown-grey.]

11. *MEROPS BICOLOR* (36).

[Cebu, male, April. Iris crimson, bill black, feet brown.]

In a series of ten examples, male and female, there is no trace of green mingled with the bright chestnut of the head, nape, and upper back. An example of a female ("breeding, April") is not distinguishable from examples of adult males.

12. *EURYSTOMUS ORIENTALIS* (37).

*Coracias orientalis*, Linn. S. N. i. p. 154.

13. *ALCEDO BENGALENSIS* (38).

[Cebu, male, March.]

14. *ENTOMOBIA GULARIS* (44).15. *SAUROPATIS CHLORIS* (47).

[Cebu, male, March. Iris brown, bill black, feet dark brown.]

16. *XANTHOLEMA ROSEA* (51).

[Cebu, male, April. Iris hazel-brown, bill black, legs and feet coral-red.]

Identical with Javan, Sumatran (Lamong), and Negros individuals. Two examples, marked female by Mr. Everett, have many of the throat-feathers yellow, tipped with red. They are probably immature birds. This species is but a developed form of *X. hæmacephala*, the only distinction between the two being that the yellow eye-patches and the yellow throat of that species are blood-red in *X. rosea*. Their distribution is curious; for while *X. hæmacephala* occurs throughout the continent of India and the Indo-Chinese peninsula, and on the Philippine island of Luzon, *X. rosea* is restricted to Java and the two Philippine islands of Negros and Cebu, while Sumatra, again, is inhabited by both species.

17. *MACROPTERYX COMATUS* (52).

[Cebu, female, March.]

18. *CENTROCOCCYX VIRIDIS* (64).

[Cebu, female, April, "pairing." Iris crimson.]

19. *LANIUS NASUTUS* (70).

[Cebu, female, March, "breeding." Iris brown, bill and legs black.]

A numerous series of the Philippine black-headed Shrike in full dress, obtained in Cebu by Mr. Everett, together with my Luzon series, enables me, after comparison made with *Lanius nigriceps* (as restricted *l. c.*) of India, to assert the specific identity of the two species. The generality of the Philippine birds have the uropygium of a paler, more tawny ferruginous hue than Bengal (Rognathpoor) and Goomsoor examples; the grey tint descends lower down the back; and the ferruginous colouring of the flanks and under tail-coverts is of a paler, more dilute, shade. Still one Cebu individual is not to be distinguished from an adult Bengal individual in this or any other respect. Philippine birds exceed somewhat in dimensions. Adult Tonghoo birds belong more nearly to *L. tricolor*; but I have not as yet met with either Pegu, Assam, or Darjeeling examples in which the deep uniform ferruginous dorsal colouring of *L. tricolor* runs up and joins the black of the nape, as in Nipaul individuals.

The examples of females marked "breeding" by Mr. Everett have the head and nape dark ashy brown, rather than black.

20. *LANIUS LUCIONENSIS* (72).

[Cebu, male, March and April; female, March.]

21. *ARTAMUS LEUCORHYNUS* (73).22. *GRAUCALUS STRIATUS* (74).[Cebu, male, April. Iris fine deep crimson; bill, feet, and nails black. *♂*. Female. Iris light claret-red.]

These Zebu birds do not differ from Luzon and Negros examples. Two, in dark plumbeous-grey plumage without pale edgings to any of the feathers, are marked male; two, dark plumbeous-grey above and banded with black on the whole under surface, are respectively noted as being male and female; a fifth example, uniform grey with the exception of the breast, abdomen, and crissum, which are banded with black, is marked male. The last example appears fully adult, and perhaps represents the dress of the adult female.

23. *VOLVOCIVORA? CÆRULESCENS* (75).[Cebu, male, April. Iris dark brown, bill and legs black. *♂*. Female, April, breeding, the same.]

Three males and as many females are in the collection. One of the males is in the pure black plumage of the adult; the other two have the black shaded with plumbeous. The females are dark plumbeous-grey, with darker margins to the dorsal plumes: one, an immature bird, has some of the secondary quills and some of the coverts margined with white. From the breeding female being in a plumbeous dress, we may infer that each sex in this species wears a peculiar adult garb. Luzon individuals do not differ from Zebu examples.

24. *LALAGE DOMINICA* (76).

[Cebu, male, April. Iris brown.]

25. *DICRURUS MIRABILIS* (81).

[Cebu, male, April. Iris crimson; bill and feet black.]

The dimensions of the single example obtained are somewhat smaller than those of typical individuals. Not hitherto recorded from Zebu.

26. *LEUCOCERCA NIGRITORQUIS* (83).

[Cebu, male and female, March. Iris brown, bill and legs black.]

27. *CYORNIS PHILIPPINENSIS*.

"*Cyornis banyumas* (Horsf.)," Walden, *l. c.* no. 84 (*nec* Horsf.).  
*Cyornis philippinensis*, Sharpe, Tr. L. S. ser. 2, Zool. i. p. 325.

[Cebu, male, April.]

The blue plumage of this single example is not of quite so dark a shade as that of Dr. B. Meyer's specimen (*l. c.*). Yet it is perceptibly darker than that of Luzon and Panay individuals. The length of the wings and tail is also slightly greater; but without a larger series for comparison it is best to retain it under the title cited.

28. *HYPOTHYMIS AZUREA* (85).29. *HIRUNDO JAVANICA*.

*Hirundo javanica*, Sparrman, Mus. Carls. t. 100.

[Cebu, male, April.]

New to the Philippines.

30. *BRODERIPUS ACORRHYNCHUS* (90).

*Oriolus acrorhynchus*, Vigors, P. Z. S. 1831, p. 97.

*Oriolus chinensis*, Linn., apud Sharpe, B. M. Cat. Birds, iii. p. 203. no. 12, nec Linn.

Mr. Sharpe has recently (*l. c.*) adopted the Linnean title *chinensis* for this purely Philippine species, for the reason that that title is "undoubtedly referable to the Oriole of the Philippines" (*l. c.* p. 197, *note*). Linnæus gave the name to Brisson's *Loriot de la Cochinchine* (Orn. ii. p. 326); and Brisson states that the subjects of his description were brought to Réaumur by Poivre from Cochin China. Judging from the description, also, Brisson's bird could not have belonged to the Philippine species; for he describes it as possessing a yellow alar speculum, which the continental form has, and the Philippine bird lacks. After saying that the wing-feathers are black, Brisson adds "quelques-unes des moyennes sont terminées par une petite tache jaunâtre." It is therefore not necessary to adopt so inappropriate a title as *chinensis* for the Philippine Oriole; and the name *O. diffusus*, Sharpe (*l. c.*), for the continental species must be suppressed (*cf.* Walden, Blyth, B. Burma, no. 483). M. Oustalet (Ois. de la Chine, p. 132) correctly identified the Chinese *Broderipus* with the Brissonian species, and adopted the Brissonian title of *cochinsinensis*, but afterwards somewhat hastily accepted Mr. Sharpe's view, and placed that title in the list of errata and addenda.

31. *ORIOLOUS ASSIMILIS*, n. s. (Plate LXXVI.)

[Cebu, male, March. Iris crimson, bill dull burnt-sienna brown, legs dark lead-grey, nails black.]

*Male*. Above and under tail-coverts dark greenish yellow; space before the eye, cheeks, ear-coverts, chin, throat, and breast dark grey, the breast being tinged with greenish yellow; abdomen, flanks, and ventral region grey or white, with broad almost black mesial bands; axillaries, under-surface of quills, and under wing-coverts grey; all the quills and major coverts above very dark grey, almost black, each washed with a pale grey on the outer webs, the wing, when closed, appearing dark grey. Tertiaries nearest the body distinctly tinged with greenish yellow. Minor wing-coverts like the back. All the rectrices above dark iron-grey, almost black. Outer pair with a pure yellow small terminal spot or mark at the apex of the inner web; all the others with slight indications of a terminal yellow margin.

Wing 4·87, tail 4·12, tarsus 0·88, culmen 1·25.

A representative form of *O. steerii*, ex Negros. Mr. Sharpe, who

has kindly compared it with the type of *O. steerii* in the British Museum, considers "that it is distinct from the Negros Oriole, and that it differs in having the greater wing-coverts grey and not yellow, and in having the spots on the tail-feathers so very small; the grey on the breast comes much lower down."

32. *MEGALURUS RUFICEPS*.

*Megalurus ruficeps*, Tweeddale, Ann. & Mag. N. H. ser. 4, vol. xx. p. 94.

[Cebu, male, March. Iris dull burnt-sienna brown.]

Identical with the Luzon types. The sexes do not appear to differ in dimensions.

33. *HYPSSIPETES PHILIPPENSIS* (102).

[Cebu, male and female, March. Iris burnt-sienna brown, bill brownish black, legs brown.]

34. *PHYLLORNIS FLAVIPENNIS*, n. s. (Plate LXXVII. fig. 1.)

[Cebu, male, April. Iris hazel, bill lead-grey, yellowish along the margin, legs and feet greenish leaden.]

The colours of the soft parts of the female are noted by Mr. Everett to be like those of the male, excepting that the yellowish commissure is not mentioned.

*Male*. Grass-green above, pale verditer-green underneath. Lores, chin, throat, and thigh-coverts yellowish green. Primaries brown on their inner webs, tinged with dark green along the shaft; outer webs of first three primaries green tinged with yellow; lower half of the outer webs of remaining primaries margined with yellow. Inner margin of all the quills, seen from below, yellow. The female like the male, but the colouring not altogether so bright.

Wing 3·75, tail 3·50, tarsus 0·80, culmen 0·87.

If the four examples sent by Mr. Everett have the sex correctly noted (of which there is little doubt), and if the males are in mature plumage (and there are no indications of immaturity), the sexes in this species do not essentially differ. There is no trace of any blue in the plumage of the males.

35. *PRATINCOLA CAPRATA* (104).

[Cebu, male, March and April. Iris brown, bill and legs black.]

36. *COPSYCHUS MINDANENSIS* (106).

37. *PHYLLOSCOPUS BOREALIS*.

*Phylloperneuste borealis*, Blasius, Naumannia, 1858, p. 313.

*Phylloscopus magnirostris*, Blyth, Walden, l. c. no. 109.

[Cebu, male and female, April.]

38. *CALOBATES MELANOPE* (115).

[Cebu, male and female, March.]

39. *CORYDALLA LUGUBRIS* (117).

[Cebu, male, April. Iris brown, maxilla brown, mandible pale ochreous, legs and feet light ochreous.]

40. *PARUS ELEGANS* (118).

[Cebu, male, April. Iris brown, bill dark, legs and feet lead-blue.]

Not separable from Luzon examples.

41. *DENDROPHILA AENOCHLAMYS*.

*Dendrophila aenochlamys*, Sharpe, Tr. L. S. ser. 2, Zool. i. p. 338 t. liii. f. 2 (1876).

[Cebu, male and female, April. Iris orange-yellow, bill greenish yellow].

The male example has all the rectrices broadly tipped with the vinaceous colour of the breast. In the female the middle pair are throughout blue, while the laterals only exhibit a vinaceous tinge at their apices.

42. *ZOSTEROPS EVERETTI*, n. sp.

[Cebu, male and female, April. Iris light yellow-brown, maxilla blackish, mandible and legs pale grey].

*Male and female*.—Above oil-green, darker than in *Z. palpebrosus*, and much darker than in *Z. meyeri* of Luzon. Narrow frontal band and lores, chin, throat, under tail-coverts, and shoulder-edge bright yellow. Below the eye a distinct black mark. Breast and flanks pale but decided iron-grey. Mesial band of abdomen, extending to vent, bright yellow. Rectrices above pale brown washed with oil-green.

Wings 2·06, tail 1·87, tarsus 0·70, culmen 0·50.

This species, closely allied to *Z. lateralis*, is to be distinguished by its green rectrices.

43. *PRIONOCHILUS QUADRICOLOR*, n. sp. (Plate LXXVII. fig. 2.)

[Cebu, April. Iris dark brown; legs, bill, and feet glossy black.]

The sex is not stated on the label.

Chin, throat, cheeks, sides of neck, breast, flanks, under wing-coverts, axillaries, abdomen and under tail-coverts pale greyish silky white, the chin, cheeks, and axillaries being almost pure white. Forehead, sides of head, vertex, and occiput, descending low down the nape, dull black. Interscapulars and back black, broadly tipped with cinnabar-red. Uropygium black with olive-yellow tips to the feathers. Upper tail-coverts, rectrices, and wing-coverts rather glossy bluish black. Quills dark blackish brown.

Wings 2·12, tail 1·25, tarsus 0·50, culmen 0·37.

This is one of the most important additions made by Mr. Everett to the Philippine fauna, adding, as it does, one of the hitherto missing characteristic Malayan genera; for, although Mr. Sharpe (*t. c.*) in-

cludes *Prionochilus* amongst the Philippine genera, it is only on the strength of a Palawan example of the genus.

44. *DICÆUM RUBRIVENTRE* (120 partim).

*Pipra papuensis*, Gm. S. N. i. p. 1004.

*Dicæum rubriventer*, Lesson, Tr. p. 303.

*Dicæum retrocinctum*, female, Gould, B. As. xxvii. t.—; cf. Salvad. Ann. Mus. Civ. Gen. viii. p. 509.

[Cebu, male, April.]

This example, in the plumage of *D. retrocinctum*, female, apud Gould, is also marked a male, like the one obtained in Cebu by Meyer (*l. c.*) and by Mr. Everett (*anteà*, p. 698) in Luzon. Count Salvadori's view (*l. c.*) that it is not the female of *D. retrocinctum*, Gould, but a distinct species, is therefore confirmed. I am further inclined to the opinion that *D. retrocinctum*, if from either island, is from Mindanao and not from Luzon, and that Sonnerat obtained the type of *P. papuensis* in Luzon and not in Mindanao.

45. *DICÆUM DORSALE*.

*Dicæum dorsale*, Sharpe, Tr. L. S. ser. 2, Zool. i. p. 340.

[Cebu, male, April. Iris brown.]

46. *ARACHNECHTHRA JUGULARIS* (123).

[Cebu, male. Iris brown, bill and legs black.]

47. *ÆTHOPYGA MAGNIFICA*.

*Æthopyga magnifica*, Sharpe, 'Nature,' August 1876, p. 297, "Negros;" Tr. L. S. ser. 2, Zool. i. p. 342; Shelley, Cinnryidæ, pt. iii. t.

[Cebu, male, April. Iris brown, bill and legs very dark brown, the mandible dark brown.]

48. *ANTHOTHREPTES CHLOROGASTRA* ?

*Anthreptes chlorogastra*, Sharpe, Tr. L. S. ser. 2, Zool. i. p. 342.

[Cebu, male, April.]

A single example of the genus was obtained by Mr. Everett; but as it represents a young male before it has assumed its metallic plumage, it is impossible to identify it with any certainty. One or two violet scapulars are present; and one of the occipital feathers is also violet. In *A. chlorogastra* the head is said to be metallic green.

49. *CORVUS PHILIPPINUS* (125).

[Cebu, male, March. Iris brown, bill and legs black.]

50. *CALORNIS PANAYENSIS* (128).

[Cebu, male and female, April. Iris vermilion-red, bill and feet black.]

51. *SARCOPS CALVUS* (129).

[Cebu, male, April. Iris brown, bare skin dull carmine, bill and legs black.]

52. *OXYCERCA EVERETTI*.

*Oxycerca everetti*, Tweeddale, Ann. & Mag. N. Hist. ser. 4, vol. xx. p. 96.

[Cebu, male, March. Iris brown, bill black, mandible grey, legs dark grey.]

Not separable from Luzon examples. Sexes alike.

53. *MUNIA JAGORI* (132).

[Cebu, male, March. Iris brown, bill pale grey, legs dark grey.]

In Mr. Everett's examples (male and female) the black mesial band is not confluent with the black of the breast. The species is very similar to *M. rubrinigra*, but has the black on the abdomen more fully developed.

54. *OSMOTRERON VERNANS* (135).

[Cebu, male, April. Iris, inner ring light blue, outer ring light ochreous; bill lead-grey, cere green, feet carmine, nails grey.]

55. *OSMOTRERON AXILLARIS* (136).

[Cebu, male, April. Iris light blue-green. *♂*. Female. Iris blue-green; bill lead-grey, base dark-red; feet greenish grey, nails grey.]

In the adult female the cap is pure grey as in male. In the younger female the crown is dingy green.

56. *RAMPHICULUS OCCIPITALIS* (138).

[Cebu, male and female, April. Iris, pale reddish-brown (female light yellow-brown). Basal half of bill vermilion, apical half yellow; feet carmine, nails grey tinged yellow.]

Neither in plumage nor dimensions do the sexes differ. Zebu examples cannot be separated from Luzon individuals.

57. *PHABOTRERON NIGRORUM*.

*Phabotreron nigrorum*, Sharpe, Tr. L. S. ser. 2, Zool. i. p. 346.

*Phabotreron leucotis* (Temmin.), Walden and Layard, Ibis, 1872, p. 104, ex Negros.

[Cebu, male and female, April. Iris brown, bill black, legs and feet bright carmine, nails grey.]

The characters whereby Mr. Sharpe separated the Negros form of this genus from the nearly allied *P. leucotis* of Luzon belong also to the Guimaras and the Zebu birds.

58. *CARPOPHAGA AENEAE* (141).

[Cebu, male, March. Iris and orbital ring bright crimson, bill lead-grey, feet dull purplish-crimson.]

A series of four Cebu individuals cannot be differentiated from Luzon and Negros specimens.



59. *TURTUR DUSSUMIERI* (147).60. *CHALCOPHAPS INDICA* (150).

[Cebu, male and female, April. Iris brown, bill orange-red, legs dark red, feet dull carmine.]

61. *TURNIX NIGRESCENS*, n. sp.

[Cebu, female, April. Iris yellowish white, bill chrome-yellow, legs chrome-yellow, feet tinged with green.]

While *T. fasciata* of Luzon chiefly differs from *T. pugnax*, ex Java, in its smaller dimensions and its broad uniform rufous nape, this Zebu bird somewhat exceeds *T. pugnax* in size, and is readily differentiated by the ground-colour of the crown, back, and uropygium being blackish brown instead of rufous. Like *T. fasciata* it also possesses a broad rufous nuchal collar.

	Dimensions.			
	Wing.	Culmen.	Tarsus.	
	in.	in.	in.	
<i>T. pugnax</i> ♀ .....	3.37	0.68	1.06	} ex Java. Throat black.
" " ♂ .....	3.06	0.62	0.95	
<i>T. fasciata</i> ♀ .....	3.00	0.62	0.83	} ex Luzon. "
" " ♂ .....	2.86	0.50	0.75	
<i>T. nigrescens</i> ♀ .....	3.50	0.75	1.12	} ex Zebu. "
" " ♂ .....	3.12	0.63	0.95	

62. *MEGAPODIUS PUSILLUS*, n. sp. (Plate LXXVIII.)

[Cebu, male, March. Iris dark hazel, bill dark brown, legs very dark brown, nearly black.]

The upper surface rich ruddy yellowish (almost golden) brown. Uropygium and upper tail-coverts and rectrices brown. Chin and throat dirty yellowish brown, the feathers being light grey at their insertion. Neck and upper breast slate-grey tipped with ruddy brown. Lower breast, abdomen, and flanks slate-grey, but faintly washed with ruddy brown. Ventral region paler grey tinged with ochreous brown. Thigh-coverts distinct ruddy, almost rusty, brown. Under tail-coverts dull ashy brown. Primaries uniform brown. Secondaries margined externally with the hue of the back. Tertiaries and wing-coverts like the back. Sides of head and forehead slightly paler than the head.

Wing 6.25, tarsus 1.70, middle toe without claw 1, culmen 0.64.

This small Megapode has the ophthalmic region, throat, and neck densely clothed, and belongs to a type different from *M. cumingi*.

Mr. Sharpe has lately (P. Z. S. 1875, p. 111) separated the Bornean Megapode from the then only known Philippine species, and given the title of *M. lowii* to the Bornean (Labuan) species. That

the Philippine and Bornean naked-faced Megapodes differ specifically seems to be established; but it would appear that the Philippine and not the Bornean species requires a new title. Mr. Sharpe proceeds on the assumption that Mr. Dillwyn described from and bestowed the title of *M. cumingi* (P. Z. S. 1851, p. 119, t. xxxix.) on Cuming's Philippine (Manila?) examples. But neither the context nor the descriptions and dimensions, the last on Mr. Sharpe's own showing, appear to support his conclusion. Mr. Dillwyn (*l. c.*) considered the Labuan Megapode to belong to the same species as that sent by Mr. Cuming to the British Museum from the Philippines; and the point of difficulty is whether Mr. Dillwyn described (*l. c.*) his *M. cumingi* from Motley's Bornean examples or from Cuming's Philippine specimens. Mr. Dillwyn described his type as being "blackish slate-colour" below, and he figured the bird (*l. c.*) dark (blackish) slate-colour below. Mr. Sharpe, when differentiating the Bornean from the Philippine Megapode, says (*l. c.*) that the Labuan specimens sent to the British Museum by Mr. Lowe are smaller and darker than the Philippine birds, especially on the breast, which is deep plumbeous grey, whereas in the Philippine bird the under surface is brownish washed with grey. If we compare the dimensions given by Mr. Dillwyn of his type of *M. cumingi* with those given by Mr. Sharpe (*l. c.*) of his *M. lowii* (ex Labuan) and of the Philippine bird, it will be found that the principal dimensions of Mr. Dillwyn's type of *M. cumingi* and of Mr. Sharpe's type of *M. lowii* are essentially the same, while the dimensions of the Philippine Megapodes are sensibly larger.

	Total length.	Wing.	Tail.	Tarsus.
<i>M. cumingi</i> , Dillwyn ( <i>l. c.</i> ) .....	in. 14.0	in. 8.6	in. 3.0	in. 2.1
<i>M. lowii</i> , Sharpe ( <i>l. c.</i> ), ex Labuan ...	14.5	8.1	3.1	2.4
<i>M. cumingi</i> , Dillwyn apud Sharpe ( <i>l. c.</i> ), ex Philippines .....	16.0	10.0	3.7	2.5

Mr. Sharpe states that the Labuan birds differ from the Philippine in being smaller, and he admits that the plate (*l. c.*) of *M. cumingi* represents the Bornean Megapode, and yet he assumes that Mr. Dillwyn described from Cuming's Philippine individuals. As I first drew attention (T. Z. S. ix. p. 225) to the desirability of recomparing the Philippine Megapode with the Bornean *M. cumingi*, and as Mr. Sharpe after making the comparison asserts that they differ specifically, I propose the title of *Megapodius dillwyni* for the Philippine species obtained by Cuming<sup>1</sup>.

<sup>1</sup> Since I arrived at this conclusion Mr. Dillwyn has kindly written to me to say, respecting the *M. cumingi* described by him in the P. Z. S. (and also in his Nat. Hist. Labuan), the description was from a specimen which he received from Motley from Labuan. Wolf's figure was taken from the same specimen.

63. *CHARADRIUS FULVUS* (159).

[Cebu, male and female, April.]

Two of the male examples are in almost full breeding-plumage, a few only of the chin- and throat-feathers not being black.

64. *GALLINULA CHLOROPUS* (169).

[Cebu, female, juv., March. Iris crimson, bill dirty orange-yellow, brown at the base, legs grass-green, nails brown. *b.* Cebu, female, April. Iris crimson, bill light brown, apical portion light greenish, legs green.]

65. *ORTYGOMETRA CINEREA* (172).

[Cebu, male, March. Iris crimson, bill greenish brown, legs dull greenish, nails brown. *b.* Cebu, female, March. Iris crimson, maxilla greenish brown, mandible green, legs dull greenish, nails brown.]

66. *RALLINA EURYZONOIDES*.

*The Rail*, Brown, Illustr. p. 94, t. xxxvii., "Ceylon" (1776).

*Gallinula eurizonoides*, Lafresn. Rev. Zool. 1845, p. 368.

*Rallus zeylanicus*, Gm. S. N. i. p. 716. no. 17; Jerdon, B. Ind. iii. p. 725, nec Gm.

*Rallus zeylanicus*, Gm., *l. c.* auctt. recent. nec Gm.

[Cebu, male, April. Iris brilliant red. *b.* Cebu, female, April. Iris bright brick-red, bill blackish, the base tinged light green, tip greyish, legs dull greenish leaden, feet dark lead-grey, nails grey.]

The two examples obtained by Mr. Everett do not quite agree with Ceylon and Continental-Indian individuals, inasmuch as the dark banding below appears much blacker, broader, and more decided, and the dorsal colouring is browner. Still, since it is impossible to select any marked characteristic difference, and as this Rail is probably a migrant, as in Ceylon, I refer these Philippine birds to the Indian species. Mr. Blyth was of opinion that the race found in the Philippines was barely distinguishable (Jerd. *l. c.*).

Brown (*l. c.*) described and figured, under the title of *The Rail*, this species from a Ceylonese example obtained by Governor Loten. At p. 96 he also described, and on plate xxxviii. he figured, a distinct bird from the same source under the title of *Rail*. Gmelin (*l. c.*) copied Brown's description of his *Rail*, and bestowed on it the title of *Rallus zeylanicus*. But Gmelin, while correctly quoting p. 96 of the Illustrations, incorrectly referred to plate xxxvii., on which is depicted Brown's *The Rail*. On Brown's description of *The Rail* Gmelin founded no title; but when incorporating the Linnæan species *Rallus capensis* (Mantissa, p. 525) in his edition of the 'Systema' (*l. c.* No. 11) and more or less transcribing the Linnæan diagnosis, he followed Latham (Synop. iii. pt. i. p. 234. no. 8) and referred the Linnæan bird to the one described by Brown at p. 94 as well as to the one figured by Brown on plate xxxviii. Latham made the identification with a note of interrogation. Gmelin in both cases associated the wrong plate with the pages containing Brown's descrip-

tive remarks, and called both species *Rail*. As Gmelin's diagnosis of his *Rallus zeylanicus* does not apply to the ferruginous-breasted Rail of Ceylon, *The Rail* of Brown, we must adopt the next title, that of Lafresnaye. I cannot with certainty identify the bird described and figured by Brown under his title of Rail (*Rallus zeylanicus*, Gm.); but it is apparently a gallinaceous bird—possibly *Galloperdix spadiceus* (Gm.).

67. AMAURORNIS OLIVACEA (176).

[Cebu, male, March. Iris crimson, bill dark green, paler at tip, legs yellow-brown. *b.* Cebu, female, March. Iris crimson, bill grass-green, legs and feet brownish dull yellow.]

68. HYPOTÆNIDIA TORQUATA (177).

[Cebu, male and female, March. Iris crimson, feet and nails lead-grey, bill black.]

The series sent consists of thirteen examples of both sexes, some being from Luzon. In plumage the males do not differ from the females. Every variety occurs in the colouring and extent of the pectoral band, which is dark pure maroon in the full plumage.

69. HYPOTÆNIDIA STRIATA (179).

*Hypotænidia obscuriora*, Hume, Str. F. 1874 (January), p. 302, "Andamans."

*Hypotænidia ferrea*, Walden, Ibis, 1874, April, p. 147, "Andamans."

[Cebu, male, March. Iris burnt-sienna brown, bill blackish brown, base carmine, legs greyish brown. *b.* Cebu, male, April. Iris Indian red; bill purplish brown, base dull crimson; legs brown.]

These Zebu specimens may be regarded as being typical; and from them Andaman and Rangoon examples cannot be separated; consequently the titles founded on the Andaman race must fall. A recomparison made with Continental-Indian and Malaccan examples does not support my former (*l. c.*) opinion that the Andaman birds specifically differ from Indian and Malaccan; otherwise the Indian race would require a new title.

70. TRINGOIDES HYPOLEUCUS (183).

[Cebu, male, April. Iris brown, bill dark brown, legs light greenish-grey, nails black.]

71. TOTANUS INCANUS.

*Scolopax incanus*, Gm. S. N. i. p. 658.

[Cebu, female, April. Iris dark brown, bill very dark brown, legs ochreous yellow, nails black.]

Wings 6.50. Breeding-dress.

72. GALLINAGO MEGALA (188).

[Cebu, female, April.]

## 73. BUTORIDES JAVANICA (197).

[Cebu, March. Iris golden yellow, orbital and loreal regions light green, bill black, base of mandible yellowish, legs and feet dull green, nails grey-black.]

## 74. NYCTICORAX MANILLENSIS (198).

[Zebu, male, May. Iris golden-yellow, bill brown, mandible dirty yellow, legs light greenish-yellow, nails grey.]

The male of which the soft parts are described above is a young bird. Above the plumage is rich dark brown, each feather centred for its entire length (as on the neck) or for its terminal half (as on the back) with clear ferruginous. Underneath the plumage has the same character; but the ferruginous colour is diluted, and on the breast tawny. The quills are of the same rich dark chestnut-colour that prevails in the adult. Chin and throat pure white. The crown of the head is like the neck, and not black as in the adult. Many of the frontal and coronal feathers have prolonged, twisted or partly curled terminal naked shafts of a yellowish albescent colour and over half an inch in length. This occurs in two specimens.

An example (without a label) in almost full dress, has the forehead, crown, and occipital crest black. The remainder of the upper plumage and the exposed surfaces of the wings are rich dark chestnut-rufous, darkest on the interscapular region. The chin and throat pure white, with a few feathers tipped and centred brown. The sides of the head, the sides and front of the neck, upper breast, and flanks pale rufous tawny with broad ruddy-brown margins. Lower breast and abdomen white and tawny-white with the brown margins narrower. Under tail-coverts white, some blotched with creamy rufous. Long axillaries pale pure rufous. Carpal edge pure white. Culmen 2·87 inches, tarsus 3·75, wing 12·75.

The long, pendent, white nuchal plumes are absent, the black tips of which are said to be one of the characters which differentiate *N. manillensis* from *N. caledonicus*. The differences between the two species are otherwise well marked; but Professor Schlegel's opinion that *N. manillensis* = *N. crassirostris*, ex Bonin Ins., requires confirmation.

The bill of this Philippine example is thicker than in *N. caledonicus*, (ad. ex Port Albany), measuring in altitude 1 inch as against 0·75.

## 75. DENDROCYGNA VAGANS (203).

[Cebu, male, March. Iris dark brown, bill shining black, legs and feet dark slate-grey. *b.* Cebu, male, April.]

The example shot in March is in almost full plumage, the secondaries being well developed. Most of the breast-feathers have one or two pairs of brown spots. The second example, shot in April, is of smaller dimensions, the secondaries shortened, the breast-plumage uniform.

2. On a Collection of Birds from Eua, Friendly Islands.  
By Dr. OTTO FINSCH, C.M.Z.S., Director of the Museum  
of Natural History of Bremen.

[Received Sept. 26, 1877.]

The Island Eua (Eooa, Eoa, Eaowe or Eaoowe), belonging to the Tonga or Friendly group, situated to the south-east of the main island Tongatabu, is much smaller than the latter, but, instead of being flat, shows a more mountainous appearance, and rises to a height of about 600 feet above the level of the sea.

When writing our 'Ornithology of Central Polynesia,' ten years ago, Dr. Hartlaub and I were, as regards the birds of the Tonga group, obliged nearly to confine ourselves to what Forster had written on the subject, Tonga birds being at that time of the greatest rarity in collections. The total number of species then known of Tonga birds was 33, of which only four were known from Eua (viz. *Platycercus tabuensis*, *Ptilotis carunculata*, *Carpophaga pacifica*, and *Gygis alba*). Since that time we have had the pleasure of publishing a welcome contribution to our knowledge of the Tonga birds, based upon the collections of Dr. Gräffe<sup>1</sup>, which reached us through the Museum Godeffroy, of Hamburg, in 1869. A very interesting account of the habits of Tonga birds was shortly after published by Dr. Gräffe<sup>2</sup> himself, which paper may be considered a valuable continuation of our memoirs. Dr. Gräffe noticed, as observed by himself, 26 species (of which 18 were collected by him and examined by us), thus adding 5 species to the avifauna, among which one proved to be new (*Colluricincla heinei*, nob.), and raising the total to 38. Since then Mr. E. L. Layard has visited the Tonga group and has published a useful contribution<sup>3</sup>, which adds, as observed by him, 7 species more (*Limosa uropygialis*, *Streptopelia interpres*, *Sterna melanauchen*, *St. panaya*, *Anous leucocapillus*, *Phaëton candidus*, and *Tachypetes aquila*), and raises the total of alleged species to 45. But as some of these occurrences rest on antiquated statements, not yet confirmed, the total number known with certainty from the whole group remains still 37.

I have now to make a further addition to our knowledge of this avifauna. Mr. F. Hübner, at the charge of the Museum Godeffroy in Hamburg, has lately again visited the Tongas, and has sent over a collection made on the island of Eua. His exertions have raised the number of birds known to occur on this island from 4 to 24.

<sup>1</sup> Dr. O. Finsch and Dr. G. Hartlaub "On a small Collection of Birds from the Tonga Islands," in P. Z. S. 1869, pp. 544-548, and Dr. O. Finsch u. Dr. G. Hartlaub "Zur Ornithologie der Tonga-Inseln," in Cabanis's Journal für Ornithologie, 1870, pp. 119-140, Taf. iv.

<sup>2</sup> Dr. Eduard Gräffe, "Ornithologische Mittheilungen aus Central-Polynesien. I. Die Vogelwelt der Tonga-Inseln," in Cabanis's Journal für Ornithologie, 1870, pp. 401-420.

<sup>3</sup> E. L. Layard, "Notes on the Birds of the Navigators' and Friendly Islands, with some Additions to the Ornithology of Fiji," in P. Z. S. 1876, pp. 490-506.

Of these, examples of 21 have been inspected by me; two (*Charradius fulvus* and *Limosa uropygialis*) I included on Mr. Layard's authority. Only one species, the Parrot *Platycercus tabuensis*, seems to be peculiar to the island.

### 1. STRIX DELICATULA.

*Strix delicatula*, Gould; Finsch & Hartl. P. Z. S. 1869, p. 545, et Journ. f. Ornith. 1870, p. 122.

Native name *Lulu* (Hübner, Gräffe).

One female from Eua, exactly resembling specimens from Feejee. "Contents of stomach, hairs of bats" (Hübner).

Mr. Hübner observed this species also in the Iapai group, north of Tongataboo.

### 2. PLATYCERCUS TABUENSIS.

*Platycercus tabuensis* (Gm.); Finsch, Papag. ii. p. 231; F. & H. Journ. f. Orn. 1870, p. 123; Layard, P. Z. S. 1876, p. 500.

Native name *Kaka* (Hübner, Gräffe).

Nine specimens (collected in August 1876), all from Eua.

The absence of red tips to the feathers of the lower rump or upper row of upper tail-coverts, as I have already remarked, is not a character of specific value in this bird. In the series before me there is only a single specimen which has the uropygium uniform green; the others all show more or less red tips to the feathers, which in some are broad and very conspicuous; in two, also, the lesser and largest scapula-coverts have purplish-red tips. The extent and width of the blue neck-collar also varies individually; generally it is broad and well defined, but in some examples is so narrow and obscure that it nearly disappears.

According to Dr. Gräffe this species is confined to the island Eua; but Mr. Layard suggests that the bird has been introduced there from Fiji.

Mr. F. Hübner writes on this species (*in litt.*):—"Notwithstanding my utmost endeavours, I was not able to obtain certain information with respect to the breeding-time of the 'Kaka.' All the holes in the trees which I inspected were uninhabited; and even the natives could not tell me where eggs were to be found. But as I obtained young birds in August I am inclined to believe that June and July are the season of incubation, although females shot by me in these months did not show any development of the ovaries. In habits the Kaka does not differ from other Parrots; it feeds on berries and fruits. The male and female are alike, except that the latter has a weaker bill. The young ones are obscure in colour, but they soon get the bright dress of the old; the iris of the latter is orange, in the young grey-brown."

In my work on the Parrots I gave, on the authority of Peale, also the Fiji Islands as the locality for this species, considering *Pl. atrogularis*, Peale, and *Pl. annæ*, Bourj., to be identical. This I now believe was a mistake, as also my statement that Peale had

erroneously given the Fijis as a locality. It is true that all the specimens I have seen from the islands of Viti-Levu, Vanua-Levu, Loma-Loma, and Kandavu belong to the much more brightly coloured *P. splendens*; but through Mr. Layard we now learn that the island of Taviuni possesses another bird which shows the same dark purplish-red colour (*atro-purpureus*) as *P. tabuensis*. A specimen from Taviuni before me differs, not only in the smaller size, but also in the total absence of the blue neck-collar, of which not even the slightest trace is visible. But I hesitate to declare this difference of specific value, as Cassin mentions in *P. atrogularis* a broad, in *P. annæ* a narrow blue collar; and as both these birds were collected on the Fijis, although without exact locality, they evidently belong to one and the same species.

The dimensions of 20 specimens of *P. tabuensis* from Eua are as follows,

Wings.		Tail.	
in.	lin.	in.	lin.
8	3	9	8
		7	8
			9
			3

whereas in the Taviuni bird the wings measure only 7'' 8''', the tail 6'' 8'''.

If the smaller size of the Fiji bird should turn out to be constant, it ought to be regarded as a different species, to which belong the three dark races pointed out by Mr. Layard<sup>1</sup> as differing in the extent of the blue collar. The synonymy of this Fiji form of *P. tabuensis* will be as follows:—

#### PLATYCERCUS ANNÆ.

*Conurus anna*, Bourj. Perr. t. 38.

? *Platycercus tabuensis*, Jard. & Selb. Ill. of Ornith. ii. pl. lxxiv. (fig. pess., without blue collar).

*Pl. atrogularis*, Peale, Unit.-St. Expl. Exped. (1848) p. 129, pl. xxxv.; Hartl. Wieg. Arch. 1852, p. 106.

*Aprosmictus tabuensis* et *A. anna*, Cass. Un.-St. Expl. Exp. 2nd edit. (1858) pp. 234, 236.

*Pl. anna*, Gray, List Psitt. p. 11.

*Pl. atrigularis*, Scl. P. Z. S. 1864, p. 158.

*Pl. tabuensis*, Gough, P. Z. S. 1849, p. 14; Finsch, Mon. Papag. ii. p. 231 (upper part).

*Pl. taviunensis*, Layard, Ibis, 1876, p. 141, et *Pl. splendens*, second race (from Mathuata), third race (from Koro), and fourth race (*taviunensis*, from Taviuni), *ib.* p. 143.

#### 3. DOMICELLA FRINGILLACEA.

*Domicella fringillacea* (Gm.); Finsch, Papag. ii. 747; Layard, P. Z. S. 1876, p. 501.

Native name *Hega* (Hübner, Gräffe).

Three specimens from Eua. Sexes alike. No difference is observable in specimens from the Navigators' and Wallis Islands. One specimen shows the green front stained with bluish.

<sup>1</sup> Ibis, 1876, p. 141.



This species has been observed also by Mr. Hübner in the Hapai group and on Vavao.

4. *EUDYNAMIS TAITIENSIS*.

*Eudynamis taitiensis* (Sparrm.).

Native names *Kaliva* (Hübner), *Haleva* (Gräffe).

One male in the spotted dress of the young bird from Eua (August 1876). This is the first specimen of this bird I have examined from the Friendly group; its occurrence there has been stated already by G. R. Gray and Dr. Gräffe.

5. *HALCYON SACRA* (Gm.).

Native name *Gikota* (Hübner, Gräffe).

Five specimens. The remarks given, Journ. f. Ornith. 1870, p. 124, are also applicable to the series before me. Generally the specimens with a tawny-coloured eye-stripe (running round the nape) show also narrow edgings of the same colour on the upper wing-coverts; but these are sometimes also present in white-eyed-striped specimens.

This species occurs also in the Hapai group (*Hübner*, in litt.).

6. *PTILOTIS CARUNCULATA*.

*Ptilotis carunculata* (Gm.); F. & Hartl. P. Z. S. 1869, p. 545; iid. Journ. f. Orn. 1870, p. 125; Gräffe, ib. p. 404 (habits); Layard, P. Z. S. 1876, pp. 491 et 501.

Native names *Fuleheu* (Hübner, Gräffe); *Fule-haio* (Layard).

Three specimens from Eua, agreeing exactly with others from the Navigators' and Viti. Of the latter I have before me two specimens from Matuka, collected during the 'Challenger' Expedition. (See above, p. 732.)

7. *COLLURICINCLA HEINEI*.

*Myiolestes heinei*, F. & H., P. Z. S. 1869, p. 546, et Journ. f. Ornith. 1870, p. 126, t. iv.

Native name *Fuiva* (Hübner, Gräffe).

Two specimens from Eua, exactly like those from Tongatabu and Vavao.

"This species is common and lives in the brush" (*Hübner*).

As it appears that the genus *Myiolestes* of Cabanis (Mus. Hein. p. 67) was based on *Muscicapa obscura*, Horsf. (= *hirundinacea*, Temm. Pl. Col. 119), from Java, a bird which is quite different generically, this Polynesian bird may be placed in the genus *Colluricincla*, from which it, in my opinion, does not differ generically.

8. *LALAGE MACULOSA* (Peale); Finsch, P. Z. S. 1877, p. 724.

*L. terat*, Layard, P. Z. S. 1876, p. 502.

Native names *Gikiviu* (Hübner); *Singiviu* (Layard).

Two specimens from Eua. One of them, nearly in full plumage,

has narrow rusty borders on the feathers of the vertex, also on those of the back; but these are more obsolete; the middle wing-coverts are white, tinged with pale rusty and with a black median streak. This is seen only on the right wing; on the left the white patch is nearly fully developed.

The second specimen is an interesting albino variety. All the parts which in the adult male are black are in this specimen pale tawny; the middle tail-feathers are brown, the rest of them pure white; bill and feet horn-colour.

#### 9. *APLONIS TABUENSIS* (Gm.).

*A. marginata*, Gould; Cass. Expl. Exp. pl. 30. f. 1.

*Lamprotornis fusca*, Peale (part).

*A. cassini*, Gray (part).

Native name *Megi* (Hübner).

Two specimens, male and female (exactly alike), from Eua. Mr. Hübner found this species breeding in the hole of a tree. According to him it occurs also on the Hapai group.

In our 'Ornithology of Central Polynesia' (p. 103), and later (Journ. f. Ornith. 1870, p. 131), we have followed Peale in stating the *Aplonis* from the Tonga and Viti group to belong to one and the same species, *i. e.* *A. tabuensis* (Gm.). A close examination convinces me, however, that they are not identical, but of two distinct species. The true *A. tabuensis*, which seems to be confined to the Tonga group (Eua, Tongatabu), is generally darker; and the underparts are dirty brownish-grey, with obsolete whitish stripes, which are caused by the light-coloured shafts on the breast and vent.

The dimensions do not give distinctive characters, although the Viti birds generally seem to be smaller.

Al.		Caud.	
in.	lin.	in.	lin.
4	0	4	2
3	8	4	0
2	1	2	1
2	3	2	3
			<i>tabuensis.</i>
			<i>vitiensis.</i>

The Viti bird is generally lighter; the shafts of the feathers on the back and shoulders are whitish, and form very narrow striæ; the under surface is light brownish, streaked longitudinally with whitish, each feather being, along the shaft, broadly whitish, so that the white shaft itself remains inconspicuous, and does not form the narrow striation as in *A. tabuensis*.

The Viti bird, which must for the future be called *Aplonis vitiensis*, Layard<sup>1</sup>, seems to be widely distributed on the Viti group; Ovalau (*Gräffe*), Vatu Lele (*Kleinschmidt*), Kandavu, Suva, Lomaloma, Taviuni (*Layard*).

Whether the *Aplonis* collected by Dr. Gräffe on the small island Uëa, Wallis group, belongs to this species or to *A. tabuensis*, I cannot say, not having seen specimens from that locality.

<sup>1</sup> Layard, P. Z. S. 1876, p. 502, = *A. tabuensis*, F. & Hartl. Ornith. Central-Polyn. p. 103, tab. x. f. 2, et Layard, P. Z. S. 1875, p. 435.

## 10. Ptilinopus porphyraceus.

*Ptilinopus porphyraceus* (Forst.).Native name *Kulukulu* (Hübner, Gräffe).

Two specimens from Eua; sexes alike.

On this peculiar species see Journ. f. Ornith. 1870, p. 131.  
It occurs also in the Hapai group (*Hübner*, in litt.).

## 11. CARPOPHAGA PACIFICA.

*Carpophaga pacifica* (Gm.); Layard, P. Z. S. 1876, p. 503.Native names *Lube* (Hübner), *Oroobe* (Layard).

Two males from Eua (August), exactly like specimens from the Navigators'.

The distinctive characters between this Central-Polynesian species and the more western *C. oceanica*, Less. (of the Carolines and Palau group), I have pointed out in Journ. Mus. Godeffroy, Heft viii. 1875, p. 26.

## 12. CHARADRIUS FULVUS.

*Charadrius fulvus*, Gm.; Layard, P. Z. S. 1876, p. 503.

Mr. Layard found this species common on Eua (in February).

## 13. TOTANUS INCANUS.

*Actitis incana* (Gm.); Layard, P. Z. S. 1876, p. 503.Native name *Kiu* (Hübner).

One female in full summer dress, from Eua, shot in August.

## 14. LIMOSA UROPYGIALIS.

*Limosa uropygialis*, Gould; Layard, P. Z. S. 1876, p. 503.

Not in the collection, but mentioned by Mr. Layard from Eua.

## 15. ARDEA SACRA.

*Ardea sacra*, Gm.; Layard, P. Z. S. 1876, p. 503.Native name *Motuka* (Hübner).

One slate-blue specimen from Eua (August).

## 16. ? ORTYGOMETRA TABUENSIS.

? *Ortygometra tabuensis* (Gml.).Mr. Hübner remarks that the *Moho*, as this species is called by the natives, "although formerly common, may be considered nearly extinct on Eua." According to Mr. Layard, the *Moho* would be *Monarcha nigra* (Sparrm.), which is now extinct (P. Z. S. 1876, p. 501).

## 17. PORPHYRIO SAMOËNSIS, Peale.

*P. vitiensis*, F. & Hartl. Ornith. Central-Polyn. p. 172; Layard, P. Z. S. 1876, p. 503.Native name *Kalai* (Hübner).

One female from Eua (August), which agrees in every respect

with specimens from the Navigators'. On the Central-Polynesian *Porphyrio* and its synonymy, *cf.* Finsch, Journ. für Ornith. 1872, p. 55.

#### 18. ANAS SUPERCILIOSA.

*Anas superciliosa*, Linn.; Layard, P. Z. S. 1876, p. 503.

Native name *Toloa* (Hübner).

One female from Eua (August).

#### 19. STERNA BERGII.

*Sterna bergii*, Licht.; *Gygis*, sp.? Gräffe, Journ. f. Orn. 1870, p. 403.

Native name *Tola* (Hübner), *Tala* (Gräffe).

One specimen from Eua (August).

Since the time of Latham the occurrence of this species on the Tonga group has not been recorded; but Mr. Layard also gives evidence of its occurrence (P. Z. S. 1876, p. 503).

Al.		Caud.	Rostr.	Altit.	Tars.	Dig.
in.	lin.	(exter.) in. lin.	lin.	lin.	lin.	med. lin.
13	3	5 7	25	7	12½	12

#### 20. ANOUS STOLIDUS.

*Anous stolidus*, L.

Native name *Gogo* (Hübner).

One old and two young specimens from Eua (August); the latter have the head and neck of a uniform sooty-brown; but the feathers on the forehead and vertex are acquiring greyish-white tips, so that there can be no doubt that still younger birds are uniform sooty-brown (*A. rousseaui*, Hartl.).

Al.		Caud.		Rostr.
in.	lin.	in.	lin.	lin.
10	6	6	0	20 Ad.
10	3	5	2	17 Jun.

According to Mr. Hübner this species breeds on the rocks on the east side of Eua.

#### 21. ANOUS ALBIVITTATUS.

*Procelsterna albivitta*, Bp. C. R. p. 773 (1856); Gould, Handb. B. Austr. ii. p. 420.

Native name *Lefulefu* (Hübner).

Two specimens, precisely alike, from Eua (August).

This species, new to the avifauna of Tonga and Central Polynesia, differs very strikingly from *A. cæruleus*, Bennett (*A. parvulus*, Gould, *A. cinereus*, Neboux, nec Gould), in the pale grey colour of upper parts and the delicate silvery greyish white of its head, neck, and underparts.

Al.	Caud.	Rostr.	Tars.	Dig. med.
in. lin.	in. lin.	lin.	lin.	lin.
6 9	3 4	11½	11	11
7 2	3 9	11½	11	11

Mr. Howard Saunders, in his Monograph of the Sterninæ (P. Z. S. 1876, p. 671, confounds this very distinct bird with *A. cinereus*, Neboux, which latter must, according to his views, bear the name *A. cæruleus*, Bennett.

## 22. GYGIS ALBA.

*Gygis alba* (Sparrm.) ; Layard, P. Z. S. 1876, p. 504.

Native name *Ekiaki* (Hübner).

One specimen from Eua (August) in the very interesting stage of the young-plumaged bird after leaving the nest. It is white ; but the feathers on the upper parts have narrow edgings of pale rufous. This bird occurs also on Vavao (*Hübner*, in litt.). Mr. Layard found it common on Eua.

## 23. PHAËTON FLAVIROSTRIS.

*Phaëton flavirostris*, Brandt. ; Layard, P. Z. S. 1876, p. 504.

Native name *Tavaki* (Hübner et Layard).

One old female from Eua (August).

Dr. Gräffe notices as "Tavaki" *Ph. æthereus* from Tonga (Journ. f. Orn. 1870, pp. 403 et 411).

Mr. Layard got the egg of this species on Eua.

## 24. DYSPORUS SULA.

*Dysporus sula* (L.), F. & H. Ornith. Central-Polyn. p. 260.

*Diomedea*, sp. ? Gräffe, Journ. f. Ornith. 1870, pp. 403 et 411.

Native name *Gutulei* (Hübner).

One old male from Eua (August).

The "Gutulei" of natives, which Dr. Gräffe supposed to be a species of *Diomedea*, turns out to be the well-known Booby of the sailors.

## 3. On the Birds of the Island of Ponapé, Eastern Carolines.

By Dr. OTTO FINSCH, C.M.Z.S., Director of the Museum of Natural History of Bremen.

[Received September 26, 1877.]

The island of Ponapé, or Ascension (sometimes written on maps Bonaby, Bonabay, Bornaby, Bonabe, Bonibet, Hunnepet, Funopet, Falupet, Falupit, Fanopé, Puynipet) is the largest of the Seniavin group, which extends between 157° 54' and 158° 30' E. long., and 6° 43' and 7° 6' N. lat., and belongs to the Eastern Caroline archipelago. The island has a surface of about 7½ German miles, a circumference of about 13 German miles, and is inhabited by about 2000 natives. Having been visited only twice by the French expe-

dition of the 'Danaïde,' under command of Capt. Boramel, in 1840, and by the well-known 'Novara' Expedition, in 1858, we were acquainted with only eight species of birds inhabiting it till 1873, when Mr. J. Kubary, the well-known naturalist in charge of the Museum Godeffroy, at Hamburg, explored the island and stayed a year on it. Unfortunately his rich harvest was lost by the wreck of the Godeffroyian brig 'Alfred,' and, except a single skin (out of 200 which Mr. Kubary had collected), only the birds preserved in alcohol were saved. Upon this collection, containing examples of 20 species, I based my first paper on the birds of Ponapé<sup>1</sup>. Since that time a second collection, consisting of well-prepared skins, made by Mr. J. Kubary, has reached me, which gives me a welcome occasion of correcting some statements in my former paper, caused by the bad conservation of some of the specimens in alcohol, and adds seven species more to the avifauna of this island. Among these a species of *Ptilonopus* proves to be new. The total species, therefore, known at present from Ponapé number 29, of which 7 are peculiar to the island.

1. *OTUS BRACHYOTUS* (L.), Finsch, Journ. Mus. Godeffr. Heft xii. p. 18.

In the first collection of Mr. Kubary.

2. *TRICHOGLOSSUS RUBIGINOSUS* (Bp.); Finsch, *l. c.* p. 18.

In Mr. Kubary's first collection.

3. *EUDYNAMIS TAITIENSIS* (Sparm.); Finsch, *l. c.* p. 19.

One female.

4. *HALCYON CINNAMOMINUS*, Sws.; Finsch, *l. c.* p. 20.

Of this species and its synonymy I treated in full in my last paper on Mr. Kubary's collection.

5. *COLLOCALIA VANICORENSIS* (Quoy & Gaim.); Finsch, *l. c.* p. 23.

In Mr. Kubary's first collection.

6. *MYZOMELA RUBRATRA* (Less.); Finsch, *l. c.* p. 26.

Sent already by Mr. Kubary.

7. *ZOSTEROPS PONAPENSIS*, Finsch, *l. c.* p. 27, t. 2. f. 1.

This peculiar species I received in Mr. Kubary's first collection.

8. *CALAMOHERPE SYRINX* (Kittl.); Finsch, *l. c.* p. 30.

Two specimens; in one the underparts are decidedly yellowish, in the other yellowish white.

<sup>1</sup> Cf. "Zur Ornithologie der Südsee-Inseln. II. Ueber neue und weniger gekannte Vögel von den Viti-, Samoa- und Carolinen-Inseln. IV. Vögel von Ponapé (Seniavin Gruppe)," in 'Journal des Museum Godeffroy,' Heft xii. 1876, pp. 14-40, Tafel I, 2.

9. MYIAGRA PLUTO, Finsch, *l. c.* p. 29.

Male and female, as described by me.

10. RHIPIDURA KUBARYI, Finsch, *l. c.* p. 29, t. 2. f. 2.

One male, as cited above.

11. VOLVOCIVORA INSPERATA, Finsch, *l. c.* p. 27.

Male and female, exactly agreeing with my descriptions, taken from specimens dissected by myself.

There are, besides these, two specimens labelled "Males," which agree in coloration with the female, except that the head and neck above are not greyish, but dark rusty brown, like the upper parts; these, no doubt, are young males.

A third specimen, also marked as a male, is changing from the rufous to the slate-grey dress.

12. CALORNIS PACIFICUS (Gm.); Finsch, *l. c.* p. 31.

One male.

13. APLONIS PELZELNI, Finsch, *l. c.* p. 32, t. 2. fig. 3.

One male, exactly like my description.

14. ERYTHRURA, sp. inc., Finsch, *l. c.* p. 35.

It is to be regretted that this collection does not contain well-prepared specimens of this Finch, as those in the first collection of M. Kubary could not be made out, on account of their preservation in alcohol.

## 15. PTILONOPUS PONAPENSIS, sp. nov.

"*Pt. fasciatus*, Peale," Finsch, *l. c.* p. 37.

Like *Pt. porphyraceus* (from Tonga), but head, neck, throat, and breast decidedly straw-yellowish (not greenish grey); broad ends of all the tail-feathers (c. 8''') dark yellow (not whitish).

Size as in *Pt. porphyraceus*: long. tot. c. 8'', al. 5'', caud. 2'' 7'''.

In my first paper I referred the *Ptilonopus* from Ponapé, with a mark of doubt, to *fasciatus*, Peale, having had only specimens preserved in alcohol, which had apparently caused some discoloration; but I expressed my suspicion that they might belong to a distinct species. Having now before me fresh-skinned and adult specimens, I see that my latter supposition was right. The *Ptilonopus* of Ponapé comes nearest to *Pt. fasciatus* and *Pt. porphyraceus*, having the same dark purplish-red cap, surrounded with a faint yellow line (as in *Pt. fasciatus*), but may be distinguished at once from both by the straw-yellow coloration of the remainder of its head and neck and under surface to the vent (which had faded in the previous specimens preserved in spirit), as well as by the colour of the ventral patch. In the latter respect it comes nearest to *Pt. porphyraceus*, the ventral patch being likewise dark green, but with a slight tinge of violet. The broad yellow apical margin of the tail-feathers is also characteristic of *Pt. ponapensis*. The lilac median spots of the outer

secondaries are as in *Pt. fasciatus*, which differs in its purplish vinaceous-red vent-patch.

16. *CARPOPHAGA OCEANICA*, Less.

One female, exactly agreeing with specimens from the Palaos (Pelew Islands), except that the hind neck and front part of the mantle are of a darker grey. Size the same.

Not yet recorded from this locality.

17. *PHLEGÆNAS ERYTHROPTERA* (Gm.)?

Male adult. Front and sinciput to behind the eye, and a narrow line bordering the sides of vertex and occiput, white, as well as the sides of the neck, chin, throat, and breast; sides of head dull brownish, mixed with new white feathers, showing that these parts become also pure white; vertex and occiput slaty black; nape, remainder of upper parts, and wings dark-brown; wing-coverts, scapulars, and some of the mantle-feathers margined broadly with shining coppery violet; underparts and under wing-coverts slaty black, like the remiges; tail-feathers the same, but on the basal half dark grey. Bill and feet horn-brown. A few feathers on the back and shoulders are margined with rufous, as well as the outer secondaries and the coverts of the primaries, showing remnants of the young plumage.

Young (labelled female). Front, sinciput, and sides of head dirty rusty-brown; chin, throat, and breast the same, but mixed and tinged with white; vertex blackish; upper parts not so dark brown, only some of the upper tail-coverts with purplish violet edgings; underparts below the breast dark slate-grey; remiges uniform slaty blackish.

Long. tot.	Al.	Caud.	Rostr. a		Tars.	Dig. med.	
			front.	lin.			
in.	in. lin.	in. lin.	lin.	lin.	lin.	in.	
c. 9½	5 5	2 8	7	15	10	♂ ad.	
..	4 11	..	7	14	10	Jun.	

Although it is very strange that, looking at the local distribution of the species of these Pacific Partridge-Doves, the far western island of Ponapé should yield the same species as is said to occur in the Tahiti group, I see no reason to separate the specimens before me specifically from that described by Latham as the "Garnet-winged Pigeon." His description answers pretty well; but having had no opportunity of comparing it with specimens of the true *P. erythroptera* from the eastern islands, which are very rare in collections, I have thought it desirable to add a mark of interrogation to my appellation, as on close comparison perhaps differences might appear which are not to be ascertained by descriptions only.

18. *GALLUS FERRUGINEUS*, Gm.

Male and female. Of the specimens from this locality, the male shows no difference from specimens from Sumatra, except that the



primaries are not cinnamon, but dull rusty brown, and the wings are a trifle longer (about  $\frac{1}{2}$  inch).

The female differs a good deal from a Sumatran specimen; the back, wings, and remainder of upper parts are blackish, nearly without rusty vermiculations; the wing-feathers are externally broadly edged with fulvous, which is the prominent coloration of underparts; the flank-feathers are margined with blackish; the feet are yellow (not dark, as in the Sumatran specimen).

Although no particulars are given, I am inclined to believe that the differences which this bird shows are due to a domestic state.

19. *CHARADRIUS FULVUS*, Gm.; Finsch, *l. c.* p. 38.

In Mr. Kubary's first collection.

20. *STREPSILAS INTERPRES*, L.

One male in winter dress, the other nearly in full plumage.

Ponapé is a new locality for this cosmopolitan species.

21. *ARDEA SACRA*, Gm.; Finsch, *l. c.* p. 38.

One white specimen (labelled female), and one slate-blue (also marked female). The latter shows only a few faint traces of white feathers along the middle of the chin.

22. *ACTITIS INCANA* (Gm.); Finsch, *l. c.* p. 38.

Sent previously by Mr. Kubary.

23. *STERNA BERGII*, Licht.

Male and female exactly alike.

Ponapé is a new locality for this Tern.

24. *STERNA FULIGINOSA*, Gm.; Finsch, *l. c.* p. 39.

In the former collection of Mr. Kubary.

25. *ANOUS STOLIDUS* (L.), *l. c.* p. 40.

The specimen sent by Mr. Kubary confirms my suggestion as regards the supposed *A. pileatus* in the Vienna Museum, collected during the voyage of the 'Novara,' near Ponapé.

26. *ANOUS LEUCOCAPILLUS*, Gould.

*A. leucocapillus*, Saunders, P. Z. S. 1876, p. 670, t. lxi. f. 3.

*A. tenuirostris*, Finsch (*nec* Temm.), pt., Journ. Mus. God. Heft viii. (1875) p. 42.

One specimen, a young one, with not fully developed wings, but in the full colour of the adult; the sides of the head are uniform black, and not tinged with grey, this being, according to Mr. Saunders, a chief point of distinction in *A. melanogenys*.

I may remark that in a good series of Sooty Terns, from Palau, which are *A. melanogenys*, Gould, = *A. tenuirostris*, Kittl. (not of Temminck, as given erroneously by me), there were two young birds, corresponding in size and colour with the one before me, which also

did not show any grey tinge on the sides of the head. *Cf.* P. Z. S. 1872, p. 114.

27. *GYGIS ALBA* (Sparrm.); Finsch, *l. c.* p. 40.

Recorded by Von Kittlitz as seen by him near Ponapé.

28. *PUFFINUS OBSCURUS* (Gm.); Finsch, *l. c.* p. 40.

Already sent by Mr. Kubary.

29. *PHAËTON CANDIDUS*, Briss.

Two males and one female; the sexes exactly alike; one male is tinged with very delicate rose-colour.

The island of Ponapé is a new locality for this widely distributed species.

4. On a Collection of Birds from Niuafoou Island, in the Pacific. By DR. OTTO FINSCH, C.M.Z.S., Director of the Museum of Natural History of Bremen.

[Received September 26, 1877.]

The island Niuafoou (Nina-fou, Niua-fu, Niu-Afohu, Onuafu, Niufu, Nua-fou, or Hope or Proby Island of the older maps), situated in lat.  $18^{\circ} 38'$  S. and long.  $174^{\circ} 55'$  W., halfway between the Navigators' and Viti groups, may be considered, although somewhat distant, as the most northern island of the Tonga or Friendly group. It was visited in 1866 by Dr. Gräffe; but his investigation as regards ornithology did not much increase our knowledge, as he only informed us of the occurrence of one bird on it, a Megapode already mentioned by Dr. G. Bennett (P. Z. S. 1862, p. 247), and described afterwards by the late G. R. Gray as *M. pritchardi* (P. Z. S. 1864, p. 41). I was therefore pleased to receive, through the Museum Godeffroy of Hamburg, an extensive collection of birds from this interesting island, made by Mr. F. Hübner, a young German collector recently engaged, for the exploration of the Pacific Islands, by Mr. Godeffroy.

This collection raises the number of the known birds of this island from one to fifteen; but I am able to include from Mr. Hübner's manuscript notes, kindly sent to me by Mr. Schmeltz, five species more, and make the total twenty species. It is worthy of remark that, according to Mr. Hübner's notes, no members of the genera *Ptilotis*, *Lalage*, *Halcyon*, or *Colluricincla*, so well known to him on the Tonga Islands, occur on Niuafoou. But it seems probable that further investigations will still add some more species, as the absence of peculiar species (except *Megapodius stairi*, which does not occur in Samoa and is confined to this island) is rather strange.

1. *STRIX DELICATULA*, Gould.

Native name *Lulu*, Hübner.

One female; agrees in every respect with that from Eua.

## 2. DOMICELLA FRINGILLACEA (Gm.).

Native name *Hega*, Hübner.

Three specimens (October 1876); not differing from those from Eua. A young bird shows only a few red feathers on the vent; but the red and blue on the head is the same as in old birds.

## 3. EUDYNAMIS, sp. ?

Mr. Hübner (*in litt.*) mentions having heard the call-note of a *Eudynamis*, which, no doubt, will turn out to be *E. taitiensis* (Sparrm.).

## 4. COLLOCALIA, sp. ?

There is no specimen of this genus in the collection; but Mr. Hübner writes:—"The *Beka-beka* (*Collocalia*) breeds in a hole of a rock on the lake in the interior of Niuafo. I always found two eggs or young ones in each nest. The natives laughed when I told them I wanted to obtain eggs of these birds, as they believed them not to lay eggs at all."

## 5. APLONIS TABUENSIS (Gm.).

Native name *Megi*, Hübner.

Three specimens (October 1876). The underparts look a little more brownish; but this may be caused by the specimens not being in full plumage and partially moulting; otherwise there is no difference from Eua birds in colour or dimensions, except that the bill is a little shorter; but this may also be a sign of immaturity.

## 6. PTILONOPUS PORPHYRACEUS (Forst.).

Native name *Kulu-kulu*, Hübner.

Two specimens, adult, male and female (October 1876); are exactly like specimens from Eua.

This species is easily distinguishable from *Pt. fasciatus*, Peale (who first obtained that species on the Navigators'), by the dark purplish-violet spot on the middle of the vent, which in *Pt. fasciatus* is dark purplish-rinaceous. All the specimens which I have inspected from Upolu and Uea (Wallis Island) agree in this respect; but I have no specimens from the Vitis for comparison. According to Mr. Layard (P. Z. S. 1876, p. 495) the Viti bird is of a different species, which he erroneously calls *Pt. apicalis*, Bp. As Bonaparte established his species on a specimen from Vavao (Tonga Island), it belongs undoubtedly to *Pt. porphyraceus*, whereas the name *fasciatus*, Peale, should stand for the Navigators' bird, having been founded on specimens from this locality. If the Vitian *Ptilonopus* is really different from *Pt. fasciatus* and *Pt. porphyraceus*, it must be renamed.

## 7. CARPOPHAGA PACIFICA (Gm.).

Not in the collection, but observed by Mr. F. Hübner.

## 8. MEGAPODIUS STAIRI, Gray, P. Z. S. 1861, p. 290 (Samoa!).

*M. pritchardi*, P. Z. S. 1864, p. 41, pl. vi. (Nina-fou).

*M. pritchardi* and *M. stairi*, F. & H. Ornith. Central-Polyn. pp. 153, 155.

*M. huttoni*, Bull. Trans. and Proceed. N.Z. Inst. iii. 1871, p. 14.

*M. pritchardi*, Hutt. ib. iv. 1872, p. 165.

*M.* (? *burnabyi*, Gray), Finsch, Journ. f. Orn. 1870, p. 420.

*M. stairi*, Finsch, ib. 1872, p. 52; Layard, P. Z. S. 1876, p. 496 (part.).

*M. burnabyi*, Layard, P. Z. S. 1876, p. 583 (part.).

Native name *Malau*, Hübner.

Male and female, old, and young bird (November 1876). The two former agree exactly in colouration and size; the last is considerably smaller, but in colour like the old.

Al.		Rostr. a rict.	Tars.		Dig. med.	Ung.	
in.	lin.	lin.	in.	lin.	lin.	lin.	
6	9	11	2	2	14½	7	♂
6	7	11	2	1	15	8	♀
5	5	9½	1	9	12½	6½	Jun.

Since Mr. Layard assures us that *M. stairi*, Gray, was based on specimens from Ninafu (and not from Samoa, where no Megapode exists) the older name must be applied to this species.

Mr. F. Hübner gives us the following observations on this bird:—“The breeding-time of this species is not so confined to certain months as has been noticed by Mr. Wallace in respect of certain Malayan species. He gives as the season of incubation August and September; but of this bird I got fresh eggs in October and November also, and, according to Captain Nagel and the natives, eggs are to be found likewise in other months. The newly hatched ones are yellowish-brown with brown undulations; their necks are feathered and not marked as in the old birds. Immediately after leaving the eggs the young birds are not only able to run, but also to fly. The old birds are excellent runners; their flight is somewhat heavy, as in the common fowl; when alarmed they perch on trees. The stomachs of those specimens which I shot I mostly found filled with land-shells, small crabs, and Scolopendras; but in a few cases I found seeds. My captured specimens I fed with Blattæ and Scolopendras, and the young ones (of which I kept one three weeks) with Termites and mashed cocoa-nuts. They refused to eat yams. The male may be distinguished at once from the female by its orange feet, which in the latter are yellow.”

#### 9. CHARADRIUS FULVUS, Gm.

Native name *Kiu*, Hübner.

Three specimens shot in October (1876) in change of plumage, showing that this arctic species loses its summer garb in its winter resorts. One specimen has already the full winter dress; the others are moulting and still show many black feathers on the under surface.

#### 10. STREPSILAS INTERPRES (Linn).

Native name *Kiu-hina-hina*, Hübner.

One male in the winter dress (October 1876).

11. *ACTITIS INCANA* (Gm.).

Native name *Kiu-lega-lega*, Hübner.

Three specimens, shot in October (1876); two in full winter garb, one moulting from summer to winter dress, showing most of the latter.

12. *ARDEA SACRA*, Gm.

Native name *Motuku*, Hübner.

One female, of a dusky slate-colour (October 1876).

13. *ORTYGOMETRA*, sp. inc.

A species of *Ortygometra* is mentioned by Mr. Hübner; most probably it will turn out to be *O. cinerea*, Vieill. (*quadririgata*, Horsf.), the most widely distributed and commonest species in the Pacific.

14. *RALLUS PHILIPPENSIS*, Briss.

Native name *Veka*, Hübner.

Three specimens (October 1876). One old male shows only traces of the maroon-coloured pectoral band, in every respect agreeing with specimens from the Navigators', Palaus, Tongas, New Zealand, and New Holland. Two young birds, one still half in dun feathers, are coloured in the same pattern as the old, but duller and colours less decided.

15. *PORPHYRIO*, sp. inc.

Mr. F. Hübner mentions the occurrence, according to the reports of the natives, of a *Porphyrio* which is probably *P. samoënsis*, Peale.

16. *ANAS SUPERCILIOSA*, L.

Native name *Toloo*, Hübner.

One specimen (October 1876).

Al.	Caud.	Rostr.	Tars.
in. lin.	in. lin.	lin.	lin.
8 3	2 9	20	18

Agrees with specimens from Eua and Navigators' which are, apparently, constantly smaller than the true *A. superciliosa* from New Zealand, as has been remarked already by Peale. In their smaller size they agree with *A. pelewensis*, H. & F. (Journ. Mus. Godeffr. 1875, p. 40); but the latter has the eye-stripe and sides of head isabelline-rusty, and the black cheek-stripe is nearly wanting.

17. *ANOUS STOLIDUS*, L.

Native name *Gogo*, Hübner.

A young bird (October 1876), just developing the wings and tail-feathers, uniform dusky, with white front. Bill not yet full-grown therefore very short (only 14'''), as are the wings (only 7'' 5''').

"This species breeds on trees or the precipitous rocks on the sea-side, and always lays but one egg."—*Hübner*.

18. *GYGIS ALBA* (Sparrm.).Native name *Tala*, Hübner.

One old male (October 1876).

The island Niuafo is a new locality for this widely distributed species.

"This species also lays but one egg, in a shallow hole on a horizontal branch of a tree, without any other material."—*Hübner*.19. *PUFFINUS OBSCURUS* (Gm.).*P. dichrous*, F. & H. Ornith. Central-Polyn. p. 244; Finsch, Journ. Mus. Godeffr. Heft viii. 1875, p. 44; id. ib. *Puffinus*, sp.? (Viti).*P. dichrous, obscurus, auduboni*, and sp.? (from Viti), Finsch, P. Z. S. 1872, p. 108–112.Native name *Teiko*, Hübner.

Male and female (October 1876), in every respect like specimens from Palau; the under tail-coverts are black, more extended in the male, with faint white tips.

Alæ.		Caudæ.		Culm.	Rostr. a	Alt.	Long.	Dig.	
in. lin.	in. lin.	in. lin.	in. lin.	lin.	riçt. lin.	basis. lin.	tars. lin.	med. lin.	
7 2	2 11	12	15	3½	16	15½			♂
7 5	3 2	12	16	...	16	16			♀

For several years I have paid special attention to the *Procellariidæ*, among the numerous members of which a good many still remain obscure generically and specifically; and none have troubled me more than the *Procellaria obscura* of Gmelin, described originally nearly a hundred years ago by Latham from Christmas Island.

In my former notes on this subject I have endeavoured to show that under this name were confounded about four species, nearly allied but differing in the coloration of the under tail-coverts and in the extent of the black and white on the cheeks. I thought it certain that there were at least two distinct species—one with black under tail-coverts (*Puffinus dichrous*, F. & H.), from the Pacific, the other with white under tail-coverts (the true *P. obscurus*, Gm.), from Madagascar. (Cf. Finsch, P. Z. S. 1872, pp. 108, 110, and Journ. f. Ornith. 1874, p. 208.) Since my last publication on this subject I have had the pleasure not only of examining one of Latham's types in the Vienna Museum (*P. tenebrosus*, Natt.), but also a series of specimens from the Palau group, together with others from Mauritius, Bourbon, and Madagascar, kindly lent to me by Dr. von Pelzeln and Professor Newton. The careful examination of this material, richer perhaps than any one has before had in aid of his studies, convinces me that the coloration of the under tail-coverts forms no distinctive character, as there exist all phases of graduation, from specimens with the under tail-coverts pure white to such as have these parts partially or nearly uniform black. The following notes taken of series of skins will prove this to be the case.

a. Latham's type from the Leverian Museum (now in the Vienna Museum), said to be from King George's Sound. Type of *P.*

- tenebrosus*, Natt. Under-tail coverts black with narrow white tips; the middle row with their shafts white. Exactly like specimens from the Palau group and M'Kean's Island (type of *P. dichrous*, F. & H.); the latter has the white on the base of the lateral under tail-coverts more extended.
- b. Specimens from Madagascar (Vienna Museum). Under tail-coverts of a uniform white.
- c. Specimens from Bourbon in the Leyden Museum (labelled in Temminck's handwriting *Puffinus obscurus* ♀, Temm. Man. d'Orn.). Like the foregoing, but the lateral under tail-coverts fringed with dusky on the outer web.
- d. Specimens from Mauritius (Coll. Newton). Lateral under tail-coverts on the whole outer web dusky.
- e. Specimens from Cape Florida (Deppe, Berlin Museum, *P. obscurus*, Audub., and type of *P. auduboni*, Finsch). "Longest lateral under tail-coverts uniform dusky, the anterior lateral under tail-feathers on the outer vane black, on the inner white."
- f. Specimen (s. n. *obscurus*?) from Mauritius (Coll. Newton). "Under tail-feathers dark brown, with white tips, exactly like Palau specimens."
- g. Specimens from Viti (*Puffinus*, sp.? Finsch, P. Z. S. 1872, p. 112, and Mus. Godeffr. 1875, viii. p. 45, note). "Under tail-coverts uniform smoky-black, with hidden white at their bases."

These notes will convince every one that the black or white of the under tail-feathers forms no specific character, and even less so the more or less extent of the black along the rictal line, which sometimes (according to the preparation of the skin) is cut off at the under margin of the eye, sometimes runs a little further down.

*P. obscurus* has, between the tropics, a wide distribution in the Atlantic and Pacific regions, but has not yet been observed along the coast of Europe, as has been maintained by Temminck, Schlegel, and others.

Its nearest ally, *P. anglorum*, may be distinguished by its larger size and lighter coloration.

On this species Mr. Hübner remarks:—"The *Teiko* lives on a small island, where during daytime it sleeps in holes in the rocks. I obtained my specimens when rowing just before daybreak in a canoe round the islands. We watched when the birds left their holes and, becoming confused by the glare of a torch, allowed us to catch them by hand."

## 20. PHAËTON CANDIDUS, Briss.

Native name *Tavaki*, Hübner.

One old female (November 1876).

5. On the *Tænia* of the Rhinoceros of the Sunderbunds (*Plagiotænia gigantea*, Peters). By A. H. GARROD, M.A., F.R.S., Prosector to the Society.

[Received October 1, 1877.]

In 1856<sup>1</sup> Dr. Wm. Peters described a tapeworm which he found in an African Rhinoceros from Mossambique, which he named *Tænia gigantea*.

In 1870<sup>2</sup> Dr. Murie described the adult proglottides of a tapeworm passed by an Indian Rhinoceros (*Rhinoceros unicornis*) living in the Society's Gardens at the time, which he named *Tænia magna*?

In 1871<sup>3</sup> Dr. Peters communicated to the Society a Note on the results of a comparison of his specimens of *Tænia gigantea* with Dr. Murie's description and figures of his *Tænia magna*?, showing their identity, and suggesting the generic name *Plagiotænia* for the species.

During this summer I have had the opportunity of eviscerating a half-grown female of *Rhinoceros sondaicus*, from the Sunderbunds, which had been a little more than six months in this country. In the commencement of the colon I found three tapeworms with their heads (scolecæ), together with several detached groups of proglottides<sup>4</sup>, these latter being quite undistinguishable from those figured by Dr. Murie, in form as well as size.

Dr. Peters has figured the scolex in his species, which is evidently in a powerfully contracted condition, to which one of my three specimens closely approaches. My other two specimens are not so, and, as a result, differ so much in appearance that I subjoin a figure of one of them.



Scolex of *Plagiotænia gigantea*, much enlarged; superior and lateral view.

Of the specimen here figured the breadth (after being kept in alcohol) of the scolex, opposite the suckers, is 4 millimetres, whilst the depth, to the lower of the two more strongly marked transverse

<sup>1</sup> Monatsb. der Akad. der Wissensch. zu Berlin, 1856, p. 469.

<sup>2</sup> P. Z. S. 1870, p. 608.

<sup>3</sup> P. Z. S. 1871, p. 146.

<sup>4</sup> In his account of his specimens Dr. Murie has most curiously mistaken the groups of proglottides (which he figures) for single segments.



lines below the suckers (the proliferating area), is 3 millimetres. The breadth of the largest of the proglottides is 3·1 centimetres, their depth being 4·5 millimetres. One decimetre from the end of the scolex the proglottides are 1·42 centimetre in breadth.

In one respect the scolex differs from that described by Dr. Peters, the rostellum or little conical elevation between the suckers being scarcely even indicated as such. This, however, seems hardly sufficient to justify specific separation.

It is an interesting fact that three different species of *Rhinoceros*, so separated in their distribution, should be troubled with the same tapeworm, which must therefore, unvarying, have followed the ancestral species in its different variations, now so easily distinguishable.

6. Notes on the Anatomy of the Chinese Water-Deer (*Hydropotes inermis*). By A. H. GARROD, M.A., F.R.S.,  
Prosector to the Society.

[Received October 1, 1877.]

Since the discovery by Mr. Swinhoe of the Chinese Water-Deer, which in the 'Proceedings' of this Society<sup>1</sup> he named *Hydropotes inermis*, naturalists have been anxious to obtain information upon its visceral anatomy, together with other features not ascertainable from adult skins or from the skeleton. At Tours our Corresponding Member M. J. Cornély has succeeded in breeding the species<sup>2</sup>, the Society having allowed him the loan of its male specimen, and his example being of the opposite sex. One of the three young ones, a female, having died shortly after its birth, M. Cornély forwarded it to Mr. Sclater, who has kindly placed it in my hands for description; and it is my notes upon this specimen which I take an opportunity of laying before the Society.

From the tip of the nose to the base of the tail the specimen is 16 inches, the tail being an inch long. From the top of the shoulder to the tip of the hoof of the fore limb it measures 12 inches. The colour of the hair, after being in spirit for some days and then dried, is a dark greyish brown, which is redder along the back than at the sides. The abdomen, as well as the throat, is a dirty white, as are the hairy inner surfaces of the ears.

The fawn is spotted with white<sup>3</sup>. The spots are not numerous or pronounced. They run in longitudinal lines from the neck to the tail, with a median area about 1·5 inch broad unspotted. There is one line, the upper, fairly defined and uninterrupted; two others, lower down, are irregular and shorter. The spots are not distinct,

<sup>1</sup> P. Z. S. 1870, p. 89.

<sup>2</sup> See M. Cornély's article in Bull. Soc. d'Acclim. 3<sup>e</sup> sér. t. iv. p. 417; and note, P. Z. S. 1877, p. 533.

<sup>3</sup> In the Society's 'Proceedings,' 1872, p. 817, Mr. Swinhoe remarks, "I learn from Mr. Russell that the fawn is spotted with dark-brown spots all over the hind quarters." I could not detect any trace of these.

because they are not produced by the presence of hairs which are white throughout, but by dark reddish hairs tipped with white for not more than one sixth of their length.

The nipples are four in number. The cruminal glands are quite small. No supraorbital glands were recognizable. In the fore limb the interdigital skin is inflected but slightly, and there is no special gland differentiated, although the surface of the skin is apparently studded with minute gland-openings. In the hind limb the interdigital skin forms a deep pocket, which almost completely separates the toes, except that they are joined by a thin transverse skin-fold along their posterior edges. The included skin is studded with small glands. I can find no trace of any metatarsal glands.

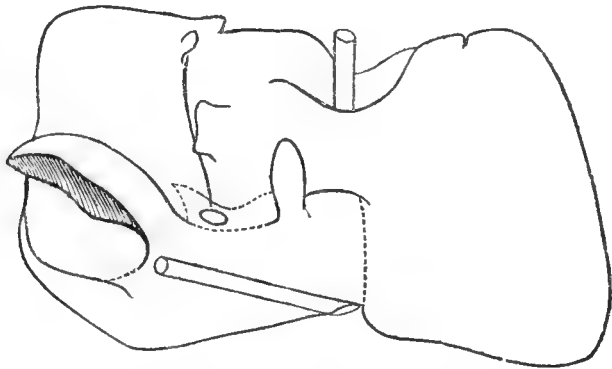
The muffle is as deep as broad, and extends one half up the outer margin of the narial orifice.

In the new-born female the milk-incisors and lower canines are cut, as is the sharp small upper canine. The milk-molars are in place, partly disguised by a layer of mucous membrane covering them. The anterior portion of the palate is covered with the ordinary transverse ridges, running outwards from the middle line; posteriorly it is smooth.

The tongue shows but little of the intermolar eminence. The fungiform papillæ are numerous, and stand out conspicuously. Postero-laterally they develop into lines of papillæ circumvallatæ.

The stomach is not favourable for study, because of its being so little developed. The villi on the rudimentary paunch look like the pile on thick-set velvet. The hexagonal cells in the reticulum are conspicuous though not high-walled. By the aid of a magnifying

Fig. 1.



Liver of *Hydropotes inermis* (still-born).

glass the psalterium is seen to be quadruplicate—in other words, to have its laminæ arranged in four powers, there being two primary laminæ, with secondary smaller folds between them, on each side of which are smaller laminæ, with linear rows of papillæ (rudimentary laminæ) between them, of the fourth power. The large abomasum is not peculiar.

The spleen is circular, flat on its gastric, and convex on its parietal surface.

The liver (fig. 1, p. 790) has no gall-bladder, therein being quite cervine. There are one or two minor lobules so situated as to develop a spurious cystic fossa; and what is still further interesting is, that in that fossa there is a white fibrous cord which runs from the transverse fissure nearly to the ventral margin of the abdominal surface of the right lobe, exactly in the situation of a gall-bladder. Once previously in a Deer (*Cervus virginianus*, I believe) have I seen a similarly situated fibrous cord, which I can hardly believe to be any thing else than an atrophied gall-bladder, although I was not able to trace its connexion with the bile-duct on account of the bad state of preservation of the specimen.

The Spigelian lobe is proportionally well developed, being tongue-shaped (or rusiform) as in the genus *Rusa*. The caudate lobe is of fair size. The umbilical fissure is shallow, the left hepatic lobe being slightly smaller than the right, both being of a square shape.

The intestines measure 9 feet 8 inches, the small intestines  $7\frac{1}{2}$  feet long, the large 2 feet 2 inches. The cæcum is  $1\frac{1}{2}$  inch long. No trace is visible of an ileo-cæcal gland. There are  $2\frac{1}{2}$  colic coils, there being an irregular reversed half-loop in the returning portion of the spiral.

In the bicorn uterus of this new-born animal the cotyledonary papillæ are as manifest as in that of the pregnant adult. There are four in one cornu and three in the other, the highest of these in the latter being particularly large. I have, in my paper on the visceral anatomy of the Ruminantia (P. Z. S. 1877, p. 12), mentioned that in a pregnant uterus of *Hydropotes*, which was lent me kindly by Mr. Ewart, of University College, there were three cotyledons in one cornu and five in the other, which agrees very closely with the specimen under consideration.

The brain is very much like that of the Pudu Deer (*Cervus pudu*) figured by Prof. Flower<sup>1</sup>, mainly differing in that the hippocampal gyrus is much less conspicuous upon the superior aspect. It is considerably more convoluted than that of *Moschus moschiferus*, upon the typical Ruminant pattern. I take the opportunity of figuring it (*vide* fig. 2, p. 792) from above.

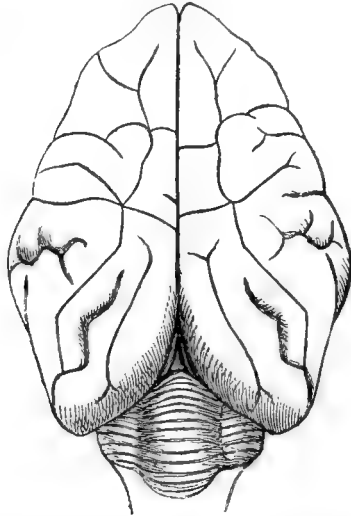
Reviewing the above-described anatomical features, the differences between the visceral anatomy of *Hydropotes inermis* and *Moschus moschiferus* clearly indicate the slightness of their relationship. In the former we find a fairly convoluted brain, a quadruplicate psalterium with 10 primary laminæ, no ileo-cæcal gland, no gall-bladder, two and a half colic coils, and an oligocotyledonophorous uterus; whilst in the latter the brain is comparatively smooth, the psalterium is duplicuplicate, with 20 or so primary laminæ, a large ileo-cæcal gland, a gall-bladder, three and a half colic coils, and a specialized linear cotyledonary arrangement. In other words, *Hydropotes* is typically Cervine, whilst *Moschus* is any thing but so.

To what group of the Cervidæ *Hydropotes* is most allied there is

<sup>1</sup> P. Z. S. 1875, p. 177.

still considerable uncertainty. That it is not allied to the New-World type is evident from its vomer not extending downwards to join the osseous palate posteriorly. That it is not Cervuline is

Fig. 2.

Brain of *Hydropotes inermis* (still-born).

equally certain on account of its tarsal cuneiform bones being free from the naviculo-cuboids. Its large hepatic Spigelian lobe favours the view suggested by Sir Victor Brooke<sup>1</sup>, that it is most closely allied to the Rusine Deer.

7. Note on the possible Cause of Death in a young Seal. By  
A. H. GARROD, M.A., F.R.S., Prosector to the Society.

[Received October 17, 1877.]

On October 1, 1877, Mr. G. Mellin presented to the Society a female Common Seal (*Phoca vitulina*), which died on the 9th of the same month. He obtained it from the Scilly Islands on September 27th, when it had attached to it the rudiments of the umbilical cord, which dropped off on the 30th, three days later. It must therefore have been born only a few days. When in the Society's Gardens it sucked milk freely from a baby-feeding bottle, and exhibited no pathological symptoms. As it did not take kindly to the water, it remained almost entirely on land.

On post-mortem examination it was found to be three feet two inches in length from the tip of its nose to the end of its tail, along the back. The lungs were of a dark red colour, collapsed, containing scarcely any air, and scarcely floating in water, otherwise also resembling those of a suffocated new-born child. The kidneys were

<sup>1</sup> P. Z. S. 1872, p. 525.

dark on section being made in the cortical portions, and quite white at the apices of the cones.

It is the heart which was peculiar, in that neither the ductus arteriosus nor the foramen ovale were obliterated, and they appeared to be as patent as they could ever have been in foetal life. The question then suggests itself as to whether the animal suffered from cyanosis, of which it died, or whether in the Pinnipedia the semi-foetal circulation continues for longer after birth than in other mammals.

The creature having lived for nine days in the Society's Gardens, and having lost the umbilical rudiment a day before it arrived, was probably about a fortnight old when it died, and ought, according to analogy with the human infant, to have lost all traces of the foetal cardiac peculiarities; whereas the ductus arteriosus and the foramen ovale were not even beginning to be obliterated. This can hardly have been otherwise than pathological, which leads me to the inference that it died morbidly cyanotic, perhaps because it lacked its normal maternal milk, and so was not in a condition to repair its foetal imperfections.

8. Note on the Absence or Presence of a Gall-bladder in the family of the Parrots. By A. H. GARROD, M.A., F.R.S., Prosector to the Society.

[Received October 17, 1877.]

In a former communication<sup>1</sup> I had the opportunity of showing that the generalization, founded upon the dissection of an insufficient number of genera, that the gall-bladder is wanting in the Columbæ, does not apply to *Carpophaga*, *Lopholæmus*, or *Ptilonopus*. On the present occasion I have to correct a similar error with reference to the Psittaci, because I have found a well-developed gall-bladder in specimens of *Cacatua philippinarum*, *Cacatua goffini*, *Cacatua moluccensis*, and *Calopsitta novæ-hollandiæ*, in which last-named species it is small and easily overlooked.

In my earlier dissections I have not recorded the presence of a gall-bladder in any species of Parrot. That, no doubt, is because, it being absent in so many, I did not expect to find it.

From the above facts it is highly probable that the presence of a gall-bladder in the Cacatuinæ will have to be included among the characteristic peculiarities of this subfamily. At the same time its persistence in them is in favour of the view that the Palæornithinæ, as restricted by me<sup>2</sup>, are but little different from the ancestral Parrots, and the Cacatuinæ still less so. The primitive Parrots must have possessed a gall-bladder—because we now know that this organ is present in the Cacatuinæ, and consequently was not absent in the primitive species, as the probability that it should have been independently developed a second time is infinitely little.

<sup>1</sup> P. Z. S. 1874, p. 257.

<sup>2</sup> P. Z. S. 1874, p. 594.

9. Reports on the Collections of Birds made during the Voyage of H.M.S. 'Challenger.'—No. V. On the *Laridæ* collected during the Expedition. By HOWARD SAUNDERS, F.L.S., F.Z.S.

[Received October 25, 1877.]

At the request of Mr. Scater, I have undertaken with much pleasure the determination of the *Laridæ* collected during the expedition of H.M.S. 'Challenger,' amounting in all to 47 specimens. It was hardly to be expected that amongst these any previously undescribed species would be found; but in consequence of the careful manner in which the specimens have been catalogued and labelled by Mr. John Murray, many of them are of great value in increasing our knowledge of the geographical distribution of the Oceanic birds. It is highly desirable that more attention should be devoted to this subject, instead of being limited, as is so often the case, to land birds only; and of the results which would probably reward such attention we may judge from the present small collection, which contains examples of 9 species, represented by 31 specimens, of Terns (*Sterna*), of 5 species, represented by 11 specimens, of Gulls (*Laridæ*), and of 3 species, represented by 5 specimens, of Skua gulls (*Stercorariidæ*); total 17 species, 47 specimens. Of these species, five have been obtained in absolutely new localities (three of them from places where they could hardly be expected to occur), whilst many of the other species derive unusual interest from the fact of their range being restricted to such seldom-visited spots as the rocks and islands of the South Atlantic. On the whole this collection of *Laridæ*, although small in numbers, is one of the most productive of knowledge which has yet been made by any of our national expeditions.

1. HYDROCHELIDON HYBRIDA (Pallas).

*Sterna hybrida*, Pall. Zoog. Rosso-As. ii. p. 338 (1811).

*Hydrochelidon hybrida*, Gray, Gen. B. iii. p. 660; Saunders, P. Z. S. 1876, p. 640.

[No. 364. ♀. Manila. January 11th–14th, 1875. Eyes black, feet dark red; stomach had crustacea.]

A nearly adult specimen, the head being slightly streaked with black.

2. STERNA VIRGATA, Cab.

*Sterna virgata*, Cabanis, J. f. Orn. 1875, p. 449; Saunders, P. Z. S. 1876, p. 646.

[1 specimen marked X on label. Christmas Harbour, Kerguelen Island.

1 specimen marked Θ on label. Ditto, ditto.

1 " " Ditto, ditto.

1 " " Betsey Cove. ditto.]

The first is nearly adult; but the black head is not yet fully

assumed, and the bill and feet are still reddish black ; in the second the black head only is wanting to complete the nuptial dress ; but the third is in full breeding-plumage, as is also a specimen in spirits.

The specimen from Betsey Cove is a young bird just fledged, many particles of down still adhering ; general colour sooty grey mottled with brown, and barred with black on the upper parts ; under wing-coverts white.

This somewhat specialized form has hitherto been only found at Kerguelen Island, and appears to be more closely allied to the New-Zealand species *S. antarctica*, Wagler, than to the less restricted form *S. vittata*, which also includes in its range portions of the same island. The principal specific distinctions of the two species are given in my paper on the Sterninæ above referred to.

### 3. STERNA VITTATA, Gm.

*Sterna vittata*, Gm. Syst. Nat. i. p. 609 (1788) ; Saunders, P. Z. S. 1876, p. 647.

[1 specimen. Inaccessible Island, Tristan d'Acunha, October 18th, 1873.

1 specimen. Royal Sound, Kerguelen Island, January 1874.]

Both these specimens are adults in breeding-plumage ; but the latter is not a very old bird, the outer webs of the long tail-feathers being still slightly tinted with grey, whereas in really mature examples they are long and white. In pointing out its specific characters (*l. s. c.*), I gave its then known range as from Kerguelen Island up to St. Paul's and Amsterdam Islands, about 700 miles to the north, apparently its head quarters, and as that of a straggler over the sea between St. Helena and Ascension ; but the fact of its having been obtained close to Tristan d'Acunha is an interesting extension of these limits. When treating of the few examples then available from the above-mentioned localities, I remarked that the affinities of this species were decidedly with *S. hirundinacea*, Less. (*S. cassini*, ScL.), of the extra-tropical coasts of South America and of the Falkland Islands ; and this view has subsequently been confirmed by the examination of a larger series brought home by the French naturalists from the Transit-of-Venus Expedition, at the same time that the two species are always perfectly distinguishable. But in the case of this individual from Tristan d'Acunha (its nearest known approach to South America), it is interesting to observe that, although the example is *undoubtedly* referable to *S. vittata* and *not* to *S. hirundinacea*, it comes nearer to the latter species than any other specimen yet examined. However, its relatively smaller size, grey colour, and the characteristic shortness of the foot and claws show distinctly that the bird in question is *S. vittata* ; and although it has a rather unusually long bill, yet there is an absence of the long curve characteristic of the American bird. It may be remarked that the bill in individuals of the present species seems to be peculiarly brittle and friable, which will account for the worn and blunted appearance often to be observed in the anterior portions of the mandibles.

There are the remains of an egg, labelled as taken at Heard Island,

February 1874, which evidently belongs to either *S. virgata* or *S. vittata*; I incline to attribute it to the former, owing to its size and dull appearance.

4. STERNA HIRUNDINACEA, Less.

*Sterna hirundinacea*, Lesson, Tr. d'Orn. p. 621 (1831); Saunders, P. Z. S. 1876, p. 647.

[No. 652, ♂. Messier Channel, Straits of Magellan, January 4th, 1876. Eyes black, bill and legs vermilion.

No. 723, ♂. } Elizabeth Island, Straits of Magellan, January  
 No. 724, ♀. } 18th and 19th, 1876. Eyes black; bill and legs  
 red; stomach had fish. A number of eggs  
 were preserved, there being a large "rookery"  
 at one of the low points of this island.]

Three fine and fully adult specimens of this well-known South-American species. Sixteen eggs from this locality are naturally rather larger than the type of those of *S. fluviatilis* or *S. macrura*; but otherwise they merely exhibit the same variations in markings.

5. STERNA BERGII, Licht.

*Sterna bergii*, Licht. Verz. Doubl. p. 80 (1823); Saunders, P. Z. S. 1876, p. 657.

[No. 77, ♂. Levuka, Fiji, July 30th, 1874. Eyes black; feet black, soles brown.] Nearly adult.

[No. 231, ♀. Dobbo, Arru Islands, September 16th and 17th, 1874. Eyes black; feet black; bill light yellow.]

A bird of the year.

[No. 345, ♂. Zamboanga, Philippine Islands, October 24th, 1874. Eyes black.]

Nearly adult, but in winter plumage, the head being merely striated and not black.

[No. 486, ♂. Nares Harbour, Admiralty Islands, March 3rd-10th, 1875. Eyes black.]

Adult, with the black head and crest, and the white frontlet band characteristic of the breeding-plumage.

6. STERNA FULIGINOSA, Gm.

*Sterna fuliginosa*, Gm. Syst. Nat. i. p. 605 (1788); Saunders, P. Z. S. 1876, p. 666.

[1 specimen ♀. Boatswain-bird Island, Ascension Island, about April 4th, 1873.

No. 124, ♀. } Raine I., Barrier  
 No. 125, ♂. } Reef, Australia } Eyes, bill and feet black.  
 Stomach of first contained a cuttlefish and a piece of coral; that of second, nothing. In great numbers. Eggs rounded and more spotted than those of the Noddy.]

Fifteen eggs of this species from Raine Island form a very fine series.



These three specimens are in adult breeding-plumage, the long outer tail-streamers being, however, somewhat abraded.

7. *GYGIS CANDIDA* (Gm.).

*Sterna candida*, Gm. Syst. Nat. i. 2, p. 607 (1788).

*Gygis candida*, Wagler, Isis, 1832, p. 1223; Saunders, P. Z. S. 1876, p. 667.

[2 specimens, ♂ and ♀. Boatswain-bird Island, Ascension Island, about April 3rd, 1873.

No. 546, ♀. } Tahiti. September 18th–October 2nd, 1875. Shot  
No. 547, ♀. } by Balfour on trees near Papuerini? Eyes black.]

There are also two specimens in spirits.

All these examples have bills broad at the base, although from the mandibular angle to the tip there is some slight variation, those of the Tahitian birds being more pointed, whilst in those from the volcanic crags of Boatswain-bird Island the bill is evidently worn down and blunted. In the coloration of the webs of the feet, also, the Tahitian birds are of a brighter lemon-colour; but the extent of this colour is the same in all, viz. down to and a little below the last joint of the middle toe. The shafts of the tail-feathers and of the primaries seem liable to become white with the age of the feather itself, owing to abrasion of the surface; but in no case are the characteristics wanting which distinguish this species from *G. micro-rhyncha*, only known at present from the Marquesas Islands, where the present species is also found. The fact of its being obtained near Ascension Island is an interesting addition to our knowledge of its range, as it has not yet been recorded on that side, so far as I am aware, beyond St. Helena.

8. *ANOUS STOLIDUS* (Linn.)

*Sterna stolidus*, Linn. Syst. Nat. i. p. 227 (1766).

*Anous stolidus*, Gray, List Gen. Birds, p. 100 (1841); Saunders, P. Z. S. 1876, p. 669.

[2 specimens. Inaccessible Island, near Tristan d'Acunha, October 16th, 1873. Eyes black. Live in caves and on trees.

No. 140, ♂. Raine Island, Australia. Feet, bill, and eyes black.

No. 444, ♀. At sea: lat. 1° N., long. 137° 11' E.

No. 485, ♀. Admiralty Islands, March 3rd–10th, 1875.

No. 564, ♂. At sea, near Tahiti, October 1875.]

In alcohol. Egg, and newly hatched young, St. Paul's Rocks, Atlantic, August 28th, 1873.

9 eggs from Raine Island, August 31st, 1874.

This is a very interesting series, showing the changes resulting from age, both in the individual and in the annual plumage. The examination of a great number of Noddies from various localities tends to show that specimens in clean and fresh plumage are very rarely to be met with; and the weatherworn appearance of some individuals, when compared with freshly moulted birds, would lead the superficial observer to suppose that he had before him distinct

species. The example No. 564 is an instance of this, it being a superb *old* bird, freshly moulted, with all the edges of the feathers perfect, the crown of the head of a pale lavender, and with much smoke-colour on the throat, neck, and breast; the primaries and tail-feathers like satin, and having in some cases not quite attained their full length; altogether the finest specimen of the common Noddy I ever saw. Both this and the next species are described in Mr. Murray's journal as being very abundant at the Admiralty Islands, hovering in immense numbers over shoals of fish. That the general range of these species is intertropical is tolerably well known; but it is somewhat surprising to find both this and *A. melanogenys* at Inaccessible Island, close to Tristan d'Acunha, in 37° S. latitude, on the peculiar domain of the Albatross and the Penguin. The two examples of *A. stolidus* from there are absolutely identical with specimens from the Tortugas; and I can find no reason for attributing any of the larger form to other than this species.

#### 9. ANOUS MELANOGENYS, Gray.

*Anous melanogenys*, G. R. Gray, Gen. Birds, iii. p. 661, pl. 182 (1849); Saunders, P. Z. S. 1876, p. 670.

*Anous tenuirostris* mult. auctorum, nec Temm.

[In alcohol. Adult, young in down, and egg. St. Paul's Rocks, Atlantic Ocean.

1 specimen. St. Paul's Rocks, August 27th, 1873.

1 specimen. Inaccessible Island, Tristan d'Acunha, Oct. 16th, 1873. In caves and on trees.

No. 484, ♀. Admiralty Islands, March 3rd and 10th, 1875.

No. 508, ♀. At sea. March 20th, 1875. Stomach contained small crustacea. Eyes black.]

In the adult specimen from St. Paul's rocks, where the breeding-season was far advanced, the feathers are much worn; and the bird from Inaccessible Island appears to be only a few months old, the portion of the bill in front of the mandibular angle being very short and weak. Under the head of the preceding species I have already remarked upon the noteworthy fact of these two Noddies being found so far south; and it would be interesting to know if they breed there. The specimens from the Admiralty Islands are adults.

#### 10. LARUS RIDIBUNDUS, L.

*Larus ridibundus*, Linn. Syst. Nat. i. p. 225 (1766).

[No. 363, ♂. Manila, January 11th and 14th, 1875. Eyes brown.

4 specimens, 2 ♂, 2 ♀. Yokohama, Japan, May 1875. Eyes brown.]

The Manila specimen and two of the Japanese are birds of the previous year; the other two are adults. One of these, a female, is remarkable for its small size, the wing (allowing for a deficient primary) being only 11.5 inches long; still I have seen and possess similar examples of diminutive females from other localities, as well as from Japan and China; and the other parts being in proportion, there is nothing else to distinguish this from the ordinary form.

## 11. LARUS CANUS, Linn.

*Larus canus*, Linn. Syst. Nat. i. p. 224 (1766?).

♂. Japan, May 1875.

A bird of the previous year; wing-coverts much abraded.

## 12. LARUS GLAUCODES, Meyen.

*Larus glaucodes*, Meyen, Obs. Zool. p. 115, pl. 24 (1834); ScL. & Salv. P. Z. S. 1871, p. 578.

[No. 650, ♂. Messier Channel, Straits of Magellan, January 4th, 1876. Eyes hazel, feet and bill reddish.]

A bird of a full year old, the tail being nearly devoid of the band showing immaturity; but the shoulders retain some brownish feathers.

Two eggs presented by Mr. Deans, of Stanley, Falkland Islands, marked "Tern Gull" appear to belong to this species, which is a well-known breeder in that group.

## 13. LARUS NOVÆ-HOLLANDIÆ, Steph.

*Larus novæ-hollandiæ*, Steph. in Shaw's Gen. Zool. xiii. pt. i. p. 169, ex Lath. (1825).

*Larus jamesonii*, Wils. Ill. Orn. pl. xxiii. et descript. (1831).

[No. 131, ♂. } Raine Island, N. Australia. Eyes white; bill

No. 132, ♀. } coral, tip darker. Only a few about the island.]

From its larger size and the difference in the amount of white on the primaries of the adults, this form seems to be fairly separable from *L. scopulinus*, of New Zealand, and is undoubtedly distinct from its ally, *L. hartlaubi*, Bruch, of the Cape of Good Hope. Specimens from the northern portions of Australia are much wanted; and these two examples are therefore of unusual value.

## 14. LARUS DOMINICANUS, Licht.

*Larus dominicanus*, Licht. Verz. d. Doubl. p. 82 (1823).

[1 specimen. Christmas Harbour, Kerguelen Island.

No. 683, ♂. Nassau Harbour, Straits of Magellan, January 11th-13th, 1876. Eyes grey; bill yellow; angle of lower mandible red.]

1 egg from Kerguelen Island } The latter partake rather more of the  
2 eggs from Elizabeth Island, } bold markings characteristic of the  
Straits of Magellan. } eggs of *L. marinus* than the former.

Two adult specimens. I can detect no specific difference between the examples of this form, which ranges from New Zealand to South Africa, and thence to the extra-tropical portions of South America.

## 15. STERCORARIUS ANTARCTICUS (Less.).

*Lestris antarcticus*, Less. Traité d'Orn. p. 616 (1831).

*Stercorarius antarcticus*, Saunders, P. Z. S. 1876, p. 321.

[1 specimen. Inaccessible Island, Tristan d'Acunha, October 16th, 1873.

1 specimen. Christmas Harbour, Kerguelen Island, January 1874.

No. 732, ♀. Falkland Islands, January-February 1876. Eyes hazel.]

The two former are of the usual dusky colour; the last shows the

pale yellow acuminate feathers on the collar, which are rarely absent in specimens from the Falklands.

16. *STERCORARIUS CHILENSIS*, Bp.

*Lestris antarcticus*, var. *c. chilensis*, Bp. *Consp. Av.* ii. p. 207 (1857).

*Stercorarius chilensis*, Saunders, *P. Z. S.* 1876, p. 323.

[No. 718, ♂. Elizabeth Island, Straits of Magellan, January 18th, 1876. Eyes brown; stomach had fish &c.]

A freshly moulted but somewhat immature specimen. Hitherto no examples of this well-marked form have been obtained beyond the eastern exit of the Straits of Magellan, its range being apparently to the westward and northward along the coast as far as the lat. 23° S. Since writing my notice of the *Stercorariinæ* (*loc. cit.*), I have had an opportunity of verifying the correctness of my opinions by the examination of Bonaparte's type in the Berlin Museum.

17. *STERCORARIUS POMATORHINUS* (Temm.).

*Lestris pomarinus*, Temm. *Man. d'Orn.* p. 514 (1815).

*Stercorarius pomatorhinus*, Newton, *Ibis*, 1865, p. 509; Saunders, *P. Z. S.* 1876, p. 324.

[1 specimen. Off Inosima, Japan, May 1875.]

A very fine adult bird, the golden tips to the feathers on the sides of the neck being very rich, and the dusky pectoral band being faint in the centre. This is quite a new locality for this species; for although its occurrence as a straggler once on the coast of Tenasserim, and once at Cape York, North Australia, would lead to the expectation that it would find its way downwards through the North Pacific, yet the only other locality on that side hitherto recorded is that of the Prybilov Islands, a long way to the N.W. The date, and the fact of this specimen being an adult, make this link in the chain of our knowledge of its geographical distribution particularly interesting.

10. Some additional Proof, if needed, of the Fact that the Red *Eclecti* are the Females of the Green ones. By Dr. A. B. MEYER, Director of the Royal Zoological Museum, Dresden. Communicated by the Secretary.

[Received 26th October, 1877.]

(Plate LXXIX.)

My assertion that the red *Eclecti* are the females of the green ones<sup>1</sup> did not at first meet with approval from many sides; but I suppose that now it begins to be looked upon as correct. Nevertheless it may not be superfluous to recur to the question, the more so as the facts which I have to record are much to the point.

Some time ago the Dresden Museum received a specimen of

<sup>1</sup> *Verh. k. k. zool.-bot. Gesellsch. Wien*, 1874, and *Mittheilungen a. d. k. zool. Mus. Dresden*, Heft i. 1875.

*Fig. 1.*



*Fig. 2.*



J.Smit lth

Hanhart imp.

TAIL OF ECLECTUS POLYCHLORUS.

$\frac{2}{3}$  n. s.



*Eclectus polychlorus* auct.<sup>1</sup> (C 3756 of the collection), which offers not the least deviation from a common specimen from New Guinea or Halmahera, except in the coloration of the tail-feathers: but just this coloration is very remarkable; viz. the left half of the tail and the under tail-coverts are partly coloured red, like the same parts in *Eclectus linnei*, as shown in the accompanying drawings (Plate LXXIX.), where fig. 1 represents the upperside, and fig. 2 the underside of the tail in the specimen.

It will be observed that one half of the tail in figs. 1 and 2 is coloured like the male, the other half like the female. In fig. 1, even a small red patch is to be seen on the right web of the middle rectrix; and in fig. 2 the edges of the inner web of the rectrices are reddish.

I had apparently strong evidence that the specimen in question came from Halmahera; but I am not able to distinguish the green specimen from Halmahera from the New-Guinea ones, notwithstanding the large series before me. It may be said that specimens from the islands Jobi and Mafoor appear to be somewhat darker, more bluish green than specimens from Halmahera and New Guinea, where this colour is a little brighter, or golden-tinged; but specimens from Halmahera and New Guinea are, in my opinion, not to be distinguished with certainty. I nevertheless do not doubt that the specimen in question comes from New Guinea and not from Halmahera, as the red parts on it correspond entirely with those of the red *Eclecti* from New Guinea, and not with those of the red ones from Halmahera, which have these parts of a yellowish colour.

I do not exactly know how to interpret this remarkable coloration. Is it something of a hermaphroditism? or is it the remains of the dress of the young male? The specimen is not an old one, the bill showing no traces of having been used very long; else one would perhaps suggest that it is a very old female, which has adopted the dress of the male, and where the red is the remains of the female plumage; but this last supposition is out of the question.

Formerly (*l. c.*) I discussed the question whether the young bird in both sexes is plain green or not; but I now believe that it is red in both sexes, *i. e.* bears the dress which the female keeps during its whole life. To this belief I came when I saw the specimen No. 22428 of the Berlin Museum (which Professor Peters kindly sent me for inspection), mentioned by Prof. Cabanis and Dr. Reichenow in the 'Journ. f. Ornithol.,' 1876, p. 324<sup>2</sup>) as a young male from New Britain. This is a green specimen, which has everywhere on the wing and its coverts dark purple-red patches of the colour which the female always has. These patches appear to be in dissolution, or fading away; and if this really is the case, and if the specimen is a normal one, we have the proof that the young male is

<sup>1</sup> This specimen was formerly in the Görlitz Museum, whose Curator, Dr. Peck, kindly transmitted it to the Dresden Museum; and I have to thank him cordially for his courtesy. Dr. Peck published a note on this specimen in the Sitzungsberichte of the Zoological Section of the Naturf. Ges. of Görlitz, 26th Jan. 1875.

<sup>2</sup> The remark made there is not quite intelligible, because, as I hear from Dr. Reichenow, the words "ist der junge Vogel" have been omitted after the word "Geschlechter."

coloured like the female—a fact which would be in accordance with numerous others in ornithology. These red patches in the Berlin specimen are chiefly in the middle of the webs, of which the edges are quite green. I will not and cannot decide whether this is the general mode of changing the colour, the specimen in the Dresden Museum, above described, having just the edges of the web still red, whereas the basal part is green.

Besides, one of the younger male specimens from New Guinea, which I collected myself (C 1306 of the Dresden Museum), has some faint traces of red on the secondaries—a fact which I had overlooked till now: this specimen is older than the Berlin one, as the coloration of the bill clearly proves; but it is still young; and I therefore doubt the less that the young male is always red like the female. That this has not been already shown by many specimens is a fact which I cannot sufficiently understand; besides, Dr. Beccari writes that the young ones offer the same differences as the adult birds (Ann. Mus. Gen. vii. 715).

At all events, whatever be the signification of these remarkable colorations, the specimens spoken of give very strong additional proof to my assertion *that the red Eclecti are the females of the green ones*<sup>1</sup>.

A short time ago Mr. Fiedler, of Agram, in the 'Orn. Centralblatt,' 1877, p. 87, reported that a green *Eclectus polychlorus*, dissected in his town, proved to be a female. I did not succeed in getting fuller particulars of this case, but have a suspicion that it will range among those to which Mr. Forbes, in his paper on *Eclectus* in 'The Ibis,' 1877, p. 281, alludes; and the Rev. George Brown's cases will perhaps come under the same head.

The "♂ ad." specimen, mentioned by Prof. Cabanis and Dr. Reichenow (*l. c.*) from New Britain, was brought over alive on the 'Gazelle,' died in Berlin, and was dissected by Prof. Peters; it proved to be a male, and it is a green individual.

Dr. Bolau has recently mentioned (Zool. Garten, 1877, p. 295) an *Eclectus linnei* from the Solomon Islands, which died in the Zoological Garden of Hamburg. He kindly informed me that it was a female, and is now in the Museum Godeffroy of that town. Mr. Schmeltz was so obliging as to send me the specimen for inspection (it is No. 14519 of that Museum); and I remark that not only are green spots to be seen on the tertiaries, but that also some of their inner webs are nearly entirely green. This specimen shows the red of the head and throat as well as the under tail-coverts tinged with yellowish, very different from the red in the specimens from New Guinea and the islands of Geelvink Bay. I do not know whether this is an individual variation, a consequence perhaps of the state of captivity,

<sup>1</sup> Count Salvadori mentions (Ann. Mus. Civ. Gen. vii. p. 756), on the authority of Signor d'Albertis, that this is a well-known fact in the Moluccas and New Guinea. If this is the case, it is to be wondered at that neither Wallace, nor Bernstein, nor Rosenberg, who all spent years in those regions, knew the Malay language well, and procured large series of males and females, nor any one else reported the well-known fact, or at least took the trouble to prove or disprove its truth.







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G Sowerby lith

Hanhart imp

HELIX SEPULCHRALIS. AND ITS ALLIES.

or whether all the Solomon-Island specimens show this obvious tint. Besides, the blue of the belly appears to be deeper, and some feathers have in certain lights a greenish shade.

11. Notes on the *Helix sepulchralis* of Férussac and its Allies ; with Descriptions of two Species. By GEORGE FRENCH ANGAS, C.M.Z.S., F.L.S., F.R.G.S., &c.

[Received October 26, 1877.]

(Plate LXXX.)

The confusion that appears to exist amongst conchologists with regard to the nomenclature of certain land shells from the island of Madagascar (hitherto passing as varieties of *Helix sepulchralis* of Férussac) has induced me to make a careful examination of this somewhat protean group of Snails. After having referred to all that authors have written concerning them, and inspected a very large series of specimens, I am of opinion that several species, each presenting certain constant and distinctive characters sufficient to justify their separation, have been mixed up under the general name of *sepulchralis*.

Férussac, in his 'Hist. Moll.,' first describes *Helix sepulchralis*, giving the diagnosis of the species as follows:—"H. *testa orbiculato-convexa, subdepressa, late umbilicata, glabra, castanea, subtus albo zonata, apice alba; labro valde expanso, intus albo, margine reflexo.*"

The type shell is figured by Férussac on plate 75. fig. 1; and on plate 75 c there are given as varieties figs. 1-12. Pfeiffer, in the 'Monographia Heliceorum viventium,' also says *Helix sepulchralis* is "*late umbilicata.*" Reeve, in the 'Conchologia Iconica,' describes the species as being *broadly* umbilicated, and on plate 39 of his Monograph of *Helix* gives three figures. The first of these, 147 a, represents the true *sepulchralis*; 147 b is a distinct shell, and has since been described and figured by Crosse in the 'Journal de Conchyliologie' for 1869, p. 391, plate 12. fig. 3, under the name of *Helix subsepulchralis*; whilst 147 c I regard as a third species, for which I propose the name of *Helix hova*.

Amongst the shells thus confused together under the general name of *sepulchralis*, there appear to me to be at least four separate species, all of which, though displaying, more or less, certain characters which I regard as belonging to the group, are yet easily recognizable at once as being distinct.

First comes the *Helix sepulchralis* proper (Plate LXXX. figs. 1, 2), the leading characters of which may be thus briefly noted. Shell double the size, or nearly so, of its allies; *widely* and *perspectively* umbilicated; spire very slightly raised; whorls with the concentric depression moderate, and carried through all the whorls to the apex; the upper surface of the body-whorl coarsely obliquely plicately malleated; colour either dark purplish chestnut, or pale olive-green inclining to violet near the apex, with occasionally a white band surrounding the umbilical region, but *never banded above*.

Secondly, *Helix subsepulchralis*, Crosse (Plate LXXX. fig. 3.). Shell much smaller and more solid; spire conical; whorls with the concentric depression and coarse plication absent; colour dark chestnut, with a narrow white band at the periphery and a broader one at the base; umbilicus more contracted, and non-perspective; umbilical region invariably of a dark colour; whilst the brown colouring shows on the interior of the lip. This is the shell figured by Reeve as *H. sepulchralis*, var. *b*.

Thirdly, I will briefly diagnose the shell figured as var. *c*. This appears, on the examination of many specimens, quite distinct from the *H. subsepulchralis* of Crosse. The shell is about the same size, but less conical; the umbilicus is more contracted; there is a faint development of the depression on the upper part of the last whorl; the painting invariably consists of three broad chestnut zones on a pale yellowish-olive ground; and the umbilical region is constantly of a light colour. For this species I propose the name of *H. hova*.

Fourthly comes another shell, equally distinct, somewhat larger than the last two, but never attaining the size of the true *sepulchralis*, from which it differs also in form, being less flattened and more compact; it wants the oblique plications, but has the concentric depression strongly developed, the lower edge of it being bounded by a prominent elevated keel; the base is very tumid in front, and forms a kind of abrupt carina bordering the *pinched* and *contracted* umbilicus. The colouring varies from dark chocolate-brown to pale green, banded with brown zones, whilst the umbilicus is almost invariably encircled by a light or dark band, sometimes by both. One marked character of this species is the freckled, diaphanous, more or less zigzag ornamentation of the epidermis, which gives to the shell a beautiful appearance, and is never discernible in *H. sepulchralis*. The species, of which there is a bad figure in Férussac (pl. 75 c. figs. 6, 7), I propose to call *Helix sakalava*.

**HELIX HOVA, n. sp.** (Plate LXXX. figs. 4, 5.)

Shell moderately umbilicated, depressedly conical, rather solid, under the lens extremely finely shagreened, greenish yellow with three broad chestnut bands; whorls  $4\frac{1}{2}$ , rather convex, the depression on the upper surface of the last whorl very slight; base rounded, with a moderate excavation round the umbilicus, which is somewhat contracted and non-perspective; aperture oblique, quadrately ovate, white within; outer lip moderately expanded and reflexed, pure white; margin joined by a thick white callus.

Diam. maj. 1 in. 5 lines, min. 1 in., alt. 10 lines.

*Hab.* Madagascar.

**HELIX SAKALAVA, n. sp.** (Plate LXXX. figs. 6-11.)

Shell umbilicated, orbicular, moderately solid, very minutely irregularly granulated above and below, chestnut, with a pale band surrounding the umbilical region, and more or less freckled throughout with angular or zigzag ochraceous diaphanous markings; spire very slightly raised, apex obtuse; whorls  $4\frac{1}{2}$ , rapidly increasing, the last

whorl large and inflated, impressed on the upper part with a broad concentric groove, the lower edge of which is bordered by a blunt prominent rib or keel just above the periphery, and with an obtuse tumid carina below surrounding the umbilicus, which is somewhat small, contracted, and non-perspective; aperture oblique, quadrately ovate, white or very pale ash-colour within; outer lip thickened, expanded and sharply reflexed, somewhat angularly dilated and obsolete toothed in the middle, white; margin approximating, joined by a moderate callus.

Average diam. maj. 1 in. 6 lines, min. 1 in. 2 lines, alt. 9 lines.

*Hab.* Madagascar.

Var. *a.* Shell entirely white, with a pale olive-yellow epidermis.

Var. *b.* Shell pale green, with three brown bands, and freckled with light diaphanous markings.

Var. *c.* Shell pale yellowish olive, irregularly painted with longitudinal brown flames, and with the typical band round the umbilicus.

The specimens figured are selected from a fine series of Madagascar shells in the collection of Sir David Barclay, Bart.

#### EXPLANATION OF PLATE LXXX.

- Figs. 1, 2. *Helix sepulchralis*, Fér., p. 803.  
 3. — *subsepulchralis*, Crosse, p. 804.  
 4, 5. — *hova*, Angas, p. 804.  
 6-11. — *sakalava*, Angus, p. 805.

December 4, 1877.

Prof. A. Newton, F.R.S., in the Chair.

The following report on the additions to the Society's Menagerie during the month of November 1877 was read by the Secretary:—

The total number of registered additions to the Society's Menagerie during the month of November 1877 was 75, of which 3 were by birth, 34 by presentation, 26 by purchase, 3 by exchange, and 9 were received on deposit. The total number of departures during the same period, by death and removals, was 99.

The most noticeable additions during the month were:—

1. A three-banded Armadillo (*Tolypeutes tricinctus*), from Brazil, purchased November 3rd. Of this scarce form of Armadillo, remarkable for its possession of the faculty of rolling itself up into a ball, we have had no living example since 1865.

2. A young example of Brown Pelican of the West Indies (*Pelecanus fuscus*), purchased Nov. 16th. This Pelican is seldom met with in captivity; and we have had no examples of it in our collection since we lost those described and figured in the Society's 'Proceedings,' 1868, p. 268, pl. xxv.

3. A Brown Tree-Kangaroo (*Dendrolagus inustus*), purchased November 19th. Of this rare animal we have received no specimen since 1865. The present example was obtained from M. Léon

Laglaize, who brought it back with him from his recent successful expedition to New Guinea.

4. An example of the Maned Fox of South America, or Brazilian Wolf (*Canis jubatus*), purchased Nov. 30th. Of this remarkable carnivore no specimen, so far as I know, has been previously brought alive to Europe; and it is even a desideratum in many museums.

Our example, which is young, probably not quite full-grown, was obtained for the Society through the agency of Mr. Petty, of Buenos Ayres, who states that it is the only specimen he has met with in captivity during many years in which he has been in the habit of interesting himself in living animals. The figure of Burmeister (Erläut. zur Fauna Brasiliens, p. 25, pl. xxi.) does not quite agree with our individual, which, as will be seen by the drawing now exhibited (Plate LXXXI.), is of a nearly uniform foxy brown colour, and has the interior of the large ears densely clothed with woolly hairs.

Mr. Henry Seebohm exhibited some of the rarer eggs and birds which he obtained on his recent visit to the arctic regions of the Yen-e-say in East Siberia, and gave a rapid sketch of his journey.

Amongst the eggs which he exhibited were those of *Turdus pallens*, *Phylloscopus borealis*, *P. tristis*, *P. superciliosus*, *Accentor montanellus*, *Emberiza pusilla*, *Charadrius longipes*, *Tringa minuta*, *Anser ruficollis*, and *Cygnus bewickii*.

Some of the most interesting skins were those of birds in immature plumage, *e. g.* :—young in down of *Charadrius longipes*; young in first plumage of *Turdus iliacus*, *T. pilaris*, *T. fuscatus*, *T. atrigularis*, *T. pallens*, *Emberiza pusilla*, and *Anthus richardi*.

He also exhibited young in first plumage of *Locustella certhiola* (Pallas, nec Middendorff), and pointed out the identity of this species with *L. rubescens* of Blyth, *L. doriae* of Salvadori, and probably with *L. minor* of David and Oustalet.

He also pointed out that *L. ochotensis* of Middendorff (of which he had examined the types in the St. Petersburg Museum) was not a good species, being the young in second plumage of *L. certhiola* (Midd. nec Pall.). Of this species he exhibited two specimens of the adult—one from Kamchatka, the type of *L. subcerthiola* of Swinhoe, and a second skin from Urup Isla, south of Kamchatka,—and a specimen of the young in second plumage, the type of *Arun-dinax blakistoni* of Swinhoe (Ibis, 1876, p. 332, pl. viii. fig. 1).

Mr. Seebohm also stated that an examination of the skins of certain *Acrocephali* in the St.-Petersburg Museum, collected by Prjevalsky in the valley of the Ussuri, in Swinhoe's collection, obtained by him in China, and in the collections of Lord Tweeddale and the British Museum, obtained by Wallace and others in the islands of the Malay archipelago, had convinced him that *Acrocephalus fasciolatus* of Gray and *Calamoherpe subflavescens* of Elliot were identical, and were the young in second plumage of *Acrocephalus insularis* of Wallace, of which *Calamoherpe fumigata* of Swinhoe is a synonym.

He also exhibited a series of hybrids between *Corvus corone* and *C. cornix*, which habitually interbreed in the valley of the Yen-e-say.



Del. J. Smit lith

Hanb art imp

CANIS JUBATUS.





Other skins were principally interesting as extending our knowledge of geographical distribution, such as those of *Phylloscopus trochilus* and *Acrocephalus schoenibænus* from long. 88° E., *Anthus gustavi* of Swinhoe (= *A. seebohmi* of Dresser, = *A. batchianensis* of Gray) from the same longitude, and young birds in first plumage of this species from the Kurile Islands.

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Mr. W. Saville Kent, F.Z.S., exhibited the plans of a Zoological Station and Museum and Institute of Pisciculture to be established at St. Helier's, Jersey, of which he was the originator. The object sought in the establishment of this institution was the provision within British waters of facilities for pursuing marine biological investigations similar to those which exist at the Naples Aquarium and Zoological Station, and at the Anderson School of Natural History at Penikese Island, Buzzards Bay, U. S. A.

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The Secretary exhibited on the part of Mr. A. Anderson, F.Z.S., one of the spotted eggs of *Ascalaphia coromanda* referred to by him at p. 316 of the Society's 'Proceedings' for 1876. Mr. Anderson was of opinion that Owls laying such remarkably well-marked eggs was one of the most extraordinary facts in oology he had heard of. He regretted that the companion egg, which was equally well marked, had been left by an oversight in India.

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The Secretary also exhibited on the part of Mr. A. Anderson, F.Z.S., the young of *Rhynchops albicollis* and *Seena aurantia* on first exclusion from the egg-shells, these chicks having been hatched in Mr. Anderson's own house along with a number of others.

Mr. Anderson drew attention to the fact that there was no appreciable difference between the bills of the two species at this early stage, so that the extraordinary scissor-shaped bill of *Rhynchops albicollis* must be developed when the bird is in a state of adolescence.

Mr. Anderson had never yet succeeded in procuring one of these birds showing the partially developed bill, owing to their habit of keeping well in the centre of large rivers, and of secreting themselves on islands, sandbanks, and drift-wood on the first approach of danger.

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The Secretary also exhibited on the part of Mr. A. Anderson, F.Z.S., portions of the skins of the parent Grebes (*Podiceps cristatus*), together with two of the nestling birds in a downy state, the nidification of which had been described by him in 'Stray Feathers,' vol. iii. p. 274.

Mr. Anderson was of opinion that it was the extraordinary heavy rainfall during that year that had induced some of these birds to linger in the plains of the North-west Provinces for the purpose of breeding. Still he considered it likely enough that a few pairs regularly nested in the Oudh tarai, and on some of the larger sheets of water in Bundelkhand, where the country had not yet been thoroughly explored during the rainy season.

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The following papers were read:—

1. On the Capture of a Specimen of Risso's Grampus at Sidlesham, near Chichester. By HENRY LEE, F.L.S., F.Z.S., &c.

[Received November 20, 1877.]

In the publications of the Zoological Society are to be found so many valuable notices of the occurrence on the coasts of Great Britain of some of the rarer Whales that I feel I ought, as one of its Fellows, to have communicated to the Society before now the capture of a specimen of Risso's Grampus more than two years ago not far from Chichester.

On the 26th of July, 1875, a "large porpoise" was seen to be embayed in shallow water at Sidlesham, near Chichester; and a party of men succeeded in cutting off its retreat seaward, and driving it in shore. As the tide receded, it was left swimming in a deep pool; and its captors, after fastening a line with cork floats to its tail to mark its "whereabouts," telegraphed to Brighton information of its arrival. On the following morning an official from the Aquarium took charge of it, and it was conveyed alive to one of the large tanks there. Unfortunately, however, it only survived for twenty-four hours.

Being in a different part of the country at the time, I had not the pleasure of seeing it alive; and when I was able to examine it it was in the hands of Mr. Brasenor, the taxidermist. I was greatly pleased, however, to find that this "bull-head porpoise," as the local fishermen called it, was a Grampus of a species extremely rare in Britain—namely, *Grampus griseus* of Cuvier (which Professor Flower and others regard as identical with Risso's Grampus) and *G. cuvieri* of Dr. Gray. Only three specimens are known to have been previously taken on the English, and eight on the French coasts. In the stomach were many horny beaks of the common Squid (*Loligo vulgaris*) and twelve small stones.

The distinctive characters and measurements of this animal were as follows:—

*Vertebrae*.—Cervical 7, dorsal 12, lumbar and caudal 49; total 68.

*Ribs*.—12.

*Teeth*.—None in the upper jaw; in the lower jaw four on each side, on the anterior part of the ramus, separate, conical, acute, curved inward (especially towards the crown). Dental formula  $\frac{0.0}{4.4}$ .

*Dimensions.*

	ft.	in.
Total length . . . . .	8	0
Girth, in front of dorsal fin . . . . .	3	8
From upper lip to anterior edge of dorsal fin (following curve) . . . . .	3	7
From upper lip to blowhole (following curve) . . . . .	1	4
From upper lip to junction of anterior edge of pectoral fin with body . . . . .	1	7

	ft.	in.
Anterior edge of upper lip to angle of mouth ..	0	9½
Length of eye-aperture. . . . .	0	1
Pectoral fin; length from junction of anterior edge with body to tip . . . . .	1	2
Pectoral fin, from junction of posterior edge with body to tip . . . . .	0	11
Pectoral fin, breadth at base . . . . .	0	5
Dorsal fin, height in perpendicular line . . . . .	0	9
Dorsal fin from base to tip, following curve of an- terior edge . . . . .	1	6
Breadth of caudal fin . . . . .	1	9

*Sex.*—Male.

The number of vertebræ is precisely the same as that given by Professor Flower as found in an individual of this species, 10 feet long, taken in a mackerel-net near the Eddystone Lighthouse, on the 28th of February, 1870; and also exactly coincides with the number found by M. Fischer in a specimen of *Grampus griseus*, 9 feet 2 inches long, stranded in 1867 on the coast of La Gironde, France, and taken to Arcachon.

Although the absence of teeth in the upper jaw is constant and persistent, the dentition in the lower jaw varies considerably in this species. In Cuvier's specimen, described by him as *Delphinus griseus* from a skeleton and drawing sent to the Paris Museum from Brest, there were only two teeth on each side of the mandible, all much worn. In M. Fischer's specimen, already referred to, the dentition was the same as that of our Brighton Grampus; and of four others mentioned by D'Orbigny as having been stranded near l'Aiguillon, La Vendée, and recognized by F. Cuvier as identical with the Brest specimen, one, a young one 7 feet long, had the same number of teeth, namely four on each side of the lower jaw; whilst two older ones had respectively six and seven, blunt, carious teeth similarly placed. In Professor Flower's adult individual, there were  $\frac{0.0}{3.3}$ . If the identity of "Risso's Dolphin" with *Grampus griseus* be accepted, the variation extends even to  $\frac{0.0}{7.7}$ .

The colour of our Grampus from Sidlesham was the same as of those described by D'Orbigny, and of the specimen which ran aground, in the Isle of Wight, in the spring of 1843, the skull of which is in the British Museum—namely, bluish-black above and dirty white beneath. From the prevalent colour of this Isle-of-Wight specimen being black and not grey, Dr. J. E. Gray changed its specific name to "*cuvieri*," considering that the word *griseus* gave a wrong impression of the animal, and that Cuvier was induced to call it so by the bad colouring of the drawing sent to him.

Professor Flower has so fully described this species and every thing of interest relating to it in his very complete and elaborate paper published in the 'Transactions of the Zoological Society,' vol. viii. part 1, March 1872, that I need only refer, for further information, to that admirable memoir.

2. On a Collection of Lepidoptera made in Northern Formosa by H. E. Hobson, Esq. By ARTHUR GARDINER BUTLER, F.L.S., F.Z.S., &c.

[Received November 13, 1877.]

Through the kindness of Dr. Lockhart, I have recently had the pleasure of examining a collection of Lepidoptera sent home by Mr. Hobson, who has generously permitted me to select, for the national collection, those species which we required.

In 1866 Messrs. Wallace & Moore published, in the 'Proceedings' of this Society, a list of the Lepidoptera taken by Mr. Swinhoe at Takow: of the forty-six butterflies there enumerated seventeen only have reappeared in the present series; and some of these will not be recognized as the same, owing to changes which have arisen in the nomenclature of the Butterflies and in the views now held by many lepidopterists of the localized character of the so-called variations of certain species.

### RHOPALOCERA.

#### NYMPHALIDÆ.

#### DANAINÆ, Bates.

#### DANAIS, Latreille.

##### 1. DANAIS PLEXIPPUS.

*Papilio plexippus*, Linn. Mus. Lud. Ulr. p. 262 (1764).

Several examples.

##### 2. DANAIS CHRYSIPPUS.

*Papilio chrysippus*, Linn. Mus. Lud. Ulr. p. 263 (1764).

Two or three specimens.

##### 3. DANAIS MELANEUS.

*Papilio melaneus*, Cramer, Pap. Exot. 1, pl. 30. D (1775).

One example.

##### 4. DANAIS TYTIA.

*Danais tytia*, Gray, Lep. Ins. Nep. p. 9, pl. 9. fig. 2 (1846).

One example.

##### 5. DANAIS SIMILIS.

*Papilio similis*, Linn. Mus. Lud. Ulr. p. 299 (1764).

Tolerably common.

#### TERPSICHOIS, Hübner.

##### 6. TERPSICHOIS MIDAMUS.

*Papilio midamus*, Linn. Mus. Lud. Ulr. p. 251 (1764).

Two or three specimens.

## EUPLŒA, Fabricius.

## 7. EUPLŒA SWINHOEI.

*Euplœa swinhoei*, Wallace, Proc. Zool. Soc. 1866, p. 358.

A pair of this beautiful and rare species.

## SALPINX, Hübner.

## 8. SALPINX HOBSONI, n. sp.

♂. Allied to *S. vestigiata*, but darker and more brilliantly shot with purple, primaries with the *submarginal blue spots of about four times the size*; costal spot smaller, elliptical interno-median spot similar; *secondaries considerably darker*, excepting at anal angle, as dark and brilliantly purple-shot as the primaries, costal area greyish sericeous; cuneiform subcostal patch clearer and brighter in colour; three submarginal spots towards the apex, the uppermost one white, *the two others bright blue*: expanse 3 inches 6 lines.

A single fine male.

This species is, at first sight, so manifestly distinct from *S. vestigiata* that I feel no hesitation in characterizing it from a single example.

## SATYRINÆ, Bates.

## 9. MELANITIS ISMENE.

*Papilio ismene*, Cramer, Pap. Exot. 1, pl. 26. A, B (1775).

Several specimens.

## ELYMNIINÆ, Kirby.

## 10. ELYMNIAS NIGRESCENS.

*Elymnias nigrescens*, Butler, P. Z. S. 1871, p. 520, pl. xlii. fig. 1.

One shattered example.

This is the common *Elymnias* of Malacca.

## NYMPHALINÆ, Bates.

## 11. ATHYMA ZOROASTRES, n. sp.

Allied to *A. cama*, from Silhet, the male without the rufous discoidal streak in primaries; the white belt of secondaries broader above, below slightly contracted from the middle to the abdominal margin; ground-colour below altogether greyer, the pearly spots and belt of secondaries narrower and less clear; female above with all the pale tawny belts of little more than half the width, below with the same differences as in the male: expanse, ♂ 2 inches 3 lines, ♀ 3 inches.

A pair.

## 12. ATHYMA LEUCOTHŒ.

*Papilio leucothœ*, Linnæus, Mus. Lud. Ulr. p. 292 (1764).

Common.

13. *DIADEMA MISIPPUS*.

*Papilio misippus*, Linnæus, Mus. Lud. Ulr. p. 264 (1764).

Not uncommon.

An interesting male variety, approaching the female in coloration, occurs in the collection.

14. *DIADEMA KEZIA*, n. sp.

Allied to *D. philippensis*, but with the spots of the postmedian fascia of primaries well separated, smaller, and in an angular series, the primaries less brilliantly shot with blue, the submarginal spots of secondaries less sharply defined; wings below with all the white spots smaller, the large spot on the costa of secondaries being no larger than the other spots of the discal series; this series on both surfaces of all the wings continuous, not interrupted by the postmedian fascia of primaries: expanse, ♂ 3 inches, ♀ 3 inches 3 lines.

Common.

This is probably the *Diadema auge* of Wallace's list; we have five examples in the collection of the British Museum; there are others in Mr. Hobson's series; and I have seen several in private collections.

15. *DIADEMA PRISCILLA*, n. sp.

♀. Allied to *D. avia* (*jacintha*, Drury), but the primaries less falcated, all the wings darker, deep chocolate-brown; the primaries with a lustrous trifid blue patch beyond the cell (instead of the four blue spots of *D. avia*), a large bifid white subapical spot commencing the discal series; submarginal spots small and indistinct, otherwise as in *D. avia*; secondaries with all the spots white, the submarginal series, of small semicircular or conical spots, followed near the margin by a series of diverging linear white markings: wings below also darker, with similar differences to those on the upper surface (of course with no blue spots or patches); external angle of primaries blackish, disk of all the wings with scarcely perceptibly paler band: expanse 4 inches 3 lines.

One female.

This species is still nearer to the Bornean form, which, however, has not yet been described, so that I am compelled to compare it with the Indian one.

16. *NEPTIS EURYNOME*.

*Limenitis eurynome*, Westwood, Donov. Ins. China, pl. 37. fig. 3 (1842).

Several specimens.

17. *JUNONIA ALMANA*.

*Papilio almana*, Linnæus, Mus. Lud. Ulr. p. 272 (1764).

Common.

18. *JUNONIA ASTERIE*.

*Papilio asterie*, Linnæus, Syst. Nat. i. 2, p. 769 (1766).

One specimen.

## 19. JUNONIA ORITHYIA.

*Papilio orithyia*, Linnæus, Mus. Lud. Ulr. p. 278 (1764).

Several examples.

## 20. VANESSA ANGELICA.

*Papilio angelica*, Cramer, Pap. Exot. iv. pl. 388. G, H (1782).

One example.

## 21. CYRESTIS THYODAMAS.

*Cyrestis thyodamas*, Boisduval, Cuv. Règne Anim. Ins. ii. pl. 138. fig. 4 (1836).

One female.

The single specimen in the collection is smaller than the average of Indian examples; it is also slightly darker, but does not differ in marking.

## 22. PYRAMEIS CALLIRHOË.

*Hamadryas callirhoë*, Hübner, Samml. exot. Schmett. (1806-16).

One or two specimens.

## 23. PYRAMEIS CARDUI.

*Papilio cardui*, Linnæus, Faun. Suec. p. 276 (1761).

One specimen.

## 24. ARGYNNIS NIPHE.

*Papilio niphe*, Linnæus, Syst. Nat. i. 2, p. 785 (1766).

Two or three specimens.

## 25. MESSARAS ERYMANTHIS.

*Papilio erymanthis*, Drury, Ill. Exot. Ent. i. pl. 15. figs. 3, 4 (1773).

Common.

## PAPILIONIDÆ.

## PIERINÆ, Swainson.

## 26. TERIAS HECABE.

*Papilio hecabe*, Linnæus, Mus. Lud. Ulr. p. 249 (1764).

Several examples.

## 27. TERIAS ÆSIOPE.

*Terias æsiope*, Ménétrés, Cat. Mus. Petr. Lep. 1, pl. 2. fig. 3 (1855).

Several examples.

## 28. CATOPSILIA CHRYSEIS.

*Papilio chryseis*, Drury, Ill. Exot. Ent. pl. 12. figs. 3, 4 (1770).

Several examples.

## 29. CATOPSILIA NEPHTE.

*Papilio nephte*, Fabricius, Ent. Syst. iii. p. 190. n. 588 (1793).

Two females.

Possibly a local variation of the preceding species; it is much larger than *C. pyranthe*, with which I have associated it in my monograph of the genus.

## 30. CATOPSILIA PYRANTHE.

*Papilio pyranthe*, Linnæus, Syst. Nat. ii. 1, p. 763 (1766).

Var. *Papilio ilea*, Fabricius, Ent. Syst. Suppl. p. 421 (1798).

Both forms of this species.

## 31. CATOPSILIA GNOMA.

*Papilio gnoma*, Fabricius, Syst. Ent. App. p. 828 (1775).

One female.

## 32. HEBOMOIA GLAUCIPPE.

*Papilio glaucippe*, Linnæus, Mus. Lud. Ulr. p. 240 (1764).

One example.

## 33. APPIAS FORMOSANA.

*Pieris formosana*, Wallace, Proc. Zool. Soc. 1866, p. 356.

One male.

## PAPILIONINÆ, Bates.

## 34. PAPILIO SARPEDON.

*Papilio sarpedon*, Linnæus, Mus. Lud. Ulr. p. 196 (1764).

One or two specimens.

## 35. PAPILIO ERITHONIUS.

*Papilio erithonius*, Cramer, Pap. Exot. iii. pl. 232. A, B (1782).

Common.

## 36. PAPILIO XUTHUS.

*Papilio xuthus*, Linnæus, Syst. Nat. i. 2, p. 751 (1766).

Common.

## 37. PAPILIO PAMMON.

Var. *P. borealis*, Felder, Wien. ent. Mon. vi. p. 22. n. 2 (1861).

Several specimens.

## 38. PAPILIO MAACKII.

*Papilio maackii*, Ménétrié, Bull. Acad. Pét. xvii. p. 212 (1859).

One shattered example.

## 39. PAPILIO DEMETRIUS.

*Papilio demetrius*, Cramer, Pap. Exot. iv. pl. 385. E, F (1782).

Two shattered examples.



## HESPERIIDÆ.

## 40. PAMPHILA MATTHIAS.

*Hesperia matthias*, Fabricius, Ent. Syst. Suppl. p. 433 (1798).  
One or two specimens.

## 41. PLESIONEURA FOLUS.

*Papilio folus*, Cramer, Pap. Exot. iv. pl. 74. F (1779).

Several specimens.

This list of Diurnal Lepidoptera, taken in conjunction with that of Mr. Wallace in 1866, brings the number of Formosan butterflies up to 70: there is, however, little doubt that in a year or two we shall be able to add greatly to this number.

## HETEROCERA.

## SPHINGIDÆ.

## MACROGLOSSINÆ.

## 42. MACROGLOSSA PROXIMA?

*Macroglossa proxima*, Butler, P. Z. S. 1875, p. 4, pl. i. fig. 1.  
One rather rubbed specimen.

## CHÆROCAMPINÆ, Butler.

## 43. CHÆROCAMPA SILHETENSIS.

*Chærocampa silhetensis*, Walker, Lep. Het. viii. p. 143 (1856).  
One specimen.

## 44. CHÆROCAMPA JAPONICA.

*Chærocampa japonica*, Boisduval, Léop. Jap. p. 36 (1869).  
Two examples.

## ARCTIIDÆ.

## 45. AREAS LACTINEA.

*Phalena lactinea*, Cramer, Pap. Exot. ii. pl. 131. D (1779).  
One specimen.

## LITHOSIIDÆ.

## HYP SIN Æ, Butler.

## 46. HYP SA ZEBRINA, n. sp.

Allied to *H. dama*, but the thorax brownish above, the black transverse bands on the abdomen narrower, primaries more glossy and without the white veins, black spots at the base larger, longitudinal claviform white streak more regular: expanse, ♂ 2 inches 7 lines, ♀ 2 inches 6 lines.

A pair.

*H. dama* is a species only found in the Australian Region.

## CHALCOSIIDÆ.

## 47. CHALCOSIA DIANA, n. sp.

Allied to *C. idæoides*, but the veins and borders distinctly bluer,

bright ultramarine in certain lights, the subapical spots of primaries united into a continuous band, the postmedian band broader, the basal two fifths of interno-median interspace and the base of the cell white; secondaries with one or two white spots on the border; vertex of head and collar bright carmine, not spotted with green as in *C. idæoides*; abdomen bright metallic bronze-coloured, not pale metallic green: expanse, ♂ 2 inches, ♀ 2 inches 2 lines.

Several examples.

This species is smaller than *C. idæoides*, and somewhat more nearly allied to an undescribed species which Mr. Moore proposes to call *C. argentata*.

#### LIMACODIDÆ.

##### 48. ANZABE SINENSIS.

*Anzabe sinensis*, Walker, Lep. Het. v. p. 1093 (1855).

One example.

#### HYPOPYRIDÆ.

##### 49. SPIRAMA RECTIFASCIATA.

*Spiramia rectifasciata*, Ménétrics, Cat. Mus. Petrop. iii.

One example, a male.

#### OPHIUSIDÆ.

##### 50. OPHIUSA FULVOTÆNIA.

*Ophiusa fulvotænia*, Guénée, Noct. iii. p. 272. n. 1710.

One poor example.

3. Contributions to the Ornithology of the Philippines.—No. III. On the Collection made by Mr. A. H. Everett in the Island of Mindanao. By ARTHUR, Marquis of TWEEDDALE, F.R.S., President of the Society.

[Received December 3, 1877.]

(Plates LXXXII.—LXXXV.)

Visited by the French naturalist Sonnerat some 106 years ago, the large Philippine island of Mindanao has continued to be almost a *terra incognita* to the zoologist ever since, while the little knowledge of its animals we possessed was restricted to those inhabiting a small portion of its southern and western limb or peninsula in the neighbourhood of the principal Spanish settlement of Zamboanga.

Dr. Steere and the naturalists of the 'Challenger' Expedition<sup>1</sup> added some 40 species to the previously known total of nineteen Mindanao birds; but their researches were likewise confined to the country in the neighbourhood of Zamboanga.

<sup>1</sup> Dr. Steere added some twenty-nine species, and the 'Challenger' Expedition eleven.



Smit lith.

Hanhart imp

LORICULUS HARTLAUBI, 1♂ 2♀.





J. Smit lith.

Hanhart imp

MULLERIPICUS FULIGINOSUS





J Smit lth

CRINIGER EVERETTI

Hannart imp







J.Smit lith.

Hanhart imp

ORTHOTOMUS NIGRICEPS.



Mr. Everett last May selected new ground, and proceeded to Butuan, on the Butuan river, in North Mindanao, and afterwards changed his station to Surigao, situated at the most northern point of the island, and then to Placer on the north-east side. At these three stations he collected eighty-one species of birds during part of the months of May, June, and July, and has thus largely added to our knowledge of the avifauna of this little-explored island. Mr. Everett in one letter states that his work has been much interrupted by the rains, in another that he has been working under numerous drawbacks—fever, constant heavy rains, and impossibility of getting regular supplies of ammunition. That, in spite of all his difficulties, he should have done so much, redounds all the more to his untiring zeal.

To the total of fifty-nine known Mindanao birds Mr. Everett has added forty-three. Of these nine are new to science:—

<i>Tanygnathus everetti.</i>	<i>Dicaeum cinereigulare.</i>
<i>Mulleripicus fuliginosus.</i>	<i>Æthopyga bella.</i>
<i>Penelopides affinis.</i>	<i>Anthothreptus griseigularis.</i>
<i>Criniger everetti.</i>	<i>Leucotreron? incognita.</i>
<i>Orthotomus nigriceps.</i>	

Three are new to the Philippine avifauna:—

<i>Cisticola greyi.</i>	<i>Limnocinclus acuminatus.</i>
<i>Ægialites cantianus.</i>	

One, stated doubtfully to occur in some Philippine island, was not included in my list:—

*Phlogœnas crinigera.*

The number of species of birds now recorded from the island of Mindanao amounts to 99, from south-west Mindanao 59, and from north-east Mindanao 81. The grand total of birds inhabiting the Philippine area (as restricted by me) has been increased by Mr. Everett's researches to about 288.

1. CACATUA HÆMATUROPYGIA (1).

[Mouth of Butuan river, ♂, May. Iris dark brown; orbital skin white; bill lead-grey; feet grey. Placer, ♂ ♀, July.]

2. PRIONOTURUS DISCURUS (2).

[Surigao, ♂, June; Placer, ♂, July.]

3. TANYGNATHUS LUCONENSIS (3).

[Butuan, ♂, May; Surigao, ♂ ♀, May.]

4. TANYGNATHUS EVERETTI.

*Tanygnathus everetti*, Tweeddale, Ann. & Mag. N. H. ser. 4, vol. xx. p. 533 (December 1, 1877).

*Tanygnathus sumatranus* (Raffles), G. R. Gray, Hand-list, no. 8248, "Island of Sama."

♀. Whole head light green. Throat, breast, and abdominal

region the same, with an ochreous tint. Upper back and interscapulars dark green. First primary dark brown, very narrowly margined with green on outer web; remaining primaries brown, with the whole of the outer web green, and, towards the ends, some of the inner webs. Secondaries, and tertiaries above, green. All the wing-coverts green, narrowly margined with yellow. Quills underneath brown. Under wing-coverts green and yellowish green. Rectrices above green, like quills; below pale golden brown. Middle and lower back and uropygium deep torquoise-blue, not sky-blue. Upper tail-coverts green. Bill in dried skin white.

Wing 7 inches, tail 5, tarsus 0·75, bill from gape 1·00.

[Butuan, ♀, May. Iris orange.]

Only one example is sent by Mr. Everett; but while very close to *T. albirostris*, Wallace, of Celebes, it can be readily distinguished by the deep tone of the blue of the back and its smaller dimensions. An example from the Philippine island of Samar, obtained by Cuming, is in the British Museum, and is alluded to by Dr. O. Finsch (Pap. ii. p. 360) as being possibly *T. muelleri* of Celebes. Mr. Sharpe, who has compared *T. everetti* with Cuming's Samar example, writes:—" *T. everetti* certainly seems to me to be exactly the same species as the bird marked *T. sumatranus* by Gray. It has the same blue edgings to the interscapular feathers. Our bird has one side of the upper breast blue-edged, which yours has not." Mr. Sharpe adds that the British-Museum skin has the bill coral-red; so that probably this Philippine species, which is a representative form of *T. muelleri*, has either a red or a white bill, like the Celebesian species (conf. Walden, Tr. Z. S. viii. p. 31). The blue edgings on the upper breast of the Samar bird do not occur in *T. muelleri*.

##### 5. CYCLOPSITTA LUNULATA (4).

[Butuan, ♂, May. Iris dark brown; bill black, the base of maxilla light grey; feet greenish.]

Seven examples from Surigao and three from Butuan are sent by Mr. Everett, and they cannot be specifically separated from Luzon individuals. Only one is marked ♀, and it has a lunated collar and crescentic markings on the lower back; some of the necklace-plumes blue on their under surface. Five examples are of adults (marked ♂) with blue collars, the lower back bright yellow-green and no crescentic markings. Four (marked ♂) are immature birds, with mixed blue and lunulated collars, and with traces, more or less, of crescentic markings on the lower back. These last examples establish the identity of *C. lunulata* and *C. loxias*; but the question whether the *lunulata* plumage belongs to adult females as well as to immature males still remains open. Some of the collar-plumes of the only female in the collection being blue underneath perhaps indicates a state of transition to the *loxias* dress. None of the adult males have the whole face, lores, and ophthalmic region blue, as is the case in two Luzon individuals killed in January.

## 6. LORICULUS HARTLAUBI (7). (Plate LXXXII.)

*Coryllis hartlaubi*, Finsch, Papag. ii. p. 711.

? *Loriculus indicus* (Briss.); Souancé, var. A, ♂, Rev. et Mag. de Zool. 1856, p. 220, partim.

? *Loriculus cyanolæmus*, Bp. Tab. Uebers. d. Papag. no. 248, Naummania, 1856, Heft iv. ex Souancé, l. c.

? *Loriculus apicalis*, Souancé, l. c.

*Loriculus melanopterus* (Scopoli), G. R. Gray, List Psittacidæ B. Mus. p. 55 (1859), nec Scop.

*Loriculus apicalis*, Souancé, G. R. Gray, t. c. p. 56.

[Butuan, ♂ (immature), May. Iris brown; bill red-orange; feet orange. Placer, ♂ (nearly adult), July. Bill deep red; cere orange. ♂ (immature), July. Bill orange-red; cere light brown.]

The series consists of twenty-one examples of both sexes, the colour of the bill being red or orange-red in all. Ten are from Butuan, one from Surigao, four from Placer, and six from Dinagat<sup>1</sup>.

When seen from above, every one of these twenty-one examples exhibits a similar distribution of markings and colour, the latter varying in intensity according to age, but not according to sex; so that all are readily to be recognized as belonging to one species. The whole top and back of the head is bright cherry-red, almost of the same shade as in *L. indicus*. The nape is pure golden-orange in adults of both sexes. The back is green, more or less washed with yellow, and in adults (♂ ♀) with golden. In all, the uropygium and upper tail-coverts are rich crimson. Adolescence in both sexes, when seen from above, is betrayed by the crown-feathers being green at their insertions and tipped with orange, instead of cherry-red, and by the back being pure green and not suffused with yellow, the uropygium being of a less intense crimson, mixed more or less with green.

Seen from below, two well-marked phases of plumage are represented, apart from the intermediate grades which characterize nonage. In one phase the cheeks, chin and upper throat, superciliaries, and lores are pale blue, the lower throat, breast, and abdomen light green or yellow-green. In the other phase the supercilium, lores, cheeks, chin, throat, and under surface generally are of a full sap-green, with the exception of a crimson, lengthened, pectoral plastron, quadrate below, and diminishing gradually to a narrow gular stripe, reaching almost to the chin. All the examples marked ♀ (6) belong to the first category, as well as some marked ♂ (5). All those with the crimson pectoral mark, or with the slightest trace of red on the breast or throat, are marked male. So distinct a species do the individuals falling under one or other of the two categories appear, that, were it not for several examples in the series marked ♂ exhibiting every gradation of the crimson pectoral mark, from a solitary crimson

<sup>1</sup> Although I propose to give in a future paper a separate account of the birds collected in Dinagat, it being a distinct Philippine island, it will be more convenient when treating of this little-known species to include the Dinagat examples.

plume to the fully developed plastron, it might be considered that two species were represented in the series. Three examples, marked ♂, with the crown obscure reddish green, have the face, chin, throat, and supercilium pale faded green, and not blue; these possess no indications of the red pectoral patch. Three other examples (♂), coloured above almost as brightly as an adult, have the lores, supercilium, cheeks, and chin blue, as in the female; but they betray their sex by a few scattered red plumes on the throat and breast. Were it not for these isolated plumes, the sex would be undeterminable by the plumage alone. In one of these three examples the blue chin- and face-feathers are passing over to bright green; and this example exhibits the greatest number of scattered red pectoral and gular plumes. In six other examples (♂), with the pectoral plastron fully developed or almost so, there is no blue about the chin and face.

If the six examples described above (marked by Mr. Everett as being of females) are in perfect plumage (and their upper plumage is not to be distinguished from that of undoubtedly adult males), the sexes in this species, when adult, have each a peculiar plumage. It was from either an adult female or else a young male with a blue face and chin, and before any red pectoral plumes had appeared, that Dr. O. Finsch described *L. hartlaubi*. Souancé's description of his *L. bonapartei* (R. et M. Zool. 1856, p. 222), a bird said to be a native of the Sooloo Islands, agrees in all respects with *L. hartlaubi* ♂ adult, the colour of the bill excepted, which is stated to be black. The adult male of *L. indicus* is difficult to distinguish from *L. hartlaubi* ♀ vel ♂ juv. But in the Ceylon bird the cherry-red of the head does not descend so low on the occiput, and the nape is not so intensely orange. The lower surface of *L. indicus* is pure light green and not yellow-green; the upper tail-coverts do not cover so much of the rectrices. The blue on the inner webs of the quills and on the under surface of the rectrices is much lighter in shade. *L. indicus* is also somewhat larger, and has a shorter and more powerful bill. Souancé's description of *L. indicus*, var. A, ♂ (*l. c.*), partly taken from examples in the Massena collection, said to be from the Philippines, may have been from Mindanao individuals of *L. hartlaubi* ♀ vel ♂ juv. But there is more reason now to infer that Souancé's species, 174 B (*L. apicalis*), said positively to be from Mindanao, was described from examples of either females or young males of *L. hartlaubi*. Souancé's remarks were comparative as between Ceylon and so-called Mindanao specimens, in which case the principal differentiating character of *L. apicalis*, and that which the title is meant to express, "l'extrémité des rectrices est colorée de bleu indigo," will hold good; for while in *L. indicus* the apices of the rectrices in most examples are light yellow-green, in several of Mr. Everett's specimens of *L. hartlaubi* they are dark blue, that darker shade of blue of the under surface of the rectrices which it has in common with *L. philippensis*, *L. chrysonotus*, and *L. regulus*. Souancé, moreover, was not sure that the apices of the rectrices in *L. indicus* contrasted with the general colour. By this view of the question Dr. Finsch's difficulty

(Papag. ii. pp. 718, 719) in recognizing *L. apicalis* is overcome. Yet a comparison of the type is desirable; and until made it is best to allow Dr. Finsch's title to stand. Mr. Sharpe has been good enough to compare one of Mr. Everett's examples (♀) with the British-Museum example from Mindanao, labelled by Gray *L. melanopterus*, and writes that it agrees<sup>1</sup>. The British-Museum example labelled *L. apicalis*, Mr. Sharpe informs me, is somewhat larger, though he "wonders the specimens have been separated."

7. *ASTUR TRIVIRGATUS* (11).

[Surigao, ♂, May. Iris golden yellow; orbital skin and cere greenish yellow; bill black, mandible whitish; legs dark chrome; claws black.]

Mr. J. H. Gurney informs me that this example belongs to true *A. trivirgatus*, *i. e.* the small race.

8. *SPILORNIS HOLOSPILUS* (16).

[Butuan, ♂, May. *b.* Surigao, ♀, May.]

9. *HALIASTUR INTERMEDIUS* (17).

[Mouth of Butuan river, ♀. Iris brown; bill, cere black mottled with yellow; feet pale greenish yellow; claws black.]

In first plumage.

10. *PERNIS PTILORHYNCHA*.

*Falco ptilorhynchus*, Tem. Pl. Col. t. 44.

[Butuan, ♀, May. Iris white; bill black; cere mottled with yellow; feet chrome-yellow; claws black.]

The only example sent is in immature transition plumage. The entire under surface is tawny rufous, each feather with a bold dark-brown mesial stripe. Above the new feathers are brown, the old brown with broad fulvous or pale rufous margins. Mr. J. H. Gurney has been good enough to compare this Butuan individual with a Philippine example in the Norwich Museum, and has expressed his opinion that it is necessary to wait for more specimens before the question of its non-identity with *P. ptilorhyncha* can be decided.

11. *THRIPONAX JAVENSIS* (28).

[Surigao, ♀, May. Iris Naples-yellow.]

12. *MULLERIPICUS FULIGINOSUS*. (Plate LXXXIII.)

*Mulleripicus fuliginosus*, Tweeddale, Ann. & Mag. N. H. ser. 4, xx. p. 534 (December 1, 1877).

♂. Slaty smoke-grey. Feathers of the forehead, vertex, occiput, chin, throat, and neck with a terminal white or fulvous-white linear mark. Lores, ear-coverts, and ophthalmic region uniform grey. Feathers covering basal walls of mandible and the cheeks crimson.

Wing 6.25 inches, tail 5.25, culmen 1.70, tarsus 1.00.

<sup>1</sup> The specimen on which Dr. Finsch founded his title of *C. hartlaubi*.

[Surigao, ♂, May. Iris Naples yellow; bill whitish horn-colour; feet dirty greenish.]

This species may be readily distinguished from *M. funebris*, its nearest ally, by being slaty grey and not almost black, by the cheeks only being red (♂) and not the sides of the head, forehead, and vertex, by the red colour being crimson and not mulberry-red, and by the form of the white marks at the tips of the gular, occipital, and nuchal feathers being linear and not round.

13. *CHRYSOCOLAPTES LUCIDUS* (32).

*Anteà*, p. 539. no. 5.

[Butuan, ♂, May. Bill black; mandible green-yellow; feet dull brownish green.]

A single example, in which, however, the middle pairs of rectrices exhibit two pairs of spots near their insertion, showing that they do sometimes appear, and that Sonnerat was correct in so figuring the bird.

14. *MEROPS BICOLOR* (36).

[Butuan, ♀, May; Placer, ♂, July.]

Chestnut of upper parts unmixed with green. This Bee-eater can no longer be included among the birds peculiar to the Philippines, if the statement made by MM. Oustalet and David (*Ois. de la Chine*, p. 73) that it visits China during summer in small parties is correct. Up to now it has only been observed in the Philippines by naturalists during the months of February, March, April, July, and October.

15. *EURYSTOMUS ORIENTALIS* (37).

[Butuan, ♂ ♀, May.]

16. *PELARGOPSIS GIGANTEA* ?

*Pelargopsis gigantea*, Walden, *Ann. & Mag. N. H.* ser. 4, vol. xiii. p. 123; *anteà*, p. 541. no. 10.

[Butuan, ♂, May. Iris dark brown; bill bright red; feet dark red.]

This single example, sent by Mr. Everett, is not in full attire. Brown predominates on the head, each feather being narrowly margined with creamy white. The under surface is buffy white, most intense on the abdomen and under tail-coverts, while the under wing-coverts and the axillaries and flanks are rich ruddy buff. Culmen 3.12, wing 5.88.

17. *CEYX ARGENTATA*.

*Ceyx argentata*, Tweeddale, *Ann. & Mag. N. H.* ser. 4, vol. xx. p. 533, "Dinagat" (December 1, 1877).

[Placer, ♂, July.]

Mr. Everett obtained two examples, both marked ♂, which differ in some respects from the type, which is a female. The dorsal plumage, as well as the upper tail-coverts, are snow-white, unmixed with blue or bluish green. The black of the flanks and breast is



washed with dark green and not with blue. The dimensions are also less. Wing 2.25.

18. *ENTOMOBIA GULARIS* (44).

[Surigao, ♂ ♀, May; Placer, ♂, July.]

19. *SAUROPATIS CHLORIS* (47).

[Mouth of Butuan river, ♂, May. *b.* Surigao, ♀.]

20. *XANTHOLÆMA HÆMACEPHALA* (50).

[Surigao, ♀, May; Placer, ♀ (young), July.]

21. *MACROPTERYX COMATUS* (52).

[Placer, ♂, ♀, July.]

Wing 5.12.

22. *COLLOCALIA TROGLODYTES* (53).

[Placer, ♀, July. Iris and legs dark brown; bill black.]

The sexes do not differ.

23. *SURNICULUS VELUTINUS*.

*Surniculus velutinus*, Sharpe<sup>1</sup>, Tr. L. S. ser. 2, Zool. i. p. 320.

[Butuan, ♀, May. Iris dark chocolate-brown, bill and claws black; feet blue-grey.]

24. *EUDYNAMIS MINDANENSIS* (61).

[Butuan, ♂, May. Iris bright crimson; bill greenish grey; feet darker greenish grey.]

These and Malanipa individuals (*anteà*, p. 543) have been compared and are identical, and the dimensions are about equal. The type, however, in all probability came from south-west Mindanao.

25. *CENTROCOCCYX VIRIDIS* (64).

[Surigao, ♂, May. Iris red.]

26. *PYRRHOCENTOR MELANOPS* (65).

[Butuan, ♂, May. Iris crimson; bill black; legs leaden. *b.* Surigao, ♂. *c.* ♀, May. Iris crimson.]

The sexes, as represented in Mr. Everett's series, wear the same plumage, and are of equal dimensions.

27. *BUCEROS MINDANENSIS*.

*Buceros mindanensis*, Tweeddale, *anteà*, p. 543.

[Butuan, ♂, May. Iris bright yellow; orbital skin blackish, with a yellow streak under the eye; feet dull coral-red; claws blackish grey. *b.* Surigao, ♂, May. Iris (in the living bird) pale green; orbital skin sooty black, but yellow just below the eye; skin of chin yellow; feet light coral-red; claws dark brown grey. *c.* Surigao, ♀, May. Iris white; feet light coral-red; nails black.]

<sup>1</sup> Mr. Sharpe has obliged me by comparing this Butuan example with the type.

All the five examples in a series of that number slightly differ from the type specimens in having the wing-coverts and back tinged with olive, and in the absence of a channelled or grooved plate, or even a distinct smooth plate, on the basal walls of the mandible. In this respect the North-Mindanao species agrees with that of Luzon, *B. hydrocorax*. One Butuan individual does exhibit a rudimentary plate; and it may be that these plates only mature with age. The rectrices, when first reproduced, are almost white.

#### 28. CRANIORRHINUS LEUCOCEPHALUS (67)

[Surigao, ♂ ♀, May. Iris crimson; feet dark brown. *b.* Butuan, ♀. Iris crimson; orbital skin, base of the mandible, and bare skin of the chin fiery orange-red; bill deep red, lateral grooves brown, intermediate plates or spaces whitish, posterior plate dull reddish; feet dull black.]

The examples with black body, neck, and head-plumage (5) are all marked ♀ by Mr. Everett, and those with tawny throats and dark chestnut napes (2) are marked ♂. This confirms what has been previously stated. The females are slightly smaller, the bill considerably shorter than in the males, and the form of the casque is of a different type. It is not inflated, and is smooth, without any folds. The casque of the female is well delineated by Mr. Smit (Tr. Z. S. ix. t. 27), and that of the male by Huet (Pl. Col. 69). The example (♂) figured (*l. c.*) is a young male.

#### 29. PENELOPIDES AFFINIS.

*Penelopides affinis*, Tweeddale, Ann. & Mag. N. H. ser. 4, vol. xx. p. 534 (December 1, 1877).

♂. Like *P. panini*, but differs in wanting the perpendicular grooves on the thick lateral plates of the maxilla, which are smooth, in the grooves at the base of the mandible not being recurved, but straight, in the whole bill being much less massive, in the abdominal region and under tail-coverts being of the same colour as the breast, and not rufous, and in the rectrices having a black band at their insertion.

♀. Bill as in the male, and to that extent differs from that of *P. panini* ♀. The female also differs in having a black band at the base of the rectrices.

	Wing. in.	Tail. in.	Tarsus. in.	True culmen. in.
♂	9·25	9·00	1·75	3·40
♀	8·75	8·37	1·60	3·25

[Butuan, ♂, May. Iris crimson; orbital skin, nude portion of chin, and unfeathered part of the rami white; casque, smooth lateral plates of maxilla, and the ungrooved triangular space at base of mandible dark brown; the whole apical part of maxilla from the smooth lateral plates, and of mandible from the grooved base, pale brown; grooves on mandible dark brown; intermediate smooth spaces

light ochreous; feet greenish lead-colour; nails greyish black. *a.* Butuan, ♀, May. Iris crimson; orbital skin, nude part of chin, and unfeathered part of the rami dark blue; bill brown; feet dark greenish leaden. *b, c.* Surigao, ♂ ♀, May.]

Fig. 1.

Head of *Penelopides affinis*.

A representative form of *P. panini*, ex Panay, Negros, and Guimaras, but readily to be distinguished from that species and *P. manilla*, ex Luzon, by the channelling on the lateral basal walls of the

Fig. 2.

Head of *Penelopides panini*.

bill. In one example some of the black upper tail-coverts are tipped and margined with dirty rusty. An old Surigao female has several of the secondary quills margined with ferruginous. A young Surigao male has a small part of the outer webs of the fourth, fifth, and

sixth primaries edged albescent. An old Surigao male has the thigh-coverts, ventral region, and under tail-coverts pale rufous, and most of the upper tail-coverts as in *P. panini*, otherwise as in typical *P. affinis*. In a Butuan and a Surigao male the middle pair of rectrices, with the exception of the basal black band, are rufous throughout, the normal black terminal band being only indicated by black blotches. The new rectrices are pale fulvous white instead of ferruginous when they first come in. The number of grooves on the mandible varies from three to four. The extreme altitude of the bill, ending at the nostril, is 1.06, whereas in *P. panini* it is 1.37.

30. *ARTAMUS LEUCORHYNUS* (73).

[Mouth of Butuan river, ♀, May; *b.* Surigao, ♂, May.]

31. *GRAUCALUS STRIATUS* (74).

[*a.* Placer, ♂, July. Iris light Naples yellow. *b.* ♂, July. Iris dirty brownish white.]

The north Mindanao individuals have the wing somewhat shorter than typical examples. The example *b* is in first plumage, with the whole under surface barred with black. The others (*a*) have only the under surface, commencing with the lower breast, banded with black.

32. *LALAGE DOMINICA* (76).

[Butuan, ♂, May. *b.* ♂, June.]

33. *DICRURUS STRIATUS*.

*Dicrurus striatus*, Tweeddale, *anted*, p. 545. no. 20.

[Butuan, ♂ ♀, May. Iris crimson; bill steel-black. *b.* Surigao, ♂, May. *c.* May, ♀ juv. Iris brown.]

Sexes alike. The young female (*c*) has the breast uniform black; no traces of metallic striation.

34. *LEUCOCERCA NIGRITORQUIS* (83).

[Surigao, ♀, June.]

35. *CYORNIS PHILIPPINENSIS*.

*Cyornis philippinensis*, Sharpe, Tr. L. S. ser. 2, Zool. i. p. 325.

[Butuan, ♂ ♀, May.]

The North-Mindanao examples agree best with those from Luzon (Monte Alban). In dimensions they are equal.

36. *HYPOTHYMIS AZUREA* (85).

[Butuan, ♀, May; Placer, ♂, ♀, July.]

37. *BRODERIPUS ACRORHYNCHUS* (90).

*Oriolus chinensis*, Linn., apud Sharpe, Cat. B. Mus. iii. p. 203, nec Lin.

[Butuan, ♂ ♀, May; *b.* Surigao, ♂ ♀, June.]

38. *MACRONUS STRIATICEPS*.

*Macronus striaticeps*, Sharpe, Tr. L. S. ser. 2, Zool. i. p. 331.

[Surigao, ♂, June. Iris white; bill blackish; legs purple-grey.]

39. *IXUS GOIAVIER* (99).

[Surigao, ♂ ♀, May. Iris rich dark brown; bill, legs, feet, and nails black; Placer, ♂, July.]

40. *POLIOLOPHUS UROSTICTUS* (101).

*Poliolophus urostictus* (Salvadori), Sharpe, t. c. p. 334.

[Surigao, ♂, May. Orbital ring lemon-yellow. a. ♀, May. Iris dark brown; orbital ring yellow; bill black; legs dark grey.]

By the words "orbital ring" Mr. Everett probably means the nude eye-wattle and skin surrounding the eye. Sexes alike.

41. *HYPSSIPETES PHILIPPINENSIS* (102).

[Butuan, ♂ ♀, May.]

Not separable from Luzon, Zebu, and Guimaras examples. It is not, as might have been expected, *H. rufigularis*—a representative species which occurs at Pasananca (South-west Mindanao).

42. *CRINIGER EVERETTI*. (Plate LXXXIV.)

*Criniger everetti*, Tweeddale, Ann. & Mag. N. H. ser. 4, vol. xx. p. 535 (December 1, 1877).

♂ ♀. Above almost golden-yellow brown. Feathers of forehead, vertex, and occiput sublanceolate, brown, margined with golden yellow. Lores yellow. Feathers at base of mandible and cheeks yellow-tipped. Throat, neck, and upper breast brownish ochreous-yellow. Chin, lower breast, abdomen, ventral region, axillaries, under tail- and wing-coverts sulphur-yellow. Inner webs of primaries brown. Exposed surface of all the quills and the wing-coverts like back. Inner margin of inner webs of quills pale yellow. Upper surface of rectrices like that of quills. Under surface pale brown, washed with yellow; inner webs margined with pure yellow. Shafts of quills and rectrices ruddy brown above; of quills underneath yellow at base and brown towards the end; of rectrices bright yellow throughout.

	Wing. in.	Tail. in.	Tarsus. in.	Culmen. in.
♂	4.50	4.62	0.87	1.25
♀	4.35	4.25	0.87	1.12

[Surigao, ♂, May. Iris dark burnt sienna-brown; bill black, mandible greyish; legs grey; claws dark grey. b. ♀, May. Iris dark sienna-brown.]

Mr. Everett has sent a series of thirteen specimens of this distinct species of *Criniger*. It is readily to be distinguished by its ochreous-brown throat and upper breast. The nuchal hairs are present. The dimensions of the adult females appear to be less than those of the

males ; otherwise the sexes are alike. This species belongs to a genus new to the Philippine area.

43. *COPSYCHUS MINDANENSIS* (106).

[Butuan, ♂ juv., May.]

Only differs from the adult male by having the breast dark grey, each feather with a fulvous central mark.

44. *CISTICOLA GRAYI*.

*Cisticola grayi*, Ann. & Mag. N. H. ser. 4. vol. ix. p. 40, "North Celebes."

[Surigao, ♂, May. Iris yellow-brown.]

This skin is not to be distinguished from the type of *C. grayi*, and may prove to be = *C. semirufa*, Cab., the description of which is, however, too meagre for recognition.

45. *ORTHOTOMUS FRONTALIS*.

*Orthotomus frontalis*, Sharpe<sup>1</sup>, Tr. L. S. ser. 2, Zool. i. p. 336 ; Ibis, 1877, p. 112, t. 2. fig. 1.

[Surigao, ♂, May. *b.* Butuan, ♀, May. Iris clay-brown ; bill dark brown, mandible white ; legs light transparent brown.]

46. *ORTHOTOMUS NIGRICEPS*, sp. n. (Plate LXXXV.)

[Butuan, ♂, May. Iris clay-brown ; maxilla black ; mandible white ; legs and feet pale brownish.]

Forehead, vertex, occiput, nape, and ear-coverts very dark brown or black. Space before the eye and a broad supercilium which passes behind the eye white ; chin, cheeks, throat, and breast pale greyish white, the bases of the feathers being dark iron-grey. Lower breast tinged with yellow. Flanks, abdomen, under wing- and tail-coverts yellow-olive. Back, uropygium, and upper tail-coverts pure olive-green. All the wing-feathers brown, the quills being externally margined with yellowish olive-green, the minor and major coverts with a paler yellow-olive. Thigh-coverts mixed pale rufous and olive-green. Rectrices above dull rufous, with very narrow pale margins. Underneath pale rufous, washed with light yellowish green.

Wing.	Tail.	Tarsus.	Culmen.
1.70	1.70	0.85	0.60

Allied to *O. cinereiceps*, but with a black head.

47. *CORYDALIA LUGUBRIS* (117).

[Surigao, ♂ ♀, May, June ; Placer, ♂, July.]

After a careful comparison made between this Philippine race, *C. rufula* of India, and *C. malayensis* from Malacca and Sumatra, it appears to be an exactly intermediate form, *C. rufula* being the palest and of an ochreous red, *C. lugubris* being darker and greyer and *C. malayensis* being more reddish brown. Every individual of my large series of this species is constant in its colouring.

<sup>1</sup> Compared by Mr. Sharpe.

48. *ZOSTEROPS EVERETTI*.

*Zosterops everetti*, Tweeddale, *anteà*, p. 762.

[Surigao, ♂, June. Iris yellow-brown; bill black; legs grey.]

A single example, which only differs from the type (♂ ex Zebu) by having the yellow on the mesial line much more developed.

49. *DICÆUM RUBRIVENTER* (120 partim).

*Dicæum rubriventer*, Lesson, Tr. p. 303; Tweeddale, *anteà*, p. 763.

[Butuan, ♂ ♀, May. *b.* Surigao, ♂, May; Placer, ♂, July.]

The example marked ♀ only differs from a considerable series of males in having the upper plumage ashy grey, and not glossy black. Underneath it is undistinguishable from the male.

50. *DICÆUM CINEREIGULARE*, sp. n.

[*a.* Butuan, ♂, May. Iris dark brown; bill black. *b.* Surigao, ♀, June. Iris chocolate. *c.* Placer, ♂, July. Iris brown; bill black; legs dark grey.]

Closely allied to *D. dorsale*, Sharpe, but differs in having the breast intense orange-red and the upper breast and sides of throat grey slightly tinged with pale yellow. The chin and middle of throat are pale yellow. These characters are present in all the specimens (eight) sent by Mr. Everett from north Mindanao.

51. *ÆTHOPYGA (EUDREPANIS) BELLA*.

*Æthopyga bella*, Tweeddale, Ann. & Mag. N. H. ser. 4, vol. xx. p. 537 (December 1, 1877).

♂. Chin, throat, breast, and uropygium bright sulphur-yellow. Forehead, vertex, minor carpal coverts, upper tail-coverts, and upper surface of rectrices dark metallic green. Occiput, nape, and wing-coverts dark olive. Cheeks, lores, behind the eye, sides of head and neck, interscapulars, and back deep blood-red. Quills almost black, margined with dark olive. Abdomen, flanks, vent, under tail-coverts, and under wing-coverts silky white, more or less tinged with pale yellow, especially on the mesial line, under tail-coverts, and carpal edge. A few blood-red feathers on the upper breast. A metallic violet spot on sides of head. A narrow line of deep blood-red runs along the rami of the mandible. A bold metallic moustache springs from the base of the mandible, and descends the sides of the neck; the upper half violet, the lower half green.

♀. Above, wing-coverts, and edgings to quills olive-green. Uropygium bright sulphur-yellow as in ♂. Space before the eye, cheeks, ear-coverts, chin, throat, and upper breast grey tinged with yellowish olive-green. Lower breast, abdomen, flanks, and under tail-coverts white tinged with yellow. Under wing-coverts white, faintly tinged with yellow. Quills and rectrices dark brown, margined with olive; lateral rectrices tipped with albescent olive.

	Wing.	Tail.	Tarsus.	Culmen.
	in.	in.	in.	in.
♂.	1.68	1.44	0.50	0.50
♀.	1.62	1.12	0.50	0.50

[Surigao, ♂, May. Iris dark umber. *b.* ♂ juv.]

Five examples of this lovely small Sun-bird were obtained by Mr. Everett, the discoverer of the species. Four are in the full adult dress, and are marked ♂; and one is in the dull olive-grey dress of either the young male or adult female, but is marked ♂ juv. No example marked ♀ is sent.

52. *NECTAROPHILA SPERATA* (122).

*Cinnyris speratus* (Lin.), Shelley, *Cinnyridæ*, pt. iv. t.

[Butuan, ♂, May. Iris brown; bill jet-black; legs blackish brown. *b.* Surigao, ♂, May; Placer, ♂, July.]

Mr. Everett has sent a large series (fifteen examples) from North Mindanao and Dinagat Island of this species in full male plumage. They in no respect differ from Luzon, Guimaras, and Negros individuals, excepting that the average length of their bill is less. Along with this series of males is a smaller series (five) of individuals all marked ♀ by Mr. Everett, and which I am at a loss to determine. Were it not that Captain Shelley has figured and described (*l. c.*) the female from a specimen obtained by Dr. Steere in Negros (?) as having the "sides and upper half of the head and neck ashy grey; the wings dark brown, edged yellowish olive; underparts sulphur-yellow," I should without hesitation refer the examples marked ♀ by Mr. Everett to *N. sperata* ♀. In a Surigao example (marked ♀) the quills are brown, conspicuously margined with rusty ochre, so that the wing when closed appears to be ferruginous or ruddy yellowish brown. The forehead, vertex, and nape are dull brownish grey. The chin and all the throat and sides of head light grey, tinged with yellow. Breast, abdomen, flanks grey, washed with a brighter yellow<sup>1</sup>. Outer pair of rectrices with a pale albescent apical mark. This individual must either be *N. sperata* ♀ vel ♂ juv., or belong to some undescribed species. Dimensions as in *N. sperata* ♂.

53. *ARACHNECHTHRA JUGULARIS* (123).

[Butuan, ♂ ♀, May; Surigao, ♂ ♀, May and June; Placer, ♀, July.]

54. *ANTHOTHREPTUS GRISEIGULARIS*, n. sp.

[Surigao, ♂ ♀, May. Iris bright Indian-red; bill black; legs greenish grey; Placer, ♀, July. Iris and bill dark brown; lower half of bill very light brown; legs greenish; nails brown; soles ochre.]

♂. Forehead, crown, occiput, nape, back metallic green. Uropygium and upper tail-coverts metallic purplish blue. A few of the carpal coverts and tips of the median wing-coverts metallic violet-blue. Median wing-coverts maroon. Minor wing-coverts metallic green. Space before the eyes, cheeks, ear-coverts, major wing-

<sup>1</sup> Unfortunately Captain Shelley does not state with precision the habitats of the specimens he has described and figured. But on referring to Mr. Sharpe's account it will be found that the only supposed female of this species was obtained by Dr. Steere in Negros.



coverts, and scapulars maroon. Chin and throat grey. A streak commencing at base of mandible and running down each side of the neck metallic green, with a tinge of violet in certain lights. Breast, flanks, abdomen, and under tail-coverts greenish yellow. Axillary tufts pure bright yellow. Under wing-coverts pale yellow-white. Rectrices black, tinged with metallic green, changing to violet-blue in certain lights. Primaries dark brown, with narrow albescent margins; secondaries dark brown, edged with maroon.

♀. Feathers of the top of head, cheeks, ear-coverts, the nape, upper back, and minor wing-coverts brown, each conspicuously margined with grey, the margins of the interscapulars and nuchal feathers being faintly tinged with green. Lower back, uropygium, and upper tail-coverts (some of the latter tinged with maroon) greyish green. Chin and throat greyish white. Upper breast grey. Lower abdomen, flanks, and under tail-coverts pale greenish yellow. Quills dark brown; primaries narrowly edged with albescent rufous, the secondaries broadly with dingy maroon. Major coverts and scapulars the same dingy maroon. Rectrices dark brown, margined with dingy maroon, and a minute albescent terminal fringe. Wing-lining as in male.

	Wing.	Tail.	Tarsus.	Culmen.
♂.	2.62	1.75	0.68	0.62
♀.	2.25	1.50	0.68	0.62

Both Mr. Sharpe and Captain Shelley are of opinion that this species differs specifically from *A. chlorogaster*, Sharpe. From *A. malaccensis* the male is chiefly distinguished by having the head and back pure green, contrasting strongly with the purple-blue of the uropygium and upper-tail-coverts, and by its pure grey and not pale rufous throat. The dress of the adult female in *A. malaccensis* is not as yet accurately known; but, presuming that in that species the adult female has a grey throat, these Surigao females only differ in having the crown of the head greyer and less green.

#### 55. CORVUS PHILIPPINUS (125).

[Suriago, ♂ ♀, May.]

The dimensions of the females are less than those of the male, and the bill is weaker.

	Wing.	Tail.	Tarsus.	Culmen.	Extreme altitude.
♂.	12.25	9.50	2.12	2.25	1.00
♀.	11.37	8.50	1.87	2.07	0.87

This discrepancy of size is to be found in Zebu examples also.

#### 56. CALORNIS PANAYENSIS (128).

[Suriago, ♂ ♀, May; Placer, ♂, July.]

Sexes alike.

#### 57. SARCOPS CALVUS (129).

[Butuan, ♀, May. *b.* Surigao, ♂ ♀, May.]

Sexes alike.

## 58. MUNIA JAGORI (132).

[Butuan, ♂, May; Placer, ♂ ♀, July.]

## 59. OSMOTRERON AXILLARIS (136).

[Mouth of Butuan river, ♀, May. Iris light silvery green; cere dull dark red; bill greenish lead. *b.* Surigao, ♂, May.]

## 60. XENOTRERON INCOGNITA.

*Ptilopus? incognita*, Tweeddale, Ann. & Mag. N. H. ser. 4, vol. xx. p. 538 (December 1, 1877).

♀. Above, tertiaries, and wing-coverts light emerald-green. Forehead, lores, ophthalmic region, cheeks, and ear-coverts grey mixed with dingy green. Chin and throat almost pure white. Neck and sides of neck greenish grey. An ill-defined pectoral band formed of green feathers tipped with ruddy orange; breast ashy green tinged with the same colour. Flanks green. Abdomen mixed green and ashy. Under tail-coverts (which are lengthened) pale creamy white with a brown central streak. Thigh- and tarsal coverts ashy brown. Exposed upper surface of rectrices tinged with golden. Lower surface pale ashy brown, with ill-defined paler tips. Quills dark brown, margined outwardly with dark green. Secondaries with a pale narrow creamy border, still narrower on the major coverts.

Wing 5·25 inches, culmen 0·75, tarsus 0·81, tail 3·75.

[Butuan, ♀, May. Iris dark hazel; bill dull greenish orange; feet pale reddish.]

The only example obtained by Mr. Everett is that of an immature female.

## 61. RAMPHICULUS OCCIPITALIS (138).

[Butuan, ♂, May. Colour of iris &c. as in Cebu birds.]

Not separable from Luzon and Zebu examples.

## 62. PHABOTRERON AMETHYSTINA (139).

[Butuan, ♂, May. Iris warm orange-brown; bill black; feet carmine; nails grey.]

Does not differ from Luzon examples.

## 63. PHABOTRERON BREVIROSTRIS.

*Phabotreron brevirostris*, Tweeddale, *anted*, p. 549.

[Butuan, ♂ ♀, May. *b.* Surigao, ♂, May; Placer, ♂, July ♂.]

The examples marked ♂ and ♀ do not materially differ; but in the male the amethystine colouring of the back and rectrices is more pronounced. The rufo-fulvous forehead, the albescent chin and throat, the amethystine-coloured cap and rectrices, and the short bill distinguish this representative form from *P. leucotis*.

## 64. CARPOPHAGA AENEA (141).

[Surigao, ♂, May. *b.* Butuan, ♂, May.]

65. *TURTUR DUSSUMIERI* (147).

[Butuan, ♀, May. Iris reddish; bill grey-black; feet dull carmine. *b.* Surigao, ♂, May; Placer, ♂, July.]

The dimensions of the female are a trifle less than those of the male. In colour and marking there appears to be but little difference, the nuchal collar being perhaps more developed in the male.

66. *PHLOGÆNAS CRINIGERA*.

*Pampusanna criniger*, Pucheran, Voy. Pôle Sud, iii. p. 118 (1853), Atlas, t. 27. f. 2; Sclater, P. Z. S. 1865, p. 238.

*Phlogœnas bartletti*, Sclater, P. Z. S. 1863, p. 377. t. xxxiv.

[Placer, ♂, July. Iris brown; bill black; legs dull carmine.]

The type is stated by Pucheran to have been found in the Sooloo Islands (Soog.). Mr. Sclater, on seeing it at Paris, recognized its identity with his *P. bartletti*, founded on four living individuals sent to Liverpool and stated to have been brought from an uninhabited island near the Philippines. A full account of these birds, together with delineations of the sternum, is given by Mr. Sclater (*l. c.*). The Sooloo habitat requires confirmation. The bird is a representative form of *P. cruenta*, but perfectly distinct. The dark claret-coloured patch on the breast replaces the blood-red pectoral plumes of the older known species; and the feathers of which it is composed are even of a harsher and stiffer texture.

67. *CHALCOPHAPS INDICUS* (150).

[Surigao, ♂, June.]

68. *CHARADRIUS FULVUS* (159).

[Butuan, ♀, May.]

A number of black feathers on the under surface.

69. *SQUATAROLA HELVETICA* (160).

[Placer, ♀, July. Iris chocolate; legs light grey.]

In winter plumage, although shot in July.

70. *ÆGIALITIS DUBIA* (162).

[Placer, ♀, July. Orbital ring orange.]

71. *ÆGIALITES CANTIANUS*.

*Charadrius cantianus*, Lath. Suppl. Ind. Orn. p. lxvi. (1801).

[Placer, ♂, July. Iris deep brown; bill glossy black; legs light grey.]

Not hitherto recorded from the Philippines.

72. *ERYTHRA PHÆNICURA* (170).

[Butuan, ♂ ♀, May.]

73. *HYPOTÆNIDIA TORQUATA* (177).

[Butuan, ♀, May. Iris crimson.]

One example; pectoral band fully developed.

74. *HYPOTÆNIDIA STRIATA* (179).

[Butuan, ♂ ♀, May.]

The female has all the throat white, and all its hues, the rufous of the head and nape included, much paler than in the male.

75. *LIMNOCINCLUS ACUMINATUS*.<sup>1</sup>*Totanus acuminatus*, Horsf. Tr. L. S. xiii. p. 192, "Java."*Schœniculus australis* (Jard. & Selby), Gould, B. Austr. vi. t. 30.

[Butuan, ♂, May. Bill dark brown; legs greenish grey.]

A single example in almost full summer dress.

76. *TOTANUS HYPOLEUCOS* (183).

[Butuan, ♀, May.]

Three examples, all marked ♀.

77. *RHYNCHÆA CAPENSIS* (189).

[Butuan, ♂, May.]

78. *ARDETTA FLAVICOLLIS* (191).

[Butuan, ♂, May. Iris bright yellow; bill purplish brown; legs darker purplish brown. *b.* ♀, May. Iris red-brown; bill light warm brown; legs and feet greyer brown.]

Examples from China, Ceylon, and all India do not differ.

79. *BUTORIDES JAVANICA* (197).

[Mouth of Butuan river, ♂, May. Iris bright yellow; legs and feet dull dark chrome; bill black; bare orbital skin green-yellow.

*b.* Butuan, ♀, May.]

Dorsal train fully developed.

80. *NYCTICORAX GRISEUS* (199).

[Butuan, ♂, May. Iris orange; bill black, base and mandible light green; legs and feet light green.]

Immature.

81. *DENDROCYGNA VAGANS* (203).

An example is in the collection, but without a label; it is either from North Mindanao or else from Dinagat.

<sup>1</sup> In this identification I am confirmed by Mr. Harting.

# APPENDIX.

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## LIST OF ADDITIONS TO THE SOCIETY'S MENAGERIE

DURING THE YEAR

1877.

- Jan. 4. 1 Common Crossbill (*Loxia curvirostra*). Purchased.  
2 Common Swans (*Cygnus olor*). Purchased.
5. 1 American Black Bear (*Ursus americanus*). Presented by Mr. W. Stead.
7. 1 Common Partridge (*Perdix cinerea*). Presented by Mr. H. Laver.  
1 Razorbill (*Alca torda*). Presented by Mr. W. Thompson.
9. 2 Secretary Vultures (*Serpentarius reptilivorus*). Presented by Capt. Larmer, S.S. 'African.'  
1 Himalayan Bear (*Ursus tibetanus*). Presented by H.R.H. the Prince of Wales.
10. 2 Crowned Partridges (*Rollulus cristatus*), ♂ and ♀. Presented by Mr. Barclay Field, F.L.S.
11. 2 Carolina Conures (*Comurus carolinensis*). Presented by Mr. L. Delves Broughton.
13. 1 Wood-Owl (*Syrnium aluco*). Presented by Mrs. A. O. Faulkner.  
3 Chukar Partridges (*Cuccabis chukar*). Presented by Capt. Newton Pauli.
15. 1 Bay Lynx (*Felis rufa*). Presented by Mr. Otho N. Shaw. From the Rocky Mountains.
16. 1 Macaque Monkey (*Macacus cynomolgus*), ♀. Presented by Mrs. Cecil Long.  
1 Ocelot (*Felis pardalis*), ♀. Purchased.  
1 Azara's Fox (*Canis azaræ*). Received.  
1 Herring-Gull (*Larus argentatus*). Presented by Mr. A. Kinnear.
17. 1 Malbrouck Monkey (*Cercopithecus cynosurus*), ♀. Presented by Mr. L. C. Brown.  
1 Pigtailed Monkey (*Macacus nemestrinus*), ♀. Presented by the Crew of H.M.S. 'Dwarf.'  
2 Teguxin Lizards (*Teius teguxin*). Presented by Mr. A. Stradling, M.R.C.S.  
1 Tataupa Tinamou (*Crypturus tataupa*). Purchased. From Bahia.  
2 Talpacoti Ground-Doves (*Chamæpe'ia talpacoti*). Purchased. From Bahia.  
2 Scaly Doves (*Scardafella squamosa*). Purchased. From Bahia.  
1 Chopi Starling (*Aphobus chopi*). Purchased. From Pernambuco.

- Jan. 17. 1 Chilian Sea-Eagle (*Geranoaëtus melanoleucus*). Purchased. From Paraguay.
18. 1 Black-eared Marmoset (*Hapale penicillata*). Deposited.  
2 Ring-tailed Lemurs (*Lemur catta*), ♂ and ♀. Purchased.
23. 3 Silky Marmosets (*Midas rosalia*), 1 ♂ and 2 ♀. Purchased.
25. 2 Vervet Monkeys (*Cercopithecus lalandii*), ♂ and ♀. Presented by Mr. T. G. Butler.  
1 Ring-necked Parrakeet (*Palæornis torquata*). Presented by Miss Smith.
26. 2 Arctic Foxes (*Canis lagopus*). Presented by Sir Thomas Erskine, Bart., F.Z.S.
30. 1 Ocelot (*Felis pardalis*). Purchased.  
1 Brazilian Tree-Porcupine (*Cercolabes prehensilis*). Presented by Mr. Eliot G. Currey. From Trinidad.
- Feb. 1. 3 Rhomb-marked Snakes (*Psammophylax rhombeatus*). Presented by the Rev. G. H. R. Fisk, C.M.Z.S. From the Cape.  
1 Hoary Snake (*Coronella cana*). Presented by the Rev. G. H. R. Fisk, C.M.Z.S. From the Cape.
2. 3 Amherst Pheasants (*Thaïmálea amherstiae*), 1 ♂ and 2 ♀. Presented by Dr. A. G. Reid, Hankow, China.  
2 Andean Geese (*Bernicla melanoptera*), ♂ and ♀. Purchased.
3. 1 Pig-tailed Monkey (*Macacus nemestrinus*), ♀. Presented by Dr. Broadbent.  
1 Yellow-fronted Amazon (*Chrysotis ochrocephala*). Presented by Mr. F. A. B. Geneste.  
2 Double-striped Thicknees (*Edienemus bistriatus*). Presented by Capt. H. King, R.M.S.S. 'Dee.'
5. 2 Chinese Geese (*Anser cygnoides*), ♂. Presented by Mr. R. H. Medhurst.
6. 1 Macaque Monkey (*Macacus cynomolgus*). Presented by Master R. Wallace.
7. 1 Common Paradoxure (*Paradoxurus typus*). Deposited.  
1 Common Raven (*Corvus corax*). Presented by Mrs. Nathan.
8. 1 Rough-legged Buzzard (*Archibuteo lagopus*). Presented by Mr. W. R. Paxton.
9. 1 Red-vented Cockatoo (*Cacatua philippinarum*). Purchased.  
2 Maned Geese (*Bernicla jubata*), ♂ and ♀. Purchased.
10. 1 Common Magpie (*Pica caudata*). Presented by Miss Jessie Bovill.  
1 Common Marmoset (*Hapale jacchus*), ♀. Deposited.
12. 1 Pike (*Esox lucius*). Presented by Mr. A. T. Ranson.
14. 1 Barbary Ape (*Macacus inuus*), ♂. Deposited.  
1 Hairy-rumped Agouti (*Dasyprocta prymnolopha*). Born in the Menagerie.
15. 2 Feline Dourocoulis (*Nyctipithecus felinus*), ♂ and ♀. Purchased.  
2 Cariamas (*Cariama cristata*). Purchased.  
1 Downy Owl (*Pulsatrix torquata*). Purchased.  
1 Mexican Eared Owl (*Asio mexicanus*). Purchased. See P.Z.S. 1877, p. 159.  
2 Globose Curassows (*Crax globicera*), ♂ and ♀. Purchased.  
1 Crested Curassow (*Crax alector*). Purchased.  
1 Great-billed Rhea (*Rhea macrorhyncha*). Purchased. See P.Z.S. 1877, p. 160.  
1 Anaconda (*Eunectes murinus*). Purchased.

- Feb. 16. 2 Pennant's Parrakeets (*Platycercus pennanti*). Presented by Mr. E. Sargent.
17. 1 Greater Sulphur-crested Cockatoo (*Cacatua galerita*). Presented by Mr. Edward Purchase.
20. 1 Maugé's Dasyure (*Dasyurus maugéi*), ♀. Presented by Mr. Robert S. Craig.
- 1 Slender-billed Cockatoo (*Licmetis tenuirostris*). Presented by Mr. Bartle G. Goldsmid.
- 1 Common Kestrel (*Tinnunculus alaudarius*). Presented by Mr. W. W. Hughes, F.Z.S.
21. 1 Burrhel Wild Sheep (*Ovis burrhel*), ♂. Deposited.
- 1 Chilian Sea-Eagle (*Geranoaëtus melanoleucus*). Presented by Mr. C. Clifton, F.Z.S.
- 1 Rough-legged Buzzard (*Archibuteo lagopus*). Presented by Lady Bunbury.
- 1 Common Rattlesnake (*Crotalus durissus*). Purchased.
22. 1 Levaillant's Amazon (*Chrysotis levaillanti*). Presented by Mrs. Matthews.
- 1 Passerine Owl (*Glaucidium passerinum*). Presented by Mr. T. W. Evans, M.P.
23. 1 Suricate (*Suricata zenik*). Deposited.
25. 2 Beautiful Parrakeets (*Psephotus pulcherrimus*), ♂ and ♀. Deposited.
27. 1 Macaque Monkey (*Macacus cynomolgus*), ♀. Presented by Mr. Thomas Daly.
- 1 Galapagan Tortoise (*Testudo elephantopus*). Presented by Lieut. W. H. Henderson, R.N., H.M.S. 'Peterel.'
- 1 Common Nuthatch (*Sitta cæsia*). Purchased.
28. 1 Red Kangaroo (*Macropus rufus*), ♀. Born in the Gardens.
- Mar. 3. 2 Herring-Gulls (*Larus argentatus*). Deposited.
5. 2 Hooded Crows (*Corvus cornix*). Presented by Mr. F. Cresswell.
- 1 Rose Hill-Parrakeet (*Platycercus eximius*). Presented by Mr. J. J. Chapman.
6. 1 Rufous-vented Guan (*Penelope cristata*). Presented by Mr. Daniel Miron.
8. 1 Bonnet-Monkey (*Macacus radiatus*). Presented by Mrs. Payton.
- 1 Hodgson's Barbet (*Megalæma hodgsoni*). Purchased. See P. Z. S. 1877, p. 303.
- 2 Striated Jay-Thrushes (*Grammatoptila striata*). Purchased. See P. Z. S. 1877, p. 303.
- 1 Red-headed Laughing-Thrush (*Trochalopteron erythrocephalum*). Purchased.
- 3 Black-headed Sibilas (*Sibia capistrata*). Purchased. See P. Z. S. 1877, p. 303.
- 3 Brown-eared Bulbuls (*Hemixos flavala*). Purchased. See P. Z. S. 1877, p. 303.
- 2 Rufous-bellied Bulbuls (*Hyppipetes macclellandi*). Purchased.
- 1 Two-Wattled Cassowary (*Casuarus bicarunculatus*). Purchased.
- 1 Hooded Crane (*Grus monachus*). Purchased.
- 1 Macaque Monkey (*Macacus cynomolgus*), rufous variety. Deposited.
13. 2 Orang-outangs (*Simia satyrus*), 2 ♂. Presented by Dr. R. Sim, F.Z.S. See P. Z. S. 1877, p. 303.

- Mar. 13. 1 Green Monkey (*Cercopithecus callitrichus*), ♀. Presented by Mr. J. Mason Allen.
- 1 Cape Hyrax (*Hyrax capensis*). Purchased.
  - 1 Chinese Blue Magpie (*Urocissa cinensis*). Purchased.
  - 1 Red-capped Parrot (*Pionopsitta pileata*). Purchased.
  - 3 Red-eared Conures (*Conurus cruentatus*). Purchased.
  - 1 Grey Amphisbæna (*Blanus cinereus*). Presented by Mr. John Goddard. See P. Z. S. 1877, p. 270.
14. 1 Grivet Monkey (*Cercopithecus griseoviridis*), ♀. Presented by Mr. J. Walter Richardson.
- 1 Common Badger (*Meles taxus*). Born in the Menagerie.
15. 1 Blossom-headed Parrakeet (*Palæornis cyanocephala*). Received in exchange.
- 1 Arabian Baboon (*Cynocephalus hamadryas*), ♀. Purchased.
16. 1 Sarus Crane (*Grus antigone*). Purchased.
17. 1 American Jabiru (*Mycteria americana*). Purchased.
19. 1 Puma (*Felis concolor*), ♂. Presented by Commander Stanhope Grove, R.N.
- 1 Black-eared Marmoset (*Hapale penicillata*). Presented by Mr. C. Weedon.
20. 1 Burrhel Wild Sheep (*Ovis burrhel*), ♂. Deposited.
- 1 Grey-breasted Parrakeet (*Bolborhynchus monachus*). Received in exchange.
  - 1 Nonpareil Finch (*Cyanospiza ciris*). Received in exchange.
21. 1 Nisnas Monkey (*Cercopithecus pyrrhonotus*), ♂. Presented by Mr. B. C. Simpson.
- 2 Upland Geese (*Bernicla magellanica*), ♂ and ♀. Purchased. From Patagonia.
22. 1 White-throated Capuchin (*Cebus hypoleucus*). Presented by Mr. George Nurse.
23. 2 Great Cyclodus Lizards (*Cyclodus gigas*). Purchased.
- 1 Stump-tailed Lizard (*Trachydosaurus rugosus*). Purchased.
  - 1 Stokes's Lizard (*Silubosaurus stokesi*). Purchased.
  - 2 Blue-bearded Jays (*Cyanocorax cyanopogon*). Purchased.
  - 2 White-fronted Guans (*Penelope jacucaca*). Purchased.
  - 2 Turkey Vultures (*Cathartes aura*). Purchased.
  - 3 West-India Rails (*Aramides cayennensis*). Purchased.
  - 2 Hairy Tree-Porcupines (*Sphingurus villosus*). Purchased.
  - 1 Common Boa (*Boa constrictor*). Purchased.
  - 1 Zebu (*Bos indicus*), ♂. Born in the Menagerie.
24. 2 Slender-billed Cockatoos (*Licmetis tenuirostris*). Presented by Mr. W. Dillon Massey.
26. 3 Fire-tailed Finches (*Erythrura prasina*). Purchased.
27. 1 Vulpine Phalanger (*Phalangista vulpina*), ♂. Presented by Mr. Thos. Welsh.
- 1 Great Kangaroo (*Macropus giganteus*), ♀. Born in the Gardens.
  - 1 Yellow-footed Rock-Kangaroo (*Petrogale xanthopus*), ♀. Born in the Gardens.
28. 1 Prussian Carp (*Carassius vulgaris*). Presented by Mr. J. Smith.
- 1 Bream (*Abramis brama*). Presented by Mr. J. Smith.
  - 6 Tench (*Tinca vulgaris*). Presented by Mr. J. Smith.
  - 6 Perch (*Perca fluviatilis*). Presented by Mr. J. Smith.
  - 18 Roach (*Leuciscus rutilus*). Presented by Mr. J. Smith.
  - 2 Rufous Tinamous (*Rhynchotus rufescens*). Presented by Mr. F. Searle Parker.



- Mar. 29. 1 Naked-eared Deer (*Cervus gymnotis*), ♀. Presented by Mr. C. Cooper. From Guayaquil.
31. 1 Feline Dourocouli (*Nyctipithecus felinus*). Purchased. From Cartagena.
- 1 Kinkajou (*Cercoleptes caudivolvulus*). Purchased. From Cartagena.
- 3 Blue-shouldered Tanagers (*Tanagra cyanoptera*). Purchased. From Cartagena.
- 1 Adorned Terrapin (*Clemmys ornata*). Purchased. From Cartagena.
- 2 Common Otters (*Lutra vulgaris*). Presented by Mr. Augustus B. Foster.
- 1 Collared Fruit-Bat (*Cynonycteris collaris*). Born in the Gardens.
- 1 Black Swan (*Cygnus atratus*). Bred in the Gardens.
- April 3. 2 Sykes's Hemipodes (*Turnix sykesi*). Presented by Mrs. Wood-Mason.
- 3 Chinese Quails (*Coturnix chinensis*), 2 ♂ and 1 ♀. Presented by Mrs. Wood-Mason.
- 1 Rain-Quail (*Coturnix coromandelica*), ♂. Presented by Mrs. Wood-Mason.
- 1 Asiatic Quail (*Perdica asiatica*), ♂. Presented by Mrs. Wood-Mason.
4. 1 Ceylon Fish-Owl (*Ketupa ceylonensis*). Presented by Capt. B. B. Turner. See P. Z. S. 1877, p. 418.
5. 1 Vulpine Phalanger (*Phalangista vulpina*), ♂. Presented by Mr. W. Bazeley.
- 1 Entellus Monkey (*Semnopithecus entellus*). Received in exchange.
6. 1 Common Wolf (*Canis lupus*), ♀. Presented by Mr. J. A. Parlet.
8. 1 Collared Fruit-Bat (*Cynonycteris collaris*). Born in the Menagerie.
9. 1 Smooth Snake (*Coronella lævis*). Received in exchange.
10. 2 Alpine Marmots (*Arctomys marmotta*). Received in exchange.
11. 1 Bennett's Wallaby (*Halmaturus bennetti*), ♂. Presented by Miss E. Woollatt.
- 1 Malabar Green Bulbul (*Phyllornis aurifrons*). Presented by Mrs. Arabin, F.Z.S.
- 2 Siamese Pheasants (*Euplocamus prælatus*), ♂ and ♀. Purchased.
- 1 Chinchilla (*Chinchilla lanigera*). Born in the Gardens.
12. 2 Smooth Newts (*Triton tæniatus*). Presented by Master Guy Lutley Sclater.
13. 1 Impeyan Pheasant (*Lophophorus impeyanus*), ♀. Purchased.
14. 1 Ring-necked Parrakeet (*Palæornis torquata*). Deposited.
- 1 White-fronted Guan (*Penelope jacucaca*). Purchased.
- 1 White-eyebrowed Guan (*Penelope superciliaris*). Purchased.
- 2 Scaly Doves (*Scardafella squamosa*). Purchased.
- 2 Superb Tanagers (*Calliste fastuosa*). Purchased.
- 1 Great American Egret (*Ardea egretta*). Purchased.
- 1 Tuberculated Lizard (*Iguana tuberculata*). Purchased.
15. 1 Green Monkey (*Cercopithecus callitrichus*). Deposited.
- 1 Brown Capuchin (*Cebus fatuellus*). Deposited.
16. 1 Brown Monkey (*Macacus brunneus*), ♂. Deposited.

- April 16. 1 Bay Bamboo-Rat (*Rhizomys badius*). Presented by Mr. J. Wood-Mason.  
 1 Horned Lizard (*Phrynosoma cornutum*). Presented by Mr. T. Clover.
19. 2 Chinchillas (*Chinchilla lanigera*). Born in the Menagerie.
20. 1 Rusa Deer (*Cervus rusa*). Presented by Mr. A. A. Fraser, F.Z.S.  
 1 Demeraran Cock of the Rock (*Rupicola crocea*), ♂. Purchased.
23. 1 Crested Porcupine (*Hystrix cristata*). Presented by Capt. Smerdon, S.S. 'Orion.'  
 1 Indian Cobra (*Naja tripudians*). Presented by the Hon. W. Dumaresq Wright.  
 8 Vulturine Guinea-Fowls (*Numida vulturina*). Deposited.
24. 1 Beisa Antelope (*Oryx beisa*), ♂. Deposited.  
 1 Bohor Antelope (*Cervicapra bohor*), ♀. Deposited. See P. Z. S. 1877, p. 418.  
 2 African Sheep (*Ovis aries*), ♂ and ♀. Deposited.  
 1 King Parrakeet (*Aprosmictus scapulatus*), ♀. Presented by Miss Jones.  
 1 Black Scoter (*Edemia nigra*). Presented by Capt. E. Dixon.
25. 1 Toque Monkey (*Macacus pileatus*), ♂. Deposited.  
 1 White Pelican (*Pelecanus onocrotalus*). Presented by Mr. A. C. Henderson.
26. 1 Indian Leopard (*Felis pardus*). Presented by Dr. Sidney Smith.  
 1 Common Nightingale (*Daulias lusciniæ*). Received in exchange.  
 1 Hawfinch (*Coccothraustes vulgaris*). Presented by Capt. Salvin.
27. 1 Pygmy Marmoset (*Hapale pygmæa*), ♂. Purchased. From Pebas, Upper Amazons. See P. Z. S. 1877, p. 418.  
 2 Yellow-thighed Parrots (*Caica xanthomera*). Purchased. From Yquitos, Upper Amazons. See P. Z. S. 1877, p. 419.  
 1 Rough Terrapin (*Clemmys punctularia*). Purchased. From Para.  
 1 Egyptian Gazelle (*Gazella dorcas*), ♂. Presented by Her Majesty the Queen.
28. 1 Suricate (*Suricata zenib*). Presented by Mr. J. Forbes Nixon.
30. 4 Common Foxes (*Canis vulpes*). Born in the Menagerie.
- May 1. 1 Rock-Cavy (*Cerodon rupestris*). Purchased.  
 1 Restless Cavy (*Cavia caprera*). Deposited.  
 2 Green-winged Doves (*Chalcophaps indica*). Presented by Mrs. M. A. Moore.  
 1 Hamilton's Terrapin (*Clemmys hamiltoni*). Presented by Mrs. M. A. Moore.  
 4 Chilian Pintails (*Dafila spinicauda*). Bred in the Gardens.  
 2. 7 Raccoon-like Dogs (*Nyctereutes procynides*). Born in the Menagerie. See P. Z. S. 1877, p. 530.  
 3 Water-Ouzels (*Cinclus aquaticus*). Presented by Mr. B. G. Davies Cooke.  
 3. 6 River-Lampreys (*Petromyzon fluviatilis*). Presented by Mr. A. H. Cocks, F.Z.S.  
 1 Indian Python (*Python molurus*). Presented by Mr. C. A. F. Powell.

- May 4. 1 Virginian Deer (*Cervus virginianus*). Deposited.  
 7. 2 Mauge's Dasyures (*Dasyurus maugei*). Presented by Capt. J. C. Harris.  
 1 Antarctic Skua (*Stercorarius antarcticus*). Presented by Capt. W. Vincent Legge, R.A. From Ceylon.  
 1 Indranee Owl (*Syrnium indranee*). Presented by Capt. W. Vincent Legge, R.A. From Ceylon.  
 1 Ceylon Hawk-Eagle (*Spizaetus ceylonensis*). Presented by Capt. W. Vincent Legge, R.A. From Ceylon. See Ibis, 1877, p. 431.  
 1 Greater Sulphur-crested Cockatoo (*Cacatua galerita*). Presented by Mrs. Dore.  
 8. 1 Bonnet-Monkey (*Macacus radiatus*), ♂. Presented by Miss Ada Sharpe.  
 2 Senegal Touracous (*Corythaix persa*). Presented by Mr. J. G. Tayler.  
 9. 1 Hoolock Gibbon (*Hylobates hoolock*), ♂. Presented by Mr. John Scrymgeour.  
 2 Meadow-Pipits (*Anthus pratensis*). Presented by Mr. J. Young.  
 2 White-eared Conures (*Comurus leucotis*). Presented by Lady Greville.  
 10. 1 Saddle-billed Stork (*Xenorhynchus senegalensis*). Purchased.  
 5 Peba Armadillos (*Tatusia peba*). Purchased.  
 1 Black Sternothere (*Sternotherus niger*). Purchased.  
 1 Masked Paradoxure (*Paradoxurus larvatus*). Purchased.  
 11. 1 Senegal Touracou (*Corythaix persa*). Presented by Capt. R. H. Crewe.  
 13. 1 Wild Boar (*Sus scrofa*), ♂. Born in the Menagerie.  
 15. 2 Tigers (*Felis tigris*), 2 ♂. Presented by Rear-Admiral Rowley Lambert, C.B. From Johore, Malay peninsula.  
 2 Javan Chevrotains (*Tragulus javanicus*). Presented by Messrs. Hill and Isaac, Lieuts. R.N.  
 1 Saddled Squirrel (*Sciurus ephippium*). Presented by Messrs. Hill and Isaac, Lieuts. R.N. From Borneo.  
 1 Green Turtle (*Chelone viridis*). Presented by Messrs. Hill and Isaac, Lieuts. R.N.  
 1 Concave-casqued Hornbill (*Buceros bicornis*). Received in exchange.  
 1 Crowned Hornbill (*Buceros coronatus*). Received in exchange.  
 3 Yellow-billed Blue Magpies (*Urocissa flavirostris*). Received in exchange.  
 16. 2 Bonnet-Monkeys (*Macacus radiatus*), ♂ and ♀. Presented by Mrs. Harper.  
 1 White-throated Capuchin (*Cebus hypoleucus*). Purchased.  
 4 Derbian Opossums (*Didelphys derbiana*). Presented by Mr. L. R. Dickinson. From U. S. Columbia.  
 1 Wood-Owl (*Syrnium aluco*). Presented by Miss Pitcairn.  
 2 Variegated Sheldrakes (*Tadorna variegata*). Bred in the Gardens.  
 17. 1 Sooty Mangabey (*Cercocebus fuliginosus*), ♂. Deposited.  
 2 Impeyan Pheasants (*Lophophorus impeyanus*), ♂ and ♀. Purchased.  
 1 Mantchurian Crossoptilon (*Crossoptilon mantchuricum*). Purchased.  
 1 Malayan Bear (*Ursus malayanus*), ♂. Presented by Dr. F. Wicksteed.

- May 17. 1 Undulated Grass-Parrakeet (*Melopsittacus undulatus*). Purchased.
- 1 Weeper Capuchin (*Cebus capucinus*). Presented by Mrs. Standish.
- 12 Sand-Lizards (*Lacerta agilis*). Presented by Mr. H. O. Forbes, F.Z.S.
- 4 Wall-Lizards (*Lacerta muralis*). Presented by Mr. H. O. Forbes, F.Z.S.
18. 2 Persian Gazelles (*Gazella subgutturosa*). Deposited.
- 1 Pinche Monkey (*Midas aedipus*). Received in exchange.
- 4 Black Francolins (*Francolinus vulgaris*). Received in exchange.
- 3 Pied Grass-Finches (*Spermestes fringilloides*). Received in exchange.
- 1 Crimson-winged Waxbill (*Pytelia phænicoptera*). Received in exchange.
- 1 Half-white Finch (*Spermophila hypoleuca*). Received in exchange.
- 2 Yellow-throated Sparrows (*Passer luteus*). Received in exchange.
- 1 Shining Weaverbird (*Hypochera nitens*). Received in exchange.
- 1 Yellow-shouldered Weaverbird (*Euplectes capensis*). Received in exchange.
- 2 Red-headed Finches (*Amadina erythrocephala*), 2 ♀. Received in exchange.
20. 1 Humboldt's Saki (*Pithecia humboldti*), ♂. Purchased.
- 1 Manis (*Manis tricuspis*). Purchased. See P. Z. S. 1877, p. 530.
- 1 Red-and-yellow Macaw (*Ara chloroptera*). Purchased.
21. 1 African Buzzard (*Buteo desertorum*). Presented by Mr. A. Anderson, F.Z.S. See P. Z. S. 1877, p. 530.
22. 1 White-backed Pigeon (*Columba leuconota*). Deposited.
- 3 Carpet-Snakes (*Morelia variegata*). Presented by Mr. J. Moseley.
23. 1 Derbian Wallaby (*Halmaturus derbianus*), ♂. Born in the Menagerie.
- 1 Guianan Crested Eagle (*Morphnus guianensis*). Purchased. See P. Z. S. 1877, p. 531.
24. 1 Green-necked Peafowl (*Pavo spicifer*), ♀. Purchased.
- 1 Barred-tailed Pheasant (*Phasianus reevesi*), ♀. Purchased.
- 1 One-wattled Cassowary (*Casuarius uniappendiculatus*). Purchased. See P. Z. S. 1877, p. 531.
- 2 Bornean Firebacks (*Euplocamus nobilis*), ♂ and ♀. Purchased.
- 2 Swinhoe's Firebacks (*Euplocamus swinhoei*), ♂ and ♀. Purchased.
- 1 Barred-tailed Pheasant (*Phasianus reevesi*), ♀. Purchased.
- 2 Japanese Pheasants (*Phasianus versicolor*), ♂ and ♀. Purchased.
- 1 Fork-tailed Jungle-Fowl (*Gallus furcatus*), ♀. Purchased.
- 1 Great-headed Maleo (*Megacephalon maleo*). Purchased.
- 1 Daubenton's Curassow (*Crax daubentoni*). Deposited.
25. 1 American Moorhen (*Gallinula galeata*). Presented by Capt. Carl Hannes.
- 1 Carolina Rail (*Porzana carolina*). Presented by Capt. Car Hannes.

- May 25. 1 Common Quail (*Coturnix communis*), ♂. Presented by J. H. de Rinzy, Esq.
26. 2 Abyssinian Guinea-Fowls (*Numida ptilorhyncha*). Presented by Capt. Burke, S.S. 'Arcot.'
27. 1 Grey Ichneumon (*Herpestes griseus*), ♀. Presented by Dr. Lynn.
- 8 Green Tree-Frogs (*Hyla arborea*). Presented by Mr. S. A'Court.
- 1 Banded Ichneumon (*Herpestes fasciatus*). Presented by the Earl of Bective.
28. 1 Mesopotamian Fallow Deer (*Cervus mesopotamicus*), ♂. Purchased. See P. Z. S. 1877, p. 531.
- 2 Scarlet Ibises (*Ibis rubra*). Presented by Miss Attwood, F.Z.S.
29. 1 Humboldt's Lagothrix (*Lagothrix humboldti*). Received in exchange.
- 1 Swainson's Long-tailed Jay (*Calocitta formosa*). Purchased. From New Orleans.
- 1 African Leopard (*Felis pardus*), ♀. Purchased.
- 1 Woolly Cheetah (*Felis lanea*, sp. nov.) Purchased. See P. Z. S. 1877, p. 532, pl. LV.
- 1 Red-winged Parrakeet (*Aprosmictus erythropterus*). Presented by Mr. W. H. Moseley.
- 1 Prevost's Squirrel (*Sciurus prevosti*). Purchased.
- 2 Imperial Eagles (*Aquila imperialis*). Purchased.
- June 1. 1 Rhesus Monkey (*Macacus erythræus*). Presented by Mr. H. Millet.
- 1 Reeves's Muntjac (*Cervulus reevesi*). Born in the Menagerie.
2. 1 White-cheeked Gibbon (*Hylobates leucogenys*), ♂. Presented by W. H. Newman, Esq., H.B.M. Consul at Bangkok. From the forests of Laos, Northern Siam. See P. Z. S. 1877, p. 679, pl. LXX.
- 1 Kinkajou (*Cercoleptes caudivolvulus*), ♂. Deposited.
- 1 Black-backed Jackal (*Canis mesomelas*), ♀. Presented by the Earl of Guilford.
3. 3 Variegated Sheldrakes (*Tadorna variegata*). Born in the Gardens.
4. 1 Lesser White-nosed Monkey (*Cercopithecus petaurista*). Presented by Mrs. Cleaver.
- 3 Crested Guinea-Fowls (*Numida cristata*). Deposited. From Mozambique.
- 2 Vulturine Guinea-Fowls (*Numida vulturina*). Deposited.
5. 1 Common Buzzard (*Buteo vulgaris*). Presented by Mr. F. Buckland.
- 4 Summer-Ducks (*Aix sponsa*). Bred in the Gardens.
6. 1 Imperial Eagle (*Aquila imperialis*). Deposited.
- 1 Smooth Snake (*Coronella levis*). Presented by Lord Lilford.
12. A collection of Spotted Salamanders (*Salamandra maculosa*). Purchased.
13. 2 Condor Vultures (*Sarcorhamphus grypus*). Presented by Mr. John T. North.
- 1 Chilian Sea-Eagle (*Geranouëtus aguia*). Presented by Mr. John T. North.
- 6 Chilian Pintails (*Dafila spinicauda*). Bred in the Gardens.
- 7 Spotted-billed Ducks (*Anas pœcilorhyncha*). Bred in the Gardens.
14. 2 Dorsal Squirrels (*Sciurus dorsalis*). Purchased.

- June 14. 1 White-crowned Pigeon (*Columba leucocephala*). Purchased.  
 1 Orange-winged Dove (*Leptoptila ochroptera*). Purchased.  
 1 Sharp-nosed Crocodile (*Crocodylus americanus*). Purchased.
15. 1 Demeraran Cock of the Rock (*Rupicola crocea*). Purchased.  
 1 Green-winged Trumpeter (*Psophia viridis*). Purchased.  
 1 Common Trumpeter (*Psophia crepitans*). Purchased.  
 1 Sun-Bittern (*Eurodygia helias*). Purchased.  
 1 Banded-tailed Urubitinga (*Urubitinga zonura*). Purchased.  
 1 Black-necked Stilt-Plover (*Himantopus nigricollis*). Purchased.
- 2 Orinoco Geese (*Chenalopex jubata*). Purchased.  
 1 Capybara (*Hydrochaeris capybara*). Purchased.  
 1 Moor Monkey (*Semnopithecus maurus*), ♂. Purchased.  
 1 Meyer's Parrot (*Psecephalus meyeri*). Purchased.
16. 2 Chaus Cats (*Felis chaus*). Presented by Mr. William Renney.  
 1 Tibetan Partridge (*Perdix hodgsoniæ*). Presented by Mr. M. J. M. Cornély, C.M.Z.S.  
 1 Greater Sulphur-crested Cockatoo (*Cacatua galerita*). Presented by Mr. M. J. M. Cornély, C.M.Z.S.  
 1 Natterjack Toad (*Bufo calamita*). Presented by Mr. H. W. Fielden.
17. 1 Crested Guan (*Penelope cristata*), ♂. Presented by Mr. Daniel Miron, of Vera Cruz.
19. 1 Purple Kaleege (*Euplocamus horsfieldi*), ♀ Presented by Mr. John Ditmas.  
 1 Pied Wagtail (*Motacilla yarrelli*). Purchased.  
 7 Spotted-billed Ducks (*Anas pæcilorhyncha*). Born in the Gardens.
20. 1 Hippopotamus (*Hippopotamus amphibius*), ♂. Purchased. Born in the Gardens of the Zoological Society of Amsterdam, July 3, 1876. See P. Z. S. 1877, p. 680.  
 1 Greater Sulphur-coloured Cockatoo (*Cacatua galerita*). Presented by Mr. W. L. Marchant.  
 2 Bronze-winged Pigeons (*Phaps chalcoptera*). Bred in the Gardens.  
 1 Geoffroy's Dove (*Peristera geoffroi*). Bred in the Gardens.  
 1 Greater Sulphur-coloured Cockatoo (*Cacatua galerita*). Deposited.  
 1 Barraband's Parrakeet (*Polytelis barrabandi*). Presented by Mr. W. H. Gregory.
21. 1 Patas Monkey (*Cercopithecus ruber*), ♀. Presented by Mr. Edward Poulson.  
 8 Summer-Ducks (*Aix sponsa*). Bred in the Gardens.  
 7 Chilian Pintails (*Dafila spinicauda*). Bred in the Gardens.  
 1 Common Kestrel (*Tinnunculus alaudarius*). Presented by Mr. A. Lidbury.
22. 1 Red-and-Blue Macaw (*Ara macao*). Deposited.  
 1 Lesser Black-backed Gull (*Larus fuscus*). Presented by Mr. J. Snell.  
 1 Imperial Eagle (*Aquila imperialis*). Deposited.
23. 1 Yellow Baboon (*Cynocephalus babouin*), ♂. Presented by Mr. H. E. Walters.  
 1 Rhesus Monkey (*Macacus erythræus*). Received in exchange.  
 1 Brown Coati (*Nasua nasica*). Deposited.
25. 2 Pig-tailed Monkeys (*Macacus nemestrinus*), ♂. Presented by Sir Harry St. George Ord, C.B., F.Z.S. From Johore, Malay peninsula.

- June 25. 1 Black Leopard (*Felis pardus*). Presented by Sir Harry St. George Ord, C.B., F.Z.S. From Johore, Malay peninsula. See P. Z. S. 1877, p. 680.
- 1 Vieillot's Pheasant (*Euplocamus vieilloti*), ♀. Presented by Sir Harry St. George Ord, C.B., F.Z.S.
- 2 Argus Pheasants (*Argus giganteus*), ♂ and ♀. Presented by Sir Harry St. George Ord, C.B., F.Z.S.
- 1 Macaque Monkey (*Macacus cynomolgus*), ♀. Presented by Mrs. Parkinson.
26. 1 Common Marmoset (*Hapale jacchus*). Purchased.
- 1 Black-eared Marmoset (*Hapale penicillata*). Purchased.
- 1 Hawk-headed Parrot (*Derophtus accipitrinus*). Purchased.
- 1 Tibetan Partridge (*Perdix hodgsoniae*). Purchased.
- 6 Chilian Pintails (*Dafila spinicauda*). Bred in the Gardens.
27. 1 North-American Reindeer (*Rangifer tarandus*), ♂. Presented by Capt. Edmund Fraser, 60th Royal Rifles. From Newfoundland.
- 1 Carrion-Crow (*Corvus corone*). Presented by Mr. W. M. Price.
- 1 Vulpine Phalanger (*Phalangista vulpina*). Born in the Menagerie.
28. 1 Bonnet-Monkey (*Macacus radiatus*). Presented by Mr. G. McCheane.
- 10 Amherst Pheasants (*Thaumalea amherstiae*). Bred in the Gardens.
- 2 Temminck's Tragopans (*Cerionis temmincki*). Bred in the Gardens.
- 2 Forked-tailed Jungle-Fowls (*Gallus furcatus*). Bred in the Gardens.
29. 1 Javan Chevrotain (*Tragulus javanicus*), ♀. Presented by Mr. W. Trent.
- 1 African Cobra (*Naia haje*). Presented by Mr. Eustace Pillans.
30. 3 Black-bellied Sand-Grouse (*Pterocles arenarius*), 2 ♂ and 1 ♀. Presented by Col. J. S. Lowe.
- 1 Pale-headed Tree-Boa (*Epicrates angulifer*). Presented by Mr. A. L. Schütte. From Cuba.
- 20 Common Boas (*Boa constrictor*). Born in the Gardens. See P. Z. S. 1877, p. 680.
- July 2. 1 Sun-Bittern (*Europtya helias*). Bred in the Gardens.
- 8 Speckled Terrapins (*Clemmys guttata*). Purchased.
- 3 Red-vented Terrapins (*Clemmys rubriventris*). Purchased.
- 7 Muhlenburg's Terrapins (*Clemmys muhlenburgi*). Purchased.
- 2 American Box-Tortoises (*Terrapene carinata*). Purchased.
6. 1 Sacred Ibis (*Geronticus aethiopicus*). Bred in the Gardens.
- 4 Common Kingfishers (*Alcedo ispida*). Presented by Mr. J. Lyford.
- 2 Horned Lizards (*Phrynosoma cornutum*). Presented by Mr. W. A. Bowie.
9. 4 Axis Deer (*Cervus axis*). Deposited.
- 1 Leadbeater's Cockatoo (*Cacatua leadbeateri*). Presented by Mrs. Shand.
10. 1 Black-necked Swan (*Cygnus nigricollis*). Bred in the Gardens.
11. 1  $\frac{3}{4}$ -breed Zebu (between *Bos indicus* ♂ and hybrid *Bos frontalis*), ♀. Born in the Menagerie.
- 1 Rhesus Monkey (*Macacus erythræus*). Presented by Mr. F. Rowling.

- July 12. 1 Sambur Deer (*Cervus aristotelis*), ♂. Presented by H.R.H. the Prince of Wales, K.G.
- 1 Spotted Porcine Deer (*Cervus minor*), ♂. Presented by H.R.H. the Prince of Wales, K.G. See P. Z. S. 1876, p. 463.
- 2 Rampoor Hounds (*Canis familiaris*, var.). Presented by H.R.H. the Prince of Wales, K.G.
13. 1 Macaque Monkey (*Macacus cynomolgus*). Presented by Mr. E. Cochrane.
- 1 Merian's Opossum (*Didelphys dorsigera*). Purchased.
- 1 Slow Loris (*Nycticebus tardigradus*). Presented by Mr. W. H. Pattison.
- 1 Prehensile Paradoxure (*Paradoxurus prehensilis*). Presented by Mr. W. H. Pattison. See P. Z. S. 1877, p. 681, pl. LXXI.
14. 1 Red Howler (*Mycetes seniculus*), ♂. Deposited.
- 2 Striped Hyænas (*Hyæna striata*). Born in the Menagerie.
16. 1 Urumutum Curassow (*Nothocrax urumutum*). Purchased. From Brazil. See P. Z. S. 1877, p. 681.
- 2 Piping Guans (*Pipile cumanensis*). Purchased. From Bahia.
- 5 Rufous Tinamous (*Rhynchotus rufescens*). Purchased. From Buenos Ayres.
- 2 De Filippi's Meadow-Starlings (*Sturnella defilippii*). Purchased. From Buenos Ayres.
- 2 West-Indian Rails (*Aramides cayennensis*). Purchased.
- 2 White-faced Tree-Ducks (*Dendrocygna viduata*). Purchased.
- 1 Orinoco Goose (*Chenalopez jubata*). Purchased.
- 3 Cayenne Lapwings (*Vanellus cayennensis*). Purchased. From Buenos Ayres.
- 1 Burmeister's Cariama (*Chunga burmeisteri*). Purchased. From the Argentine Republic.
- 1 Chilian Sea-Eagle (*Geranoaëtus melanoleucus*). Purchased. From Uruguay.
- 1 Brown Milvago (*Milvago chimango*). Purchased.
- 1 Virginian Eagle-Owl (*Bubo virginianus*). Purchased. From Uruguay.
- 1 Brazilian Stilt-Plover (*Himantopus brasiliensis*). Purchased. From Buenos Ayres.
17. 1 Wapiti Deer (*Cervus canadensis*), ♀. Born in the Menagerie.
- 1 Slight-billed Cockatoo (*Licmetis tenuirostris*). Presented by Mrs. H. M. Richardson.
- 2 Silver Pheasants (*Euplocamus nyctemerus*), ♂ and ♀. Received in exchange.
18. 1 Egyptian Gazelle (*Gazella dorcas*), ♂. Presented by Mr. H. B. Benson.
- 2 Black Vultures (*Cathartes atratus*). Purchased.
- 1 Horned Tragopan (*Cerionis satyra*), ♀. Received in exchange.
- 1 Malbrouck Monkey (*Cercopithecus cynosurus*). Presented by Mrs. Escott.
19. 2 Black Swans (*Cygnus atratus*). Deposited.
- 2 Black Vipers (*Vipera aspis*). Presented by Mr. G. F. Fenton. From France.
- 2 Common Snakes (*Tropidonotus natrix*). Presented by Mr. G. F. Fenton. From North Italy.
- 1 Smooth Snake (*Coronella lævis*). Presented by Mr. G. F. Fenton. From France.



- July 20. 1 White-cheeked Capuchin (*Cebus lunatus*). Presented by the Hon. E. H. Ellis.  
 4 Silky Marmosets (*Midas rosalia*), 1 ♂ and 3 ♀. Presented by the Hon. E. H. Ellis.  
 1 Brown Coati (*Nasua nasica*). Presented by Mr. Thynne.  
 1 Indian Muntjac (*Cervulus muntjac*), ♀. Born in the Menagerie.
21. 3 Rhesus Monkeys (*Macacus erythræus*), 2 ♂ and 1 ♀. Presented by Mr. A. G. Williams.  
 1 White-headed Sea-Eagle (*Haliaeetus leucocephalus*). Presented by Mr. A. G. Williams.  
 3 Horned Vipers (*Vipera cornuta*). Deposited.
23. 1 Squirrel Monkey (*Saimaris sciurea*), ♀. Deposited.  
 5 Green Lizards (*Lacerta viridis*). Presented by Mr. A. Fraser.  
 1 Common Carp (*Carassius vulgaris*). Presented by Mr. A. Woods.  
 1 Military Macaw (*Ara militaris*). Purchased.
24. 1 Bonnet-Monkey (*Macacus radiatus*), ♂. Presented by Mr. C. L. Norman.
25. 1 Common Crane (*Grus cinerea*). Chinese variety. Presented by Mr. T. Hance of Chingkiang. From Shantung, North China. See P. Z. S. 1877, p. 681.  
 1 Common Moorhen (*Gallinula chloropus*). Presented by Mr. J. Wildey.
26. 3 Chaplain Crows (*Corvus capellanus*). Presented by Dr. J. Huntly. From Fao, Persian Gulf.
27. 1 Barbary Ape (*Macacus inuus*). Deposited.  
 10 Amherst Pheasants (*Thaumalea amherstiae*). Bred in the Gardens.  
 3 Temminck's Tragopans (*Cerionis temmincki*). Bred in the Gardens.  
 1 Red River-Hog (*Potamochoerus penicillatus*), ♂. Received in exchange.  
 1 Common Hangnest (*Icterus vulgaris*). Presented by Miss Chambre.
28. 1 Raven (*Corvus corax*). Presented by Miss I. Latham Browne.  
 1 West-African Python (*Python sebae*). Presented by Mr. Lionel Hart.
29. 1 Wapiti Deer (*Cervus canadensis*), ♂. Bred in the Gardens.
30. 1 Grivet Monkey (*Cercopithecus griseo-viridis*), ♂. Presented by Mr. J. Harvey.  
 1 Weeper Capuchin (*Cebus capucinus*), ♀. Presented by Mrs. Cameron.
31. 1 Wood-Brocket (*Cervus nemorivagus*), ♀. Presented by Mr. C. C. Berington. From Trinidad.  
 1 Oil-bird (*Steatornis caripensis*). From Trinidad. Presented by Mr. G. W. Des Vœux.  
 1 Berigora Hawk (*Hieracidea berigora*). Presented by Major Spicer, F.Z.S.  
 1 White Goshawk (*Astur nova-hollandiae*). Presented by Major Spicer, F.Z.S.  
 1 Great-billed Rhea (*Rhea macrorhyncha*). Received in exchange.
- Aug. 2. 1 Axis Deer (*Cervus axis*), ♂. Born in the Menagerie.  
 1 Solitary Thrush (*Monticola cyanus*). Presented by Mr. W. W. Verner.

- Aug. 2. 1 Harpy Eagle (*Thrasaëtus harpyia*). Received in exchange.  
 4. 6 Branched Seahorses (*Hippocampus ramulosus*). Purchased.  
 1 Levallant's Amazon (*Chrysotis levallanti*). Presented by Mr. H. King. From Vera Cruz, Mexico.  
 6. 2 Rufous Tinamous (*Rhynchotus rufescens*). Presented by Capt. Fairfax, R.N.  
 7. 1 Spotted Cavy (*Cælogenys paca*). Presented by Mr. J. Trotter.  
 1 Coati (*Nasua nasica*), ♂. Presented by Mr. J. Trotter.  
 1 Gannet (*Sula bassana*). Presented by Mr. S. N. Sharpe.  
 8. 1 Central-American Agouti (*Dasyprocta isthmica*). Born in the Menagerie.  
 1 Geoffroy's Dove (*Peristera geoffroyi*). Hatched in the Gardens.  
 1 Roseate Cockatoo (*Cacatua roseicapilla*). Presented by Miss Potter.  
 9. 2 Common Swans (*Cygnus olor*). Presented by Major Kennan.  
 10. 1 Moustache-Monkey (*Cercopithecus cephus*), ♂. Presented by Lieut. E. F. Domville, R.N.  
 11. 1 Ring-necked Parrakeet (*Palæornis torquatus*). Presented by Mrs. Russell.  
 1 Common Chameleon (*Chamæleon vulgaris*). Presented by Mr. D. G. Wright.  
 4 Common Carps (*Cyprinus carpio*). Presented by Mr. Wood.  
 1 Common Tench (*Tinca vulgaris*). Presented by Mr. Wood.  
 13. 1 Slow Loris (*Nycticebus tardigradus*). Received in exchange.  
 3 Brazilian Tortoises (*Testudo tabulata*). Received in exchange.  
 1 Cape Hedgehog (*Erinaceus frontalis*). Received in exchange.  
 See P. Z. S. 1877, p. 681.  
 14. 1 Guiana Partridge (*Odontophorus guianensis*). Purchased.  
 2 Solitary Tinamous (*Tinamus solitarius*). Purchased.  
 1 Obsolete Tinamou (*Crypturus obsoletus*). Purchased.  
 1 Fulvous Tree-Duck (*Dendrocygna fulca*). Purchased.  
 15. 1 Wedge-tailed Pigeon (*Treron sphenura*). Presented by Mrs. A. H. Jamrach.  
 1 Madagascar Boa (*Pelophilus madagascariensis*). Purchased.  
 16. 1 Spotted Turtle Dove (*Turtur suratensis*). Bred in the Gardens.  
 2 Martinique Waterhens (*Porphyrio martinicus*). Purchased.  
 5 Black Salamanders (*Salamandra atra*). Presented by Mr. Aug. Kussmaul. From Switzerland.  
 18. 1 Egyptian Gazelle (*Gazella dorcas*), ♀. Presented by Capt. John Graham. From Barbary.  
 1 Grey-headed Parrakeet (*Agapornis cana*). Presented by Mr. B. Barnett.  
 20. 1 Slender-billed Cockatoo (*Licmetis tenuirostris*). Presented by Major M. Pasley, R.A.  
 22. 1 Scammerring's Antelope (*Gazella scammerringi*), ♂. Presented by Capt. F. Cotton.  
 1 Arabian Gazelle (*Gazella arabica*), ♀. Presented by Capt. F. Cotton.  
 23. 1 Emu (*Dromæus novæ-hollandiæ*). Presented by Mr. F. Green.  
 1 Bonnet-Monkey (*Macacus radiatus*), ♂. Presented by Mr. G. B. Southern.  
 24. 1 Crested Ground-Parrakeet (*Calopsitta novæ-hollandiæ*). Deposited.  
 26. 1 Purple-faced Monkey (*Semnopithecus leucopymnus*), ♂ Purchased.  
 1 Macaque Monkey (*Macacus cynomolgus*), ♂. Presented by Miss Gover.

- Aug. 27. 1 White-fronted Capuchin (*Cebus albifrons*). Presented by Mr. Shipman.
28. 1 Common Hangnest (*Icterus vulgaris*). Deposited.  
1 Leadbeater's Cockatoo (*Cacatua leadbeateri*). Presented by the Rev. S. J. Whitmee, C.M.Z.S.
29. 1 Pig-tailed Monkey (*Macacus nemestrinus*). Presented by Mrs. Rintoul.
30. 1 Tamandua Anteater (*Tamandua tetradactyla*). Purchased.  
1 American Darter (*Plotus anhinga*). Purchased.  
1 Ashy-headed Gull (*Larus cirrhocephalus*). Purchased.  
3 Brazilian Teals (*Querquedula brasiliensis*), 2 ♂ and 1 ♀. Purchased.  
1 Brazilian Motmot (*Momotus brasiliensis*). Purchased. See P. Z. S. 1877, p. 681.  
1 Sorry Thrush (*Turdus tristis*). Purchased.  
1 American Tantalus (*Tantalus loculator*). Purchased. From the Rio Magdalena. See P. Z. S. 1877, p. 681.  
2 Prince Albert's Curassow (*Crax alberti*), ♀. Purchased. From Cartagena.  
3 Black-faced Spider-Monkeys (*Ateles ater*). Purchased. From Cartagena.  
1 Kinkajou (*Cercoleptes caudivolvulus*). Purchased. From Belize.  
1 Vinaceous Pigeon (*Columba vinacea*). Purchased. From Cartagena.  
2 Wild Cats (*Felis catus*), ♂ and ♀. Received in exchange.
31. 1 Jameson's Gull (*Larus jamesoni*). Presented by Mr. C. Clifton, F.Z.S.  
1 Barbary Ape (*Macacus inuus*). Presented by Mr. G. Nurse.  
1 Barbary Ape (*Macacus inuus*). Deposited.  
1 Esculapian Snake (*Coluber esculapii*). Presented by Mr. G. F. Fenton.
- 30 Wall-Lizards (*Lacerta muralis*). Presented by Mr. G. F. Fenton.  
1 Green Lizard (*Lacerta viridis*). Presented by Mr. G. F. Fenton.
- Sept. 5. 1 Vervet Monkey (*Cercopithecus lalandii*). Deposited.  
1 Mandrill (*Cynocephalus mormon*). Presented by Mr. Francis Lovell.  
1 Common Fox (*Canis vulpes*). Presented by Mr. R. Haysen. From Germany.
6. 2 Mealy Amazons (*Chrysotis farinosa*). Deposited.  
1 Ring-necked Parrakeet (*Palæornis torquata*). Deposited.  
1 Common Paradoxure (*Paradoxurus typus*). Deposited.
7. 1 Egyptian Vulture (*Neophron percnopterus*). Deposited.  
1 Short-toed Eagle (*Circæetus gallicus*). Deposited.  
1 Raven (*Corvus corax*). Deposited.  
1 Common Genet (*Genetta vulgaris*). Deposited.  
1 Great Ant-eater (*Myrmecophaga jubata*). Presented by the Hon. L. S. Sackville West. From Buenos Ayres.  
2 Spotted-sided Finches (*Amadina lathamii*). Presented by Mr. J. M. Mitchell.  
1 Angola Vulture (*Gypohierax angolensis*). Presented by Mr. J. A. Solomon.  
1 Vociferous Sea-Eagle (*Haliaeetus vocifer*). Presented by Mr. J. A. Solomon.

- Sept. 7. 1 Aden Sheep (*Ovis aries*). Presented by Mr. A. Swanzy.  
 1 Common Kingfisher (*Alcedo ispida*). Presented by Mr. W. Thompson.  
 1 Bonnet-Monkey (*Macacus radiatus*). Presented by Mrs. Cullen.  
 1 Crested Hangnest (*Ostinops cristatus*). Purchased.  
 1 Purple-faced Monkey (*Simnopithecus leucopymnus*). Presented by Mr. J. H. B. Knocker.
10. 3 Capybaras (*Hydrochærus capybara*). Purchased.
11. 1 West-African Python (*Python sebæ*). Presented by Mr. Francis Lovell.  
 1 Common Hangnest (*Icterus vulgaris*). Presented by Mr. Hamilton Dunlop.
14. 1 Violet Tanager (*Euphonia violacea*). Purchased.  
 1 Yellow-winged Blue Creeper (*Cœreba cyanea*). Purchased.  
 2 Talpacoti Ground-Doves (*Chamæpelia talpacoti*). Bred in the Gardens.  
 1 Porto-Rico Pigeon (*Columba corensis*). Bred in the Gardens.
15. 2 Guilding's Amazons (*Chrysotis guildingi*). Purchased. From St. Vincent, W. I. See P. Z. S. 1877, p. 683.  
 1 Osprey (*Pandion haliaëtus*). Presented by Mr. W. S. Quintin. From Yorkshire.  
 1 Macaque Monkey (*Macacus cynomolgus*), ♀. Presented by Mr. A. S. Percival.
17. 1 Green Monkey (*Cercopithecus callitrichus*), ♀. Presented by Mr. W. W. Stead.  
 1 Capybara (*Hydrochærus capybara*). Presented by Mr. W. Smith.  
 1 Goffin's Cockatoo (*Cacatua goffini*). Deposited.  
 1 Ariel Toucan (*Ramphastos ariel*). Purchased.  
 1 Maximilian's Aracari (*Pteroglossus wiedi*). Purchased.  
 2 Blue-bearded Jays (*Cyanocorax cyanopogon*). Purchased.  
 2 West-Indian Rails (*Aramides cayennensis*). Purchased.
18. 1 Grivet Monkey (*Cercopithecus griseo-viridis*), ♀. Presented by Mr. W. D. James.  
 1 Nisnas Monkey (*Cercopithecus pyrrhonotus*), ♀. Presented by Mr. W. D. James.  
 3 Andean Geese (*Bernicla melanoptera*). Purchased. From Peru.  
 2 Upland Geese (*Bernicla magellanica*). Purchased. From Patagonia.  
 2 Slaty Coots (*Fulica ardesiaca*). Purchased. From Peru. See P. Z. S. 1877, p. 683.
19. 1 West-African Python (*Python sebæ*). Presented by Mr. J. J. Kendall.  
 1 Royal Python (*Python regius*). Presented by Mr. J. J. Kendall.
20. 1 Axis Deer (*Cervus axis*), ♂. Born in the Menagerie.
21. 1 Rhesus Monkey (*Macacus erythræus*). Deposited.
22. 1 Peregrine Falcon (*Falco peregrinus*). Presented by the Rev. W. Willimott.  
 1 African Buzzard (*Buteo desertorum*). Presented by the Rev. W. Willimott.
23. 1 Macaque Monkey (*Macacus cynomolgus*), ♂. Presented by Mr. J. F. Greenwood.  
 1 Yellow-footed Rock-Kangaroo (*Petrogale xanthopus*). Born in the Menagerie.

- Sept. 24. 1 Greater Sulphur-crested Cockatoo (*Cacatua galerita*). Presented by Mr. G. S. S. Williams.  
 1 Robben-Island Snake (*Coronella phocarum*). Presented by the Rev. G. H. R. Fisk, C.M.Z.S.  
 1 Java Sparrow (*Padda oryzivora*). Purchased.
26. 1 Chimpanzee (*Troglodytes niger*), ♂. Deposited.  
 2 Spotted Turtle Doves (*Turtur suratensis*). Bred in the Gardens.
27. 2 Red-backed Shrikes (*Lanius collurio*). Presented by Capt. F. H. Salvin.  
 2 Common Swans (*Cygnus olor*), ♂ and ♀. Deposited.
28. 1 Leonine Monkey (*Macacus leoninus*), ♂. Deposited.  
 1 Common Adder (*Vipera berus*). Presented by Mr. W. H. B. Pain.
29. 1 White-fronted Capuchin (*Cebus albifrons*), ♂. Purchased.  
 1 Laughing-Gull (*Larus atricilla*). Purchased.  
 3 Common Cormorants (*Phalacrocorax carbo*). Purchased.
- Oct. 1. 1 Common Seal (*Phoca vitulina*). Presented by Mr. G. Mellin.  
 2. 1 Vervet Monkey (*Cercopithecus lalandii*). Deposited.  
 1 Arabian Gazelle (*Gazella arabica*), ♀. Deposited.  
 3. 2 Peregrine Falcons (*Falco peregrinus*). Presented by Mr. Darill Stephens.  
 2 Emus (*Dromæus novæ-hollandiæ*). Presented by Lord Francis Conyngham, M.P., F.Z.S.  
 1 Lion (*Felis leo*), ♂. Deposited. From Persia.
5. 1 Grivet Monkey (*Cercopithecus griseo-viridis*), ♂. Presented by Mr. R. Dudgeon.  
 1 Great Kangaroo (*Macropus giganteus*), ♀. Presented by Mr. T. Phillips.
6. 1 Collared Peccary (*Dicotyles tajacu*). Presented by Mrs. E. J. Barrett.  
 1 Blackheaded Partridge (*Caccabis melanocephala*). Presented by Capt. Burke, S.S. 'Arcot.' From Hedjar.  
 1 Hyacinthine Porphyrio (*Porphyrio hyacinthinus*). Presented by Capt. Burke, S.S. 'Arcot.' From Mesopotamia.  
 1 Chinese Trionyx (*Trionyx perocellatus*). Purchased. From the Yang-tse Kiang river.
8. 1 Bonnet-Monkey (*Macacus radiatus*), ♂. Presented by Miss Ward.  
 1 Layard's Flying Squirrel (*Sciuropterus layardi*). Presented by Sir Charles Peter Layard. From Ceylon. See P. Z. S. 1877, p. 754.
9. 1 Wood-Owl (*Syrnium aluco*). Presented by Mrs. North.
10. 1 Bonnet-Monkey (*Macacus radiatus*). Presented by Mr. T. Golding.  
 2 Red Kangaroos (*Macropus rufus*). Deposited.
11. 1 Vulpine Phalanger (*Phalangista vulpina*). Born in the Menagerie.  
 1 River Jack-Viper (*Vipera rhinoceros*). Presented by Mr. J. J. Kendall.
12. 1 Brown Coati (*Nasua nasica*). Presented by Dr. G. P. Best, M.R.C.S.  
 2 Bronze-winged Pigeons (*Phaps chalcoptera*). Bred in the Gardens.  
 4 Chinese Turtle Doves (*Turtur chinensis*). Deposited.
13. 1 White-whiskered Paradoxure (*Paradoxurus leucomystax*). Purchased.

- Oct. 13. 1 Large-billed Crow (*Corvus culminatus*). Purchased.
15. 1 Azara's Fox (*Canis azaræ*). Purchased.  
 2 Crab-eating Raccoons (*Procyon cancrivorus*), ♂ and ♀. Purchased.
- 1 Yarrell's Curassow (*Crax carunculata*), ♂. Purchased. From Bahia.
- 1 Sclater's Curassow (*Crax sclateri*), ♀. Purchased. From the Amazons.
- 1 Globulose Curassow (*Crax globulosa*). ♀. Purchased. From the Amazons.
- 2 Brazilian Cariamas (*Cariama cristata*). Purchased.
- 1 Crested Screamer (*Chauna chavaria*). Purchased.
- 2 Solitary Tinamous (*Tinamus solitarius*). Purchased.
16. 4 Penguin Ducks (*Anas boschas*, var.). Presented by Mr. J. Guthrie, F.Z.S.
17. 4 Silky Cow-birds (*Molothrus bonariensis*). Purchased. From Bahia.
- 1 Yellow-winged Blue Creeper (*Cæreba cyanea*). Purchased. From Rio Janeiro.
- 1 Maximilian's Aracari (*Pteroglossus wiedi*). Purchased. From Rio Janeiro.
- 2 White-bellied Guans (*Ortalia albiventris*). Purchased. From Bahia.
- 1 Banded Cotinga (*Cotinga cincta*). Purchased. From Rio Janeiro.
- 1 Yellow-footed Thrush (*Turdus flavipes*). Purchased. From Rio Janeiro.
- 1 Garden's Night-Heron (*Nycticorax gardeni*). Purchased. From Brazil.
- 1 Black Tanager (*Tachyphonus melaleucus*), ♀. Purchased. From Bahia.
- 1 Macaque Monkey (*Macacus cynomolgus*), ♂. Deposited.
- 1 Smooth-headed Capuchin (*Cebus monachus*), ♀. Deposited.
18. 1 Macaque Monkey (*Macacus cynomolgus*), ♂. Presented by Mr. Watkins.
19. 1 Ostrich (*Struthio camelus*), ♀. Received in exchange.
- 1 Chub (*Leuciscus cephalus*). Presented by Mr. Parsons.
- 1 Bonnet-Monkey (*Macacus radiatus*), ♂. Presented by Mr. Richard Turner.
22. 1 Common Genet (*Genetta vulgaris*). Presented by Mr. P. V. Carletti.
23. 2 Hyacinthine Porphyrios (*Porphyrio hyacinthinus*). Presented by Mrs. Henry Cobb.
24. 1 Diamond-Snake (*Morelia spilotes*). Purchased.
25. 3 Darwin's Pucras (*Pucrasia darwini*), 2 ♂ and 1 ♀. Deposited.
- 1 Pennant's Parrakeet (*Platycercus pennanti*). Presented by Mr. Henry Attwater.
- 1 Chinese Blue Magpie (*Urocissa sinensis*). Deposited.
- 1 Sun-Bittern (*Eurypyga helias*). Deposited.
- 1 Moose (*Alces machlis*), ♂. Purchased.
- 1 Gannet (*Sula bassana*). Presented by Mr. Alex. Paterson.
26. 2 All-green Parrakeets (*Brotogerys tiriacula*). Presented by Miss Rowe.
27. 2 Common Marmosets (*Hapale jacchus*). Presented by Mrs. Clayton.
- 2 East-African Buffalos (*Bubalus æquinoctialis*), ♂ and ♀. Purchased. See P. Z. S. 1877, p. 754.

- Oct. 27. 1 Yellow-bellied Liothrix (*Liothrix luteus*). Presented by General Breton.
28. 3 Tigers (*Felis tigris*). Born in the Menagerie.
30. 1 Grey Ichneumon (*Herpestes griseus*), ♀. Presented by Mrs. Henry Jephson Mello.
- 1 Central-American Agouti (*Dasyprocta isthmica*). Presented by Mr. A. Stradling.
- 1 Puff-Adder (*Vipera arietans*). Presented by Mrs. Tweed.
31. 1 Cape-Buffalo (*Bubalus caffer*). Born in the Menagerie.
- 2 Geoffroy's Doves (*Peristera geoffroyi*). Bred in the Gardens.
- Nov. 1. 1 Anubis Baboon (*Cynocephalus anubis*), ♂. Presented by Mr. H. Ward.
- 3 Sclater's Curassows (*Crax sclateri*), 1 ♂ and 2 ♀. Presented by Mr. Alex. F. Baillie. From Paraguay.
- 2 Coatis (*Nasua nasica*). Born in the Menagerie.
2. 1 Common Jackal (*Canis aureus*). Presented by Mr. John Allan.
- 1 Axis Deer (*Cervus axis*). Deposited.
- 1 Vulpine Phalanger (*Phalangista vulpina*). Presented by Mr. J. Page.
- 2 Cape-Doves (*Æna capensis*), ♂ and ♀. Presented by Mr. A. B. Wylde.
3. 1 Macaque Monkey (*Macacus cynomolgus*), ♂. Presented by Dr. W. B. Stirling.
- 1 Sooty Mangabey (*Cercocebus fuliginosus*), ♀. Presented by Mr. E. Sellars.
- 1 Brazilian Three-banded Armadillo (*Tolypeutes tricinctus*). Purchased. See P. Z. S. 1877, p. 805.
- 1 Pike (*Esox lucius*). Presented by Mr. A. D. Bartlett.
5. 5 Reindeer (*Rangifer tarandus*), 2 ♂ and 3 ♀. Deposited. From Lapland.
- 1 Californian Quail (*Callipepla californica*). Presented by Mrs. A. H. Jamrach.
- 2 Grey Plovers (*Squatarola helvetica*). Presented by Mr. F. Cresswell.
- 1 Ringed Plover (*Ægialites hiaticula*). Presented by Mr. F. Cresswell.
- 1 Dunlin (*Tringa cinchus*). Presented by Mr. F. Cresswell.
6. 1 Common Cuckoo (*Cuculus canorus*). Presented by Mr. J. Heath.
- 1 Ring-Hals Snake (*Scpedon haemachates*). Presented by Mr. Eustace Pillans.
- 1 Cayenne Lapwing (*Vanellus cayennensis*). Purchased.
- 1 Brown Pelican (*Pelecanus fuscus*). Purchased. See P. Z. S. 1877, p. 805.
- 1 Cape-Zorilla (*Ictonyx zorilla*). Purchased.
7. 1 Saker Falcon (*Falco sacer*). Presented by Mrs. Arthur Coote. From Egypt.
8. 1 Cape-Buffalo (*Bubalus caffer*), ♂. Received in exchange.
9. 1 Wonga-Wonga Pigeon (*Leucosarcia picata*). Bred in the Gardens.
- 1 Tiger (*Felis tigris*). Presented by Mr. A. Forbes Angus. From China.
10. A collection of American Charr (*Salmo fontinalis*). Presented by Mr. F. Buckland.
11. 1 Macaque Monkey (*Macacus cynomolgus*), ♀. Presented by Mr. H. W. Henderson.

- Nov. 12. 1 Common Squirrel (*Scuirus vulgaris*). Presented by Mr. T. Massey, F.Z.S.  
 1 Radiated Tortoise (*Testudo radiata*). Presented by Mr. H. Harrison.  
 1 Bay Antelope (*Cephalophus dorsalis*), ♀. Received in exchange.
13. 2 Red-backed Squirrel Monkeys (*Saimaris ærstedii*), ♀. Purchased. From Chiriqui.  
 2 Black-handed Spider Monkeys (*Ateles melanochir*), ♀. Purchased.  
 1 Derbian Opossum (*Didelphys derbiana*). Purchased From Chiriqui.  
 1 Rufous-vented Guan (*Penelope cristata*). Purchased. From Greytown.  
 1 Bonnet-Monkey (*Macacus radiatus*). Deposited.
14. 1 Common Chameleon (*Chamceleon vulgaris*). Deposited.  
 1 Greater Sulphur-crested Cockatoo (*Cacatua galerita*). Presented by Mr. F. Lablache.
19. 1 Brown Tree-Kangaroo (*Dendrolagus inustus*). Purchased. See P. Z. S. 1877, p. 806.  
 1 Slow Loris (*Nycticebus tardigradus*). Purchased.
20. 1 Green Monkey (*Cercopithecus callitrichus*), ♀. Deposited.
21. 1 Common Boa (*Boa constrictor*). Presented by Miss Alice Leith.  
 1 River Jack-Viper (*Vipera rhinoceros*). Purchased.
22. 1 Black-backed Jackal (*Canis mesomelas*). Presented by Capt. Fulton, S.S. 'Taymouth Castle.'
24. 2 Black-eared Marmosets (*Hapale penicillata*). Presented by Miss Quain.
26. 1 Long-eared Owl (*Asio otus*). Presented by Mr. W. H. Millington.  
 3 Weeper Capuchins (*Cebus capucinus*). Purchased.  
 1 Squirrel Monkey (*Saimaris sciurea*). Purchased.
27. 1 Vervet Monkey (*Cercopithecus lalandii*). Presented by Mr. J. H. Taylor.  
 1 Little Grebe (*Podiceps minor*). Purchased.
28. 1 Sharp-nosed Crocodile (*Crocodylus americanus*). Received in exchange.  
 1 Spotted Ichneumon (*Herpestes auropunctatus*). Presented by Mrs. Fleuss. From Persia.
29. 1 Green Monkey (*Cercopithecus callitrichus*). Presented by Mr. J. R. Phillpotts.  
 2 Cheer Pheasants (*Phasianus wallichi*). Purchased.
30. 1 Red Wolf (*Canis jubatus*). Purchased. From Buenos Ayres. See P. Z. S. 1877, p. 806, pl. LXXXI.  
 1 Azara's Fox (*Canis azaræ*). Purchased.
- Dec. 1. 1 Common Ocelot (*Felis pardalis*). Presented by Mr. George Ransom.  
 1 Scarlet Ibis (*Ibis rubra*). Presented by Mr. George Ransom.  
 1 Fulvous Tree-Duck (*Dendrocygna fulva*). Presented by Mr. George Ransom.
4. 1 Rhesus Monkey (*Macacus erythræus*), ♀. Presented by Mr. R. S. Cox.  
 2 Lesser Sulphur-coloured Cockatoos (*Cacatua sulphurea*). Presented by Mrs. Roberts.
5. 2 Schlegel's Doves (*Chalcopelia puella*), 2 ♂. Purchased.



- Dec. 5. 4 Barbary Turtle Doves (*Turtur risorius*). Deposited.  
 1 Hobby (*Hypotriorchis subbuteo*). Presented by Mr. W. Renney. Captured at sea.
6. 2 White Storks (*Ciconia alba*). Presented by Mr. C. Clifton, F.Z.S.  
 1 Heron (*Ardea cinerea*). Presented by Mr. C. Clifton, F.Z.S.  
 1 Greater Black-backed Gull (*Larus marinus*). Presented by Mr. C. Clifton, F.Z.S.
7. 1 Diana Monkey (*Cercopithecus diana*), ♀. Presented by Mr. Walter Mayhew.  
 7 Gelada Baboons (*Cynocephalus gelada*), 3 ♂ and 4 ♀. Deposited. See P. Z. S. 1878, p. 1.  
 2 Alario Sparrows (*Passer alario*). Purchased.
10. 2 Axis Deer (*Cervus axis*), ♂ and ♀. Presented by Dr. Carl Siemens.
11. 2 Schlegel's Doves (*Chalcopelia puella*). Purchased.
12. 1 Chinchilla (*Chinchilla lanigera*). Born in the Menagerie.  
 2 Waxwings (*Ampelis garrulus*). Purchased.  
 4 Bullfinches (*Pyrrhula rubicilla*). Purchased.  
 4 Common Waxbills (*Estrela cinerea*). Received in exchange.  
 2 African Silverbills (*Munia cantans*). Received in exchange.  
 2 Cinereous Waxbills (*Estrela caerulescens*). Received in exchange.  
 7 Yellow-rumped Seed-eaters (*Crithagra chrysopyga*). Received in exchange.  
 6 Orange-cheeked Waxbills (*Estrela melpada*). Received in exchange.
13. 1 Bonnet-Monkey (*Macacus radiatus*). Presented by Mr. T. H. Evans.  
 1 Diana Monkey (*Cercopithecus diana*). Presented by Mr. P. Spink. From the Akah country, W. Africa.  
 2 Lesser Razor-billed Curassows (*Mitua tomentosa*). Purchased.  
 1 Eel (*Anguilla vulgaris*). Presented by Mr. F. Buckland.
14. 1 Patas Monkey (*Cercopithecus ruber*), ♀. Deposited.  
 1 Red-backed Saki (*Pithecia chiropotes*). Purchased. From Trinidad.  
 1 Red-faced Spider Monkey (*Ateles paniscus*). Purchased.  
 2 Kinkajous (*Cercoleptes caudivolvulus*). Purchased.  
 1 Coati (*Nasua nasica*). Purchased.  
 1 Azara's Fox (*Canis azaræ*). Purchased.  
 1 Black Vulture (*Cathartes atratus*). Purchased.
15. 2 Alario Sparrows (*Passer alario*), 2 ♀. Purchased.  
 2 Musk Deer (*Moschus moschiferus*), ♂ and ♀. Presented by Sir Richard Pollock, K.C.S.I. See P. Z. S. 1878, p. 1.
17. 2 Grey-breasted Parrakeets (*Bolborhynchus monachus*). Presented by Mr. Alex. F. Baillie. From Paraguay.
21. 14 Moccasin Snakes (*Tropidonotus fasciatus*). Born in the Gardens.
22. 1 Greater Sulphur-crested Cockatoo (*Cacatua galerita*). Presented by Mrs. Cohen.
24. 1 Green Monkey (*Cercopithecus callitrichus*), ♀. Presented by Mr. J. Scott.  
 1 Bonnet-Monkey (*Macacus radiatus*), ♀. Presented by Mr. J. H. Thompson.
25. 1 Macaque Monkey (*Macacus cynomolgus*), ♀. Deposited.

- Dec. 26. 2 Lions (*Felis leo*), 2 ♂. Presented by Mr. John Baird. From Upper Nubia.
27. 1 Common Thickknee (*Ædicnemus crepitans*). Presented by Mr. F. Moll.
28. 1 Collared Fruit-Bat (*Cynonyctoris collaris*). Born in the Menagerie.
- 1 Geoffroy's Dove (*Peristera geoffroyii*). Bred in the Gardens.
31. 1 Macaque Monkey (*Macacus cynomolgus*). Deposited.

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THE END.















