Mr. Carter observes, "The two Lizards of a lavender or light lead-colour, with nearly invisible brown spots or lines, were caught in the island of Massera, which is about forty miles long, barren, and situated close to the shore of the south-east coast of Arabia, towards its easternmost end.

"The tail of one has dropped off. To the best of my recollection, it was not bushy or crested, like that of the one which remains on; and that at the time made me think the latter was the male, and the other the female of the species.

"It is just possible they may be new; for Massera is little known, and I think we (the surveying people) were the first white men who were ever on the island."

Most probably the tail of the second specimen, which was lost, might have been reproduced, and thus without the lateral fringe.

"The channel on the inner side of the island swarms with the Edible and Hawk'sbill or Turtle-shell Turtle; and the island is bestrewn with the bones of the former: for the inhabitants are all mere brutes (Anthropophagi and Ichthyophagi)."

This genus of *Geckoidæ* has many characters in common with the *Agamidæ*. Like *Eublepharis* it has a large circular pupil to the eye, and in this respect they form together an aberrant group of the family. In both these genera the pupil is large as well as circular. It is also peculiar, among the Geckoids, for the scales being all of a uniform size and character; but this is found in a few other species, such as *Boltanea sublævis*, where the minute sublenticular scales are often almost entirely wanting.

"The Prickly-tailed Lizard, of a light-brown colour, was caught on or close to the town of Makulla, a port on the south-east coast of Arabia.

"I regard it as the young of a species just like it, which grows to a foot or more in length, on the coast mentioned."

This is very nearly allied to *Uromastix spinipes*; but unfortunately the specimen is too young and not in a sufficiently good condition to determine if it is absolutely the same.

June 23, 1863.

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

Prof. Huxley, F.R.S., read a communication* on the form of the placenta in the Cape Hyrax (*Hyrax capensis*).

Prof. Rolleston read a communication* on the form of the placenta in the Tenrec (*Centetes ecaudatus*).

Mr. R. Swinhoe exhibited a skin of a Royal Tiger (*Felis tigris*) killed in the vicinity of Amoy, China.

* These papers will be printed in the Society's 'Transactions.'

The Secretary read the following letter addressed to Dr. Gray by Mr. L. A. Monteiro relating to the habits of *Cynocephalus anubis*:—

"29 Harewood Square, N.W.,
June 1863.

"Dear Sir,—In fulfilment of my promise, I beg to hand you the following notice, as the substance of what my son Joachim J. Monteiro has written to me upon the two Apes, *Cynocephalus anubis* male and female, presented by him to the British Museum.

"It seems that the aspect of their native place or habitat about Cuio Bay, in Angola (a Portuguese possession on the western coast of Africa), is very different from that in which other Monkeys on that coast are placed, and, as he thinks, even different from the rest of the world, the difference being in the great scarcity of vegetation and the absence of water.

"The geological formation seems to be gneiss; the littoral region a narrow belt of gypsum and limestone rocks. The whole distance of fifty or sixty miles inland is hilly, and cut up in all directions by deep, dry, and solitary gullies and grand rocky ravines.

"The vegetation is restricted to dry prickly shrubs, a few roots of grass, and certain species of thick club-stemmed dwarf shrubs, all bearing a few leaves only during the few months of the year in which rain falls; the rest of the year nothing is seen but dry rock and leafless firewood, scorched and burnt month after month by the constant tropical sun. At distances far apart, brackish water is sparingly obtained by Zebras, these Monkeys, and other animals, by excavating holes in the sand at the bottom of the gullies.

"The principal food of these Apes is the root and stem of the thick tuber-rooted shrubs [*Welwitschia*?] above mentioned. Part of the root of these plants grows above the surface of the ground; and these Monkeys gnaw it off as a sheep does a turnip or mangel-wurzel, their dog-like elongated jaws and perhaps dentition appearing to him specially adapted to this manner of feeding.

"They are gregarious: he once counted fifteen together; and a few days previously to his writing, not less than thirty to forty came down to drink at a well he had opened at the copper-mines. He was then engaged in exploring at about four miles inland from Cuio Bay. Two were captured alive at Equemina, a place twelve miles south.

"They run very fast, on all fours, in a kind of sideway gallop, the young ones holding on to the backs of the dams.

"It seems that he had not been able to ascertain exactly their geographical distribution either in longitude or latitude from the bay, though he believes it does not reach northward of the River Quanza.

"It perhaps deserves to be mentioned that in the vicinity of the rivers in that part of the coast the vegetation assumes a more luxuriant character; but these rivers being but few and far apart, this does not alter the dry, bare character of the country where these Monkeys abound.

"The natives and Portuguese about these parts affirm that a troop of these Monkeys is always preceded by several scouts, which communicate by signals either danger or safety to the rest, and that these

E.W.Robinson del. W.West imp.

1.Mechanitis isthmica. 2.Ithomia (Ceratinia) leucania. 3.Papilio xanticles.
4.Dircenna callipero. 5.Ithomia iphianassa, var. panamensis.

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NATURAL HISTORY

scouts are set upon and punished if any mistake is committed by them.

"The two sent by my son were hunted down by the blacks with dogs, and killed with sticks.

"I remain, with consideration,

"Dear Sir,

"Your most obedient Servant,

"L. A. MONTEIRO."

"*Dr. J. E. Gray, F.R.S.*"

The following papers were read:—

1. ON A COLLECTION OF BUTTERFLIES BROUGHT BY MESSRS. SALVIN AND GODMAN FROM PANAMA, WITH REMARKS ON GEOGRAPHICAL DISTRIBUTION. BY H. W. BATES.

(Plate XXIX.)

Besides the rich ornithological and herpetological booty obtained by Messrs. Salvin and Godman during their recent tour in Central America, a large collection of Butterflies was made in different parts, chiefly, however, on the Atlantic and Pacific sides and in the central valleys of Guatemala. Having always a philosophic aim, these gentlemen were careful to keep the collections made in different districts separate, and also to note the vertical and horizontal ranges of the species: the gathered material, therefore, gives promise of furnishing important data in illustration of various questions connected with geographical distribution, such as the range of closely allied species and varieties and its dependence or not on physical barriers, the relations of the fauna to those of other neotropical regions, and so forth—questions which insects, and especially Butterflies, seem well adapted to illustrate. I hope to be able, with the permission of Messrs. Salvin and Godman, to examine and report upon the results of their entomological labours, devoting a paper to the collections of each district. The present notice is confined to a separate small collection obtained on the Isthmus of Panama, in the low forest-country situated about ten miles from the railway terminus on the Gulf of Mexico.

Although the Panama collection contains but thirty-one species (seventy-six specimens), it is very interesting as showing the close relation of the fauna to that of New Granada, and as adding to the proof that this north-western part of South America constitutes quite a distinct province as far as its land-fauna goes, having a considerable proportion of species peculiar to itself and a general specific dissimilarity from the adjoining region of Guiana (or the Guiano-Amazonian province), to which it has hitherto been united*. My own nearly complete collection of the species inhabiting the plains of the Amazons enables us to arrive at a tolerably accurate conclusion on this point.

* Woodward's 'Recent and Fossil Shells,' map.

Thus, if we withdraw those species, twelve in number, which (being found in open situations, generally in the suburbs of towns, and possessing large powers of dissemination) are widely distributed in Tropical America, an analysis of the collection yields the following results :—

Species not found in the Guiano-Amazonian region (six of which are new)	15
Species found in the Guiano-Amazonian region, but not extending their range further southward	4

Of the twelve generally distributed neotropical species, four present themselves in the form of tolerably well-marked varieties which seem to be peculiar to Panama and Central America. It may also be added that one of the four species which extend to the Guiano-Amazonian region reaches no further than the western part of the Amazons plains. The six new species contained in the collection are all more or less nearly related to New Granadian and Guianian forms, except one (*Papilio xanticles*), the nearest relative of this *Papilio*, from which, however, it is well distinct, being a Mexican species.

It may perhaps be premature to draw any inferences from these data bearing upon the former physical condition and changes of these regions, seeing that a much more extensive basis of facts is required, which can only be obtained by an analysis of the whole Columbian fauna; but it may be useful to point some of them out as an incitement to further research. For instance, as a large amount of peculiarity in the existing fauna of any land-area must prove that its inhabitants have not, geologically speaking, recently migrated to it, such area must be the site of a land of high geological antiquity. Moreover, as the productions which furnish these data are species belonging to genera and groups which inhabit only the low, warm, and humid forests of Tropical America, this ancient land must have always possessed districts supplying these same physical conditions. It cannot at present be decided how far this land extended to the south, as our knowledge of the productions of Eastern and Central Peru and Bolivia is at present very limited; but towards the north, the considerable change of species seen in Southern Mexico, which possesses districts very similar in physical conditions to many in Columbia, would seem to show that there was formerly a separation between the two regions, in the same way as the great dissimilarity between the faunas of Columbia and Guiana would show this to have been the case between these two now continuous lands. This latter conclusion, however, must be drawn with great caution, as a diversity of fauna between adjoining areas, even although their physical conditions may appear to us almost identical, does not necessarily prove the existence of a former physical barrier between them; for I found in the alluvial forest-plains of the Amazons that different small areas continuous with each other contained each their separate representative species, proving that some other cause besides physical barriers operates to limit the ranges of species.

1. PAPILIO XANTICLES, n. sp. Pl. XXIX. fig. 3.

♂. Wings above with a broad outer border brownish black; the rest of their surface pale ochreous, the ochreous portion crossed by six, mostly very short, brownish-black stripes, namely, one near the roots, broadish on the fore wings, but continued as a thin line on the hind wings to the posterior border near the anal angle; a second rather broader reaching only to the outer edge of the cell of the hind wings; three short stripes extending from the costa to the median nervure of the fore wings, the last of which covers the end of the cell; and lastly, a sixth similar but shorter one beyond the cell. The black border is, besides, traversed in its whole length by a row of ochreous lunules running nearly parallel to the outer margin, the anal lunule of the hind wings being double; there is also a short, narrow, oblique, bright red line near the anal angle. Tails long and linear, brownish black, narrowly margined throughout with ochreous.

Beneath, the same, except that the second black stripe on the hind wings has in the middle a narrow bright red line, which, commencing at the costa, is at first strongly flexuous, and then becoming straight continues to the outer border of the wing, that there are three grey lunules near the anal angle, and that the dark border has an indistinct pale line besides the row of lunules.

Body and antennæ black; head, thorax, and abdomen with an ochreous stripe on each side. Expanse 3″ 10‴.

This species, of which there are five examples, belongs to the same cosmopolitan section of the genus to which the European *P. podalirius* appertains, and to the minor group of which the North American *P. ajax* may be considered the chief member—a group which apparently does not extend to South America, the cluster of species of which it consists inhabiting extratropical North America, Mexico, and the West India Islands. *P. xanticles* is distinguished from the North American and West Indian species by the strongly flexuous red line of the under surface of the hind wings; in this feature it agrees with *P. philolaus*, a common Mexican and Guatemalan species, and with *P. arcesilaus**. It is, however, quite distinct from both in the colours and pattern of the wings, and forms an interesting addition to the South American species of this fine genus.

2. PAPILIO PROTESILAUS, Linn. et auct.

Var. *macrosilaus*, Boisduval, MS.

P. protesilaus under its typical form ranges from the south of Brazil to Guiana, and westward to the end of the Amazonian plains. In the valley of the Magdalena a very large form of it occurs, which, although differing in nothing except size from its type, has received a separate name. This fine variety seems quite to take the place of the true *P. protesilaus* at Panama, as all the specimens (four) contained in the collection belong to it. They differ, however, from examples

* This species is known only from the figure and description given by Lucas (Rev. et Mag. Zoologie, 1852, p. 131, pl. 10. f. 2. Its locality seems doubtful, as Lucas gives simply the vague one of North America.

from the valley of the Magdalena in having the inner row of pale lunules of the border of the hind wings much enlarged, and of a rich buff-colour, instead of the ground-colour of the wing, and also in the sides of the head and prothorax being of the same hue.

3. PAPILIO POLYCAON, Cramer et auct.

An example contained in the collection does not differ in the least from specimens obtained in the Amazons region and at Bahia, South Brazil.

4. PAPILIO ILUS, Fabricius.

Papilio ilus, Fabr. Ent. Syst. iii. 1. p. 17, no. 51.
P. hostilius, Felder, Lepid. Nov. Columbiæ, no. 5.

Two Panama examples agree precisely with the description given by Fabricius seventy years ago. As the species is not found in Guiana, Brazil, or the recently explored parts of Venezuela and New Granada, it has not been seen by subsequent writers on the genus, and two other quite distinct forms have been made to bear the name. The insect recently described by Dr. Felder from specimens obtained by Moritz in the province of Merida, Western Venezuela, is evidently the same as our Panama species. *P. ilus* is distinguished from *P. ariarathes* and *P. evagoras* (with which it has been confounded) by the absence of the red streak from the base of the fore wings beneath, and by the spots of the occiput and prothorax being red instead of white. Its nearest relative is the *Papilio branchus* of Guatemala.

5. PAPILIO ANCHISIADES, Esper.

Var. *pandion*, Boisduval, MS.

The true *P. anchisiades* is found abundantly in semicultivated places throughout the Amazons region and in Guiana; but although in most districts variable and tending to segregate local varieties, I have not seen any variety approaching the present one which is known as inhabiting Southern Mexico. It differs from the type in having, on the fore wings, instead of a large cream-coloured rounded spot near the hinder margin, a long oblique streak of the same colour extending from the costa across the cell towards the outer margin. There is only one example in the collection.

6. PIERIS MONUSTE, Linn. et auct.

Var. B. Boisduval, Spec. Gen. des Lepidop. p. 495.

Differs from the type in wanting the dusky streaks on the under surface of the hind wings. The typical *P. monuste* occurs abundantly throughout the whole of Tropical South America; the var. B appears to be peculiar to Central America.

7. CALLIDRYAS STATIRA, Cramer.

The three specimens of this species differ from South American examples in the opake ochreous coloration of the under surface of the hind wings. The species is one which performs extensive mi-

grations, countless thousands being seen, on travelling along the Amazons in the fine season, all moving in one direction. It is a proof, however, that these migrations do not extend very far in a limited time, that in the not very distant region of Panama a quite distinct local form exists.

8. CALLIDRYAS TRITE, Linn. et auct.

The specimens of this and the following are precisely similar to South American examples.

9. CALLIDRYAS ARGANTE, Fabricius.

10. DANAIS THERSIPPUS, n. sp.

♂. Wings, above (including the nervures), dull reddish brown, with a distinct, rather broad, dark-brown outer border of nearly uniform breadth. The white spots of the fore wings are the same in number and arrangement as those of *D. eresimus*, Cramer (Pap. pl. 175. figs. G, H), except that the exterior row is continued to the apex of the fore wings, instead of being interrupted. The dark border of the hind wings is nearly spotless.

Beneath, the fore wings are the same as above; but the hind wings have the nervures bordered with dark brown, which dark borders are again accompanied by lines of white: the dark outer borders of the wings have a double row of large white spots. Body and antennæ as in *D. eresimus*. Expanse 3″ 4‴.

This species seems to be midway between *D. eresimus* and *D. erippus*, and resembles very closely *D. berenice*; but the ground-colour of the wings is of a duller and browner shade than in any of those species.

11. TITHOREA TARRICINA, Hewitson.

Tithorea tarricina, Hewits. Exot. Butt. Helic. iv. f. 1.

This very fine and distinct species is at present known only from New Granada, whence it has been received in the same way as the rest of the large collections exported from that country, namely, without further information about its locality and range. The Panama specimens (two) differ from the New Granada one figured by Hewitson in the yellow stripe towards the apex of hind wings being nearly obliterated.

12. DIRCENNA CALLIPERO, n. sp. Pl. XXIX. fig. 4.

♂. Fore wings above with the basal third reddish tawny, semitransparent, the costa being dusky, and the centre of the cell having a small round dusky spot; beyond this a broad semitransparent belt of a yellowish hue crosses the wing from the subcostal nervure to near the hind angle; the rest of the wing is dusky, with a subapical yellowish belt from the costa to near the middle of the outer margin. Beneath, the same, except that there are three whitish spots near the apex.

Hind wing, above, reddish tawny, semitransparent, with a well-defined black outer border, broad near the apex, and gradually narrowing to the anal angle. Beneath, the same, except that there is a submarginal row of large silvery-white spots. Body brown; wing-lappets reddish tawny. Antennæ black; club yellowish. Expanse 2″ 2‴.

This species is of the same size and shape as *Dircenna epidero* of the Amazons region; it has, however, no near relationship to that or any other of the variable forms of this genus.

13. Ithomia victorina, Guérin.

Heliconia victorina, Guérin, Iconogr. Règne Animal, texte, p. 470.
Ithomia victorina, Hewitson, Exot. Butt. Ith. fig. 75.

This species is hitherto known only as inhabiting Venezuela and Bolivia; it is entirely absent from the intervening plains of the Amazons, where no form at all nearly related to it is found. There is one example in the present collection.

14. Ithomia nephele, Bates.

Ithomia nephele, Bates, Trans. Linn. Soc. vol. xxiii. p. 548.

This interesting form appears to be abundant on the isthmus, there being twelve examples in the collection. It is very closely allied to *I. nero* (Hewitson, Exot. Butt. Ithom. f. 37), differing only in being smaller and in the lower discocellular nervule of the hind wings lying at a much more acute angle with the median nervure. It is found also at Tabatinga, on the upper part of the Amazons region (being quite absent from the lower part thence to the Atlantic); its line of migration, therefore, like that of *I. victorina*, would seem to lie along the eastern side of the Andes, the easternmost chain of which it has crossed to reach the Isthmus of Panama.

15. Ithomia iphianassa, Doubleday.

Ithomia iphianassa, Dbldy. in Dbldy. & Hewits. Gen. Diurn. Lepid. pl. 18. f. 3; Hewits. Exot. Butt. Ith. f. 91–93.

Local var. or race *panamensis*.

Ithomia iphianassa has been recorded as inhabiting Venezuela and New Granada, in which latter region it appears to be very unstable. It has lately been received also in some numbers from Canelos, on the eastern slope of the Andes in Equador (sent by Spruce, the well-known botanical traveller), but, if we may judge from the large number of examples sent, all closely resembling each other, exists there as a well-marked and constant local variety or race. The single specimen contained in the present collection from Panama appears to represent another equally well-marked race. Thus *I. iphianassa* would seem to be one of those interesting forms whose present condition throws great light on the formation of species, being very variable towards the centre of its area of distribution, and showing the segregation of distinct races or semispecies in different parts of the confines of its area. It is to be remarked that whilst the Canelos

race approaches one extreme (fig. 93 of Hewitson, *op. cit.*) of the New Granadian unstable form, the Panama one approximates the opposite extreme (fig. 91, *op. cit.*), both the Canelos and the Panama forms being further divergencies in the direction of these two extreme varieties.

Ithomia iphianassa, var. *panamensis*. Pl. XXIX. fig. 5.

♀. Wings opake; fore wing above with the basal third orange-tawny, which colour is prolonged a short distance along the costal and hind margins, the costal edge being black, and the centre of the cell ornamented with a large rounded black spot; this is followed by a broad, oblique yellow belt, commencing at the subcostal nervure, and narrowing to its termination near the hind angle. Apical portion of the wing beyond the cell black, crossed in the middle by a row of three widely distant yellow spots; apex with three smaller whitish submarginal spots. Beneath, the same, except that there is a row of seven submarginal white spots.

Hind wing above with the basal half orange-tawny, the outer half black, the black portion contracted near the apex, which has a row of three minute whitish spots. Beneath, the same, except that there is a yellow spot at the root of the wing, a black spot at the end of the cell, and a row of white submarginal spots. Antennæ orange, basal portion blackish. Thorax yellowish, with two white dorsal lines; collar orange. Abdomen dark brown. Expanse 2″ 2‴.

16. Ithomia balboa, n. sp.

♀. Wings semitransparent; fore wing above with the basal third orange-tawny, and with a rounded black spot in the middle of the cell, the costal edge being broadly black. To this succeeds a broad oblique yellow belt, commencing near the costal edge, and extending nearly to the hind angle; rest of the wing sooty black, semitransparent, the nervures darker, the black colour extending on the basal side of the first median branch to the median nervure. This black apical portion is crossed by a light yellow belt, extending from the costa to near the middle of the outer margin. Beneath, the same, except that there are three clear white spots in a row near the apex.

Hind wing, above, orange-tawny, with a broad black outer border of uniform width. Beneath, the same, except that the black outer border has a submarginal row of clear white spots. Antennæ black; club orange-yellow. Body brown; collar, wing-lappets, and thorax spotted with light yellow. Expanse 2″ 4‴.

This species is nearly related to *I. iphianassa*, having the same disposition of the nervures on the hind wings, which approximates this group to the subgenus *Ceratinia*. It is, however, quite distinct, having a white-spotted, instead of orange, prothorax—a character which distinguishes minor groups of species in this genus. It is identical in colours with a species figured, since the present paper was read, by Mr. Hewitson, under the name of *I. agrippina* (Exot. Butt. Ithom. f. 152—New Granada), but differs in the neuration of the hind wings, *I. agrippina* having the nervures so disposed that

the lower radial (or discoidal) is not visible across the wing—a character which places it in the section *Hymenitis*.

17. ITHOMIA (CERATINIA) LEUCANIA, n. sp. Pl. XXIX. fig. 2.

♀. Fore wing above with the basal third orange-tawny; costal edge dusky at the base; on the outer edge of the basal tawny part there are two large subtriangular black spots, namely, one in the middle of the cell, and one between the median nervure and its first branch; to these spots succeeds a short discoidal white cross belt, separated into two elongate spots; apical portion of the wing black, crossed in the middle by a flexuous white belt, beginning on the costal edge, and ending at a distance from the outer margin near the middle; besides which there is a submarginal row of seven large white spots. Beneath, the same.

Hind wing, above, orange-tawny, with a discoidal indented stripe and the outer border (narrowly) black; the border has a row of white submarginal spots, which are partly indistinct. Beneath, the same, except that the root of the wing has a yellow spot. Antennæ yellowish; base black. Collar and wing-lappets orange-tawny. Thorax marked with yellow. Expanse 2″ 4‴.

This species might perhaps be more correctly treated as one of the numerous local forms of *Ithomia* (*Ceratinia*) *ninonia*, in the same way as *I. panamensis* is placed as a race of *I. iphianassa*; but the grouping of the different races of *I. ninonia* would lead to the classing together of so many forms, graduating from the slight variety to the well-segregated species, that the combined set would be almost equivalent to a subgenus. I have described the way in which a great part of Tropical America is peopled by these derived species and semispecies in a former treatise (Linnean Trans. vol. xxiii. p. 524); to the list there given the present new local form may be added. The general practice of descriptive naturalists, especially ornithologists, is to treat every local form, however slight may be its distinguishing characters from its nearest relatives, under a separate head, in the same way as the more distinct species, leaving the impression that all the successive forms numbered in order under a given genus are neatly circumscribed species. This might be done to a certain extent in the group of forms to which *Ithomia ninonia* belongs; for many of the local races, notwithstanding their close alliance to the type, seem to be tolerably constant. But in one part, at least, of its area the species presents so finely graduated a series of varieties that the separation into these distinct local forms or assumed species is impossible; the whole must be considered as one variable form. If, however, it be considered so, the facts of variation exhibited are such as to compel us to infer that all the other more distinct local races, allied to it, have been derived from the same stock; for the varieties show in some districts a tendency to segregation, in one of them being more abundant than the others. Protean species, like *I. ninonia*, are not uncommon in entomology; and the close study of their varieties with reference to their geographical positions throws great light on the formation of races and species. Did none such exist,

and were the species in every genus so neatly arranged and circumscribed in nature as they are in the monographs of naturalists, the conclusion arrived at by most students, namely that they were all independently created, would be certainly the only one that could be drawn. It would be desirable to know whether none of these instructive species occur in ornithology and in the other branches of zoology.

18. Mechanitis isthmia, n. sp. Pl. XXIX. fig. 1.

Expanse 2″ 7‴. Fore wing, above, brownish black, a basal streak over the median nervure and the hind margin being orange-tawny; a spot across the cell near its termination, an interrupted belt across the wing from the costa to near the middle of the outer margin, and an oblong subapical spot yellow. Beneath, the same, except that the hind angle is also orange-tawny, and that there is a row of eight submarginal white spots along the outer margin.

Hind wing, above, orange-tawny, with a spot near the apex and a narrow outer border from the middle of the costa to the anal angle brownish black. Beneath, the same, except that the root of the wing has a yellow spot, and that there is a submarginal row of five white spots.

Body brownish; wing-lappets and thorax spotted with tawny-orange; antennæ yellow, with the base dusky.

This is one of the numerous local forms of *Mechanitis polymnia*, a species which exhibits the process of variation, segregation of local varieties, and formation of species in the same way as already described under *I. ninonia*. But the proof of complete formation of a species is more complete here than in the last, seeing that one at least of the local forms—proved by the existing variability of the species in other districts to have been derived from the same stock—coexists with a sister form without interbreeding with it. The various races and half-formed races of *Mechanitis polymnia* are distributed each in its district over the whole of Tropical America; the two sister races which coexist in the manner described are *M. polymnia*, var. *lysimnia* and var. *nesæa*, in the neighbourhood of Bahia in South Brazil.

19. Heliconius hecalesia, Hewitson.

Heliconia hecalesia, Hewits. Exot. Butt. Hel. f. 6.

This most beautiful and distinct species, like *Tithorea tarricina*, has hitherto been recorded only as inhabiting New Granada. Like *T. tarricina* also, the Panama example differs in a slight degree from the New Granada type, the yellow submarginal spots of the hind wings being much smaller.

20. Heliconius demophoon, Ménétriés.

Heliconia demophoon, Ménétr. Cat. d. l. Coll. Imp. Ac. des Sci. St. Pétersbourg, p. 86, t. 2. f. 4.

This handsome species occurs also in Nicaragua and Mexico. It

is closely allied to *H. amaryllis* (Felder) of Eastern Peru; and both are so nearly related to *H. phyllis*, the common species of Southern Brazil, that all three might be treated as local forms of one stock. No species at all nearly related to these three is found in the Amazons plains: this confirms what has already been remarked under *Ithomia nephele*, namely, that the line of migration of species across the equator has been along the eastern slopes of the Andes.

21. HELICONIUS ERATO, Linn. et auct.

This species is widely distributed over the northern part of South America.

22. COLŒNIS VANILLÆ, Linnæus.

A very common species in the tropical and subtropical zones of the New World. I have noticed that the examples from Florida are much more bright in colour and more sharply defined in markings than those from Tropical America.

23. COLŒNIS PHAËTHUSA, Cramer.

Also a widely distributed species; it seems to remain constant in all districts.

24. ANARTIA FATIMA, Fabricius.

This species is peculiar to Central America. It seems to be common on the Isthmus.

25. PYRRHOGYRA TIPHA, Linnæus.

The Panama example does not differ from Pará ones; the species nevertheless is strongly modified in the much nearer region of the Upper Amazons.

26. PREPONA AMPHITOË, Goddart.

The single example does not differ from those taken by myself in the Amazons region.

27. PAVONIA AJAX, Doubleday.

Caligo ajax, Westwood, in Dbldy. & Hewits. Gen. Diurn. Lepid. pl. 56. f. 2.

This magnificent species has been hitherto recorded only as inhabiting Venezuela and Guayaquil: there is one example in this collection.

28. PAVONIA OILEUS, Felder.

Caligo oileus, Felder, Lepid. Nov. Columbiæ, no. 106.

There are three examples of this species, which appears to be peculiar to the regions bordering the south-western part of the Gulf of Mexico, it having been received from New Granada and the province of Caraccas in Venezuela.

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NATURAL HISTORY

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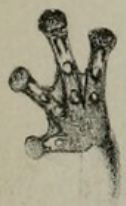

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J. Jennens del. et lith.

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Fig A x B. HYLA PERONII.
C. HYLA PHYLLOCHROA.
D. HYLA KREFFTII.

29. PAVONIA ILIONEUS, Cramer.

This is a widely distributed species in Tropical America. I find no difference worthy of note between Amazonian, Bogota, and Panama examples.

30. PAVONIA AUTOMEDON, Cramer.

Also a widely distributed species, reaching as far south as Bahia in Brazil. The single Panama example does not differ from those taken by myself in the Amazons region.

31. EUPTYCHIA OCYRRHOË, Fabricius.

This small and weak-flying insect is also widely distributed, and appears to remain constant in its specific characters.

2. OBSERVATIONS ON AUSTRALIAN TREE-FROGS LIVING IN THE SOCIETY'S MENAGERIE. BY DR. A. GÜNTHER.

(Plate XXX.)

The only Australian Batrachian which, to my knowledge, has until lately been exhibited in the Society's menagerie is *Pelodryas cæruleus* (*Hyla cærulea*, White), a specimen of which, almost unobserved, lived there for two or three years. In the beginning of the spring of this year, however, an opportunity was taken of procuring eight specimens, which were imported by a collector from New South Wales, and which belonged to four species, viz. to *Pelodryas cæruleus*, *Hyla peronii*, *Hyla krefftii*, and to an apparently undescribed form, which we shall name *Hyla phyllochroa*. Having had opportunity of observing these for some time in the Gardens in the Regent's Park, as well as at my own house, I may make the following remarks. In general, I was surprised to find a great similarity in their habits with those of our common European Tree-frog. They sleep during the day, squatting in a corner, generally selecting a place in which they are hidden from view, but easily roused on the approach of some insect, which they seize with their tongue. When the prey is large, or when they have accidentally seized a small piece of wood, &c., together with the insect, they use their fore foot to push the insect into the mouth, or to remove the object which is unfit for food. They never enter the water during the summer months, and tried to escape from a tank when put into it. They leave their hiding-places towards dusk, becoming very lively, apparently less with the object of obtaining food (which they can only procure by quietly remaining in wait for it) than with that of enjoying themselves; and *Pelodryas cæruleus*, which is endowed with a voice, indulged every evening in a musical performance. They became more quiet after midnight, and at sunrise they had settled down at some resting-place, sometimes one individual choosing the same place for several consecutive days. They preferred bluebottle flies to every other insect, and never touched ants or black beetles. *Pelodryas cæruleus*

feeds freely on meal-worms when other food is scarce; but they are frequently vomited, and I doubt whether these frogs could be kept in good health if restricted to this particular kind of food. In all these points the Australian species mentioned agree with the European Tree-frog, and I need hardly say that they as easily climb smooth surfaces, glass, &c., as the latter species.

Pelodryas cæruleus, White (Günth. Batr. Sal. pl. 9. fig. B).—The natural colour of this species is a light grass-green, which, when the animal is kept in the dark or in a very wet place, changes into dark sap-green; roundish yellowish-white spots are sometimes scattered on the sides. I have mentioned above that it has a voice, which is a kind of grunting, somewhat resembling that of *Rana esculenta*, but lower. I must remark, however, that the two examples in the menagerie, a male and female, are evidently not full-grown; and I was rather surprised to hear a voice at all from the male, as in *Hyla viridis* the vocal sac and the voice are not developed before the individual has attained to maturity and to its full size. The hind limbs are comparatively short, and therefore this species cannot make such wide jumps as the true *Hylæ*. I could not observe any secretion from the parotoid glands, which are so much developed in full-sized individuals, but which are scarcely perceptible in our specimens. These Frogs soon became familiar, especially the male, which, when I went to feed them, used to approach and to watch the opening through which I introduced the flies into their cage.

Hyla peronii, Bibron (Plate XXX. figs. A, B, *a*).—This species is very remarkable on account of the change of its colours. When awake (see fig. A) it is brownish olive, covered all over with blackish-brown spots, between which small green dots are scattered; the anterior and posterior sides of the thigh and the loin are bright yellow, with irregular reticulated black spots. The pupil is open, horizontally elliptic, and crossed by a very distinct blackish vertical band. We have given a second figure of the same individual (fig. B) when asleep: the dark spots disappear entirely, the ground-colour becomes lighter, sometimes even lighter than it is indicated in the figure; the green dots are very indistinct, and the numerous tubercles with which the skin is covered are whitish at the top. The pupil is contracted into a minute square opening, from which four black lines radiate.

This species is very nimble in its motions, making great leaps when pursued, and darting after flies from 8 to 10 inches distant; but it frequently misses its aim in these attempts. I have heard it emit a sound, but only when it was caught, and which I cannot otherwise describe except by comparing it with that emitted by *Hyla arborea* under similar circumstances.

Hyla krefftii (Pl. XXX. fig. D).—A single specimen of this species, lately described by myself *, being in the collection, I am enabled to give a description of the natural colours. A broad brown band commences between the eyes and extends to the vent, occupying the back almost entirely; it is lighter along the middle; another dark-brown band descends obliquely from the eye to the humeral pit;

* Ann. & Mag. Nat. Hist. 1863, xi. p. 28, pl. 4. fig. C.

the sides are light reddish olive, and covered with minute brown dots, like the back. The hind part of the thigh is of a beautiful purple colour. This species changes the colours but little; but they appear darker and the markings more intense when the animal is awake than when asleep. Our specimen is much less greedy and less active than *H. peronii*, although it is not less slender, and makes leaps as long as the other species; it selects its hiding-place on the ground below some stones. I have not heard any voice from it; but I am not certain about its sex.

Hyla phyllochroa, n. sp. (Pl. XXX. figs. C, *c*).—Snout rather short, broad, with the canthus rostralis angular. The vomerine teeth form two very small groups, situated behind the level of the hinder edge of the inner nostrils. Tympanum distinct, much smaller than the eye. Tongue scarcely notched behind. Perfectly smooth above; belly granular; a fold across the chest. Fingers one-fourth webbed; the membrane between the toes does not extend to the terminal disk. Uniform green above, white below; a very narrow, slightly prominent black line, edged with yellow superiorly, runs from the eye, above the tympanum, to the side of the body, where it is lost.

Besides the living specimen in the Society's menagerie, I have examined three others in the British Museum (two from Sydney, received through Messrs. Cuming and Krefft, and one from Errumanga, New). This species possesses the faculty of changing its colours only in a slight degree; it is generally of a uniform light sap-green, which, under certain circumstances, becomes darker. I have not heard a voice from it. Those in the British Museum are females; the largest has the ovaria fully developed, and measures 17 lines from snout to vent; the hind leg 29 lines.

3. Note on the Occurrence of the European Sea-Eagle in North America. By P. L. Sclater, M.A., Ph.D., F.R.S., Secretary to the Society.

It is well known that the European Sea-Eagle is found in Greenland. Professor J. Reinhardt, in his article on the Ornithology of Greenland, published in the 'Ibis' for 1861*, states that it is "very common" in that country, occurring "in South Greenland all the year round, in North Greenland only in summer." But I am not aware that any instance is hitherto known of this Eagle having been met with on the continent of North America; indeed Professor Baird, in his 'Birds of North America,' states the contrary to be the case. I have therefore thought that it would be desirable to place on record a short statement of the facts which induce me to believe that the *Haliaëtus albicillus* is not merely an occasional visitant to the northern shores of North America, but even resides and breeds in that country.

In December 1861, Mr. A. W. Crichton deposited in the Society's

* "List of the Birds hitherto observed in Greenland," Ibis, 1861, p. 1.

Gardens two young Eagles. Although it is not possible to be certain of the species of *Haliaëti* in their immature plumage, these two birds seemed to be of the common European species. I was therefore much surprised when Mr. Crichton informed me that he had obtained them in Nova Scotia. One of the two birds deposited by Mr. Crichton died in our Gardens in June 1862. The companion bird, which was presented by Mr. Crichton to Lord Lilford, still lives in his lordship's menagerie, and, as I am informed by its noble owner, although two years old, shows no indication of being anything else than *Haliaëtus albicillus*. I subjoin Mr. Crichton's kind reply to my application for exact particulars as to the capture of these birds.

"11 Eaton Place, S.W.

"My dear Sclater,—It would give me the utmost pleasure were I able to give you more satisfactory answers to your queries concerning the American Eagle; but I will tell you all I know about them. One morning (August 12th, 1861) a rough-looking seafaring Yankee appeared at the mess-room door of the barracks where I was staying when at Halifax, Nova Scotia, with a young Eagle under each arm, which he offered for sale. All I could learn from him was that he had obtained them "somewhere *up* the coast" by cutting down a tree. The exact spot (even had the man been aware of its name, which I doubt) I am sorry I did not take the precaution to register. I never felt perfectly certain myself as to what they were, whether *washingtonii*, Jard., or *leucocephalus*, Savigny; but the present state of plumage of the survivor must begin to speak for itself. I have not yet seen Lord Lilford this season, and so know nothing of the present state of the case. With my best regards,

"Believe me, yours very truly,

"Arthur William Crichton."

"Saturday, June 20th."

So far for one instance, which appears tolerably conclusive as to the breeding of *Haliaëtus albicillus* in Nova Scotia. But I have a second case, which seems equally circumstantial in its details. On the 25th of last month Mr. J. Rendall, of Old Palace, Croydon, presented to the Society a specimen of the European Sea-Eagle, taken from the nest near St. John's, Newfoundland, by his brother. In answer to my application, Mr. Rendall informs me that he has mislaid the letter that advised him of the shipment of the Eagle in question, but that he is quite certain of its having been obtained by his brother in Newfoundland in the manner stated.

I shall, of course, not neglect to get further information of the exact spot where this latter bird was obtained, when Mr. Rendall's brother arrives in this country, which will shortly be the case. But looking at the map, and observing the close proximity of the shores of Southern Greenland (where *Haliaëtus albicillus* is common) to Newfoundland and Nova Scotia, I am only surprised that this bird has never before been noticed on the American continent.

P.S. Since this paper was read, I have received information from Mr. Rendall that the Eagle in question was taken from a nest in

Placentia Bay, about 100 miles from St. John's, Newfoundland, where this species breeds every year.

4. Notice of a New Species of Batagur from North-western India. By Dr. J. E. Gray, F.R.S., F.L.S., etc.

Sir Andrew Smith, M.D., has lately sent to the British Museum, with some other interesting reptiles, a young specimen of *Batagur* from the River Chenab, which seemed different from any that I had hitherto seen; but I was disinclined to describe a species on a single specimen in a young condition.

Dr. Günther, the other day, found in a collection that was offered for sale at Chatham a specimen of a *Batagur*, which he thought was different to any that we had in the Museum; and I have little doubt that this specimen is an older and probably nearly adult specimen of the same species as that sent to the Museum by Sir Andrew Smith. I therefore proceed to give a short notice of them.

The species is intermediate in character between the sections *Kachuga* and *Pangshura*. It has the elongated rhombic fourth vertebral plate of *Pangshura*; but the feet are very broad, the toes long, the claws elongate; the back is evenly rounded, and the second vertebral plate broad and six-sided, as in *Kachuga*.

Batagur smithii.

Shell oblong above, rather wider and very slightly dentated behind; the back regularly rounded, interruptedly and subnodosely keeled. The three first vertebral shields oblong; the first rather urceolate; the second subhexangular, rather broader than long; the third narrower, nearly twice as long as broad, with a prominent keel on the hinder half; the fourth very long, tapering, and very narrow in front, square, truncated, and keeled behind; nuchal shield small; marginal shields broad, the sixth and tenth with the upper edge produced upwards; the sternum flat, slightly keeled on the sides, white, it and the underside of the marginal shields blotched with blackish; the gular plate triangular.

Hab. North-western India: Punjab; "River Chenab, 3rd December, 1848."

The younger specimen is not so strongly keeled; the second and third vertebral plate are rather broader compared with their length, and the fourth is more nearly lozenge-shaped.

This species, which will be figured in Dr. Günther's 'Reptiles of British India,' which he is preparing for the Ray Society, may be known from *B. lineata*, which it most resembles, by the shell being more ovate, and by the form of the fourth vertebral plate, which is so contracted in front that it is not wider than the keel of the third vertebral shield.

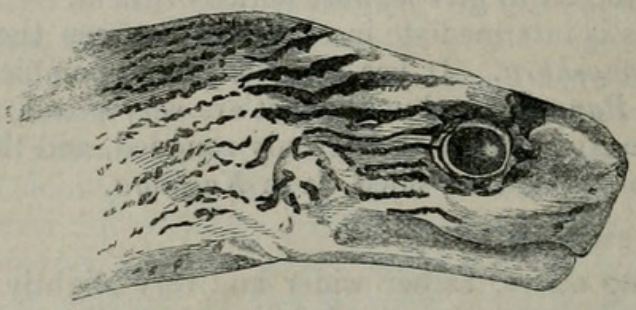
I have named this species after my excellent friend Sir Andrew Smith, the late Director-General of the Army Medical Board, an encourager of science, and very accurate and industrious herpetologist and traveller.

5. Description of a New Geoclemys lately living in the Gardens of the Zoological Society. By Dr. J. E. Gray, F.R.S., F.L.S., etc.

Some time ago the British Museum received a *Geoclemys* from the Zoological Society that had been living in the Gardens, which we have preserved in spirits. Having occasion to examine it the other day, in connexion with some other Terrapens more lately received, it appears to be distinct from any other that we have, and from any that I can find described. Unfortunately it was not accompanied by any account whence it came, so that I cannot give its habitat.

Geoclemys callocephalus.

Shell oblong, convex, bluntly keeled; dark blackish brown; shields thin, slightly ringed, the margin nearly entire; vertebral shields about



as long as broad, the second and third rather longer; nuchal shield short; the marginal shields broad, the ninth rather higher than the rest; underside of these yellow, not spotted or ringed; the sternum convex, rather bent up in front, broadly truncated before, and behind pale yellow, more or less blackish on each side of the central line. The upper part and side of the neck pale; the upper part of the legs closely speckled with minute black dots; the front of the fore legs pale, with some black spots on the edge of the large flat scales which cover this part; the front toes short, coalesced nearly to the claws, with a few rather narrow angular shields on the upper surface; the palms covered with moderate scales, and with a cross row of five large, nearly uniform-sized, squarish shields on the hinder part of the wrist; the hind legs covered with small scales; the hind foot broad, the toes short, and coalesced like the front one, but with rather larger shields above the soles, with moderate-sized scales, and with some large triangular shields at the hinder part of the heel, in two or three series; the chin and throat white, spotless; the head rather flattened; the eyes lateral; upper jaw slightly notched in front; the crown of the head (in spirits) pale, with three black-edged white broad streaks concentric one within the other, and diverging parallelly towards the occiput, where they are lost among the black specks; cheek with five or six narrow black horizontal lines, the lower bending up to the tip of the ears; there is an obscure black streak from the nose to the middle of the orbit, and a narrow streak near the upper edge of

the upper jaw, and some black oblong spots on the lower side of the ear and temple, which may be more distinct in the living specimen.

Hab. Unknown; perhaps China.

This species in several respects agrees in form and appearance with *Emys chinensis*, of which, as is shown by the specimen brought by Mr. Swinhoe to this country, the Tortoise described by me as *Emys bennetti* is only the adult. It is at once known from *E. chinensis* by the minutely speckled body and the bands on the head, and by the under surface of the marginal shield being destitute of any rings or spots. The head and neck of *E. chinensis* are covered with uniform narrow black lines, which on the chin and throat form circles. *E. chinensis*, like *E. bealei*, is a true *Emys*, with slender, distinctly developed toes and fingers, which are united by a web to the claw,—*E. chinensis* having moderate-sized thick scales in the front of the fore legs, with some larger and broader scales, or small shields, scattered among them, and *E. bealei* small granular scales on the legs, with three or four broad, thin, lunate, band-like shields across the front of the fore legs.

In the black speck on the neck and body, and the ornamental lines on the head, this species has some affinity to *E. pulcherrima*, described and figured in my Catalogue from a very young specimen, said to come from Mexico. But this habitat is doubtful, as some other animals, procured from the same person and said to be from the same habitat, have proved to be from other countries. This species also, as far as can be judged from the dry state of the specimen, may probably be a *Geoclemys*.

6. Description of a New Species of Macrurous Decapod Crustacean belonging to the Genus Penæus, from the Coast of Portugal. By James Yate Johnson, Corr. Mem. Z. S.

Penæus bocagei, sp. n.

The subcylindrical carapace is less than half the length of the abdomen, including the caudal segment, and is excavated at the middle of the posterior margin. A median crest commences near the posterior margin, and projects in front as the rostrum, which is more than half the length of the carapace. This rostrum extends much beyond the eyes, but not quite so far as the distal extremity of the peduncle of the superior antennæ. It has a slight sigmoid flexure, is compressed, and is marked at each side with two low crests and two grooves. Its lower edge is simple; but its upper edge carries eight small teeth, the first of which is over its base, and the last some little distance from its anterior extremity. There is a fringe of hair at the lower edge posteriorly. The median crest of the carapace carries a single tooth, which is distant from the anterior margin about one-third of the length of the carapace. At each side of the carapace, a little in front of this tooth, there is a large tooth or small spine, in

the neighbourhood of which there is a depression. Above the spine a narrow and somewhat sinuous groove extends nearly the whole length of the carapace. A little behind each anterior angle of the carapace there is another spine smaller than the one last mentioned. The anterior margin of the carapace is deeply excavated at the base of the inferior antennæ, and between this excavation and the base of the ocular peduncle there is a strong sharp tooth or spine; whilst over the base of the eye-stalk there is a minute angular projection, hardly to be called a tooth. The eye is large, being both broader and longer than its stalk.

The superior antennæ have the basal joint of the peduncle broad and much hollowed to receive the eye, and its inner border carries a short lamellar appendage. Each has two filaments with thickened bases, of which one is nearly twice as long as the other, and the longer has a length nearly equal to that of the carapace exclusive of the rostrum. The basal joint of the inferior antennæ is short and thick, and it has a small emargination in front on the upper side. Their palps are large, extending very nearly as far as the rostrum, and they are shaped like the quarter of an elongated ellipse; but the thick outer margin curves slightly inwards, and projects in front as a short tooth. The inner margin is fringed with hair. The filament is longer than the total length of the Crustacean, including the rostrum.

All the feet are slender, and the first three pairs are two-fingered, with ovate hands, the rest being monodactyle: none are multiarticulate. The order of their length, commencing with the longest, is 5, 4=3, 2, 1; the third and fourth pairs reach beyond the eyes; the first pair has a fringe of hair at the under edges of all the joints, and the second and third joints each carry a spine at the distal extremity of the underside. The first pair of pedipalps is long, slender, and pediform; they extend beyond the eyes.

The abdomen is subcompressed in front, much compressed behind, and the anterior five segments are furnished with large and prominent false feet, each terminated by a pair of narrow flexible plates fringed with hair, of which the outer one is longer; the basal joint is shorter than either. All the segments have their inferior margins fringed with hair. The fourth, fifth, and sixth segments possess a median keel, which terminates posteriorly with a small sharp tooth; and the sixth segment has in addition a small tooth at each posterior angle. The posterior margins of the fourth and fifth segments have a small notch at the middle of each side. The seventh or caudal segment is about as long as the sixth, which is longer than any of the preceding segments; it is narrow, terminates in a point, and is armed with a small spine at each side near the posterior extremity. The lateral plates are narrowly oval and fringed with hair; both pairs extend beyond the seventh abdominal segment, but the outer plates are larger than the inner, which latter have a longitudinal median groove on the upper surface between two low crests. There is also a groove on the upper surface of the exterior plates; but it is not in the median line, and it terminates at the outer margin not far

from the posterior extremity of the plate. At this place there is a small sharp tooth, and here commences a low crest which crosses the plate with a curve and divides it into two unequal portions. The common basal joint of these plates has a small sharp tooth at its postero-exterior angle.

Large quantities of this *Penæus* are taken at the mouth of the Tagus during the spring and summer months; and it frequently appears on the breakfast-tables of the hotels in Lisbon, where indeed it first attracted my attention. It is known in the market under the name of "Camarão," *i. e.* Prawn. The living Crustacean has a pale red colour, which deepens on being boiled into the pinky red of our Prawn. It may be readily distinguished from *Penæus caramote*, which has also been taken on the coast of Portugal, by the single crest on the carapace, by the absence of teeth from the underside of the rostrum, by the presence of a spine near the anterior lateral angles of the carapace in addition to the spine between the bases of the inferior antennæ and the eye-stalks, by the much greater length of the filaments of the superior antennæ, which in *P. caramote* are not more than a fourth of the length of the carapace minus the rostrum, by the absence of spines from the two basal joints of the second and third pairs of legs, and by the presence of a single spine, in place of three, at each side of the caudal segment of the abdomen.

Examples having a total length, including the rostrum, of $5\frac{1}{4}$ inches, and a carapace with a width of rather more than half an inch, are not uncommon; but the finest specimen I have seen was kindly presented to me by Dr. J. V. Barbosa de Bocage, Director of the Royal Museum of Lisbon. This specimen, which is now in the British Museum, has the following dimensions:—

	inches.
Total length from tip of rostrum to end of caudal plates	$6\frac{6}{16}$
Rostrum, length	$1\frac{1}{8}$
Carapace, without rostrum, measured at the side, and including the frontal spine	$1\frac{10}{16}$
Carapace, width	$\frac{10}{16}$
Abdomen, length to the tip of the caudal segment	$3\frac{19}{32}$
First legs, length	$1\frac{1}{8}$
Fifth legs, length	$2\frac{1}{16}$
Outer pedipalps, length	$1\frac{9}{16}$

7. Description of a New Siliceous Sponge from the Coast of Madeira. By James Yate Johnson, Corr. Mem. Z. S.

Order SILICEA, Bowerbank.

Dactylocalyx, Bowerbank, Phil. Trans. 1862.

Skeleton siliceo-fibrous. Fibres solid, cylindrical. Reticulations unsymmetrical.

DACTYLOCALYX BOWERBANKII, sp. n.

The skeleton of this sponge is composed of an inelastic network of silex of a dense and irregular structure. Under a power of sixty diameters a slice of it resembles the crumb of bread, without any trace of the structure resembling spoked wheels, such as is exhibited by a siliceous sponge preserved in the Museum at Paris under the name of *Iphiteon*—a similar structure being also seen in the pith of some water-plants. The fibre is smooth, but somewhat nodulous. The skeleton is covered with a rather thin crust, of a close texture, without conspicuous orifices, and this crust abounds with large spicula of the form denominated "spiculated patento-ternate" by Dr. Bowerbank in his memoir read before the Royal Society in 1857; and some of them are developed into the dichotomo-patento-ternate form, such as is represented in fig. 48 of plate 23 of the 'Philosophical Transactions' for that year. But in the sponge under description the shaft is not prolonged through the common base of the triradiating branches, and the second division of these branches is much longer than the first or third; the third division, or ultimate branchlets, are pointed, and not in the same plane with each other or with the preceding portion of the branch, just as in the case of the spiculum represented in the figure already referred to. The shafts of the spicula project into the reticulations of the skeleton. In addition to the large spicula, the dermal membrane abounds with minute elongo-stellate spicula having short stout cylindrical radii; and a very few of these are dispersed in the interstitial membranes beneath the dermis. On the surface of the skeleton, immediately beneath the dermis, there is an abundance of long acuate spicula, disposed either singly or in fasciculi which are often parallel with each other. These acuate spicula are not found in the deeper interstitial portions of the sponge, but a few long, very slender, and flexuous spicula are occasionally to be found there. No sexradiate spicula could be detected, nor were any gemmules observed.

The single example of this sponge which has been obtained was brought up from deep water off the coast of Madeira. It was attached to a rock or stone by the middle portion of the underside. Its colour is white; and although its texture even when fresh was firm, the finger-nail easily made a permanent impression upon its surface. The animal matter was in comparatively small quantity. When a portion of the sponge was immersed in nitric acid it acquired a yellow tinge. The shape is that of a concave disk or shallow cup, with the border undulated into a few strong folds, some of which rise two or three inches above the rest of the surface. In one instance the opposite sides of a fold have grown together. The general appearance calls to mind a large fungus such as is sometimes seen attached to the trunk of an old tree. It measures fourteen inches across in one direction, in another twelve inches, and it has a thickness varying from half an inch to nearly an inch.

Dr. Gray has had the kindness to let me examine the half of a siliceous sponge which came into his possession from Mr. Stutchbury, who obtained it, I understand, from Barbadoes, and described it in

the 'Proceedings of the Zoological Society,' 1841, p. 86, under the name of *Dactylocalyx pumiceus*, in these words:—"Sponge fixed, siliceous; incurrent canals uniform in size; excurrent canals large, forming deep sinuosities in the outer surface, radiating from the root to the outer circumference." Comparing the sponge now described with Dr. Gray's, I find in mine no well-marked system of incurrent and excurrent canals with large orifices, as in the Barbadian sponge, which latter is of a much more open and porous texture, and besides exhibits in its present state not the slightest trace of a skin.

Dedicated to Dr. J. S. Bowerbank, F.R.S., who has devoted his attention for many years to the Spongiadæ, and who is now giving to the scientific world, through the medium of the 'Philosophical Transactions,' the results of his important investigations.

8. Catalogue of the Birds of China, with Remarks principally on their Geographical Distribution. By Robert Swinhoe, F.Z.S.

Psittacidæ.

1. Palæornis rosa, Bodd.

P. bengalensis, Briss.
P. cyanocephalus, L.
P. flavicollaris, Frankl.; Jerdon, Birds of India, i. p. 259.

Two pairs of this species were shot, out of a flock in autumn near Canton, by Dr. Dod, two of which were kindly given me by that gentleman for identification. This is the only well-authenticated instance of the occurrence of any of the Parrot-group in China. The Chinese call all Parrots "Ying-ko," and import various species from the Straits as cage-birds.

Falconidæ.

2. Aquila heliaca, Savigny.

A. imperialis, Cuv.
A. mogilnik, Gr.; Bp. Consp. Av. p. 13.

An immature male of this species was shot at the close of 1861, near Foochow, by Mr. A. Andrews. The specimen was identified by Mr. J. H. Gurney. I have lately received a letter from Mr. Andrews informing me that he had this last winter shot another Eagle, a female, probably of the same species as the first, at Foochow.

3. Haliaëtus albicilla, L.

Hab. Amoorland (v. Schrenck, Amurland, p. 223).

Captain Blakiston's expedition-party shot one on the 23rd of February at Chinkiang, on the Yangtsze, the head and leg of which were brought home and identified by Mr. J. H. Gurney. I once saw a large Sea-Eagle in the month of December at Amoy, which I believe to be of this species; and I was assured of its occasional

occurrence during the same season at Hongkong by the late Dr. Harland, a most diligent and accurate observer, whose collections in the various branches of natural history at present enrich the Museum of Scarborough, his native place.

4. HALIAËTUS PELAGICUS, Pall.

Hab. Sea-coasts of the Amoorland, Mantchuria, and Japan. Not hitherto observed in China.

5. PANDION HALIAËTUS, L.

Hab. Amoorland (v. Schrenck) and Japan. Abundant on all the rivers and bays of Formosa and China. The Chinese and Formosan specimens are rather smaller than those from Europe.

6. POLIORNIS POLIOGENYS, Temm.

Buteo pyrrhogenys, Schleg. Faun. Jap.

Originally described from Japan; since procured at Tientsin by Mr. Fleming, R.A. (see P. Z. S. 1862, p. 315; and The Ibis, 1863, p. 88).

7. BUTEO JAPONICUS, Schleg. Faun. Jap. t. 6; Bp. Consp. Av. p. 18.

Closely allied to the European Buzzard, but never acquires the dark plumage of the adult of that bird. Its tarsi, moreover, as Bonaparte remarks in his 'Conspectus Avium,' are more feathered. Found in Amoy, Hongkong, and Canton, in the winter only.

8. MILVUS MELANOTIS, Schleg.

M. govinda, Sykes, of some of my lists of Chinese Birds in The Ibis.
M. niger, var. *melanotis*, von Schrenck, Amurland.

Found throughout China, from Canton to Talien Bay, in the Amoorland, in Japan, and in Formosa.

9. FALCO SACER (Schleg.), Bp. Consp. Av. p. 24.

Procured by myself at Pekin (see The Ibis, 1863, p. 88).

10. FALCO PEREGRINUS, L.

Occurs from Canton to the Amoor. Found also in Japan and Formosa.

11. FALCO SUBBUTEO, L.

Found in Amoorland, according to v. Schrenck. I have seen specimens from Tientsin, Hankow (Central China), Foochow, and Amoy.

12. FALCO VESPERTINUS, L.

Found in Amoorland (v. Schrenck), in Talien Bay, and in the neighbourhood of Pekin.

13. FALCO ÆSALON, L. Merlin.

I have seen specimens from Pekin, Amoy, and Foochow.

14. TINNUNCULUS JAPONICUS, Schleg. Faun. Jap. t. 1, 1*a*; Bp. Consp. Av. p. 27. Japanese Kestrel.

Common in South China and Formosa; somewhat rare about Pekin. The Kestrel mentioned by v. Schrenck as occurring somewhat scantily in Amoorland is probably the same. I have, however, one specimen from Amoy, in which the colours are lighter and clearer, and the back considerably less spotted, as in the *T. alaudarius* of Europe.

15. ASTUR PALUMBARIUS, L. Goshawk.

This bird is found in the neighbourhood of Pekin. I have there seen it carried on the wrist by natives for the purposes of hawking. It is noted by von Schrenck as found in Amoorland.

16. ACCIPITER NISUS, L. Sparrow-Hawk.

Occurs from Canton to the Amoor; also in Japan.

17. MICRONISUS SOLOËNSIS, Horsf.

Falco cuculoides, Temm. Pl. Col. 110, 129; Bp. Consp. Av. p. 33.

I have seen specimens from Amoy, Foochow, and Tientsin. A good mark of distinction in this species, as pointed out by Mr. J. H. Gurney, is the clear unspotted cream-colour of the axillaries.

18. MICRONISUS GULARIS, Schleg.

I have seen skins from Amoy and Formosa. It inhabits also Japan, whence originally described and figured in the 'Fauna Japonica.'

19. MICRONISUS STEVENSONI.

Accipiter stevensoni, Gurney, Ibis, 1863, p. 447, pl. 11.

A resident species at Hongkong, Canton, and Macao. One specimen received from Tientsin.

20. CIRCUS CYANEUS, L.

From Canton to the Amoor.

21. CIRCUS SWAINSONII, A. Smith.

C. pallidus, Sykes.

A female specimen of this was procured by Captain Blakiston on the Yangtsze, and identified by Mr. Gurney.

22. CIRCUS MELANOLEUCUS, Pennant.

Procured by Mr. Fleming, R.A., at Tientsin. Probably extends throughout the interior of China, as it is common in the plains of Hindostan.

23. CIRCUS SPILONOTUS, Kaup; Swinhoe, Ibis, 1863, p. 213, pl. 5.

Found in South China; especially abundant in the neighbourhood of Amoy. Has also been procured from Singapore and the Philippines.

STRIGIDÆ.

24. ATHENE CUCULOIDES, Vigors; Bp. Consp. Av. p. 40.

From Canton to Ningpo.

25. NINOX JAPONICUS.

Strix hirsuta japonica, Schleg. Faun. Jap. t. 9; Bp. Consp. Av. p. 41.

From Amoy to Tientsin; found also in Formosa. Originally described from Japan.

26. KETUPA CEYLONENSIS, Gmel. Crab-Owl.

Procured only from the hills of Hongkong. Abundant in Ceylon and in many parts of India.

27. SCOPS SEMITORQUES, Schleg. Faun. Jap.

S. lempiji, var. *lettia*, Hodgs., Blyth's Catalogue.

South China; as yet only traced from Canton to Foochow, thence across to Formosa. Also in Japan, and throughout the hilly regions of India. Is replaced in the Malayan peninsula by the allied *S. lempiji*, Horsf.

28. SCOPS JAPONICUS, Schleg.; Bp. Consp. Av. p. 48.

S. bakkamœna, Penn.

From Canton to Peking; also in Japan. Occurs in South China in winter, and is found in Tientsin during summer. I procured it at Amoy twice, and have seen it on several occasions in winter only, and Captain Blakiston procured one at Canton on the 15th of November; hence I infer it to be a bird of passage, spending the summer in North China and Japan, and wintering in South China. Is probably the same as the bird of Hindostan, *S. bakkamœna*, Penn.; at least it has been so identified by Mr. E. Blyth.

29. BUBO MAXIMUS, Sibbold. Great Horned Owl.

B. atheniensis (Aldrov.), Bp. Consp. Av. p. 48.
Strix bubo, L.; von Schrenck, Amurland, p. 249.

From Canton to Talien Bay, and thence on to the Amoor. In many parts of China it is by no means rare throughout the year.

30. OTUS VULGARIS, Flem. Long-eared Owl.

Otus vulgaris, Bp. Consp. Av. p. 50.
Strix (*Ægolius*) *otus*, L.; v. Schrenck, Amurland, p. 246.

Procured by Mr. Fleming at Tientsin. Found in Amoorland (v. Schrenck), and more or less common in many parts of China proper.

31. OTUS BRACHYOTUS (Gmel.). Short-eared Owl.

Brachyotus palustris, Bp. Consp. Av. p. 51.
Strix (*Ægolius*) *brachyotus*, v. Schrenck, Amurland, p. 246.

From Canton to the Amoor.

32. SYRNIUM SINENSE, Lath.; Bp. Consp. Av. p. 52.

Said to have been received from Canton. I have never come across the bird.

CAPRIMULGIDÆ.

33. CAPRIMULGUS JOTAKA, Schleg.

C. dytiscivorus, Swinhoe, Ibis, 1860, p. 130.
C. swinhoii, Blyth.

Tarsi feathered; allied to *C. europæus*, L.

Summers in North China and Japan; common in South China, chiefly in spring and autumn; when in its migration it spends two months in Amoy and Hongkong. Old birds very black, with much less buff markings. White spots on the primary quills of male very variable in size. White band on tail also variable in breadth, and at different distances from tip in different specimens. In the freshly moulted males both are strongly tinged with buff.

The female has no band across the tail, and the spots on the underneck and wings are rust-coloured instead of white. Her whole plumage is much more rufescent.

Both sexes in the very young plumage have no spots on the wings or tail, the throat of the male alone showing whitish patches.

34. CAPRIMULGUS STICTOMUS, Swinhoe, Ibis, 1863, p. 250.

Tarsi bare; allied to *C. monticola* of India and *C. affinis* of Java. Outer tail-feathers in male white. Spends the summer in the south of China; found near Amoy in September and October. Amoy specimens very rufescent and clearly marked. Formosan variety smaller and very pale.

CYPSELIDÆ.

35. ACANTHYLIS CAUDACUTA, Lath.

Hirundo fusca, Shaw.
Chætura australis, Steph.
C. macroptera, Sw.
C. nudipes, Hodgs.
Cypselus leuconotus, Deless.
Hirundo ciris, Pall. Zoogr. Ross. Asiat. p. 541.

Most naturalists are, I believe, now agreed that the Himalayan and Australian birds are one and the same species, and identical with the individual that was shot in England. In the south of China I never saw but one pair; the male I secured. This specimen agrees entirely with Australian skins. Von Schrenck observed this Swift in Amoorland; and it is doubtless the bird described by Pallas as *Hirundo ciris*.

36. CYPSELUS VITTATUS, Jard. & Selb. Ill. Orn. n. s. t. 39.

Closely allied to *C. pacificus*, Lath. (*C. australis*, Gould). Sexes of similar plumage; wings and tail of variable length in both, in the former seldom more than $\frac{1}{2}$ inch difference between two specimens.

Found as a summer visitant in China, from Amoy to Talien Bay; also in Formosa. Not noticed in von Schrenck's 'Amurland.'

37. Cypselus subfurcatus, Blyth, J. A. S. xviii.

C. affinis, var., Strickland, P. Z. S. 1846, p. 99.

Larger than *C. affinis*, J. Gr., and of a much blacker and glossier colour, with much more white on the throat; tail longer and subfurcate. Approaches *C. vittatus* more nearly than *C. affinis* does. Sexes alike. Wings vary somewhat in length in individuals. Resident on the Chinese coast not much higher than Amoy, whence it ranges southwards to Malacca. Found also in southern Formosa.

Upupidæ.

38. Upupa epops, L.

U. vulgaris, Pall.

A resident bird throughout China, from Canton to Talien Bay. Found also in Amoorland, according to von Schrenck. Chinese specimens identical with the European bird. Some individuals are strongly imbued with a rufous tinge. The young are at once distinguishable by their much shorter bills. Builds in holes of walls and exposed Chinese coffins. The younglings call for food with a hissing note. The male during the breeding-season utters its song of love, "Hoo-hoo-hoo." To produce these notes the bird draws the air into its trachea, which puffs out on either side of the neck, and the end of the bill is tapped perpendicularly against a stone or the trunk of a tree, when the breath being forced down the tubular bill produces the correct sound. I have watched a male crying on a rope, where, instead of striking its bill, it merely jerked its head. The song then given forth was quite different, sounding more like "hoh-hoh-hoh." Feeds on worms, for which it stamps the ground with its feet, clutching them by the head with its bill. It bruises the worm by beating it against the ground, and then, throwing up its head, jerks it down to its small mouth, and finally swallows it.

Cuculidæ.

39. Eudynamys orientalis.

Cuculus orientalis, niger, mindanensis, et *scolopaceus*, L.
C. maculatus, Gmel.

A summer visitant to the extreme south of China; common about Canton. I have a specimen from Swatow; but I do not think it ranges much higher. I have never found it at Amoy. For an account of the bird as observed at Canton, see The Ibis, 1861, p. 46.

40. Cuculus canorus, L.

I have a series of each of two forms from China, both of which Mr. Blyth refers to *C. canorus*. I have a skin from Tientsin, one from Peking, and a third from Foochow—all undoubtedly true *C. canorus*, with white underparts banded with narrow bars, and the axillaries

also similarly banded. On the Foochow hills I have heard the true Cuckoo-note in June. Of the second series, I have one from Tientsin, and four from Amoy. These are of similar form, with fulvescent under parts banded with much broader bars more widely set, with the axillaries nearly barless. One has a somewhat large bill, and two are almost entirely blackish brown in the parts which should be grey. I have never heard the notes of the race that touches in greatest abundance at Amoy in its migrations, and therefore will not attempt at present to separate it. It may be found, on further acquaintance, worthy of specific distinction. This variety is not noted in Jerdon. The true Cuckoo is very variable in tints, length of wing, and size of bill, and even in my small series leads away to the following allied forms (which, however, differ from it in note) in such a manner that I can hardly help thinking that the various races interbreed, the offspring probably studying the note of that parent to which its inherited form most assimilates, and to the society of which it is on that account attracted. The straggler which I procured in south-west Formosa belongs to the second variety.

41. Cuculus himalayanus, Vigors (not of Gould's 'Century,' which=*C. poliocephalus*, Lath.).

C. saturatus, Hodgs.

I have an individual of this Cuckoo, shot at Amoy on its vernal northward migration. It has been identified by Mr. Blyth, and answers well to Jerdon's description (Birds of India, i. p. 323). It is of similar form to *C. canorus*, but is smaller and much more deeply and brightly coloured. I have never observed it alive; but some remarks on its habits and peculiar note are given in the work referred to.

42. Cuculus micropterus, Gould.

Of this I have also one shot at Amoy, in the neighbourhood of which place it is frequently seen and heard in spring. It is a plain-dressed species, with very broad and widely set bars on the under parts; smaller than *C. canorus*, with rather a large bill (see Jerdon, Birds of India, i. p. 326, where an account of its note and habits are given).

43. Cuculus hyperythrus, Gould.

I have only an immature bird, from Shanghai, the locality whence Mr. Gould procured his typical specimen. This is a much more powerful bird than *C. canorus*, with short wings and heavy bill. The plumage of my bird is brown on the upper parts, with the yellowish mottling of immaturity. The under parts are fulvous, barred at long intervals with black, but there are deep-rust-colour indications of a change into what should be the plumage of the adult bird.

44. Hierococcyx fugax.

Cuculus fugax, Horsf. Linn. Trans. xiii.
Cuculus sparverioides, v. Schrenck, Amurland, i. p. 24, t. 10.

This abnormal form of Cuckoo, with peculiar bill and somewhat graduated tail, is ably described by von Schrenck in the work above noted, but wrongly referred to the much larger Himalayan type. It is also noticed in Jerdon's 'Birds of India,' p. 331. I have seen it in Hongkong in April; but have, unfortunately, only one individual in hepatic or rufous plumage from Manilla, and must therefore direct my readers to von Schrenck's work, with the caution, however, that the bird there figured is not in the plumage of the adult. This species of Cuckoo is, curiously enough, spotted and streaked instead of being barred on the under parts. I have to thank Mr. Blyth for drawing my attention to Dr. Horsfield's type specimen in the E. I. C. Museum, from the Straits, which appears identical with our bird.

45. POLYPHASIA TENUIROSTRIS.

Cuculus tenuirostris, Gray.

A summer visitant to the south of China, though some few stay very late. I have an adult male, shot at Amoy on the 9th of December 1857. Chinese specimens agree almost entirely with those from India; but their tints are usually of a higher tone, the grey runs lower down on the breast, the under parts are more brightly rufescent, there is much more whitish on the edge of the carpus, and much less white on the under wing. The bills and wings of my specimens vary somewhat in length. Like the larger Cuckoos, this bird in the adult plumage often exhibits bars of red on the upper parts; and frequent cases of the rufescent or hepatic plumage occur. I have one adult male which is of a fine chestnut-red on the upper parts barred with bronze-black, the under parts being rufous barred with black and white. One specimen in the partial hepatic plumage has an admixture of grey on the lower parts, showing a tendency to the allied *P. nigra* of Hindostan. The notes of the Indian *P. tenuirostris* would appear, according to Jerdon, to differ from those of our summer visitant.

46. CENTROPUS VIRIDIS, Scopoli.

C. bengalensis, Gmel.
C. lepidus, Horsf.
C. affinis, Horsf.
C. tolu, Raffles.
C. pumilus, Lesson, &c. (see Jerdon, Birds of India, i. p. 350).

This small Lark-heel is a resident species in South China, being chiefly confined to islands. It is somewhat rare on the main, where the large species abounds. In Formosa it is the only species. (See The Ibis, 1861, p. 48.)

47. CENTROPUS RUFIPENNIS, Illiger.

(For synonyms, see Jerdon, Birds of India, i. p. 348.)
C. sinensis, of my "Canton List," Ibis, 1861, p. 49.
C. eurycercus, A. Hay.

The large Lark-heels from India, Malacca, and China have been

considered as three distinct species. The first I have received from Mr. Blyth, the second from Siam through the kindness of Sir R. Schomburgk, and I have a large series from Canton and Foochow. In size, form of bill, and proportion of wings and tail-feathers, the bird is as variable as in the distribution of black bars on its upper plumage. I have skins showing quite as narrow tails as in *C. rufipennis* of India, and others displaying even broader rectrices than in the *C. eurycercus* from Siam. I have thus been compelled to unite them together. The habits as well as the notes of the species observed by myself tally closely with Jerdon's remarks, with the exception of what he states of the nest. I have never found the nest domed as is that of *C. viridis*. It is shaped like a long narrow basket, made almost entirely of fresh grass, suspended in the centre of a thick hedge, and usually contains four pure-white eggs, ovate and not roundish as those of its small ally. This Crow-pheasant is a resident bird in South China, ranging a few hundred miles above Foochow, —not quite so far north, I think, as Ningpo.

Picidæ.

48. Yunx torquilla, L.

Yunx japonica, Bp. Consp. Av. p. 112.

Summers in North China, the Amoor, Kamtschatka (v. Schrenck), and Japan, and winters in South China, at which season it is very common at Amoy. Lives almost entirely on ants. Specimens very variable as to tints, spots, and markings. This Eastern form is rather smaller, and offers a few peculiarities distinguishing it from the European bird, but scarcely sufficient to cause it to be recognized as anything more than a race of the European type.

49. Micropternus fokiensis, Swinhoe, P. Z. S. 1863, p. 87.

Allied to *M. phaioceps*, Blyth, of India, and *M. badius*, Raffles, of Java, which form Bonaparte and Malherbe's genus *Phaiopicus*. Procured at Foochow, where it is a resident species, and probably extends throughout Southern China. I may here remark that a Sumatran specimen received from Professor Schlegel, labelled *P. brachyurus*, Vieill. (*P. badius*, Horsf.), is much larger than my Malacca specimens so named by Mr. Blyth, and has the throat strongly mottled with blackish brown, as is the *M. gularis*, Jerdon, of South India and Ceylon; but the various brown species with red spotted cheeks in the male are so intimately connected by intermediate forms from intermediate localities, that, like the *Picus major* group, they cannot be regarded as more than local races. *M. badiosus*, Temm., of Borneo, which I have also received from Professor Schlegel, seems however to establish its own distinctness by the red markings of the male extending in specks to the eyebrow and occiput.

50. Gecinus canus, Gmelin.

Picus chloris, Pallas.

North China, about Pekin, where common; also Amoorland (v. Schrenck).

51. GECINUS GUERINII, Malherbe.

Originally described from specimens from Shanghai. Procured by Captain Blakiston on the Yangtsze, near Shanghai. Differs chiefly from *G. canus* in its smaller size, in its deeper and more olive plumage, in its larger frontal red patch, and in having a black-marked occiput.

52. GECINUS TANCOLA, Gould, P. Z. S. 1863; Swinhoe, Ibis, 1863, p. 389.

Allied to *G. occipitalis*. The young in the nest are similar to their parents in colour and markings, showing the usual sexual distinction; in this respect they differ from *G. viridis*, which has an immature dress. I have a young pair (male and female) taken, with the male parent, from a tree on the Pehling Mountains, near Foochow. This species ranges over the higher hills of South China and Formosa.

G. guerinii, from an intermediate locality, is quite intermediate between this and the true *G. canus*. In *G. canus* the black on the crown shows itself in faint streaks; in *G. guerinii* it becomes marked, and extends in a patch to the occiput; in *G. tancola* it is much more extensive. In the same way the black moustache-streak, indistinct and disconnected in the first, is more connected in the second, and in the third a broad black line. In fact, part with part compared, the entire plumage of *G. guerinii* takes an intermediate position between the two. Nevertheless specimens of *G. canus* from Pekin are identical with European specimens, and show the barred immature plumage.

53. PICUS MANDARINUS, Malherbe.

P. luciani,
P. gouldii,
P. cabanisi,
} Malherbe, Mon. Picidæ.

For remarks on this group of Chinese Woodpeckers, see P. Z. S. 1863, p. 88. Races of this variable bird are found throughout China, from Canton to Pekin. The further north they extend the whiter and more spotted they become, until the Amoorland is reached, where von Schrenck reports the form identical with *P. major* of Europe.

54. PICUS SCINTILLICEPS, Swinhoe, Ibis, 1863, p. 96.

Belongs to the spark-headed group of small Pied Woodpeckers, of which numerous species are recorded. Common about Pekin. A smaller and browner species occurs in Japan (the *P. kisuki* of the Faun. Jap.); and the form is represented in Formosa by a species allied to the Chinese bird—my *P. kaleënsis* (see The Ibis, 1863, p. 390).

55. PICUS HYPERYTHRUS, Vigors, var. POLIOPSIS, Swinhoe.

Abundant near Pekin. The Chinese bird is too close to that of the Himalayas to be considered more than a variety of that bird (see

Ibis, 1863, p. 96). Its back is more barred with white, and it has less rufous on the sides of the neck.

Capitonidæ.

56. Megalæma virens, Bodd.

Bucco grandis, Gmel.

Inhabits wooded hills of Southern China, and the Himalayas. I have received specimens from the neighbourhood of Foochow, and Captain Blakiston shot it on the 16th of March near Canton.

Alcedinidæ.

57. Halcyon smyrnensis, L.

H. fuscus, Jerdon, Birds of India, i. p. 224.

A common resident species from Canton to the River Yangtsze.

58. Halcyon atricapilla, Gmel.

H. pileata, Gray ex Bodd.; Bp. Consp. Av. p. 155.

Also a resident species from Canton to the Yangtsze.

59. Alcedo bengalensis, Gmelin.

A. ispidioides, Lesson.

Found throughout Eastern Asia to the Amoor, in Japan, and in Formosa. In the female the plumage is not so brilliant; but the chief sexual distinction is her pale-yellowish-red under mandible, which is always black, like the rest of the bill, in the male and young bird. This I have found a constant character in the Chinese bird, but I do not see it remarked in Jerdon's account of this species, nor yet in v. Schrenck's 'Amurland.' The bill of the young bird is tipped paler; its breast is washed with a dingy bluish grey, almost black in some individuals; the rufous has only a slight admixture of yellow; and the upper plumage is paler and dingier. I suspect that the mandibular distinction of the female will also be found to hold good in the European *Alcedo ispida*, L., and I would call the attention of British ornithologists to the fact.

60. Ceryle rudis, L.

Found about all rivers in South China from Canton to Foochow; does not extend so far north as Shanghai. The males carry two bands across the breast. In very mature males the throat and underneck are spotted thickly with round black spots. In spots and particular markings my specimens vary a good deal.

Coraciidæ.

61. Eurystomus orientalis, L.

A summer visitant to Southern China; procured at Canton and Foochow. At the latter port a male used to perch for the greater part of the hot spring days on the top of a flagstaff, whence it

uttered its loud unmusical notes, springing at intervals into the air, and after throwing a somerset returned to its post. This action was not performed in the pursuit of insect food, but apparently in play. For a further account of its habits see The Ibis, 1861, p. 31.

Certhiidæ.

62. Tichodroma muraria, L.

A specimen of a bird answering to this was shot by Mr. Consul Gingell on the mountain-plateau near Foochow during winter. The bird was accurately described to me by that gentleman, but I did not see the specimen. I have never met the bird myself in China.

Certhia familiaris, L., is given from Amoorland and Japan. We should therefore expect to meet with it in North China.

Paridæ.

63. Parus minor, Schleg. Faun. Japon.; and

64. Parus cinereus, Vieill.

The first of these is the form found in Japan and from Chefoo (Shantung promontory) down to Foochow. It is easily distinguished from the second by its greenish-yellow back and its smaller bill. *P. cinereus* is the form ranging over India and its archipelago, and has a grey back. In Amoy we get the typical *P. minor*, and others with grey backs, resembling the *P. cinereus*, but with the smaller bill of *P. minor*. Between these two every stage of yellow and grey back can be procured out of the same party of Tits. In Canton occasional specimens of true *P. cinereus* occur, but the most ordinary form is the variety oscillating between the two species. Most Canton specimens have, however, larger bills. I have never seen the typical *P. minor* shot so far south as Canton; and Mr. Blyth tells me that he has never heard of the yellow-backed form being found in the Indian countries. Hence it is but fair to consider the two extreme forms as good species, and allow that they interbreed on the boundaries of their respective localities, and blend into one another gradually and almost imperceptibly. The large *P. major*, L., is said by Pallas to extend throughout Siberia to Kamtschatka.

65. Parus kamtschatkensis, Bp.

P. borealis, Selys?.
P. palustris, var. *borealis*, von Schrenck, Amurland.
P. palustris, Swinhoe, Ibis, 1861, p. 331.

This form of the Marsh-Tit prevails from Peking to Amoorland. I have met no Marsh-Tit in South China. It has also been procured from Hakodadi, Northern Japan.

66. Mecistura caudata, L.

Mr. Gould remarks that Japanese specimens of the Long-tailed Tit closely resemble British specimens, which offer variation from those procured in continental Europe; while von Schrenck found

those from the Amoorland so similar to European birds that he has set them down as identical. I have no specimens with me, but I observed the form common about the plantations at Shanghai in July 1857. I have never met them further south in China. Captain Blakiston met them at Shanghai in January; hence we may infer that in that neighbourhood at least they are a resident species, or found both winter and summer.

67. SUTHORA WEBBIANA, G. R. Gray, P. Z. S. 1852, p. 70.

First procured by Mr. Webb near Shanghai. Captain Blakiston met with it in large companies at Shanghai in January. He says they hang about the twigs like Tits. I have never come across the bird.

ALAUDIDÆ.

68. MELANOCORYPHA MONGOLICA.

Alauda mongolica, Pall.

Frequents the Mongolian desert near Pekin, and is kept as a cage-bird throughout China (see The Ibis, 1861, p. 333).

69. CALANDRELLA PISPOLETTA, Pall.

Alauda pispoletta, Pall.

Cultivated fields of Talien Bay, North China (see The Ibis, 1861, p. 255). These have more conical bills and longer tails than the European *C. brachydactyla*, and are doubtless referable to Pallas's species from Siberia.

70. ALAUDA ARVENSIS, L.

A. pekinensis, Swinhoe, P. Z. S. 1863, p. 89.
A. japonica, Swinhoe, Ibis, 1861, p. 333; 1863, p. 94.
A. arvensis, von Schrenck, Amurland, &c., i. p. 273?.

The Skylark is abundant about Peking, and ranges into Amoorland, whence von Schrenck procured specimens. I have, since describing it as peculiar, seen specimens, shot in England, in Mr. Tristram's collection identical with my skins from Peking.

71. ALAUDA CANTARELLA, Bp.

A. intermedia, Swinhoe, P. Z. S. 1863, p. 89.

This is the Lark that abounds in the valley of the Yangtsze and Shanghai. It is intermediate between the above and the following. This bird was first procured by Prince Bonaparte at Florence. Mr. Tristram has one, shot by himself in Geneva, which is identical in every way with the Shanghai bird. It is difficult to believe that this form extends right across the vast continent, maintaining its distinctness from *A. arvensis* throughout; but it seems rather that the operation of similar causes in the extreme west and east has produced the same form.

72. Alauda cœlivox, Swinhoe, Zoologist, 1860.

This is a small Lark common from Canton to Foochow, and in Formosa. My specimens from the latter place are more largely spotted on the back, and the streaks on the breast are much broader and numerous, but they are otherwise so similar that they can only be regarded as a race.

73. Galerida leantungensis.

Alauda leantungensis, Swinhoe, Ibis, 1861, p. 256.

Common about the hills of cultivated valleys of Talien Bay, North China. A species of crested Lark is noticed by Pallas as *Alauda galerita* from Dauria.

74. Otocorys alpestris, L.

O. penicillata, Gould.
O. scriba, Bp.
O. albigula, Brandt.

A specimen was procured by Mr. Fleming at Tientsin (see The Ibis, 1863, p. 95). Von Schrenck notes a bird of this genus as the *O. alpestris*, L., from Amoorland. I have compared mine, in company with Mr. Tristram, with a specimen of *O. alpestris* of Europe, and we can find no difference. All the species of this genus appear to get yellow faces in the breeding-season.

75. Corydalla richardi, Vieill.

C. sinensis, Bp.
Anthus thermophilus, Hodgs., of my previous lists.
C. infuscata, Blyth.

I have a very large number of this species, shot at Amoy and elsewhere in China, Siam, and India. It is in South China a winter bird, but a few remain about the hills to breed. I found a few on the Foochow hills in June; these were smaller, with larger bills and legs, and darker and more distinctly marked plumage. I sent one to Mr. Blyth, who, under the impression that it came from the Philippines, christened it under the new name *C. infuscata*. But between this and the ordinary winter race I have every gradation of form and plumage. I also procured in spring at Amoy a few specimens of a somewhat smaller Pipit, richly washed with ochreous; this is Bonaparte's species *C. sinensis*, and, if correctly identified by Mr. G. R. Gray, *Anthus thermophilus*, Hodgs. But here again in my large series every step both in form and colour occurs between it and the larger pale race. It is easy to conjecture how these different climatic races of the same bird should turn up at one spot. For the island of Amoy by its position affords a resting-place to vast numbers of birds bound on widely different migrations; and the different groups of the Richard's Pipit, influenced in their forms and tints by the greater or lesser heat of their birth-places and summer resorts, and doubtless by other local causes, in passing to their winter

quarters rest for a few days on our island. The large pale variety stays the cold season with us; the rich-tinted variety arrives early, passes away, and returns late, thence showing that it has a long way to travel southwards. The intermediate forms are less regular in their movements. As the nesting-area is found to be more fixed than their winter haunts, the same birds returning to breed year after year to the same spot, it is not improbable that the extreme forms of these races would be found to inhabit in summer areas widely divided, the intermediate gaps being filled up with forms intermediate and approximating most nearly to those to which they were nearest, until amalgamation would ensue.

76. Anthus (Agrodroma) gustavi, Swinhoe, P. Z. S. 1863, p. 90.

Touches at Amoy during the first fortnight of May, bound from the south into the interior of Central China.

77. Anthus blakistoni, Swinhoe, P. Z. S. 1863, p. 90.

Allied to *A. obscurus*, Gmel. Procured by Captain Blakiston on the Yangtsze. A species referred to *A. aquaticus* is noticed by von Schrenck from Kamtschatka; and the same is also given by Schlegel from Japan. These may be identical with our species.

78. Anthus cervinus, Pall.

A winter bird in South China and Formosa, which passes the summer in Kamtschatka and the northern regions. Von Schrenck does not notice it in Amoorland. Flocks pass over Amoy as late as the first week in May; these are probably arrivals from the Indian Archipelago, whence specimens in winter plumage have been received. Before leaving us the bird undergoes an entire moult, when the eyebrows, throat, and breast show a pale vinaceous mixed with more or less ochreous, but unspotted. As the nuptial season comes on, the silvery tinge intensifies into a uniform dusty vinaceous, which encroaches further on the lower parts. I have a fine series showing every gradation between the pale-spotted winter and the fine nuptial dress.

79. Anthus japonicus, Schleg.

This is said to occur in North China and the Amoor, but I have never procured any specimens of it. I have a strong suspicion that it is only the winter dress of *A. cervinus*.

80. Anthus agilis, Sykes.

This Tree-Pipit stays the winter in the south of China, and summers in the north, Amoorland, and Japan. The birds from the two last have generally been noted by writers as *A. arboreus*; and Bonaparte, in his 'Conspectus,' remarks on the Japanese form as "*vix distinctus*." Our bird is the same as the Indian *A. agilis*, and can scarcely be regarded as more than a race of the European *A. arboreus*.

81. Budytes flava, L.

B. cinereocapilla, Savi.

Our Amoy and South-China bird moults in summer into the true European *B. flava*, with grey head and cheeks, white eyebrow and chin. Those received from Tientsin (North China) in nuptial dress have the entire head grey, and are almost undistinguishable from *B. cinereocapilla*. *B. cinereocapilla* was procured in October at Canton by Captain Blakiston. The Formosan variety retains the head green, with a yellow eye-streak, as the *B. rayi* of Great Britain, but differs in having dark olive cheeks. According to von Schrenck, in Amoorland the true *B. flava* occurs, and not the grey-headed *B. cinereocapilla*. In the Malayan Archipelago, I am told, the green-headed variety occurs, but with dark, almost black cheeks; and I suspect that the true British form, with yellow cheek-spot, will turn up at Japan, at which most of the European birds that extend to East Asia undergo a similar change in plumage to what takes place in British forms as compared with those of Europe. I would draw attention to the fact that the Japanese climate is affected by the Pacific Gulf-stream in a manner corresponding to the influence exercised over the British Islands by Maury's "River in the Ocean;" and doubtless the similarity of climate so caused is at the root of this similarity of variation.

82. Motacilla (Pallenura) boarula, L.

M. (*Calobates*) *sulphurea*, Bechst.
M. melanope, Pall.

Found throughout China and Formosa, the Amoor, and Japan. Is more a vagatory than a migratory species, and is found at all seasons in the south of China.

83. Motacilla luzoniensis, Scop.

M. alba, var. *paradoxa*, von Schrenck.
M. leucopsis, Gould, P. Z. S. 1837, p. 78.
M. alboides, Hodgs. As. Res. xix. p. 190.

This white-faced Pied Wagtail is a common species throughout China and Formosa, extending into Amoorland. It is also found throughout India and its archipelago, as far as the Philippines. The young are yellowish olive-grey on the upper parts and breast, and have the white of the body more or less washed with ochreous. The male in summer plumage has the occiput and upper parts glossy black, the black of the breast extending nearly to the chin. In winter large flocks of this species visit South China from the north, but a fair number spend the entire year with us. Cognate to *M. alba*, but smaller, and with much whiter wings.

84. Motacilla lugubris, Temm.

85. Motacilla japonica, Swinhoe.

86. Motacilla ocularis, Swinhoe.

Under the term *M. lugens* seu *lugubris* there has been a confusion of the races of the Pied Wagtails with black eye-streaks, which I have been at some pains to clear up. The difficulty began with Temminck, who, in his 'Manuel d'Ornithologie,' p. 175, described Pallas's Russian species from Japanese examples. He there gives the summer plumage as having the *forehead white*. At a later date Professor Schlegel refused to acknowledge the existence of Pallas's species as a European bird. Pallas, however, procured his typical specimens, as he tells us, from the shores of the Black Sea; and it has since been brought by officers from the Crimea, and by Mr. Tristram from Egypt. One of Mr. Tristram's two specimens (both of which I have carefully examined) has been figured in Mr. Bree's work on the Birds of Europe. I have no hesitation, therefore, in applying Pallas's name to the race or species found in Western Asia adjoining Europe. Middendorff (Sib. Reis.) applies Pallas's name to the Wagtail of Amoorland, which, from his description, is identical with the bird found throughout China, of which I possess numerous examples in all plumages from Amoy, and one adult summer male from Tientsin. This permanently grey-backed race I have named *M. ocularis*. In Japan a race occurs similar to the Chinese bird, in having the broad white forehead, but resembling the *true M. lugubris* in its summer black back. The following diagnosis will, I think, serve to distinguish the three races or species.

(1.) Motacilla lugubris, Temm.

M. albeola, var. *lugens*, Pall.

From two specimenss hot by Mr. Tristram, 2nd February 1860, in Egypt. The pectoral band incomplete, showing the birds to be in winter plumage. *Forehead black; upper parts blackish brown, with no indications of bluish grey; the primaries are white for only one-third at their bases, and the lateral tail-feather is entirely white.*

Hab. Shores of Black Sea; Odessa; Turkey; Egypt (in winter).

(2.) Motacilla japonica, Swinhoe.

M. lugubris seu *lugens*, Temm. & Schleg. Faun. Jap.

The adult summer plumage of this race has been correctly figured in the 'Fauna Japonica.' *The forehead is always white; greater part of primaries pure white, but the white lateral tail-feathers with a black inner edge.* In winter its back becomes smoke-grey, but always more or less patched with black, with a black shoulder.

Hab. Japan; straggles to the China coast in winter.

(3.) Motacilla ocularis, Swinhoe.

M. alba, var. *lugens*, von Schrenck & Midd.

M. albeola, var. *kamschatica*, Pall.

Back, scapulars, and shoulder-patch perennially light French grey; quills more or less broadly edged with white, never so entirely white as in foregoing; lateral white tail-feathers broadly edged interiorly with black. In summer the breast blackens to the bill,

leaving however the cheek and side of neck white as before; the plumage remains otherwise the same.

Hab. Eastern Siberia; China; Formosa; through Amoorland to Kamtschatka. Some stay all the year in South China and Formosa.

From the appearance of Mr. Tristram's specimens, it strikes me that the true *M. lugubris* in summer has the entire head and neck black, leaving only the white eyebrow. If this be the case, it would be more nearly affine to *M. maderaspatana*, Briss., of Hindostan, from which, however, it differs in its smaller size and in the different distribution of white on its wings. I am strongly of opinion that its affinities are, strictly speaking, rather with this South Asiatic form, and not with the East Asiatic species, both of which have broad white foreheads, and in full summer plumage the cheeks and sides of neck white. In winter our two Eastern species can always be distinguished from *M. alba* and cognate races by the black eye-line. In that season *M. lugubris* and *M. maderaspatana* approach our birds by retaining the black eye-line, but it is in them much broader, and their backs vary from a pale to a dusky brown, and have none of the blue-grey tint that is to a great extent acquired even by *M. japonica*. Bree is certainly wrong in the blue coloration of the back in his plate, for neither of Mr. Tristram's birds shows any trace of it. The rarity of the true *M. lugubris* in collections has doubtless led to all the confusion that exists; but whether we regard them as races or good species, it is worth while, for the sake of scientific accuracy, that these variations should be correctly identified and localized.

87. Nemoricola indica, Gmel.

Noticed by me near Pekin (Ibis, 1861, p. 333), and afterwards brought home from same locality by Mr. Fleming (Ibis, 1863, p. 94).

Cinclidæ.

88. Henicurus leschenaultii.

Turdus leschenaultii, Vieill.
Motacilla speciosa, Horsf.; Ibis, 1861, p. 265.
Enicurus coronatus, Temm. Pl. Col. 113.

Never observed by me in China except on the hills round Foochow, where I have procured it both in winter and summer. My specimens from that locality correspond entirely with Javan skins.

89. Henicurus schistaceus, Hodgs. As. Res. xix. p. 190; Ibis, 1861, p. 409.

The only Chinese specimen I ever saw of this bird was procured in February 1861 by M. De Grijs, Netherlands Consul at Amoy, in the tea-hills some 150 miles inland of Amoy. The skin was, I believe, forwarded to the Leyden Museum. It was kindly lent to me, and I took down the following note from it:—"Bill black; legs and claws pale flesh-colour; upper parts slate-colour; a white streak crosses the forehead and runs over the upper half of the eyelid; nostrils, throat, and cheeks black; under parts pure white; smoke-grey on the flanks, and black under the shoulder; wings and tail

deep blackish brown; shoulder-edge, tips of greater coverts, spot on base of primaries, and tips of secondaries white; rump, two outer tail-feathers, and tips of the rest white." M. De Grijs told me that he saw these birds on the margins of pools on the hills, and that they frequently uttered twittering notes not unlike those of the Sand-piper (*Tringoides hypoleucus*), but louder. I compared the Chinese skin at the time with one from Burmah, received from Mr. Blyth, and could not find any noticeable difference between them.

90. Cinclus pallasii, Temm.

This is noted from Amoorland, Japan, and Formosa. I have therefore no hesitation in including it in my Chinese list, as it is sure to occur in the interior mountain-ranges.

91. Pitta nympha, Schleg. Faun. Jap. Supp. pl. A.; Ibis, 1861, p. 412.

I never procured but one specimen of this bird, and that was in June 1861 at Amoy; so that at present I cannot regard it as more than a straggler, probably from the extreme south of China. My specimen runs uncommonly close to *P. cyanoptera*, var. from Siam, which has the black crown-line separate from the nuchal bar. Mine has the black crown-line only indicated by a brown patch, and the white on its wings more extended. At the best I presume it can only be considered a race of the varying species *P. cyanoptera*. The Malacca race has the black crown-line united to the nuchal bar.

92. Myiophonus cæruleus, Scop.; Ibis, 1861, p. 36.

Common on all the retired rocky hills from Canton to Ningpo, where it is ever a constant resident. The males are a good deal larger than the females. It finds its nearest ally in the *M. temminckii*, Vigors, of Assam and Arakan, which is always distinguishable from our black-billed bird by its partly yellow bill. The group is represented in Formosa by a species of the subdivisional form *Arrenga*, hitherto only known from Java and the Neilgherries.

Pycnonotidæ.

93. Hypsipetes holtii, Swinhoe, Ibis, 1861, p. 266.

Very closely allied to *H. maclellandi*, Horsf. First procured at the Foochow hills. Has since been obtained on the Ningyang tea-hills near Amoy(see The Ibis, 1861, p. 409). Resident on the hills.

94. Ixos jocosus, L.

Gracula cristata, Scop.
Sitta chinensis, Osbeck.

In China not found north of Canton; about that city it is specially common (see The Ibis, 1861, p. 39). Our specimens appear identical with those from Calcutta. The young birds have a brown instead of a black crest, the lore and under the eye only being black, and the upper plumage generally is much lighter and mixed with

light yellowish red. The vent is brownish buff, with only a tinge of crimson, and the crimson eye-spot is entirely wanting.

95. Ixos chrysorrhoides, Lafresn.; Ibis, 1861, p. 39.

Crown of head black; under the eye, lore, and chin blackish brown; vent crimson. This is a common resident species in the south of China, from Canton to Foochow.

96. Ixos sinensis, Gm.

I. occipitalis, Temm.

A very common resident species from Canton to Foochow, and also in Formosa. The young of this species have the head a uniform colour with the back, which is light brown instead of grey; the rest of the colours are much paler. Among my series from Amoy I have one very curious variety, in which the white of the occiput and throat is of a fine clear smoke-grey. My specimens differ from one another chiefly in the development of the white occipital patch; some have it very large, and occupying a good portion of the head, while in others it gets encroached upon by the black, until in some specimens it almost entirely disappears. There is also a great variation in size, and length of wing and tail; but in the form and length of bill the difference is not so appreciable as I have found it in many species of birds.

97. Spizixos semitorques, Swinhoe, Ibis, 1861, p. 266.

A resident species in the high plateau near Foochow. I have also procured it from the mountain-ranges of Formosa. The male and female are of similar form and colouring.

Timaliidæ.

98. Leucodioptron sinense, L.

L. canorum, L., of my previous lists; Ibis, 1861, p. 38.

The Chinese Song-thrush, or Hwa-mei. A common bush-bird about all the hills from Canton to Foochow. Is replaced in Formosa by a closely allied form wanting the white eyebrow. Is frequently kept in confinement by the Chinese for its fine song and pugnacious habits.

99. Garrulax perspicillatus, Gmel.; Ibis, 1861, p. 38.

A resident bird from Canton to Foochow.

100. Pomatorhinus stridulus, Swinhoe, Ibis, 1861, p. 265.

Only as yet procured from the hills near Foochow.

Turdidæ.

101. Oreocincla aurea, Hollandre.

Turdus whitei, auct. Brit.

Two seen at Amoy in March 1859; a male procured. Feathers

of a specimen were found in a wood near Pekin (see The Ibis, 1861, p. 333). I extract my note on the bird procured:—Length 11½ in.; wing 5$\frac{2}{10}$; tail 4¼; bill 1, to gape 1$\frac{4}{5}$; tarsi 1$\frac{4}{10}$; mid toe 1$\frac{3}{10}$; hind toe 1; side toes equal. The second primary is ¼ inch longer than the fifth, whereas Bonaparte, in his 'Conspectus Avium,' says that in the true *O. aurea* they are equal. Bill pale brown; legs and claws pale brownish; irides deep hazel; feathers of the rump spinous, as in the Cuckoos, *Geocichlæ*, *Campephagæ*, and *Pericrocoti*; testes dark purple; stomach somewhat oval, compressed, rather muscular, and about $\frac{9}{10}$ in widest diameter; intestine 17 inches long, from $\frac{2}{10}$ to $\frac{3}{10}$ wide; cæca ¼ long, one slightly higher than the other, and placed 1½ inch distant from anus. Whether this be a distinct race from the Siberian and rare British visitant I am not prepared to say; I have but one specimen of our bird. It was an extremely rare visitant to Amoy, and, as far I could ascertain, only in spring, when the banyan-berries were ripe. I presume it came from the wooded mountain-ranges of the interior. Formosa yields a race which is larger and paler than the Amoy bird, with sensibly longer wings and tail. For this I have proposed the specific name *O. hancii* (see The Ibis, 1863, p. 275). The Japanese race, which is declared to have been shot in Britain, as well as the true *O. aurea*, is by some considered a good species, and has been named *O. heinei*.

102. Turdus sibiricus, Gm.

T. leucocillus, Pall.

A male in complete plumage shot at Amoy, 19th April, 1861, was of a smoky black, with a pure white eyebrow, white on the axillaries, a white bar across under wing, and drops of white on the medial belly-line and crissum. Bill black; inside of mouth orange-ochre; edge of rictus pale dusky yellow; legs and claws ochre, with saffron base to tarsi and soles of toes.

This is said to be a common bird in Siberia. In Japan it probably breeds, as Captain Blakiston brought young birds from Hakodadi. In the south of China it is rare, occurring occasionally during its migrations. It is said to have been procured as far south as Java, but is not noticed by von Schrenck from Amoorland. The females are brown and Thrush-like; and the young plumage closely assimilates the species to *Oreocincla*, which group it also approaches in the somewhat spinous rigidity of the feathers of its rump, and in the white bar across its wing. In addition to these two last characters, in the smoke-grey hue of its mature plumage it appears to show a decided tendency towards the Campephagine group *Volvocivora*, which in the immature state has the white bar across the wing, allying it to the usually red-tinted *Pericrocoti*, one of which (the *P. cinereus*, Lafresn.) has, like it, a sober grey plumage and a constant *white* under-wing bar. The *Campephagæ*, as most naturalists are aware, also enjoy the peculiarity of having spinous rump-feathers, which prick the hand when passed upwards over the rump. All true *Geocichlæ* have this curious spinous character, as also the white bar across the under wing.

103. Turdus cardis, Temm. Pl. Col. 518.

This Thrush hails from Japan. It is noted from the Amoor by von Schrenck. It is found in flocks every winter on the south coast of China, as far as Canton. I do not know whether the young males on leaving the nest resemble the female; but when they reach Amoy, they differ in being duskier, with larger spots, and with scarcely any rufous except on the axillaries. The plumage continues to change gradually, the olive-green upper parts at first becoming smoke-grey, and the spots on the breast disappearing, until the entire bird is black, except on the belly and vent, which remain white. I have a series of five males showing the gradual transition. Like all Thrushes, *T. cardis* varies much in size. The female retains her immature or *Turdine* dress. I have four females of different ages. The older birds are more richly coloured, with larger spots, and more rufous on the under parts.

104. Turdus hortulorum, Sclater, Ibis, 1863, p. 196.

Found as a resident species in South China, about Canton and Macao. Mr. Blyth once procured a similar bird at Calcutta (which he named *Geocichla dissimilis*), but I have reason to believe it is not the same as the South-China species; neither surely can it be *T. cardis*, with which Jerdon, in his 'Birds of India,' has confounded it. Mr. Sclater has drawn the character of the species from the oldest male I possessed, but it is not quite matured. It strikes me that the adult will have the whole throat and breast cinereous, instead of only a pectoral band of that colour.

105. Turdus chrysolaus, Temm. Pl. Col. 537.

Summers in the Amoor and Japan. Visits the south of China during winter in flocks, extending its migrations easterly to Formosa and Manilla.

106. Turdus daulias, Temm. Pl. Col. 515.

T. pallidus, Gm. ex Lath.

Common during winter in South China and Formosa. Spends the summer in Amoorland and Japan.

107. Turdus pallens, Pall.

T. obscurus, Gmel.

Found in Japan and the Amoorland; migrates southwards during the winter.

108. Turdus fuscatus, Pall.

Found during winter in South China; noted from Amoorland.

109. Turdus naumanni, Temm.; Ibis, 1862, p. 319, pl. x.

Found in the Amoorland; and specimens have been received from China as far down as Shanghai. On the more southern coast it is occasionally, though rarely, met with during winter.

110. Turdus ruficollis, Pall.

This Fieldfare I found in flocks about Pekin in the commencement of the cold season (see The Ibis, 1861, p. 332, and 1863, p. 93). I have never met with it in Southern China, and it is not noted from either Japan or the Amoor.

111. Turdus (Merula) mandarinus, Bp. Consp. Av. p. 275.

Both sexes of this Blackbird have lemon-coloured bills, that of the female being tipped with black. The female is usually browner than the male; but the male himself is a dull brownish black, and sometimes the two are uncommonly hard to distinguish, especially before the immature bill has changed to yellow. This is a common resident species throughout Southern China, from Canton to Shanghai. I did not meet with it in Pekin, nor has it been noted from the Amoor. It builds a nest like that of the common Blackbird, but its eggs more resemble those of the Missel Thrush (*T. viscivorus*).

112. Petrocincla manilensis, Bodd.

P. pandoo, Sykes.
P. affinis, Blyth.

The Rock-Thrush of Formosa and of all the exposed islands has, as far as I have ascertained, invariably a red belly in the adult male, and answers to the *P. manilensis* of authors. It is found on the Chinese coast, from Canton to Tientsin. But on the Chinese main, some distance inland, the bird is blue, and undistinguishable from *P. pandoo*, Sykes. Nearer the coast we have the intermediate race, *P. affinis* of Blyth, with partly red under parts and somewhat more graduated tail. From Amoy I have procured all three forms, and every intermediate gradation. The females of all three are, to my eyes, identical. Now the only way I can account for these three so-called species inhabiting the same locality is, that, being near the sea, the island constantly receives fresh individuals from the channel islands, which interbreeding with the blue race, *P. pandoo*, produce the third, *P. affinis*, and the intermediate forms. In song, habits, and nesting the two extreme forms observed at Amoy and in Formosa are not to be separated; and their females are so alike that it strikes me that, to solve the difficulty, we must believe the two of one common parentage, sequestrated by circumstances, and, owing to climatal or other causes, to have undergone an amount of change in their internal economy sufficient to alter the colour of their under plumage, but that this change has not so far alienated the two races as to prevent them interbreeding freely, and producing fertile offspring, in places where they are thrown together. In my large series the skins vary a good deal in size, proportions of bill, wings, tail, and legs. *P. pandoo* is generally separated from the *P. cyanea*, but I do not see on what sufficient grounds. Mr. Jerdon, in his 'Birds of India,' has rightly enough connected them. It is easy to account for *P. affinis* occurring in Burmah; for we know that the red-bellied *P.*

manilensis occurs on the coasts of Java and Siam, and, I suspect, would be found on the Andamans and on the coast of Burmah itself, where they would meet with the blue race from the interior, and cross, as I know them to do in China; *P. affinis* would then be produced. In Amoy the red-bellied race, the blue race, and the *affinis* are found in about the proportion 4 : 2 : 1. This fact of red-bellied and pale-bellied birds crossing and producing apparently fertile hybrids appears to be repeated in the small Cuckoos *Polyphasia* (see Jerdon, Birds of India, i. p. 335).

113. Orœcetes gularis, Swinhoe, Ibis, 1863, p. 93, pl. iii., and 1861, p. 332.

This forest-thrush has its nearest ally in *O. cinclorhynchus*, Vigors. It has as yet only been procured from the neighbourhood of Pekin.

114. Oriolus chinensis, L.

O. cochinchinensis, Briss.
O. indicus, Briss.

This is a summer visitant to the whole of China, and ranges as far north as the Amoor, and eastwards to Formosa. Our birds wend southwards in the winter. I have a specimen received from Siam, kindly sent me by Sir R. Schomburgk, and others from Malacca and Burmah in different stages of plumage, all identical with our summer visitant. These Malayan countries are therefore doubtless the winter resort of our bird; and I think it will be found that few, if any, of this species spend the warm season in those regions, their place being there supplied by an allied race, the *O. tenuirostris*, which we do not get. The male Oriole carries a partially immature plumage throughout the second year, the females to the third or fourth year; but in fully adult dress the sexes are not to be distinguished. It is, however, much rarer to see mature females than males. This similarity of adult sexes holds good in the allied *Psaropholus* group, and, as I am told by reliable observers, in all the Orioles.

Campephagidæ.

115. Volvocivora melaschistos, Hodgs.

Campephaga ——?, Ibis, 1861, p. 42.
C. avensis, Blyth.
C. silens, Tickell.
C. culminatus, A. Hay?

I have five of this species from China, two from Burmah, and one from Calcutta, of which the mature birds are identical in all respects, except in the size and proportions of the bill. If we regard this as a character in this bird, we should have to separate the adult specimen I procured at Canton from an adult from Amoy, the former having a very much shorter bill than the latter. But on comparison of specimens, the bill varies in each individual, and is therefore in-

sufficient as a character. *V. fimbriata*, as Jerdon remarks, does appear smaller; but all skins that I have seen from the Malacca collectors are shrunk in size, owing to their mode of preservation. Like the *Graucalus macei*, which I fully expect to meet with some day in China, this bird has a wide range over the greater part of tropical Asia. In South China, from Canton to Amoy, it is only a summer visitant, spending the season of nidification with us, and returning southwards again in the autumn. I have a nice series of the different stages of plumage it undergoes. I have a bird of the year, collected by Captain Blakiston in Canton, which is of a blackish grey, each feather carrying a bar of black and a broad cream tip; the quills and tail are greyish brown glossed with green, the former edged and tipped with cream-colour, and the latter broadly tipped with white; the under tail-coverts are cream-buff, irregularly barred with light black; many of the quill-feathers are edged inwardly with white, forming an indistinct under-wing bar. In this stage the bird appears to form a link between the young of *Oreocincla* and *Dicrurus*. As it advances to maturity, the spots disappear, the plumage becomes light smoky grey, with a wash of rusty buff and faint bars on many of the under feathers; the white on the under wing increases and forms a distinct bar. In this stage it more resembles the second plumage of *Pericrocotus cinereus*, which in the young state also has a mottled plumage, but carries a white under-wing bar through all dresses. In the adult bird the white bar disappears entirely; the wings and tail become a glossy green-black, with broad white tips to all but the two central rectrices; and the rest of the plumage deepens into a bluish smoke-grey, much paler on the under tail-coverts. The female is paler and less glossy than the male, but in other respects similar. The adult bird, when viewed seated on the bough of a tree, launching forth on wing after an insect and returning to its post, brings forcibly to mind the habits of the *Dicruri*. But at other times it may be seen hanging about the ends of branches, searching the leaves, and taking short flits into the air. On these latter occasions the younger birds, especially with their white wing-bars, might be easily mistaken for large grey *Pericrocoti* with stunted tails.

116. Pericrocotus cinereus, Lafr.; Swinh. Ibis, 1861, p. 42.

Found in summer throughout China as far north as the Amoor. Procured originally from the Philippines, to which it probably wanders in the winter. In autumn and spring, flocks are frequently met with about Canton, Amoy, and Formosa. Its plumage is black, grey, and white, with an occasional tinge of saffron on the flanks and under-wing bar. Curiously enough, this yellow tinge is brighter on the younger birds and females than on the males. The male is distinguished from the female by its broad white forehead, by its black occiput and hindneck, and by the rest of its plumage being deeper and glossier. The youngest bird I have is from Pekin, in which the under plumage is faintly barred, and the tertiaries barred with black and tipped with white. In this the under wing-coverts

and upper wing-spot are primrose-yellow. At first glance this might be taken for a Pied Wagtail. The spinous rigidity of its rump-feathers is stronger in this than in any other species with which I am acquainted.

117. PERICROCOTUS CANTONENSIS, Swinhoe, Ibis, 1861, p. 42.

This species, forming so happy a link between the preceding grey and some of the crocus-tinted forms of this group, I have as yet only seen from Canton, where it was pretty common. The tendency of the female to develope the yellow tints is in this much more strongly shown than in the last, so much so that Dr. Sclater declined to accept my identification of the sexes. But apart from any special examination of the sexual organs, the skins carry in their plumage their sexual stamp; for, analogous to what obtains in the foregoing species, the male of this has a white forehead and a dark head. I have no young specimen; but, judging from the last, I should say that the young would be as strongly tinged with saffron as the female.

♂. Bill and legs black; irides deep brown; forehead, throat, sides of nape, and vent white; the rest of the under parts dingy; head, back, and scapulars deep brown, with a wash of grey, blacker on the former; rump and upper tail-coverts light yellowish brown; wings and tail rich hair-brown, the former edged paler, the latter with the stems brownish white, and more or less white on all except the two central rectrices; white of under wing and wing-bar with a wash of pale saffron, the yellow being rather bright on some of the axillaries; wing-spot dingy yellow.

♀. Rump more of a colour with the back than in the male; upper parts lighter and browner; wing-spot bright yellow; quills edged with yellow; the light part of rectrices rather bright yellow; axillaries and wing-bar fine primrose-yellow; forehead narrow, dingy white; in other respects like the male.

Length $7\frac{2}{8}$; wing $3\frac{1}{2}$; expanse $9\frac{2}{8}$; tail $3\frac{6}{8}$.

118. PERICROCOTUS SORDIDUS, n. sp.

I have a bird, procured at Amoy on the 29th September, 1859, which differs from the preceding two in many respects, but yet has such intermediate characters that I have at one time felt inclined to consider it a variety of the one, and at other times of the other. After due deliberation, I have thought it best to separate it as a distinct form. My only specimen is a male, not quite mature. Upper parts greyish brown, paler on the forehead, and darker blue-grey on the head and hind neck; wings and tail hair-brown; greater wing-coverts tipped with white, but no wing-spot outwardly visible; two middle rectrices unicolorous, the rest more or less white; throat and vent white, the former tinged with brown; a black spot in front of the eye; under plumage greyish brown; a dingy white bar runs across the under wing, with a faint tinge of primrose-yellow. Length $7\frac{1}{2}$ in.; wing $3\frac{1}{2}$; tail $3\frac{7}{10}$. This may turn out to be only a more northern race of the *P. cantonensis*; but, at all events, it is extremely interesting as drawing the species closer still to *P. cine-*

reus. All these species have similar call-notes, and feed chiefly on tree-bugs (*Cimicidæ*) and their eggs, in search of which they creep and hang about among the leaves and branches of large trees, ranging the country in flocks.

119. Pericrocotus speciosus, Lath.

Phœnicornis princeps, Gould.

I have only one of this species, purchased alive from a boy who was playing with it at Foochow. I have never met with it in my rambles. Its plumage is of such a dazzling red that it quite hurts the eyes to look at it, affording a strong contrast to the sober hues of the three above.

Dicruridæ.

120. Dicrurus leucophæus, Vieill.

General plumage light bluish grey; the eye standing in a conspicuous white cheek-patch; nasal feathers, edge of outer rectrices, shafts of quills and tail, and greater part of most of primaries black; bill and legs black; irides carmine-red. This species is, strangely enough, not mentioned in Jerdon's 'Birds of India.' It has been received from the Malayan peninsula, where it is probably only a winter visitant, and is quite a distinct bird from *D. cineraceus*, Horsf., which is a Javan species. In China it is common in summer about the Vale of Foochow, and probably extends into the interior of Central China. My specimens agree precisely with a Malacca skin in Mr. Gould's collection. Captain Blakiston procured it at Canton in September, on its southward migration, and I have procured it at Amoy on its spring return, but its summer habitat does not appear to extend south of the latitude of Foochow. It will probably be found during that season to range as far north as Ningpo, though at Shanghai it is not known.

121. Dicrurus macrocercus, Vieillot.

Adult deep black, glossed with blue and green. Young birds dark brown, without the gloss, and mottled on the axillaries and lower parts with white. A summer visitant throughout China right up into Amoorland. Exceedingly abundant in Formosa. I have a specimen from Hankow, Central China. Appears to be the most widely spread *Dicrurus*.

A third species of *Dicrurus* visited our garden at Amoy one spring. It was much smaller than either of the foregoing, and sang most sweetly. It stayed a few days and then disappeared. Though this was many years ago, I have never seen the form since.

122. Chibia hottentotta, L.

I have a pair shot at Amoy in the spring of 1861, and I have seen another from Tientsin (North China). We must suppose, then, that this species is a summer visitant to China, and at that season sparsely scattered throughout that land. Ours is identical with the Indian bird. The female is dingier than the male, and not so well marked.

Both carry the peculiar long bristles that, springing from the root of the bill, pass over the crown down to the back and shoulders.

123. Lanius schach (Gm.).

L. chinensis, Gray.

This Shrike throws off its young plumage at the first moult, when the male and female are similar in dress. The young is light chestnut-brown on the upper parts, mottled and barred with black; throat white, rest of lower parts pale chestnut, mottled on the breast; wings deep brown, the coverts being tipped and the tertiaries edged and tipped with chestnut-red. The black eye-mark is strongly marked, but lighter than in the adult. Of the variability of this species, and the tendency it frequently shows towards allied forms, I have before remarked in my paper on the birds of Formosa, in The Ibis, 1863, p. 270. The small race from India and Borneo is distinguished as *L. erythronotus*, Vigors; and *L. nigriceps* and *L. tephronotus*, both from India, are forms closely akin to ours.

124. Lanius phœnicurus, Pall.

L. lucionensis, L.
L. superciliosus, L.
L. cristatus, L.

The first of these is found in China as a summer visitant, extending to Talien (North China) and perhaps to the Amoor. In autumn large numbers pass southwards down the coast, some making for the Philippines, touching on their way at south-west Formosa. How far south of China these migrants go we do not know; but at Malacca we have another race, distinguished by its bright rufous instead of ashy head and back. In Java, the Andamans, and Ceylon, our bird again makes its appearance, but whether as a resident or a migrant history telleth not. In Hindostan the *L. cristatus* occurs in winter chiefly, being of a browner plumage, with indistinct eye-mark; this will probably be the typical *L. phœnicurus* of Pallas, finding its summer resort in Siberia. Now, can we suppose that the large numbers of these small Butchers that leave China find their way down to the southern islands, passing over the habitat of an allied race, and after spending a few months speed back the same long distance to their summer quarters? Pondering over the laws of migration, I was much puzzled in procuring at Amoy a specimen of *L. superciliosus* (the Malacca race), and shortly after a pair of the Indian form. But when I collected a large series I found the gradation from one to the other most complete. Is it possible that in their migrations they occasionally induce others of allied forms to return with them and interbreed? I cannot help thinking it far more probable that the browner Siberian bird is the typical race, from which the others have sprung, and that the rufous colouring of the ashy *L. lucionensis*, making it in some cases almost identical with Indian birds, shows merely a natural tendency to return to the typical plumage. The characters of both these forms strongly com-

bined serve to produce the Malacca race. But, at any rate, some other agent than that of climatal influence must have been at hand to work the change, in alienating forms from their pristine type and in assimilating the aliens situated under apparently such different circumstances.

I have a fourth well-marked variety, with the ashy head, but with no white on the forehead, and scarcely any eyebrow; its back is rufous-brown, like the tail. This may yet turn out to be another race peculiar to some particular area.

On its arrival in spring and autumn at Amoy, this Shrike announces itself very soon by its loud jarring note. It feeds occasionally on insects, but I think more frequently on small birds. It arrives with the majority of the Willow-Wrens, following closely at their heels and preying daily upon them. While feeding it impales its prey on thorns, as do most Shrikes. If a bird, it usually suspends it by the neck, and commences operations on the brains. It sometimes, during its visit, entertains us with a song, which is the most melodious of its kind that I have ever heard.

125. Lanius bucephalus, Schleg. Faun. Japon.

I have one female, procured so far south as Amoy. It is found in Japan and North China.

126. Artamus fuscus, Vieill.

Reported by Cassin to have been procured by Commodore Perry's expedition at Macao. I have never met the bird. (See Report, &c., of Perry's Japanese Expedition.)

Hirundinidæ.

127. Hirundo gutturalis, Scop.

H. rustica, var. *rufa*, von Schrenck.

A summer bird throughout China as far as the Amoor. Also visits in the same season Japan and Formosa. Winters in Siam and Hindostan. Is the eastern representative of *H. rustica*, L.

128. Hirundo daurica, L.

H. alpestris, Pall.

Locally distributed throughout China as far as Peking. In North China only a summer visitant. In South China vagrant during winter. Represented in Japan and Formosa by larger varieties.

129. Chelidon lagopoda, Pall.

Never procured in China, except at Tientsin. It thence ranges into Amoorland. For comparison of this eastern race with the European *C. urbica* and with *C. blakistoni* of Japan see The Ibis, 1863, p. 91.

130. Cotyle riparia, L.

Procured in North China (Tientsin), where it is a summer visitant. It is noted by von Schrenck from Amoorland.

131. Cotyle sinensis, J. E. Gray.

Distinguished from the foregoing by its much shorter tail. Represents the form in South China and Formosa, repairing thither in summer to breed. It visits the plains of Hindostan in winter, and is said to breed there again in that season. Mr. Tristram tells me that he found the *C. riparia* breeding in Egypt in winter; and as they all disappear from that country in summer, it is not improbable that it is the same bird that visits Europe, and breeds a second time on arrival at its summer quarters.

Muscicapidæ.

132. Hemichelidon sibirica, Gmel.

Muscicapa fuscedula, Pall.
H. fuliginosa, Hodgson.

I have only one of this very interesting species procured at Amoy. Ours is rather larger and has longer wings than the Himalayan bird, but I think is the same. It is said to range to the Amoor, and beyond to Kamtschatka. Its axillaries, under wings, and tips to greater wing-coverts are strongly rufescent, and approximate it to the following, from which it may be considered subgenerically to differ in the shape of the wing, though the several members of this group, as I have enumerated them, connect this in regular gradation with the typical *Butalis grisola*.

133. Butalis ferruginea, Hodgs.

Butalis rufescens, Jerdon.
Hemichelidon rufilata, Swinhoe, Ibis, 1860, p. 57.

This is a summer visitant to South China. It is not very common; but every spring a few make their appearance at Canton and Amoy. It is identical with the Indian bird.

134. Butalis latirostris, Raffles.

Muscicapa pondiceriana (Licht.), Midd. Sib. Reis.
M. cinereo-alba, Schleg. Faun. Japon.

Is a winter visitant to South China, from North China, the Amoorland, and Japan. It is identical with the Indian species, which is there a winter visitant, probably from Siberia, whence it is recorded as a summer bird.

135. Butalis griseisticta, Swinhoe, Ibis, 1861, p. 330.

Muscicapa grisola, var. *daurica*, Pall.

This links the small half-Swallow group of Fly-catchers with the spotted *Butalis*, and might with propriety be placed in either genus. It is a summer visitant to China, at which season I have found it as far north as Peking.

136. Xanthopygia leucophrys, Blyth, Journ. As. Soc. xvi. p. 123.

The male of this may at once be distinguished from that of the following species by its white eyebrow, which, in the other, is bright golden, by its less flammeous tints, and by its smaller size and more slender form. The female is widely different from the female of the other, if my specimen from Tientsin be correctly marked; but I suspect it is an immature male. This bird extends its summer migration as far north as Tientsin. I procured a male once at Amoy. It was originally described from the peninsula of Malacca, where I suspect it hybernates. Its migrations must be performed well inland, or we should see more of it on the coast.

137. Xanthopygia narcissina.

Muscicapa narcissina, Temm. & Schleg. Faun. Japon. (the male).
Muscicapa hylocharis, Temm. & Schleg. Faun. Japon. (the female).

Occurs at Amoy and Canton in large numbers in spring and autumn, bound apparently to Japan, where they are found in summer. The male and female are by mistake distinguished in the 'Fauna Japonica' as two distinct species. I found this to be the case on looking over the plates, and proved my suspicions to be correct by an examination of the birds in the Leyden Museum.

138. Tchitrea principalis.

Muscicapa principalis, Schleg. Faun. Jap.

Passes Canton and Amoy, on its way to and from Japan. Is found during winter in the Malacca peninsula, where it is noted as *T. atricaudata*, A. Hay. Varies a good deal in size and length of wings and tail.

139. Tchitrea incei, Gould, Birds of Asia.

Allied to *T. affinis*, from which distinguished by its smaller bill, by its green-black head and neck, and by the purpler tints of its upper parts. Combines to a certain degree the characters of *T. affinis* and *T. paradisi* with those of *T. principalis*. Mr. Whiteley of Woolwich procured several, through Mr. Fleming, from Tientsin, and one in the white plumage. Is a summer visitant to North China, from Shanghai to Tientsin. Mr. Gould's type specimen was from the former locality.

140. Myiagra azurea, Bodd.

Common in Formosa. A rare winter straggler to Amoy. Occurs in various parts of India and Malayana (see Jerdon's Birds of India). Is said also to occur in the Philippines.

141. Eumyias melanops, Vigors.

Stoparola melanops of my Amoy list.

Of the distribution of this bird in China I know nothing. I

never procured but one female, and that was at Amoy, in December 1857.

142. CYANOPTILA CYANOMELÆNA (Temm.), Pl. Col. 470 (the male).

Muscicapa gularis, Temm. Faun. Jap. (the female).

In spring and autumn these birds are very abundant about Canton and Amoy, on their way to and from North China and Japan. I do not think many, if any, stay in the south. I have seen specimens from Tientsin; and von Schrenck notes the female *M. gularis* from the Amoor. I have one specimen with very short bill; but specimens differ in the size of that organ, and in the tint of the blue on the crown. For a further account of this species, see The Ibis, 1861, p. 41.

143. ERYTHROSTERNA LEUCURA (Gm.).

Muscicapa albicilla, Pallas.

The eastern representative of *E. parva*, Bechst. It is common in North China, and is found as far north as the Amoor. In winter it migrates southwards, at which season we meet with it in Amoy and Canton. It differs from *E. parva* in having only a red patch on the throat, which does not extend down the breast. Both *E. parva* and *E. leucura* occur, I am told, in Hindostan during winter.

144. ERYTHROSTERNA LUTEOLA.

Muscicapa luteola (Pall.), Midd. Sib. Reis. pl. 17. f. 1–3.
M. mugimaki, Schleg. Faun. Jap.
M. erythaca, Blyth.
Muscicapa hylocharis, Swinhoe, Ibis, 1862, p. 305 (nec Schleg.).

The male of this species is figured in the 'Fauna Japonica' as *M. mugimaki*, and I myself have long confounded it with the preceding bird. The female, with its Robin-like plumage, and absence of white on the lateral rectrices, is the *M. erythaca* of Blyth, from Penang. I procured a female at Amoy in November 1861, and unfortunately made the already existing confusion worse by describing it in The Ibis as *Muscicapa hylocharis* of the 'Fauna Japonica.' Von Schrenck figures a young bird from the Amoor in mottled plumage, with the white base to tail. It is rather curious, then, that our female should have no signs of it. This bird would appear to extend over the north of Eastern Asia and Japan, repairing southwards in winter.

SYLVIIDÆ.

145. IANTIHA CYANURA.

Lusciola cyanura, Faun. Jap.
Ianthia et *Nemura rufilata* of my former lists.

Male blue on upper parts, white-eyebrowed; white on hinder parts, with orange-coloured sides; distinguished from the Himalayan

race, *I. rufilata*, Hodgson, by the white eyebrow, which in the other is wanting. Female greenish olive on upper parts, olive buff on lower, with orange sides, blue tail-coverts, and blue-washed tail. Summers in North China, the Amoor, and Japan, and visits Amoy and South China in winter.

146. Ruticilla fuliginosa, Vigors.

Inhabits high hill-ranges of South China, and is found in the plains during winter. Is identical with the Himalayan bird. Occurs also in Formosa.

147. Ruticilla aurorea, Pall.

Ruticilla leucoptera, Blyth.

Summer visitant to North China, the Amoor, and Japan; found in Amoy and South China in winter. Easily recognized by its conspicuous white wing-spot.

148. Pratincola ferrea, Hodg.

Intermediate between the Chats and the Redstarts. Roams about in parties in South China during winter. Probably retires to the mountains of the interior to breed. Specimens from the Himalayas and Tenasserim are identical with ours.

149. Pratincola rubicola, var. indica, Blyth.

This is nothing more than an eastern race of *P. rubicola* of Europe, chiefly distinguished by its black, instead of white, axillaries in the adult male. My specimens vary a good deal in size and length of wing. During winter it is abundant in the South of China, but in spring betakes itself north, and in summer is found in North China, the Amoor, and Japan.

150. Cyanecula cærulecula, Pall.

This is the red-spot Bluethroat. I have never seen it in China, except from the neighbourhood of Tientsin, where it would appear to be a rare summer straggler. It is not noticed from the Amoor or Japan.

151. Copsychus saularis, L.

The common resident Magpie-robin of South China up to Foochow. It does not extend so far north as Shanghai. Our bird is identical with the species prevalent in Hindostan.

152. Larvivora gracilis, Swinhoe, Ibis, 1861, p. 262, et P.Z.S. 1862, p. 316.

Male cyaneous on the upper parts, with black face and cheek, pure white on under parts. Female greenish olive on the upper parts, white on the lower, with buff markings on the face and sides. Young birds like the female, but with the throat and breast buff. Allied to *L. cyanea*, Hodgs., of the Himalayas.

These birds are locally distributed throughout China, from Canton to Pekin. They roam about during winter, but I believe do not

regularly migrate. I found them not uncommon about Canton. I have procured them at various seasons at Amoy, and have seen them from Tientsin.

153. LARVIVORA SIBILANS, n. sp.

Larvivora, sp.?, Swinhoe, Ibis, 1861, p. 34.

My only specimen from Macao of this bird is a very wretched one. It may be that of a female, but I have reason to believe it an adult bird; for I watched several, and they all appeared of similar plumage. It is of a sober olive-brown, with the red tail of a Redstart, the feet of *Larvivora*, and the bill of a Robin. It was not at all uncommon about the copses and thickets near Macao in May, but extremely difficult to get at. I trust I may make the bird's better acquaintance on some future day. I have thought it worth while now to allude to it, as I consider it a good species.

154. CALLIOPE KAMTSCHATKENSIS, Gm.

Male with fine crimson throat. Females with throat whitish, and without the white and black that ornaments the face of the male. When passing our coast in spring, the young males are found returning without having acquired the adult tints, usually only a few reddish feathers appearing on the throat; but the change of hue (not moult) goes on very rapidly, and probably would be perfected by the time of their arrival at their northern destination. The young males can be readily distinguished from the females by their much whiter throats and darker lores. These birds touch at Amoy in their northward migrations in April; I would hence infer that they had been a long way south for their winter. Their summer range is all through North China, Mantchuria, as far as Kamtschatka. I found them at Pekin in October; but they were young birds, and might have been late in their southward migrations. They occur abundantly, I am told, during winter in Hindostan. These would be birds from the Siberian region. Our northern migrants would be expected to winter in Siam and the Malayan peninsula, whence, I believe, specimens have been received. In form these birds are intermediate between the Robins and the Reed-warblers.

155. TRIBURA SQUAMEICEPS, n. sp.

Allied to *Tribura luteiventris*, Hodgs., from Nepal. I have only one specimen, procured by Captain Blakiston at Canton. Upper parts rich brown, with a tint of chestnut and olive, the former strongest on the head and wings. A well-defined cream-coloured eyebrow runs over the eye. The feathers of the head edged darker, giving the appearance of scales; under parts white, with an occasional tinge of buff; axillaries and flanks olive-brown; wing 2·1, short and rounded, the fourth quill being the longest, the third and fifth $\frac{1}{12}$th shorter, and nearly equal. The specimen is unfortunately tailless, and I therefore cannot give a very detailed description of it.

156. Locustella hendersonii, Cassin, Proc. Phil. Acad. Sciences, 1858, p. 194.

L. macropus, Swinhoe, P. Z. S. 1863, p. 93.

Allied to *Sylvia locustella*, L., of Europe, but with conspicuously larger feet. I have only procured it in South China in summer. If ours is the same as that spoken of by von Schrenck as occurring in Amoorland in May, the summer resort of our bird will be of vast extent, and it will probably be the same species found in Siberia, and reported visiting the plains of Hindostan in winter. The bird from Hakodadi (Japan), described by Cassin, would appear to be identical with the *Locustella* from Amoorland and this species.

157. Locustella minuta, Swinhoe, P. Z. S. 1863, p. 93.

A diminutive species resident in South China, procured at Amoy and Canton.

158. Locustella ochotensis, Middendorff, Sib. Reis.

With stronger legs and feet than most species of this genus. Von Schrenck considers it the same as *L. certhiola*, Pall.; but that is a larger and distinct bird, with apparently a more western range through Siberia. This is a summer visitant to North China, the Amoor, and Japan. In South China it has occurred only in winter.

159. Calamodyta sorghophila, Swinhoe, P.Z.S. 1863, p. 92.

The eastern representative of *C. phragmitis* of Europe. I procured one specimen on the 20th of May at Amoy. It would appear to be a summer visitant to the South of China. No Sedgewarbler is noted from the Amoor.

160. Calamoherpe bistrigiceps, Swinhoe, Ibis, 1860, p. 51.

Calamodyta maackii, von Schrenck, Amurland.

I first procured this bird on the 25th of October 1856, and described it in The Ibis for January 1860. The same species appears to have been brought from Amoorland by M. Maack, and styled by von Schrenck *maackii*, after its discoverer, also in 1860, but subsequently to the publication of my name, which will hence have to be adopted. I have three specimens, all from the neighbourhood of Amoy. It is in South China a winter bird, returning to the north in summer.

161. Calamoherpe orientalis, Bp.

Salicaria turdina orientalis, Temm. & Schleg. Faun. Jap.
Acrocephalus magnirostris, Swinhoe, Ibis, ii. p. 51.

Ranges in China, from Canton to Shanghai, as a summer bird. In the extreme south a few stay all the year. Found in summer also in Formosa and Japan. Is the eastern representative of the European *C. turdoides*.

162. Calamoherpe fumigata, Swinhoe, P. Z. S. 1863, p. 91.

Lusciola caligata, Licht. (*Motacilla salicaria*, Pall.)?

A summer visitant to South China. Abundant on the Island of Amoy for a few days in the middle of May.

163. CALAMOHERPE AËDON.

Turdus aëdon, Pallas.
Arundinax olivaceus, Blyth.

I have a specimen from the Andamans presented to me by Mr. Blyth, and another from Tientsin, both precisely identical. It is figured by von Schrenck from the Amoor. I have not yet met with it in South China. It summers in Siberia, North China, and Amoorland, and winters in Hindostan, probably extending during that season along the Malayan peninsula and into the Andamans.

164. CALAMOHERPE CANTILLANS.

Salicaria cantillans, Temm. & Schleg. Faun. Jap.

One specimen procured by Mr. Fleming at Tientsin. It would appear to replace in North China and Japan the following species of the south.

165. CALAMOHERPE MINUTA.

Arundinax minutus, Swinhoe, Ibis, 1860, p. 52.

This bird arrives from the south to spend the summer in South China. A few, however, occur all the year. It is a curious diminutive of the following, though entirely distinct in manners and song.

166. CALAMOHERPE CANTURIANS.

Arundinax canturians, Swinhoe, Ibis, 1860, p. 52.

Abundant from Canton to Shanghai, and in Formosa. A southwardly migration takes place in winter, but numbers stay all through the year. As the *C. cantillans* replaces the *C. minuta* north of Shanghai, so I suspect the *C. cantans* of Japan replaces this species in that region.

167. DRYMŒCA EXTENSICAUDA, Swinhoe, Ibis, 1860, p. 50.

Female smaller than male, with shorter tail. Winter plumage more strongly tinted with buff than summer. Bill in winter light-coloured, in summer black. For notes on the habits of this bird, see my different lists in The Ibis. Found as a constant resident in South China, from Amoy to Foochow; also in Formosa.

168. PRINIA SONITANS, Swinhoe, Ibis, 1860, p. 50.

A resident in South China, from Canton to Foochow; also in Formosa.

169. ORTHOTOMUS PHYLLORRHAPHEUS, Swinhoe, Ibis, 1860, p. 49.

An abundant resident in South China, from Canton to Foochow. The male acquires long central tail-feathers in spring.

170. Cisticola schœnicola, Bp.

C. cursitans, Franklin.
C. brunneicephala, Temm. & Schleg. Faun. Jap.
C. tintinnabulans, Swinhoe.

Common at Shanghai in summer, extending its range to Pekin. The majority from the north wend southwards, and pass the winter in South China, at which season only I have found it near Amoy. In south-west Formosa it is resident. It has also been noted from Japan, but not from the Amoor. I have, in company with Mr. Tristram, compared Chinese, Formosan, and Indian examples with European specimens, and can note no tangible differences.

171. Phyllopneuste fuscata.

Phylloscopus fuscatus, Blyth, J. A. S. xi. p. 113; xii. p. 965.
Phyllopneuste sibirica, Middendorff, Sib. Reise, ii. tab. 16.

Summers in Siberia, North China, and Amoorland, and winters in South China and the plains of Hindostan. A few, I suspect, stay all the year in South China. It varies much in size and length of wing. I have one very large specimen from Amoy, evidently only an individual variety.

172. Phyllopneuste tenellipes.

Phylloscopus tenellipes, Swinhoe, Ibis, 1860, p. 53.

Found about Amoy and South China during winter; probably winters in North China, but has not yet been noted thence, nor yet from the Amoor. I have three specimens from Amoy. Length 4·4; wing 2·3; tail 1·9. Bill brown, paler at edges, tip, and base of gonys; inside of mouth light yellow. Legs and claws pale flesh-colour. This is one of the most distinct species of this group, and in colouring holds a place between the foregoing brown bird and the greener forms.

173. Phyllopneuste sylvicultrix.

Phylloscopus sylvicultrix, Swinhoe, Ibis, 1860, p. 53.
P. javanica (Horsf.), Blasius, Ibis, 1862, p. 69?

I have nearly 200 examples of this species from Amoy, which differ in general size, in the length and bulk of the bill, in the length of the wings and of the first primary, and in the tints of the tarse. Were two of the extreme forms taken separately, some naturalists would be inclined to set them down as distinct species; but with my large series of every intermediate grade and form before one, the special points of distinction disappear, and one cannot help avowing them all to be the same. In this view Mr. Tristram, who has kindly examined them with me, entirely concurs. All the Chinese forms of *Phyllopneuste*, with the exception of the *P. fuscata*, show more or less yellowish spots on the wing—a distinction which does not appear to be shared by any of the European forms. In this character the wings of our birds show some affinity to the well-banded wing of the *Reguloides* group, to which they further approximate in the shape of their tails.

P. sylvicultrix visits Amoy in large numbers during its autumnal and vernal migrations. It probably summers in the interior of China and about Ningpo and Shanghai. I have procured it in autumn in south-west Formosa, and I have reason to believe it winters in the Philippines. Its great destroyer is the *Lanius lucionensis*, Strickl., which migrates about the same time, passing Amoy in immense numbers, and crossing over to the Philippines *viâ* south-west Formosa. Professor Schlegel showed me some Willow-wrens, I think from Halmahein, which seemed identical with Chinese examples of this bird. These would doubtless be the same that Professor Blasius refers to as *P. javanica*, Horsf. (see Ibis, 1862, p. 69). The type specimen of Horsfield's *Sylvia javanica* in the East India Museum is, however, a *Zosterops*, as demonstrated by Mr. Blyth and others years ago. It is not at all improbable that our *P. sylvicultrix* spreads in winter throughout the Malayan Islands. The various Chinese species of *Phyllopneuste*, with the exception of *P. fuscata*, Mr. Blyth and I have ascertained by actual comparison to be quite distinct from those found in India.

174. PHYLLOPNEUSTE XANTHODRYAS, n. sp.

♂, shot at Amoy on the 23rd of April 1861. Length 5·5; wing 2·9; tail 2·3. First primary pointed, ·65; second ·4, shorter than the third, which is nearly of a length with the fourth and fifth. Bill blackish brown on the upper mandible; edge of ditto, tip, and lower mandible yellow-ochre, rather dingy on the latter. Inside of mouth light orange-yellow. Eyelid light black. Legs and claws pale brown, with a tinge of yellow on the feet and claws.

♀, shot on the 20th of May, at Amoy. Length 5·4; wing 2·7; tail 2·2. Bill and gape less yellow than before, the former browner. Legs light sienna-yellow, tinged with brown.

This is the largest *Phyllopneuste* I have met with in China. It approaches *P. coronata* nearest in size of bill, but has no coronal stripe, and the under parts are much yellower. From *P. sylvicultrix* it is easily recognized by its much superior size, its yellow under parts, its more robust claws, the larger size of the first primary, and the greater difference between the second and third.

The gizzard of one dissected was round, compressed on the sides, with a large circular tendon on each side. It was lined internally with a thick rugous epithelium, and contained remains of flies.

This species may, I think, be considered as a summer visitant to Central China from the south, passing Amoy *en route*.

175. PHYLLOPNEUSTE PLUMBEITARSA.

Phylloscopus plumbeitarsus, Swinhoe, Ibis, 1861, p. 330.
Phyllopneuste rufa, von Schrenck, Amurland.
P. borealis, Blasius, Ibis, 1862, p. 69?

I have only one specimen of this bird, procured near Pekin in October, which I take to be an individual migrating southwards from its summer quarters in Amoorland. From that region von Schrenck

gives *P. rufa*; and, from its approach to that species, the bird mentioned by that authority would naturally be our species. But from *P. rufa* ours is at once distinguishable by its short thicker bill, and by the yellowish tips to its lesser and greater wing-coverts. In the shape of its bill, ours has more affinity with *P. eversmanni* of Siberia, figured in Middendorff, Sib. Reis., but differs also from that in its yellowish wing-markings.

176. PHYLLOPNEUSTE CORONATA.

Ficedula coronata, Temm. & Schleg. Faun. Jap.

This is a summer visitant to North China and Japan, repairing in winter to South China, at which latter season it occurs at Amoy. *Reguloides trochiloides*, Sundevall, is a closely allied species from India, but is smaller, has a smaller bill, and brighter yellow tips to wing-coverts. It is the representative race of our species in more Western Asia, and ought perhaps, with ours, rather to be included in this genus than among the pseudo-Goldcrests.

177. REGULOIDES SUPERCILIOSUS (Gm.).

Regulus modestus, Gould.

Summers in North China and Japan, and is abundant during the cold season throughout Southern China and Formosa. It is then also said to occur in the plains of Hindostan. The bird shot by Mr. J. Hancock, of Newcastle, on the coast of Yorkshire I have lately had the privilege of examining, and find to be identical with my Chinese examples.

178. REGULOIDES PROREGULUS, Pall.

A summer visitant to North China, and a winter visitant to South China. Recognized at once from the foregoing by its yellow rump-band. I have procured this, as well as the last, near Pekin in September; and I hence infer that this also ranges into the Amoor territory, and has been confounded by von Schrenck with the above.

ZOSTEROPIDÆ.

179. ZOSTEROPS SIMPLEX, Swinhoe, P. Z. S. 1862, p. 317, et Ibis, 1863, p. 294.

This species ranges in China, from Canton to Foochow, and perhaps a little higher, but not to Shanghai, where it is replaced by the following. In Formosa it is also an abundant resident. On its nesting and habits I have already written much in The Ibis, and therefore will not here repeat my remarks. It has its nearest ally in the *Z. palpebrosa* of India, being, like it, light grey on the under parts. An occasional specimen or two, however, may be picked out of my Amoy series with a tinge of chestnut-brown on the under parts, showing the tendency of the species towards the Japanese *Z. japonica*. Some have the belly deeper grey than others. The yellow on the throat and

vent varies in intensity, as also does the green of the upper parts; but these are chiefly distinctions of sex or age. I have one pale (almost yellow) variety, procured by Captain Blakiston at Canton. All the adults have the black lore and eye-line, shown also in the following and in many of this group. I have specimens from Hongkong, Macao, Canton, Amoy, Foochow, and Formosa, and they all agree in essential characters.

180. Zosterops erythropleura, Swinhoe, P. Z. S. 1863, p. 204.

This species, which extends from Shanghai to Tientsin and the Amoor, I had confounded with the *Z. japonica* of the 'Fauna Japonica,' until lately, when, on a visit to M. Jules Verreaux at Paris, I had the pleasure of examining for the first time a Japanese specimen, and of comparing it with North China skins. The difference in the two birds is striking. The under parts of *Z. japonica* are a dull light brownish chestnut, while the flanks of this species are a deep rusty chestnut. This bird is larger and longer-winged than our South-China species, but is exceeded in both by the Japanese. I have examined two specimens from Shanghai from M. Jules Verreaux's collection, and one from Tientsin. The two former are much brighter on the flanks than the latter; but as they are both males, and our Tientsin bird is a female, the difference may be only a sexual one, and not one of locality. What could have induced von Schrenck to confuse this species with the *Z. chloronota*, Gould, of Australia, I cannot understand. The shape of the bill and head of this last, as well as the dull sordid colour of the plumage, show at once a marked difference from the Chinese bird. Indeed there are many species from Asia and Africa far more closely allied to our species than is the *Z. chloronota*. As I have never met with the North China species alive, except as a cage-bird, I have nothing special to relate regarding its habits.

Ampelidæ.

181. Liothrix lutea.

Sylvia lutea, Scopoli.
Tanagra sinensis, Gmel.
Parus furcatus, Temm.

Often seen alive in cages at Canton. Is said to be brought from the interior. I never met with it in a wild state.

182. Ampelis garrula, L.

Occasionally met with in North China during winter.

Fringillidæ.

183. Fringilla montifringilla, L.

Met with in North China during winter. Summers in Amoorland. Captain Blakiston killed one out of a small party at Shanghai in January.

184. ÆGIOTHUS LINARIUS, L.

185. ÆGIOTHUS CANESCENS, Gould.

Both these species come down into North China from Amoorland and the north during winter.

186. CHRYSOMITRIS SPINUS, L.

Comes down from the north in winter, as far south as Foochow.

187. CHLOROSPIZA SINICA, L.

Fringilla kawariba minor, Temm. & Schleg. Faun. Jap.

Common throughout China, from Canton to Pekin, at all seasons. A larger race occurs in some parts of Japan, while in others its place is said to be supplied by this bird.

188. CARPODACUS ERYTHRINUS, Pall.

Procured at Tientsin. Is said to be taken occasionally near Canton during winter.

189. COCCOTHRAUSTES MELANURUS, Gmel.

A common resident bird from Canton to Shanghai. I have not traced it further north. Is replaced in Japan by a near species, *C. personatus*.

190. COCCOTHRAUSTES VULGARIS, Ray.

Found in Amoorland, about Pekin, and at Japan. I have not discovered it in the more southerly part of China.

191. LOXIA CURVIROSTRA, L.

A winter visitant to North China. Is found in Amoorland, where *L. leucoptera* is said also to occur. Brought from Hakodadi, North Japan.

192. MUNIA ORYZIVORA, L.

Found about Canton, and occasionally near Amoy. A South-China bird, extending to the Straits of Malacca and Java.

193. MUNIA TOPELA, Swinhoe, Ibis, 1863, p. 90.

A common resident from Canton to Foochow, and in Formosa.

194. MUNIA ACUTICAUDA, Hodgs.

An abundant resident from Canton to Shanghai, and in Formosa. Is domesticated in Japan, where it also probably occurs in a wild state, though it has not been noted from there.

195. PASSER MONTANUS, L.

The common House-Sparrow throughout China, the Amoor, Formosa, and Japan.

196. PASSER RUSSATUS, Temm. & Schleg. Faun. Jap.

The Tree-Sparrow of China, Japan, and Formosa. The female

of this species presents a plumage like that of the female *P. domesticus*, L.

197. Euspiza rutila (Pall.); Bp. Consp. Av. p. 469.

Found in Siberia, Amoorland, and Japan. A few wend their way southwards in winter. I have procured it at Amoy, where it is extremely scarce.

198. Euspiza aureola (Pall.); Bp. Consp. Av. p. 468.

Summers in North China, Amoorland, and Japan, and winters in South China, and plentifully in Burmah. Abundant about Canton and Amoy during the cool season. Known to Europeans in China as the "Canton Ortolan."

199. Euspiza sulphurata.

Emberiza sulphurata, Temm. & Schleg. Faun. Jap.

Summers in Japan, and winters in South China. Numbers touch Amoy on the northward migration in April. Has not been noted either from North China or the Amoor. In Sir William Jardine's 'Life and Memoirs of Mr. Hugh Strickland,' a bird is described and figured as *Euspiza cinerea* from Smyrna, which looks much like a larger representative race of this species.

200. Melophus melanicterus (Gmel.); Bp. Consp. Av. p. 470.

Abundant at all seasons about Canton, Macao, and Amoy, extending upwards to Foochow, but I do not think much further north.

201. Emberiza pityornis (Pall.); Bp. Consp. Av. p. 466.

Siberia, North China, and the Amoor. I met with it at Pekin in October.

202. Emberiza spodocephala, Pall.

E. personata, Temm.
E. melanops, Blyth.

I have a large series of this bird, all shot at Amoy, in various stages of plumage, answering to the three so-called species. The entire grey head and neck, and black round the bill, are put on by the male in full plumage; and the yellow tints of the under parts vary in hue and intensity. Von Schrenck notices the two first from Amoorland as distinct species; and Mr. Blyth has described the third as an occasional straggler in North-eastern India. In winter it visits the south of China in large numbers, returning on the approach of summer to North China, the Amoor, and Japan.

203. Emberiza ciopsis, Bp.

E. cioides, Temm. & Schleg. Faun. Jap.

This species is found in North China, Amoorland, and Japan. It is a winter visitant to South China.

204. EMBERIZA RUSTICA (Pall.); Bp. Consp. Av. p. 466.

North China, the Amoor, and Japan. Not yet met with in South China.

205. EMBERIZA FUCATA (Pall.); Bp. Consp. Av. p. 464.

Winters in South China. Found in summer in North China and Japan.

206. EMBERIZA STRACHEYI (Moore); Swinhoe, Ibis, 1863, p. 9.

Procured at Tientsin (Fleming), and at Kumaon (Strachey). Nothing is known of its movements or distribution.

207. EMBERIZA CHRYSOPHRYS (Pall.); Bp. Consp. Av. p. 464.

Siberia, and probably Western China. I procured a specimen near Pekin in September.

208. EMBERIZA CANESCENS, Swinhoe, Ibis, 1860, p. 62.

Occurs in South China in winter only; probably retires to North China to breed.

209. EMBERIZA PUSILLA (Pall.); Bp. Consp. Av. p. 464.

Abundant in North China near Pekin, some visiting South China in winter. Found also in Amoorland.

210. SCHŒNICOLA PASSERINA, var. β, Pall. Zoogr. Ross. Asiat. ii. 48, 49.

Emberiza schœniclus, var. *minor*, Midd. Sib. Reise.
E. polaris, Midd.?

Amoorland and North Japan. It is doubtless also a North-Chinese bird.

211. PLECTROPHANES NIVALIS, L.

Visits North China in the cold weather.

212. CENTROPHANES LAPPONICA, L.

Abundant near Pekin in winter.

STURNIDÆ.

213. STURNUS VULGARIS, L.

I include this bird in my Chinese list on the authority of a specimen in the British Museum, said to have been brought by Mr. Reeves from Canton. I have never met with the bird.

214. STURNUS CINERACEUS, Temm. & Schleg. Faun. Jap.

Summers in Japan and North China to the Amoor. Visits South China in large flocks during winter.

215. STURNUS SERICEUS, Gmel.

A resident species from Canton to Shanghai, extending probably

further north. In winter assembles in large flocks and ranges about the country, often associating with the foregoing.

216. Hetærornis sinensis.

Oriolus sinensis, Gmel.
O. buffonianus, Shaw.
Pastor turdiformis, Wagl.
Sturnia cana, Blyth.

Arrives in large numbers in spring in South China, frequenting houses, and building in the holes of their roofs. It stays the summer, and then disappears. It is in that season very common from Canton to a little above Amoy, not extending so far north as Foochow. Its winter migration appears to extend into Pegu, whence identical specimens have been received. All the species of this genus become strongly tinged in the breeding-season with a rusty buff, very bright in parts. In the autumn the moult takes place, when the feathers resume their natural colour. What is the cause of this tint I cannot divine; but, to show how strong it is, Mr. Blyth named the species from the Nicobars *H. erythropygius*, from its red rump. The next specimen he procured was later in the season, and the red-tinged parts had moulted into their natural white colours. This tinge is perhaps analogous to that of the breast of *Gypaëtus barbatus*, of the Teal, and of several other birds. In our bird it is too generally diffused to suppose that it has been rubbed on extraneously. It comes doubtless from the body of the bird, and must owe its origin to some constitutional peculiarity.

217. Hetærornis dauricus.

Sturnus dauricus, Pall.
Turdus dominicanus, Gm.
Pastor malayensis, Eyton.

Found in North China and Amoorland in summer; its southward migration would appear to extend into Hindostan, the Malayan peninsula, and Java, whence specimens have been received. It does not appear to travel down the Chinese coast to its winter destination, or we should have met with it in South China, which we never have. It probably takes an inland route through Daouria, whence Pallas obtained and described his type specimens.

This species is replaced in Japan by the little *H. pyrrhogenys*, Müll. (*Lamprotornis pyrrhopogon*, Schleg. Faun. Jap.), which is there a summer visitant only, being found during the winter in the Philippines, whence I have received skins. I naturally expected to find it touching on its travels at Formosa, but did not; nor have I ever come across it on the Chinese coast. I may here remark that a specimen of this bird sent to Mr. Blyth was described by him as a new species, under the name *Calornis albifrons*.

218. Acridotheres cristatellus, L.

Found in China as a resident species, from Canton to Shanghai.

Abundant also in Formosa. Is found also in the Philippines, whither it is said to have been conveyed originally for the destruction of locusts. The members of this genus are closely allied, but very local in their distribution. Great confusion exists in their nomenclature; but the description of Linnæus doubtless refers to the Chinese Starling so called, though he describes it as a bird from Bengal.

There is quite a peculiar species in Siam, which I have received from Sir Robert Schomburgk, H. M. Consul at Bangkok. This in coloration is a good deal similar to the Chinese bird, but has the bill a bright yellow, instead of light lemon-colour; its vent is pure white, instead of black tipped with white; its nasal crest is much smaller, and the pointed feathers on its crown much longer, than in ours; its rectrices are, moreover, much more largely tipped with white. In size and other respects the two nearly agree. For this I would now propose the name *A. siamensis*.

219. Gracupica nigricollis.

Gracula nigricollis, Paykull.
Pastor bicolor, Gr.
Pastor temporalis, Wagl.
Sturnus temporalis, Blyth.
Gracula melanoleuca, Sonnerat.
Gracupica melanoleuca, Less.

A resident species in South China, from Canton to Foochow; extends in its distribution as far south as Siam. Its bare cheeks, when alive, are bright yellow, and not red as stated in Bp. Consp. Av. p. 421. The immature bird has the head and neck light brown, and its general colours are much lighter than in the adult.

Corvidæ.

220. Pica caudata, Ray, var. *media*.

P. media, Blyth.
P. sericea, Gould.

The Magpie is an abundant resident throughout China, Amoorland, Kamtschatka, Japan, and Formosa. On specimens procured from these different regions two additional species have been created, founded on the variation of the length of wing and expansion of alar white,—*P. japonica*, Bp., and *P. media*, Blyth. My specimen from Pekin seems entirely to agree with British skins; but the majority of those from Amoy differ in the tints of the tail, and in having much less white on the quills. I have, however, from that locality one which is identical with the Pekin bird. On examining nestlings and young birds, I find that the alar white is again much less; and, on carefully comparing my large series of Amoy skins, I find great variation in length of wing, in the tints of the tail, and in the size of the white band on the rump, this last, in some, being scarcely visible. I therefore cannot help reducing the so-called species again into the original one; for, as the Magpie is not a migratory bird, one can scarcely suppose that the true Pekin race would oc-

casionally find its way down to Amoy, a distance of over 1000 miles. We might, perhaps, regard the South-China bird as a race of itself, with a frequent tendency to revert to the typical form.

The tail of *P. caudata* from Holland and England is very much bronzed, much more so than that of the Pekin bird, but in no greater degree differing than does the Pekin bird and one from Amoy from the majority of those from that locality. The tail of *P. numidica* is similarly different from that of the English bird; and, on analogy, it is therefore not improbable that the Amoor bird would more nearly approach the Dutch and English in brightness.

221. CYANOPICA CYANEA, Pall.

Pica melanocephalos, Wagl.

Abundant from Shanghai to Pekin, thence into Amoorland and Japan. A resident species. I have not been able to recognize two distinct species in these, as is done by Bonaparte in his Conspectus, p. 382.

222. UROCISSA SINENSIS, L.

A resident species on all the wooded hills from Canton to Ningpo, represented in Formosa by another species, the *U. cærulea*, Gould. The male has a much larger bill than the female, of a uniform orange-red, and not tipped, like hers, on the apical culmen with black. The young bird has a brownish-yellow bill, brown legs and irides. Crown of head pale grey; nasal feathers, cheeks, and sides of neck light black, lighter on the under neck, and nearly grey on the throat. The rest of the plumage paler and duskier than in the adult.

This species was procured by Captain Blakiston near Ichang, 1100 miles up the Yangtsze; so that its range would appear to extend throughout entire Southern China.

223. DENDROCITTA SINENSIS, Lath.

Said to inhabit the mountains of South China.

224. GARRULUS SINENSIS, Gould.

Very closely allied to *G. bispecularis*, Gould, of the Himalayas. Ranges in China from Canton to Ningpo. Further north, it is represented by another species, of which I have no specimens, but which I believe to be the *G. brandtii*, Eversm., a bird found also in Amoorland, and lately procured in Hakodadi, North Japan, by Capt. Blakiston. South Japan produces an ally of *G. glandarius*, in *G. japonicus*, Schleg., and Formosa a diminutive ally of *G. sinensis*, in *G. insularis*, Gould.

225. LYCOS DAURICUS.

Corvus dauricus (Pall.), Faun. Japon. t. 41.

Abundant about Pekin, thence ranging north into Amoorland. and west into Siberia. I have not traced it further south into China, It also occurs in Japan.

226. Lycos neglectus.

Corvus (*Monedula*) *neglectus*, Temm. & Schleg. Faun. Japon.

This has the same range as the above, and is much more closely allied to the true *L. monedula*. I have unfortunately no specimens.

227. Corvus torquatus, Less.

C. pectoralis, Gould.

A resident species in China, from Canton to Pekin. The only species of Crow at Amoy. The male and female do not appear to differ much in size of bill.

228. Corvus sinensis, Gould.

C. corone of Temm. & Schleg. and von Schrenck.

I have four specimens of this bird—a female from Pekin, an immature male from Foochow, and a male and female from Swatow. The northern birds are larger than the southern, but in essential characters they are the same. The distinctness of the Chinese bird from *C. corone* of Europe Mr. Tristram agrees with me in considering undoubted; and it is hard to understand how, after a comparison, they could ever have been united. *C. sinensis* has a bill more allied to that of the Ravens than to the Jackdaw-like bill of *C. corone*. The bill of the male *C. sinensis* is about one-third bulkier than that of its female, which is about the same proportion larger than that of the male *C. corone*; that organ is, moreover, well culminated, like that of *C. culminatus* of India. Apart from the bill, however, there are numerous other satisfactory distinctions. The whole plumage of *C. sinensis*, except the scapulars, coverts, and secondary-edges, is washed with a green bronze, which in *C. corone* is purplish, and the feathers of the throat and under neck are lanceolate; the latter marked distinction will enable the most superficial observer to distinguish them. The Chinese is, besides, a good deal larger in size and in length of wing. *C. culminatus* has a very similar bill to the Chinese bird. In size, it appears to more nearly equal the European species, and in shades of plumage to be intermediate between it and the Chinese, but it likewise wants the strongly acuminate throat-feathers of *C. sinensis*. The specimens of *C. culminatus* that I have had for comparison are from Calcutta and the Andaman Islands. I have also *C. macrorhynchus*, Temm., and *C. enca*, Horsf., both from Java, sent me by Prof. Schlegel. These are long-billed species, the former being nearly double the size of the latter.

229. Corvus japonensis, Bp.

C. macrorhynchus, Schleg.; Bp. Consp. Av. p. 386.

North China, Amoorland, and Japan.

230. Corvus pastinator, Gould.

C. frugilegus of Temm. & Schleg. and von Schrenck.

An abundant resident from Shanghai to Pekin; extends into Amoorland and Japan. Mr. Tristram agrees with me in consider-

ing Mr. Gould right in separating this bird from the European Rook; in size they are very similar. The Chinese bird is, however, at once distinguishable by the whole of its head being glossed with purple like the back, the European Rook having the head and face glossed with blue-black. But the greatest distinction is in the peculiar black-feathered throat and chin, these parts in *C. frugilegus* being quite bare. My specimen was procured in October, at Pekin, and, being in mature plumage, must be over a year old at the least. More specimens are required to determine whether the throat ever does get bare, like the base of the bill, with advancing age; but if this character fail, the different tints of the head will be sufficient to establish the Chinese bird as a distinct race of Rook.

231. NUCIFRAGA CARYOCATACTES, L.

Said to occur in North China. Reported from Amoorland and Japan.

232. FREGILUS GRACULUS, L.

North China; procured near Tientsin. Not noted from Amoorland or Japan.

COLUMBIDÆ.

233. COLUMBA RUPESTRIS, Bp. Consp. Av. ii. p. 48.

C. leucozonura, Swinhoe, Ibis, 1861, p. 259.

Common about the rocky shores of China in the extreme north, and rocky coast of Mantchuria.

234. TURTUR RUPICOLA (Pall.); Bp. Consp. Av. ii. p. 60.

Found in North China, the Amoor, and Japan. A winter visitant to South China and Formosa.

235. TURTUR CHINENSIS (Scop.); Bp. Consp. Av. ii. p. 63.

A resident species from Canton to Shanghai, and at Formosa.

236. TURTUR HUMILIS (Temm); Bp. Consp. Av. ii. p. 66.

A summer visitant to South China, ranging in that season as far north as Shanghai and into Formosa.

GALLINÆ.

237. SYRRHAPTES PARADOXUS, Pall.

Abundant about the plains of Pekin and Tientsin during winter. Roams about the country in immense flocks, flying in figures, as do Plovers and most sea-birds.

238. CROSSOPTILON MANTCHURICUM, Swinhoe, P. Z. S. 1862, p. 287.

One specimen procured through Dr. Lamprey at Tientsin. Said to have come from Mantchuria.

239. Phasianus torquatus, Gmel.

Found throughout China, up into Amoorland.

240. Phasianus reevesii, J. E. Gray.

Central China and borders of Mongolia.

241. Thaumalea picta, L.

China bordering on Thibet and Mongolia.

242. Thaumalea amherstiæ (Leadb.).

China bordering on Eastern Thibet.

243. Euplocamus nycthemerus, L.

Nycthemerus argentatus, Swainson.

Wooded mountain-country of Southern China.

244. Polyplectron chinquis (Temm.); Blyth's Cat. p. 241.

Specimens in the British Museum from Mr. Reeves, said to have been procured in Southern China.

245. Ceriornis temminckii.

Satyra temminckii, Gray.

In British Museum, from Reeves. China.

246. Ceriornis caboti, Gould, Birds of Asia, pt. x.

Said to have been procured in Southern China.

247. Francolinus sinensis.

Tetrao sinensis, Osbeck.
T. perlatus, Gmelin.
T. pintadeus, Scopoli.
T. madagascariensis, Gmel.

A non-perching Francolin, found on the hills of Southern China. Usually met with single, and difficult to flush. Has been introduced into the Mauritius. Male spurred; female with only a wart.

248. Bambusicola thoracica.

Perdix thoracica, Temm.
P. sphenura, J. E. Gray, Zool. Misc. no. 1, p. 2.

Male spurred; female with only a wart. For remarks on this and its allied Formosan representative, see The Ibis, 1863, p. 399.

249. Perdix barbata, J. Verreaux, P. Z. S. 1863, p. 62, Pl. IX.

Brought to the Tientsin market from the plains adjoining Eastern Siberia. Mentioned by Pallas as a variety of *P. cinerea* inhabiting Dauria. Procured by Middendorff in the Barabá Steppe, and noted by him in his 'Sib. Reise' as *P. cinerea*.

250. Coturnix communis, Bonnaterre.

Tetrao coturnix, L.
C. dactylisonans, Temm.

Found throughout China, in the north as a summer bird, in the south chiefly as a winter visitant, though many stay to breed. I have procured their eggs at Amoy. It is found also at Japan and in Formosa, but is not noted from the Amoor.

251. Excalfactoria chinensis.

Tetrao chinensis, L.

Has a wide range throughout Southern Asia and its islands to Australia. Found in Southern China and Formosa, and has been introduced into the Mauritius.

252. Turnix maculosa, Temm.

Occurs sparsely throughout China from Canton to Pekin; and I suspect also in Formosa, though I did not procure specimens. Mr. Blyth considers the Chinese race the same as that from Burmah, which he has lately described as *T. blanfordi* (Journ. As. Soc. Beng. 1863, p. 8). He says it holds the same relationship to *T. dussumieri*, Temm., of India, that the *T. sykesi* of India holds to the *T. andalusica* of S. Europe and N. Africa.

253. Turnix ocellata.

Oriolus ocellatus, Scop.
Tetrao luzoniensis, Gmel.
Hemipodius thoracicus, Temm.

Inhabits Southern Asia and its archipelago, to the Philippines. Occurs also in Southern China and Formosa.

Grallæ.

254. Otis tarda, L.

We frequently hear in China of Bustards, though I have never met any. They are brought to the Tientsin market from the neighbouring plains, and through the kindness of Dr. Lamprey I have been enabled to procure a sternum. This agrees entirely with that of the European Bustard, which is also noted from the Amoor. In South China probably other species occur.

255. Grus cinerea, L.

G. cinerea longirostris, Faun. Jap.

North China to Amoorland and Japan. Visits South China in winter in large flocks, frequenting cultivated fields, and feeding on sweet potatoes (*Batatas edulis*).

256. Grus leucogeranos, Pall.

North China, Amoorland, and Japan.

257. Grus viridirostris, Vieill.

Antigone montignesia, Bp. Consp. Av. p. 100.

North China and Japan. Frequently seen in captivity at Shanghai. Emblem of longevity among the Chinese, and the subject of many pictures and works of art.

258. Grus monacha, Temm.

North China and Japan.

259. Glareola orientalis, Lath.

In all marshy plains throughout China, as far north as Pekin; also abundant in Formosa. Not noted from the Amoor or Japan.

260. Vanellus cristatus, Meyer & Wolf.

North China from Shanghai to Pekin and Amoorland. Shot by Captain Blakiston, at Shanghai, in January.

261. Lobivanellus cinereus, Blyth, J. A. S. B. xi. p. 587.

Chætusia wagleri, Bp.

Common on the banks of the Yangtsze, Central China, in summer, whence it probably migrates southwards to the plains of Hindostan. A specimen brought by Captain Blakiston agrees entirely with those from India. The *Lobivanellus inornatus* of Japan is said to be distinct. One shot at Amoy was referred by Mr. G. Schlegel to that species, but it may have been the bird that migrates to India. It is said to be extremely rare in Japan; hence it is not unlikely that a few only straggle there, as the bird we procured straggled to Amoy.

262. Squatarola helvetica, Gmel.

Winter visitant to the coasts of China and Formosa from the north.

263. Charadrius longipes, Temm.

C. virginicus of my previous lists.

Throughout China and Japan. Many stay to breed about South China and Formosa. The females are smaller than the males, and their eggs unusually small.

264. Eudromias morinellus, L.

Observed by Middendorff in North-eastern Asia in June and August. Procured, according to Cassin, at Hakodadi (North Japan).

265. Ægialites leschenaultii.

Charadrius leschenaultii, Less.
C. geoffroyii, Wagler.
C. asiaticus (*caspius*), Pall.
Hiaticula rufina, Blyth.

On all the coasts of Southern Asia. Somewhat rare on Chinese coast. Common in Formosa, where it stays the whole year and breeds. This appears to be the largest of this group, and has a heavy black bill. *Ægialites hiaticula*, L., of Europe, is said by

Temminck to have been procured from Japan, but I should think it extremely doubtful. Mr. Tristram has an undoubted specimen of this species, shot by himself between Cairo and Suez in February. This is the most westerly occurrence of this bird I have heard of.

266. ÆGIALITES MONGOLICUS.

Charadrius mongolicus, Pall.; Midd. Sib. Reise.
C. ruficollis, Cuv.
C. pyrrhothorax, Temm.
C. cirrhipedesmos, Wagler.
C. sanguineus, Less.
C. rufinellus, Blyth.

Inland plains of North China, Mongolia, and Amoorland. Common in winter in Lower Bengal. It appears rarely, if ever, to come to the sea-coast, and is probably a Dotterel, though it has many affinities with the Sand-plovers.

267. ÆGIALITES CANTIANUS.

Charadrius cantianus, Lath. (*alexandrinus*, Pall.).

Though not noted by von Schrenck from the Amoor, I suspect the summer resort of this bird extends as high up as Kamtschatka. I found it at Talienwan, and in winter we receive large accessions to our resident numbers from the north. It is, I think, entirely a bird of the coast, never being met with inland. The birds that stay to breed on the coasts and islands of South China and Formosa can at once be recognized by their flesh-coloured legs, which in the arrivals from the north are leaden. Our southern birds are, moreover, larger, very pale, in some cases almost white, and never, to my knowledge, attain aught but an indication of the bright rufous and black that adorn the head of the northern form. A similar resident race has been procured on the coast of California, and separated by Cassin as a distinct species under the term *Hiaticula nivosa*. I do not think we can regard this form other than as a climatal or incipient species, or, if the term be preferred, *conspecies*.

268. ÆGIALITES PHILLIPINUS.

Charadrius philippinus, Scopoli.
C. minor, Meyer, and of British authors.
C. curonicus, Beske.

Abundant on the coasts of China and Formosa, where many spend the whole summer. Extends into Amoorland and Japan. Is somewhat an inland bird, and frequently found on the sandy banks of rivers, and in winter on freshly ploughed fields, margins of pools, marshy grounds, and wet rice-fields.

269. HÆMATOPUS LONGIROSTRIS, Gray.

H. ostralegus, L., of my former lists.

Bill an inch and more longer than in *H. ostralegus*, and differently shaped. It never has the white collar, even when immature, and

has more white on the tail, especially on the outer feathers. Winter visitant to south coast of China, thence to the Indian Archipelago. Found in summer at Talienwan. Extends up the coast of Mantchuria to northern latitudes in summer, at which season it also occurs in Japan.

270. Hæmatopus niger, Pall.

Kurile Isles, Sagalien, and Sea of Ochotsk.

271. Recurvirostra avocetta, L.

Winter visitant to South China. Summers probably in North China and Amoorland.

272. Totanus glottis, L.

T. glottoides, Vigors.

Visits the coasts of China, Japan, and Formosa in winter.

273. Totanus stagnatilis, Bechst.

Rare on the Chinese coast. Seen occasionally during winter on the coast in small flocks. A specimen procured in Formosa. It also appears to be rare on the coasts of North-eastern Asia; for Middendorff procured it only once on the shores of the Sea of Ochotsk.

274. Totanus fuscus, L.

Winter visitant to south coast. Specimens procured at Macao and Tientsin.

275. Totanus calidris, L.

Commoner than the last in winter, though both somewhat rare. Specimen procured in Formosa.

276. Totanus glareola, Gmel.

Common in small flocks in marshy places in September and October in South China, just arrived from the north, and evidently bound to more southerly latitudes. Disappears in winter, and returns late in spring, bound north. Never seen on the coast.

277. Totanus affinis, Horsf.

I procured one of this species out of a small party in a rice-field near Amoy, on the 12th of September 1859. The flight and note of the bird struck me as peculiar at the time. It is most nearly allied to *T. glareola*, from which it is at once distinguished by the deep olive-tint of the upper parts, the head and back being destitute of spots, by the few whitish spots of its wing-coverts and tertiaries, which are, on the other hand, spotted with black, in these respects resembling *T. ochropus*. The tail, however, is closer to that of *T. glareola*; but the central feathers are more olive, and with few white markings. The breast is washed on the sides with olive-brown, and has no spots. The tarsus is shorter than in either *T. glareola* or *T. ochropus*, as also the bill. Mr. Tristram agrees with me in considering it a good species. It has also considerable affinity with *T. hypoleucus*.

278. Totanus ochropus, L.

Seldom found on the coast. Rather solitary in habits. A few stay all the year in South China.

279. Totanus brevipes, Vieill.

T. pulverulentus (Müll.), Faun. Jap.
T. glareola, Pall.
T. griseopygeus, Gould, Birds of Austr.
T. fuliginosus, G. R. Gray, G. of B. (winter).

Found on Chinese coast in winter, but much commoner during the early part of that season in Formosa. Extends its winter migration to the Indian Archipelago and to Australia. Procured also from Japan, where it probably breeds. Not noted from Amoorland by von Schrenck, but has been procured from Kamtschatka and the Sea of Ochotsk.

280. Totanus hypoleucus, L.

T. empusa, Gould, Birds of Austr.
Tringoides hypoleuca of previous lists.

Everywhere a common resident species on the coast and on banks of rivers. Associates in flocks and parties in winter, and in rigorous weather shifts southwards.

281. Machetes pugnax, L.

From Kamtschatka and Siberia, where it summers, visiting India and interior of China in winter.

282. Terekia cinerea.

Scolopax cinerea, Gmel.
Limosa recurvirostra, Pall.
L. cinerea, apud von Schrenck.

Procured in summer plumage at Tientsin, and noticed as a summer bird in Amoorland. I have never observed it on the South Chinese coast, and it is not improbable that it migrates southwards through the interior. Is a common winter bird in India and its archipelago, and has been procured in that season in Australia.

283. Limosa uropygialis, Gould, Birds of Austr.

Procured only once at Amoy in early spring. Not noted before from any part of East Asia. This is probably the species procured in Java and Timor, and not the *L. lapponica*, as has been recorded. Probably breeds in North-east Asia, and migrates south-easterly, a few occasionally finding their way to the Chinese coast. No short-legged Godwit is noted from Hindostan (see Blyth's 'List'). My specimen is identical with Australian specimens, and was procured at Amoy. Middendorff gives *L. rufa* seu *lapponica* from North-east Asia; but I strongly suspect it will be found to be this species, for both forms could hardly be expected to occur together. *L. rufa* is also recorded by Schlegel from Japan.

284. Limosa ægocephala, L. (*L. melanura*, Leisler).

L. melanuroides, Gould, Birds of Austr.

Never observed on the Chinese coast, and not noted from the Amoor by von Schrenck. Middendorff found young birds on the great Schantar Island on the 11th August. Said to be found on lakes and inland marshes of China, whence it is brought to the Tientsin and Shanghai markets in winter. It is probably from Mantchuria that these birds come, spreading down to the Indian Archipelago southwards, and eastwards to North Australia, to both of which places they resort in winter. Temminck and Schlegel note it from Japan.

285. Pseudoscolopax semipalmatus, Jerdon, Blyth, J. A. S. xvii. 252.

Micropalama tacsanowskia, J. Verreaux, Revue de Zoologie.

Summers in inland Northern China and Mongolia, migrating overland in winter southwards, occasionally into the plains of Hindostan. Messrs. Jerdon and Blyth have procured it near Calcutta and on the Coromandel coast in the cool season. I have one in partially moulted plumage, shot in autumn at Hankow, Central China, and another in full summer plumage from the neighbourhood of Tientsin. In its bright rufous summer garb, and in almost every particular, this bird is a perfect Godwit. You have only to cut off the bill, and it is almost undistinguishable from *Limosa uropygialis*. It forms the same connecting link between *Limosa* and *Scolopax* that *Macroramphus griseus* appears to form between *Totanus* and *Scolopax*.

286. Scolopax rusticola, L.

Very common in North China and Japan during winter. Frequent, but rarer, during the same season on the hills of Southern China. Curiously enough, it is not noted from Amoorland. Specimens identical with the European bird.

287. Gallinago solitaria, Hodgs.

Scolopax hyemalis (Grismann), Midd. Sib. Reise.

I procured a specimen one winter on the hills of Amoy, which was identified by Mr. Blyth as of this species. The specimen was unfortunately never returned to me; so I have not been able to compare it with skins in museums in England. It is said by Messrs. Temminck and Schlegel ('Fauna Japonica') to be also found in South Japan. If so, we can easily account for its presence in Amoy. My specimen haunted for several weeks a mountain stream, and did not care apparently to mix with the Snipes of the rice-fields on the plains. I may here remark that a large Snipe, brought by Captain Blakiston from North Japan, was identical with *G. australis*, Gould, of Australia (see The Ibis, 1863, p. 416).

288. Gallinago megala, Swinhoe, Ibis, 1861, p. 343.

Scolopax palustris, Pall.

This is the Great Snipe of China. I found it on the marshes near Peking in September. At the close of the same month it passes down the coast, being found at Shanghai, Amoy, and Canton for a few days only, and apparently bound further southwards. At the end of April and beginning of May it occurs in South China again for a few days, and is then bound north. During the season of its migrations, I procured it also in S.W. Formosa. It does not appear to have been noted in Amoorland; but Pallas's Great Snipe from Siberia will probably be the same as our bird. Pallas failed to distinguish the Eastern from the Western Great Snipe. His name therefore might with equal propriety be applied to either.

289. GALLINAGO STENURA, Temm.

G. horsfieldii, Gray.

Abundant from Canton to Pekin. It moves about in flocks in winter, but seems to breed in many places throughout China, north and south. Chinese specimens are identical with those from Hindostan and Java.

290. GALLINAGO SCOLOPACINA, Bp.

Scolopax gallinago, L.
S. biclava, Hodgs.

This Snipe appears to be of very general distribution throughout Asia. It is the only one of this genus noted by von Schrenck from Amoorland. In North China it probably breeds; but, as far as my observations go, in South China and Formosa it is only a winter bird.

291. GALLINAGO BURKA (Lath.).

G. brehmi, Kaup.
G. uniclava, Hodgs.

The same peculiarity of fourteen tail-feathers, with the long outermost one, occurs in the majority of my Snipes from Canton and Pekin. This is the *common* Snipe of China, visiting the south in large wisps during winter. Indian skins are identical with those from China. It appears to be the Eastern representative of the foregoing, which occurs more sparsely.

292. GALLINAGO GALLINULA, L.

Said by sportsmen to be abundant at Canton. I have never met with it, and therefore know nothing of its movements. It may retire northwards by an inland route; but von Schrenck does not note it from the Amoor, and it is not recorded as a Japanese bird.

293. RHYNCHEA BENGALENSIS, L.

Scolopax capensis, Gm.
R. orientalis, Horsf.
R. sinensis, Lath.

The Cape, the Indian, and the Chinese bird all appear to be the

same species, the female being much larger, and coloured in a more brilliant and variegated manner. It is somewhat sparsely scattered throughout the plains of China, from Canton to north of Foochow; but I do not think it ever occurs so far up as Shanghai. It is a resident species, and generally found solitary or in very small parties.

294. Calidris arenaria.

Charadrius calidris, L.
Tringa tridactyla, Pall.

This bird occurs at Amoy and on the South China coast only in September, October, April, and May, its southward destination being apparently in lower latitudes, and its northward much higher, though it is not noted from Amoorland. A few are occasionally met with the winter through.

295. Strepsilas interpres, L.

The same remarks may be applied to this as the last. I have procured both these birds in summer as well as winter dress at Amoy.

296. Lobipes hyperboreus, L.

Noted from Amoorland. Parties come down our coast as early as October, and some do not return till very late. I have procured them off the Amoy coast in May, in nearly complete summer plumage.

297. Phalaropus fulicarius, L.

I have not yet observed this species in China, but it occurs in winter in Hindostan. Middendorff found it breeding on the 17th July in S.E. Siberia; and it thence doubtless visits the interior of China, if not the coast. It has been procured from Kamtschatka and the Kurile Islands.

298. Tringa tenuirostris.

Totanus tenuirostris, Horsf. Linn. Trans. xiii. p. 192.
Schœniclus magnus, Gould, Birds of Austr.
T. crassirostris, Temm. & Schleg. Faun. Jap. 1850.

Noted from Amoorland and Japan. A few occasionally come down the China coast. I have one from Shanghai. Its migrations from the Amoor are doubtless in a more easterly direction, towards Australia, touching at Japan, from both which countries it has been brought.

299. Tringa canutus, L.

Noted from Amoorland. Extremely rare in China. I have a young specimen from Shanghai.

300. Tringa maritima, Brünn.

Three specimens procured out of a flock, on the 9th August, by Middendorff in Amoorland, lat. 75°.

301. TRINGA PLATYRHYNCHA, Temm.

Rare on the Chinese coast, but pretty common in early winter on the mud-flats of Formosa.

302. TRINGA RUFESCENS, Vieill.

A single specimen procured by Middendorff, on the 30th June, on the south coast of Sea of Ochotsk.

303. TRINGA CINCLUS, L.

T. chinensis et *T. subarcuata* of my previous lists in The Ibis.

Very abundant on the China coast the winter through. They retire northwards on the approach of summer, but return early, often in nearly full summer plumage.

304. TRINGA SCHINZII, Brehm.

Found by Middendorff amongst flocks of the foregoing, 11th August, on south coast of Sea of Ochotsk.

305. TRINGA ACUMINATA.

Totanus acuminatus, Horsf. Linn. Trans. xiii. p. 192.
Schœniclus australis, Gould, Birds of Austr. vi. pl. 30.

Allied to *T. pectoralis* of America, but quite distinct. Very common on marshes near Pekin in August. It occurs occasionally on South Chinese coast. I procured a few at Amoy in April and May in almost full summer dress. I suspect their migrations are usually more easterly, to Australia.

306. TRINGA DAMACENSIS.

Totanus damacensis, Horsf. Linn. Trans. xiii. p. 192.
Tringa subminuta, Midd. Sib. Reise.

Allied to *T. minuta*, Leisl., but at once distinguished by its very long toes, and by the brown instead of white shafts to its primaries. Middendorff (Sib. Reis.) procured a pair in summer plumage in Siberia. In that plumage they were similar to *T. minuta*, except in the distinctions before stated. I have one in winter plumage from Formosa, two in summer from Amoy, and several sent to me by Mr. Blyth from Calcutta labelled *T. minuta*. I have compared our specimens from China and India, in company with Mr. Tristram, with examples of the European *T. minuta*, and we are agreed in its decided specific distinction. The true *T. minuta* occurs only as a straggler in Siberia, where it is replaced by this species, which doubtless thence ranges in winter into Hindostan in great abundance. These birds occur every year in sparse numbers near Amoy, on inland marshes, early in winter and late in spring, during their migrations. *T. pusilla*, Wils., of America, has longer toes than *T. minuta*, and seems to form a link between it and this species.

307. TRINGA ALBESCENS, Temm.

Visits the South China coast in flocks in September, and again in

April and May. It has probably a long way to travel, for in winter it is found throughout the Indian Archipelago and in Australia. In summer its throat and neck become brick-red, and it then looks much like a miniature of the Sanderling (*Calidris arenaria*). I have in previous lists wrongly referred this species to *T. subminuta*, Midd.

308. Tringa subarcuata, L.

A specimen in full red summer plumage received from Tientsin. It is also noted from Amoorland. Its migrations do not appear to extend far south, for I have never met with it on the coast below Shanghai.

309. Tringa temminckii, Leisl.

Common during the winter in South China, on the banks of inland lakes and marshes.

310. Eurinorhynchus pygmæus, Lath.

A large flock of these was observed by Middendorff on the south coast of the Sea of Ochotsk in July.

311. Numenius minutus, Gould, Birds of Austr.

N. minor, Temm. & Schleg. Faun. Jap.

Smaller than *N. borealis* of America, and quite distinct. It is noted from Amoorland and Japan, whence probably it migrates to winter in Australia. A few occur occasionally on the South China coast. I have a pair shot at Amoy on the 29th of April.

312. Numenius phæopus, L.

Is said to be common in India in winter, whither it probably comes from Siberia, where it occurs in summer, according to Pallas and Middendorff. Temminck notes having procured it from Japan. Hence I include it in my list, though not as yet observed on the Chinese coast.

313. Numenius uropygialis, Gould, Birds of Austr.

Procured by myself in South-west Formosa in October. Found in Australia and the islands of the Indian Archipelago, in all of which it probably breeds, as I have reason to suppose it does at Formosa. My two specimens are identical with two from Halmaheira, sent me by Professor Schlegel. It differs from the Whimbrel, *N. phæopus*, in having a brown and white-barred rump, and forms the intermediate link between that species and the brown-and-black rumped *N. hudsonicus* of America.

314. Numenius ——?

A species smaller than *N. arcuatus*, with long thin bill, allied to *N. tenuirostris* of North Africa, is noted by Cassin (Proc. Acad. Sci. Phil.) from Hakodadi, North Japan. This species has, unfortu-

nately, not been named. Nothing is known of it except from Cassin's short note.

315. NUMENIUS TAHITIENSIS, Gmel.; Cassin in Perry's Expedition to Japan, ii. p. 228.

This species was procured by the members of the American Expedition to Japan under Commodore Perry. It was previously considered peculiar to Otaheite and the islands of the Pacific. Figures and a good description of it are given in the work named. It may have been only a straggler to the Japanese shores; but I include it in my list on the probability of its also occasionally occurring on the shores of China. I strongly suspect, however, that it is identical with the foregoing *N. uropygialis*.

316. NUMENIUS ARCUATUS, L.

Visits the coasts of China, as far south as Canton, in large flocks in winter, retiring northwards on approach of summer. Von Schrenck does not note it from Amoorland.

317. NUMENIUS MAJOR, Temm. & Schleg. Faun. Jap.

Distinguished from the last by its much longer and heavier bill and by its longer legs. Visits the shores of South China and Formosa in winter, and probably retires to Japan to breed, whence it was originally described.

318. NUMENIUS AUSTRALIS, Gould.

Easily distinguished from *N. arcuatus* and allied species by its barred upper tail-coverts. It is the only Curlew reported from Amoorland. I found it very abundant about the marshes near Pekin in August, but have never observed it on the coasts of South China; hence I should infer that its migrations are in an easterly direction towards Australia, in which country it is found in winter.

319. NUMENIUS RUFESCENS, Gould, P. Z. S. 1862, p. 286.

Appears to be a local race of the last, being, like it, barred on the rump, but much more rufescent. I found it breeding in North Formosa.

320. THRESKIORNIS MELANOCEPHALUS, L.?

This is the only known species to which I can liken the black-headed white Ibises that I met in a flock at Talienwan in July 1860 (see The Ibis, 1861, p. 261). It is found in India, and, as is the case with many other Indian species of birds, probably summers in the interior of North China. It has not been recorded by others from Eastern Asia.

321. IBIS NIPPON, Temm. & Schleg. Faun. Jap.

Breeds probably in Japan, and is found in small parties on the coast near Shanghai and at North Formosa in winter. The immature plumage is grey; that of the adult pure white.

322. Platalea major, Temm. & Schleg. Faun. Jap.

Breeds probably in Japan. A winter visitant to Formosa and the South Chinese coast, as far south as Canton. I have procured it from Swatow.

323. Platalea minor, Temm. & Schleg. Faun. Jap.

Described from Japan. I have never seen it from China, but it probably occurs on the coast during winter.

324. Ciconia nigra, L.

Noted from Amoorland. Said to occur in North China.

325. Ciconia alba, L.

Noted from Amoorland. Said to occur in North China.

326. Ardea cinerea, L.

Throughout China to Amoorland, Japan, and in Formosa.

327. Ardea purpurea, L.

Interior of Central China. I have specimens from Hankow. Has also been procured from Japan (Temminck).

328. Herodias alba, L.

Ardea modesta, Gray.
A. syrmatophora, Gould.

Mr. Blyth agrees with me in considering the Great Egret of Europe, Asia, Africa, and Australia the same. It acquires a black bill and long dorsal plumes in summer, in winter the plumes fall away, and the bill of the bird becomes yellow. There is a considerable difference in size between the male and female, the male being much larger. Found throughout China into Amoorland, in Formosa, and probably Japan, though not yet noted from the last place.

329. Herodias intermedia, Wagl.

Ardea egrettoides, Temm.
H. plumifera, Gould, Birds of Austr.

In size this is intermediate between the foregoing and the succeeding. In winter it also has a yellow bill, but that organ is proportionally very short. In summer the bill turns black; it acquires long straight dorsal plumes, not curled upwards as in the next; and the pectoral plumes are like those of the back, not acuminate, thus distinguishing it at once from its near allies. I have a specimen from Hankow, Central China, and have seen it at Tientsin; so I suspect it is widely distributed throughout China. It is also noted from Japan and India, and is probably the same as *H. plumifera* of Australia.

330. Herodias garzetta, L.

A very lovely bird in full plumage. Very abundant throughout

Southern China, as far north as Shanghai, as also in Formosa. Not noted from Northern China, Amoorland, or Japan.

331. Herodias eulophotes, Swinhoe, Ibis, 1860, p. 64, et 1863, p. 418.

Sparsely distributed throughout Southern China, but commonest in North Formosa. Allied to the foregoing, but has a *yellow* bill in summer, the dorsal plumes straight, and the occipital plumes a bunch instead of a few long feathers. In winter it is distinguishable by its very short legs and by its thicker light greenish-yellow bill.

332. Buphus coromandelianus, Scop.

A common summer visitant to South China and Formosa, retiring south on approach of winter. Has been procured, according to Temminck, in Japan.

333. Butorides javanica, Horsfield.

B. virescens, var. *scapularis* (Illig.); von Schrenck, Amurland, p. 437.

A summer visitant to China and Amoorland.

334. Ardeola prasinosceles, Swinhoe, Ibis, 1863, p. 421.

A resident species in South China, as far north as Shanghai, extending westwards to Hankow, and southwards probably to Siam. Its nearest ally is the *A. speciosa*, Horsf., of Java, which, however, in mature plumage has the head and neck orange-buff, with long cream-white crest-feathers, instead of having the whole a deep maroon colour.

335. Nycticorax griseus, L.

A resident species, abundant throughout China from Canton to Pekin, and in Formosa.

336. Nycticorax melanolophus, Raffles.

Ardea goisagi, Temm. & Schleg. Faun. Jap.

From Japan and the Indian Archipelago. I observed a bird resembling this near Tientsin (see The Ibis, 1861, p. 344).

337. Botaurus stellaris, L.

Somewhat sparsely scattered throughout China to Amoorland. I have specimens from Canton and Swatow.

338. Ardetta flavicollis, Lath.

South China, from Canton to Shanghai and in Formosa. A few, I think, stay all the year, though most are summer visitants.

339. Ardetta cinnamomea, Gmel.

A summer visitant to China, Amoorland, and Japan. A few stay all the year in South China.

340. Ardetta sinensis, Gmel.

Found in summer, from Canton to Tientsin, and in Formosa. On the approach of winter they retire south. I have an undoubted hybrid between this and the last species, procured at Amoy. It curiously combines the characters of both. M. J. Verreaux has mentioned to me an analogous case of a hybrid between *A. cinerea* and *A. purpurea*. Temminck refers the small Japanese Bittern to *A. minuta*, L., of Europe, but I suspect he is wrong in this.

341. Hydrophasianus sinensis, L.

Parra luzoniensis, Gmel.

Interior of Southern and Central China. I have fine specimens in full summer plumage from Hankow.

342. Gallicrex cristatus, Lath.

I consider this bird a summer visitant to South China, from Canton to Shanghai, and also to Formosa. I have specimens in full summer plumage from Hankow; and it was shot by Captain Blakiston's party at Foochow in Szechuen, 1700 miles up the Yangtzse, in May, in a wheat-field near no water.

343. Gallinula chloropus, L.

A resident species throughout China and Formosa. Specimens from there are identically the same as European ones. The Japanese form is said to vary somewhat.

344. Gallinula phœnicura, Penn.

This is I think a summer visitant to China. It is not uncommon during that season from Canton to Tientsin, and in Formosa.

345. Porzana fusca, Shaw.

P. erythrothorax, Temm. & Schlegl. Faun. Jap.

Identical with Indian examples. Varies much in size. Found throughout China, Japan, and Formosa.

346. Porzana minuta, Pall. (*P. pusilla*, Gmel.).

This species is given by Temminck from Japan.

347. Porzana pygmæa, Naumann.

Gallinula bailloni, Vieill.

Procured from Tientsin, and is probably found throughout Central China, as it is throughout Hindostan. Japan (Temminck).

348. Ortygometra crex, L.

Said to have been procured from China. I have never met with the bird there.

349. Rallus striatus, L.

Procured in Formosa, identically the same with Indian and Malayan specimens. It probably also ranges throughout Southern China.

350. Rallus aquaticus, L.

Identical with British examples, except in its having a thicker bill. Specimens received from Tientsin. It probably ranges throughout Northern and Central China. It occurs also in Japan. The Indian race has a thicker bill, and more distinct white striæ on the upper wing-coverts.

351. Fulica atra, L.

Found throughout China, but commoner in the northern half, from Shanghai to Pekin. From the last-named and from Hankow I have specimens identical with the European bird. Occurs also in Japan.

Anseres.

352. Podiceps minor, Gmel.

P. philippensis, Gmel.

Found throughout China and Formosa. In cold, many leave the ponds of the interior and take to the sea. In full plumage, identical with European specimens.

353. Podiceps rubricollis, Lath.

P. subcristatus (Jacq.), von Schrenck, Amurland, p. 493.

P. rubricollis major, Temm. & Schleg. Faun. Jap.

Lakes of North China, up to Amoorland, and in Japan. I have never met with it on the coast.

354. Podiceps auritus, L.

Lakes of Central and Northern China, appearing on the southern coast in severe winter seasons. Japan (von Schrenck). I have a specimen from Amoy.

355. Podiceps cornutus, Lath.

North China to Amoorland. Visits the south coast in winter. I have a specimen from Amoy.

356. Podiceps cristatus, L.

P. cornutus, Pall.

Very common. In winter large numbers appear on the southern coast. Kamtschatka and Japan (Temminck).

357. Colymbus septentrionalis, L.

Very common on the southern coast in winter.

358. Colymbus glacialis, L., var. *adamsii*, Gray.

Sea of Ochotsk (Midd.).

359. Colymbus arcticus, L.

Amoorland (von Schrenck); said to visit the north coast of China.

360. Mergus albellus, L.

North China in winter. Abundant in the Tientsin market.

361. Mergus serrator, L.

Common throughout China.

362. Mergus merganser, L.

North China. Abundant in markets at Tientsin in winter. It is probably also a summer bird in the large marshes of that neighbourhood.

363. Cygnus musicus, Bechst.

Visits North China and Japan in winter (Temm.).

364. Cygnus minor, Pall.

C. bewickii, Yarr.

Commoner than the foregoing. Comes down in winter occasionally as far south as Canton.

365. Anser cygnoides, L.

A large wild Goose, answering to von Schrenck's description of the so-called stock of the Chinese domestic Goose, visits the shores of North China in winter, and is frequently procurable in the market; but it has no distinct knob on the bill.

366. Anser hyperboreus, Pall.

Sea of Ochotsk (Midd.); Japan and Kamtschatka (Temm. & Sieb.).

367. Anser grandis, Gmel.

Shanghai in winter.

368. Anser segetum, Gmel.

Down to Canton in winter.

369. Anser ferus.

A. cinereus (Meyer & Wolf); von Schrenck.

To Canton in winter.

370. Anser albifrons, Penn.

All these are procurable during winter in the Shanghai and Tientsin markets.

371. Anser erythropus (Linn.) (*A. minutus*, Naumann); Midd. Sib. Reise.

372. Anser leucopsis, Bechst.; Midd. Sib. Reise.

373. Anser bernicla, Ill.; Midd. Sib. Reise.

374. Anser ruficollis, Pall.; Midd. Sib. Reise.

375. Anser brenta, Pall.

Sea of Ochotsk (Midd.).

376. Aix galericulata, L.

Found in the lakes of Central China and neighbourhood of Ningpo in winter. Said to breed in Amoorland.

377. Tadorna vulpanser, Linn.

378. Casarca rutila, Pallas.

379. Anas boschas, L.

380. Anas pœcilorhyncha, Temm.

381. Anas glocitans, Pall.

382. Anas falcaria, Pall.

383. Anas crecca, L.

384. Anas querquedula, L.

385. Anas strepera, L.; Midd. Sib. Reise.

386. Anas acuta, L.

387. Anas penelope, L.

388. Anas stelleri, Pall. (Midd. Sib. Reise).

389. Anas clypeata, L.

390. Anas spectabilis, L. (Midd. Sib. Reise).

391. Anas histrionica, L. (von Schrenck).

392. Anas clangula, L.

393. Fuligula marila, L.

394. Fuligula cristata, Leach.

395. Œdemia nigra, L. (*A. atra*, Pall.).

North and East Siberia (Pallas). Japan (Temminck).

396. Œdemia americana, Swainson.

Shot by Captain Blakiston's party at Chinkiang, on the Yangtsze, in winter.

397. Œdemia fusca, L.

Amoorland (Midd.).

398. Harelda glacialis, L.

Amoorland (Midd.).

399. Phalacrocorax carbo, L.

Graculus carbo, L.; Cassin, Perry's Exped. ii. p. 239.

At Yeddo in April.

I can find no special points of difference between my Amoy spe-

cimens and the English bird. It only winters in South China, returning to the north and Amoorland to breed.

400. PHALACROCORAX CAPILLATUS, Faun. Jap. pl. 83.

Carbo filamentosus, Temm. & Schleg. Faun. Jap. p. 129.

This species from Japan is recognized as distinct by Temminck, and well described and figured in the 'Fauna Japonica.' I admit it on the authority of that work, though I have never met with it in China.

401. PHALACROCORAX BICRISTATUS, Pall.

Sea of Ochotsk (Midd.). Also Japan, according to Temminck and Schlegel, 'Fauna Japonica,' where it is described and figured. A straggler was procured one winter at Amoy, South China.

402. PELECANUS ONOCROTALUS, L.

Said by Temminck to have been procured in Japan. From East Europe and Hindostan.

403. PELECANUS PHILIPPENSIS, Gmel.

This bird visits the south coast of China during winter in small parties.

404. SULA FUSCA, Shaw.

A bird from Shanghai is of this species. I have never met with it on the Chinese coast. It is recorded in the 'Fauna Japonica' from Japan.

405. LARUS NIVEUS, Pall.; Bp. Consp. Av. ii. p. 224.

L. canus, var. *major*, Midd. Sib. Reise.

The Eastern representative of *L. canus*, with larger and stronger bill; irides yellowish grey; eyelids red; bill unspotted, greenish yellow; legs yellowish green. Is found in Kamtschatka and North-eastern Asia, visiting the south coast in winter. I have several from Amoy in all plumages, and one without a hind claw. The immature birds that reach us have always the back more or less grey, proving the plumage completed in two years.

406. LARUS TRIDACTYLUS, var. BRACHYRHYNCHUS.

Rissa brachyrhyncha, Gould.
Gavina citrirostris, Bruch.; Bp. Consp. Av. ii. p. 226.

The Eastern representative of *Rissa tridactyla*, L. Found in Kamtschatka. Not yet procured in China. Thus distinguished by Bonaparte:—"Minor: alba, pallio plumbeo-cano: remigibus primariis griseis, *nec intus* albis, extimis duabus apice late nigris; tertia, quarta et quinta fascia subapicali nigra; sexta macula tantum nigra in pogonio externo: rostro brevi, robusto, incurvo, flavissimo: pedibus rubro-flavis.

"Long. 14 poll. Rostr. $1\frac{1}{3}$. Al. 12 poll. Caud. $4\frac{1}{2}$. Tars. 1 poll."

407. Larus crassirostris, Vieill.

L. melanurus, Temm. & Schleg. Faun. Jap.

Albus, dorso alisque fusco-cinereis; remigibus primariis nigris, ceteris cum tectricium apicibus albis; cauda alba, fascia subterminali latissime nigra: rostro validiusculo, flavido, apice nigro annulato: pedibus fusco-carneis.

Long. 17 poll.

This species breeds in Japan and Talienwan, repairing in large numbers to the South China coast. In full plumage it can always be distinguished from *L. niveus* by its black tail-band, its much darker mantle, and by its large bill, banded at the end with black and crimson. The immature are very much browner than those of the other bird. The different stages of its plumage have been well figured in the 'Fauna Japonica.' I have numbers of specimens from various parts of China,

408. Larus glaucescens, Licht.; Bp. Consp. Av. ii. p. 216.

L. glaucus, Brünn.; Midd. Sib. Reise.
L. brachyrhynchus, Gould.

Ex Ocean. Pac., Arct. et Kamtschatka. Not yet met with on the coasts of China or Japan. Simillimus *L. glauco*, sed minor (long. 2 ped.), et remigibus *perlaceis*, nec nigris nec albis, apice tantum candidis: rostro flavo, angulo mandibulæ aurantiaco.

409. Larus leucopterus, Faber; Midd. Sib. Reise.

A small form of the preceding (length 20 inches), with comparatively longer wings, said by Middendorff to occur also in North-east Asia.

410. Larus occidentalis, Aud. Synop. Birds of Am. p. 328.

"Bill robust, compressed, yellow, with an orange-red patch toward the end of the lower mandible; iris light hazel; feet flesh-coloured; head, neck, lower parts, rump, and tail pure white; back and wings light greyish blue, of a deeper tint than in *L. argentatus*; edges of the wings and extremities of the quills white; first seven quills greyish black toward the end, that colour including the outer webs and the greater part of the inner of the two first, and on the rest gradually diminishing, so as on the seventh merely to form a subterminal bar; the first quill with a patch of white on both webs near the end; the tips of all white.

"This species, which is very intimately allied to *Larus argentatus*, is remarkable for the great depth and comparative shortness of its bill."—*Aud.*

Length 27 inches; wing $18\frac{1}{2}$; tail $8\frac{1}{4}$; bill, along culmen, $2\frac{1}{2}$; height at angle $\frac{9}{10}$.

The above description answers exactly to the large form of Gull, allied to *L. argentatus*, that visits our southern coasts in winter. I have frequently procured them at Amoy in that season in all stages, but more frequently in the immature. It is the West American re-

presentative race, extending probably to Kamtschatka, whence, doubtless with many other sea-birds, it wends southwards down our line of coast. I have two in very complete plumage. From observation, I should say that these birds require full three years for change into adult attire.

411. Larus cachinnans, Pallas.

L. argentatus, var. *major*, von Schrenck.

Amoorland.

Length 22½ inches; wing 16½–18; tail 7; tarsi 2½; bill, along culmen, 2¼; height at angle $\frac{7}{10}$.

This smaller representative of *L. argentatus* bears to the preceding species the same relation that *L. leucopterus* does to *L. glaucus*, its wings being relatively longer. It is a commoner winter visitant than the former to Amoy, whence I have procured several both adult and immature. It has a darker more slaty back than *L. argentatus*, and is considered by some an intermediate link between that species and *L. fuscus*. It summers in N.E. Asia. Specimens vary a good deal in size and proportions, but I have never procured any exactly intermediate between the largest of this and the smallest of *L. occidentalis*.

412. Chroicocephalus ichthyaëtos, Pall.

This monster black-capped Gull is noted by Cassin as procured at Hakodadi (see Perry's 'Expedition to Japan,' vol. ii. p. 252). It is said to be a bird of the Caspian and Red Seas, and to occur abundantly in the Bay of Bengal. It is not stated to be found in Amoorland or Kamtschatka; but it possibly makes its way to Japan, following the course of the warm Gulf-stream.

413. Chroicocephalus brunneicephalus, Jerdon.

L. ridibundus, var. *major*, Midd. Sib. Reise.

The Siberian and Japanese bird would appear, from descriptions, to be the same as the Brown-hooded Gull of India. Its range extends to Kamtschatka. I have a specimen from India, forwarded to me by Mr. Blyth.

414. Chroicocephalus capistratus, Temm.

Larus brunneicephalus, Cassin, Perry's 'Expedition to Japan,' vol. ii. p. 232.

This comes to Amoy in the winter. I have one from Amoy, and another from Macao; and Cassin notes the occurrence of a similar bird from Hakodadi. It is smaller than the European *C. ridibundus*, and has a more slender bill, and is doubtless its representative in the East. It answers well to the description of *C. capistratus*, Temm., which has occurred in Great Britain, and which Mr. Tristram and others are inclined to believe is only a variety of *C. ridibundus*. The specimens, however, that have occurred in Europe might possibly have been stragglers from the East.

415. Chroicocephalus kittlitzii, Licht.

Easily distinguished by its short, thick, *black* bill. It acquires a deep-black hood in summer. I have it in both summer and winter plumage from Amoy, where it occurs in large numbers the winter through, ascending rivers at fall of tide in search of mollusks and small crustaceans. It is said to summer in Kamtschatka and N.E. Asia.

416. Chroicocephalus sabinii, Leach.

417. Chroicocephalus minutus, Pall.

Both birds of the British lists. I introduce them from the fact of Middendorff stating that they occur on the shores of the Sea of Ochotsk.

418. Lestris pomarina, Temm.
419. Lestris parasita, Boie.
420. Lestris buffonii, Boie.

Said by Middendorff to occur on the shores of the Sea of Ochotsk. None of them have yet been obtained in China.

421. Rhynchops albicollis, Swainson.

Southern Ocean. Said occasionally to occur on the coast of Southern China.

422. Sylochelidon caspia.

Sterna caspia, Latham.
Sylochelidon strenuus, Gould, B. of Austr.

Visits the coasts of China in winter. I have specimens from Amoy.

423. Gelochelidon anglica.

Sterna anglica, Montagu.

Said to wander occasionally to the coast of South China in winter.

424. Hydrochelidon indica.

Viralva indica, Stephens.
Sterna hybrida, Pallas.
S. leucopareia, Natterer.

A common resident on the marshy plains of S.W. Formosa. I have not observed it elsewhere in China.

425. Hydrochelidon nigra.

Sterna nigra, L.
S. fissipes, Pall.
S. leucoptera, Temm.

Found throughout China, into Amoorland. I have a specimen in full summer plumage from Amoy, and several in a variety of plumages from near Pekin.

426. Thalasseus cristatus.

Sterna cristata, Stephens.
S. pelecanoides, King.
S. velox, Rüppell.

Seas of Southern China. Numbers breed yearly on the rocks of North Formosa.

427. Sterna macrura, Naum.; Midd. Sib. Reise.

Said to occur in N.E. Asia.

428. Sterna fuliginosa, Temm. & Schleg. Faun. Japon.

Procured as yet only from Japan.

429. Sterna hirundo, L.

S. fluviatilis, Naumann.

Central China; never yet observed on the coast. I have a specimen from Hankow.

430. Sterna longipennis, Nordmann; von Schrenck, Amurland, Vögel, p. 512.

From Amoorland, probably descending into North China. I have never met with it. Allied to the last, but with *black* bill and longer wings.

431. Sternula minuta, L.

Visits the Chinese coast in winter. I have specimens from Amoy.

432. Sternula sinensis, Gmel.; Swinhoe, Ibis, 1863, p. 429.

S. sumatrana, Raffles.

A common summer species in Formosa, breeding in large numbers on the precipitous rocky coast on the eastern side of the island. I have also specimens in various stages of plumage from Hankow, showing that it also breeds in Central China. I have never met with it on the Chinese coast; but from its being found in the Malayan archipelago, I should fancy that it migrates thither in winter.

433. Anous stolidus.

Sterna stolida, L.

Found in South China Sea; breeds on the eastern rocks of Formosa, whence I have a pair.

434. Diomedea brachyura, Temm.
435. Diomedea nigripes, Audubon.

Seas of Southern China, the former ranging as far north as Japan. These are the only two species of Albatros found north of the line. For remarks on them, see Ibis, 1863, p. 431.

436. Procellaria glacialis.

Procellaria glacialis, L., var. *pacifica*, Aud.; Bp. Consp. Av. ii. p. 187.

Kurile Islands and Amoorland.

437. Procellaria desolata, Gm.; Bp. Consp. Av. ii. p. 189.

Kamtschatka.

438. Thalassidroma leachii, Temm.; Bp. Consp. Av. ii. p. 195.

Amoorland.

439. Nectris tenuirostris, Temm.; Bp. Consp. Av. ii. p. 202.

Puffinus tenuirostris, Faun. Jap. pl. 86.

Corea and Japan.

440. Puffinus leucomelas, Temm.; Bp. Consp. Av. ii. p. 205.

Procellaria æquinoctialis, Pall.

Japan (Temm. Pl. Col. 587).

441. Uria antiqua, Penn.

U. senicula, Pall.
Synthliboramphus antiquus, Brandt.

Amoorland (v. Schrenck), Japan (Faun. Jap.).

442. Uria umizusume, Temm. & Schl.

Synthliboramphus temminckii, Brandt.

Japan (Faun. Jap.).

443. Uria (Cepphus) carbo, Pall.; von Schrenck, Amurland, p. 496.

Amoorland.

444. Uria (Cepphus) columba, Pall.

Sea of Ochotsk.

445. Uria (Cepphus) lomvia, Brünn.

Sea of Ochotsk.

446. Alca torda, L.

Japan (Faun. Jap.).

447. Ceratorhyncha monocerata.

Alca monocerata, Pall.

Hakodadi, North Japan (Cassin, Perry's Exped. ii. p. 233).

448. Phaleris cristatella, Pall.; von Schrenck, p. 500.

Amoorland.

449. Phaleris mystacea, Pall.

Sea of Ochotsk, Japan (Cassin).

450. Phaleris tetracula, Pall.; Midd. Sib. Reise.

N. E. Asia.

451. Ombria psittacula, Pall.; Midd. Sib. Reise.

South Sea of Ochotsk.

452. Mormon cirrhatum, Pall.; von Schrenck, p. 503.

Amoorland.

453. Mormon corniculatum, Kittlitz; Midd. Sib. Reise.

South coast and islands of Sea of Ochotsk.

454. Mormon glaciale, Leach.

Kamtschatka, Kurile Islands, and Saghalien (Midd.).

In the above list, down to No. 254 (*Otis tarda*), I have restricted myself to those birds that I know from personal observation, or believe on reliable evidence, to occur in China limited—that is, from Canton to the borders of Mantchuria. Beyond that number, I have included all the species that I have been able to find recorded from North-eastern Asia and its islands. These are chiefly sea-birds, which, as every naturalist knows, are of an erratic nature, and often in severe winters turn up in very low latitudes on the same line of coast. I have in every case quoted the authority for the localities given.

For the sake of comparison with the land-birds of China, I subjoin comparative lists of the land-birds of Japan, Amoorland, and Formosa. My authorities for the first of these have been the 'Fauna Japonica,' Cassin's articles in Perry's 'Expedition to Japan' and in the 'Proceedings of the Academy of Natural Sciences of Philadelphia,' and Captain Blakiston's two papers in The Ibis*. For the second I have resorted to Middendorff's 'Sibirische Reise' and von Schrenck's 'Amurland.' The third I have added from my articles on the Ornithology of Formosa in The Ibis, 1863, pp. 198, 250, 377.

The lists are as complete as I have been able, with these references, to make them. In the Japanese list, those marked "(Temminck)" are inserted from von Schrenck's "Schlussfolgerungen," at the end of his 'Birds of Amoorland;' and I am therefore not responsible for the authority. There are some birds so given which I cannot believe to be Japanese; these I have marked with notes of surprise. *Thaumalea picta* is certainly not a Japanese bird. I have, however, thought it best for the present to leave them as they stand for the criticism of future explorers.

* See The Ibis, 1862, p. 309, and 1863, p. 97.

Amoorland.	No.
Aquila nævia, *Briss.*	1
Haliaëtos albicilla, *L.*	2
—— pelagica, *Pall.*	3
Pandion haliaëtus, *L.*	4
Milvus melanotis, *T. & S.*	5
Falco candicans, *Gmel.*	6
—— peregrinus, *L.*	7
—— subbuteo, *L.*	8
—— vespertinus, *L.*	9
Tinnunculus alaudarius, *Briss.*	10
Astur palumbarius, *L.*	11
Accipiter nisus, *L.*	12
Circus cyaneus, *L.*	13
Nyctea nivea, *Daud.*	14
Glaucidium passerinum, *L.*	15
Asio otus, *L.*	16
—— brachyotus, *L.*	17
Bubo maximus, *Siebold*	18
Ulula uralensis, *Pall.*	19
Nyctale funerea, *Lath.*	20

Japan.	No.
Aquila chysaëtos, *L.*?	1
Haliaëtos albicilla, *L.*	2
—— pelagica, *Pall.*	3
Pandion haliaëtus, *L.*	4
Buteo poliogenys, *T. & S.*	5
—— japonicus, *T. & S.*	6
—— hemilasius, *T. & S.*	7
Pernis apivorus, *L.*	8
Milvus melanotis, *T. & S.*	9
Falco candicans, *Gmel.*	10
—— peregrinus, *L.*	11
Tinnunculus japonicus, *Bp.*	12
Astur palumbarius, *L.*	13
Accipiter nisus, *L.*	14
—— gularis, *T. & S.*	15
Circus cyaneus, *L.*	16
—— æruginosus, *L.* (*Blakiston*)	17
Ninox japonicus, *T. & S.*	18
Asio brachyotus, *L.*	19
Scops semitorques, *T. & S.*	20
—— japonicus, *T. & S.*	21
Ulula rufescens, *T. & S.*	22
Syrnium aluco, *L.* (*Temminck*)	23
Strix flammea, *L.* (*Temminck*)	24

Formosa.	No.
Pandion haliaëtus, *L.*	1
Buteo japonicus, *T. & S.*	2
Milvus melanotis, *T. & S.*	3
Falco peregrinus, *L.*	4
Tinnunculus japonicus, *Bp.*	5
Spizaëtos orientalis, *T. & S.*	6
Accipiter gularis, *T. & S.*	7
Circus spilonotus, *Kaup*	8
Ninox japonicus, *T. & S.*	9
Athene pardalota, *Swinhoe*	10
Scops semitorques, *T. & S.*	11
Bubo caligatus, *Swinhoe*	12

Amoorland.	No.
Nyctale barbata, *Pall.* (*Midd.*)	21
Caprimulgus jotaka, *T. & S.*	22
Acanthylis caudacuta, *Lath.*	23
Upupa epops, *L.*	24
Cuculus canorus, *L.*	25
Hierococcyx fugax, *Horsf.*	26
Yunx torquilla, *L.*	27
Gecinus canus, *L.*	28
Dryocopus martius, *L.*	29
Picus major, *L.*	30
—— minor, *L.*	31
—— leuconotus, *Bechst.*	32
Apternus tridactylus, *L.*	33
Alcedo bengalensis, *Lath.*	34
Certhia familiaris, *L.*	35
Sitta europæa, *L.* (?)	36
Parus ater, *L.*	37
—— cyanus, *Pall.*	38
—— kamtschatkensis, *Bp.*	39
Mecistura caudata, *L.*	40

Japan.	No.
Caprimulgus jotaka, *T. & S.*	25
Upupa epops, *L.*	26
Cuculus canorus, *L.*	27
Yunx torquilla, *L.*	28
Gecinus awokera, *T. & S.*	29
Dryocopus martius, *L.* (*Blakiston*)	30
Picus leuconotus (*Blakiston*)	31
—— kisuki, *T. & S.*	32
Halcyon coromandelianus, *Scop.*	33
Alcedo bengalensis, *Lath.*	34
Ceryle lugubris, *T. & S.*	35
!! Coracias garrula, *L.* (*Temminck*)	36
Certhia familiaris, *L.*	37
Sitta roseilia, *Bp.*	38
Parus varius, *T. & S.*	39
—— minor, *T. & S.*	40
—— ater, *L.* (*Blakiston*)	41
!! —— cæruleus, *L.* (*Temminck*)	42
—— kamtschatkensis, *Bp.* (*Blakiston*)	43
Mecistura trivirgata, *T. & S.*	44

Formosa.	No.
Caprimulgus stictomus, *Swinhoe*	13
Cypselus vittatus, *T. & S.*	14
—— subfurcatus, *Blyth*	15
Cuculus canorus, *L.*	16
—— kelungensis, *Swinhoe*	17
Centropus viridis, *Scop.*	18
Gecinus tancola, *Gould*	19
Picus insularis, *Gould*	20
—— kaleënsis, *Swinhoe*	21
Megalæma nuchalis, *Gould*	22
Halcyon coromandelianus, *Scop.*	23
Alcedo bengalensis, *Lath.*	24
Parus castaneiventris, *Gould*	25
Alcippe morrisonia, *Swinhoe*	26
—— brunnea, *Gould*	27

Amoorland.	No.
Alauda arvensis, *L.*	41
Otocorys alpestris, *L.*	42
Anthus aquaticus, *Bechst.* (*Midd.*)!	43
—— cervinus, *Pall.* (*Midd.*)	44
—— japonicus, *T. & S.*	45
—— agilis, *Sykes*	46
Budytes flava, *L.*	47
Motacilla boarula, *L.*	48
—— ocularis, *Swinhoe*	49
—— luzoniensis, *Scop.*	50
Cinclus pallasi, *Temm.*	51
Turdus chrysolaus, *T. & S.*	52
—— daulias, *Temm.*	53
—— fuscatus, *Pall.*	54
—— naumanni	55
Oriolus chinensis, *L.*	56

Japan.	No.
Alauda japonica, *T. & S.*	45
Otocorys alpestris, *L.*	46
! Anthus aquaticus, *Bechst.* (*Temm.*)	47
—— cervinus, *Pall.* (*Temm.*)	48
—— japonicus, *T. & S.*	49
—— agilis, *Sykes*	50
? Budytes rayii, *Yarr.*	51
Motacilla boarula, *L.*	52
—— japonica, *Swinhoe*	53
Cinclus pallasi, *Temm.*	54
Microscelis amaurotis, *T. & S.*	55
Oreocincla heinei, *Bp.*	56
Turdus sibiricus, *Pall.*	57
—— cardis, *T. & S.*	58
—— chrysolaus, *T. & S.*	59
—— daulias, *T. & S.*	60
—— pallens, *Pall.*	61
—— naumanni, *Temm.* (*Blakiston*)	62
Merula mandarina, *Bp.*	63
Petrocincla manilensis, *Bodd.*	64

Formosa.	No.
Alauda cœlivox, *Swinhoe*	28
Anthus cervinus, *Pall.*	29
—— agilis, *Sykes*	30
—— richardi, *Vieill.*	31
Budytes taivana, *Swinhoe*	32
Motacilla boarula, *L.*	33
—— ocularis, *Swinhoe*	34
—— japonica, *Swinhoe*	35
—— luzoniensis, *Scop.*	36
Cinclus pallasi, *Temm.*	37
Hypsipetes nigerrimus, *Gould*	38
Ixos sinensis, *Gmel.*	39
Spizixos semitorques, *Swinhoe*	40
Oreocincla hancii, *Swinhoe*	41
Turdus chrysolaus, *T. & S.*	42
—— daulias, *T. & S.*	43
—— pallens, *Pall.*	44
—— fuscatus, *Pall.*	45
—— naumanni, *Temm.*	46
Petrocincla manilensis, *Bodd.*	47
Oriolus chinensis, *L.*	48
Psaropholus ardens, *Swinhoe*	49
Herpornis xanthochlora, *Hodgs.*	50
Garrulax taivanus, *Swinhoe*	51
—— ruficeps, *Gould*	52

Amoorland.	No.	Japan.	No.	Formosa.	No.
.....		.....		Garrulax pœcilorhynchus, *Gould*	53
.....		.....		Pomatorhinus musicus, *Swinhoe*	54
.....		.....		—— erythrocnemis, *Gould*	55
.....		.....		Myiophonus insularis, *Gould*	56
Pericrocotus cinereus, *Lafresn.*	57	.....		Pericrocotus cinereus, *Lafres.*	57
.....		.....		—— griseigularis, *Gould*	58
.....		.....		Graucalus rex-pineti, *Swinhoe*	59
Dicrurus macrocercus, *Lath.*	58	.....		Dicrurus macrocercus, *Lath.*	60
.....		.....		Chaptia brauneana, *Swinhoe*	61
Lanius excubitor, *L.* (*Midd.*) !	59	! Lanius excubitor, *L.* (*Temm.*)	65	Lanius shach, *L.*, var.	62
—— phœnicurus, *Pall.*	60	—— bucephalus, *T. & S.*	66	—— lucionensis, *Strickl.*	63
Hirundo gutturalis, *Scop.*	61	Hirundo gutturalis, *Scop.*	67	Hirundo gutturalis, *Scop.*	64
—— daurica, *L.*	62	—— daurica, *L.*, var.	68	—— daurica, *L.*, var.	65
Chelidon lagopoda, *Pall.*	63	Chelidon blakistoni, *Swin.* (*Blakiston*) ..	69	.....	
Cotyle riparia, *L.*	64	.....		Cotyle sinensis, *J. E. Gray*	66
Hemichelidon sibirica, *Gmel.*	65	.....		.....	
Butalis latirostris, *Raffles*	66	Butalis latirostris, *Raffles*	70	Butalis latirostris, *Raffles*	67
.....		.....		—— griseisticta, *Swinhoe*	68
.....		Xanthopygia narcissina, *T. & S.*	71	.....	
.....		Tchitrea principalis, *T. & S.*	72	Tchitrea principalis	69
.....		.....		Myiagra azurea, *Bodd.*	70
Cyanoptila cyanomelæna, *T. & S.*	67	Cyanoptila cyanomelæna, *T. & S.*	73	.....	
Erythrosterna leucura, *Gmel.*	68	.....		.....	
—— luteola, *Pall.*	69	Erythrosterna luteola, *Pall.*	74	.....	
Ianthia cyanura, *Pall.*	70	Ianthia cyanura, *Pall.*	75	Ianthia cyanura, *Pall.*	71
Ruticilla aurorea, *Pall.*	71	Ruticilla aurorea, *Pall.*	76	Ruticilla aurorea, *Pall.*	72
.....		.....		—— fuliginosa, *Vigors*	73
Saxicola saltatrix, *Mén.* (*Midd.*)	72	.....		.....	
Pratincola indica, *Blyth*	73	Pratincola indica, *Blyth*	77	Pratincola indica, *Blyth*	74
Accentor alpinus, *Gmel.*	74	.....		.....	
.....		Accentor rubidus, *T. & S.*	78	.....	
.....		Erithacus komadori, *T. & S.*	79	.....	
.....		—— akahige, *T. & S.*	80	.....	

Amoorland.	No.
Calliope kamtschatkensis, *Gmel.*	75
Locustella hendersonii, *Cassin*	76
—— ochotensis, *Midd.*	77
—— certhiola, *Pall.*	78
Calamoherpe bistrigiceps, *Swinhoe*	79
—— aëdon, *Pall.*	80
Phyllopneuste fuscata, *Blyth*	81
—— borealis, *Blasius*	82
Reguloides superciliosa, *Gmel.*	83
Regulus cristatus, *L.*	84
Zosterops erythropleurus, *Swinhoe*	85
Ampelis garrula, *L.*	86
—— phœnicoptera, *T. & S.*	87
Fringilla montifringilla, *L.*	88
Cannabina linaria, *L.*	89
Chrysomitris spinus, *L.*	90
Carpodacus erythrinus, *Pall.*	91
—— roseus, *Pall.*	92
Corythus enucleator, *L.*	93

Japan.	No.
Calliope kamtschatkensis, *Gmel.*	81
Locustella hendersonii (*Cassin*)	82
—— ochotensis (*Midd.*) (*Blakiston*)	83
Calamoherpe orientalis, *T. & S.*	84
—— cantans, *T. & S.*	85
—— cantillans, *T. & S.*	86
Cisticola schœnicola, *Bp.*	87
!! Sylvia atricapilla, *L.* (*Temm.*)	88
Phyllopneuste coronata, *T. & S.*	89
Regulus japonicus, *Bp.*	90
Zosterops japonicus, *T. & S.*	91
Ampelis garrula, *L.*	92
—— phœnicoptera, *T. & S.*	93
Fringilla montifringilla, *L.* (*Temm.*)	94
Cannabina linaria, *L.* (*Temm.*)	95
Chrysomitris spinus, *L.* (*Temm.*)	96
Chlorospiza sinica, *L.*	97
—— kawariba, *T. & S.*	98

Formosa.	No.
Calliope kamtschatkensis, *Gmel.*	75
Calamoherpe orientalis, *T. & S.*	76
—— canturians, *Swinhoe*	77
—— minuta, *Swinhoe*	78
Drymœca extensicauda, *Swinhoe*	79
—— flavirostris, *Swinhoe*	80
Suya striata, *Swinhoe*	81
Prinia sonitans, *Swinhoe*	82
Cisticola schœnicola, *Bp.*	83
—— volitans, *Swinhoe*	84
Phyllopneuste fuscata, *Blyth*	85
—— coronata, *T. & S.*	86
—— sylvicultrix, *Swinhoe*	87
Reguloides superciliosa, *Gmel.*	88
Zosterops simplex, *Swinhoe*	89
Chlorospiza sinica, *L.*	90

Amoorland.	No.
Pyrrhula orientalis, *T. & S.*	94
Uragus sibiricus, *Pall.*	95
.....	
Coccothraustes vulgaris, *Ray*	96
Loxia curvirostra, *L.*	97
—— leucoptera, *Gmel.*	98
.....	
.....	
Passer montanus, *L.*	99
.....	
Euspiza rutila, *Pall.*	100
—— aureola, *Pall.*	101
.....	
Emberiza pityornis, *Pall.*	102
—— spodocephala, *Pall.*	103
—— ciopsis, *Bp.*	104
—— rustica, *Pall.*	105
.....	
.....	
.....	
—— polaris, *Midd.*	106
—— pusilla, *Pall.*	107
Schœnicola passerina, *Pall.*	108
Plectrophanes nivalis, *L.*	109
Centrophanes lapponica, *L.*	110
Sturnus cineraceus, *T. & S.*	111
Hetærornis dauricus, *Pall.*	112
.....	
Pica caudata, *Ray*	113
.....	
.....	
Cyanopica cyanea, *Pall.*	114
Perisoreus infaustus, *L.*	115

Japan.	No.
Pyrrhula orientalis, *T. & S.*	99
Uragus sanguinolentus, *T. & S.*	100
Eophona personata, *T. & S.*	101
Coccothraustes vulgaris, var.	102
Loxia curvirostra, *L.*	103
—— leucoptera, *Gmel.* (*Temm.*)	104
Munia acuticauda, *Hodgs.* (*Swinhoe*)	105
.....	
Passer montanus, *L.*	106
—— russatus, *T. & S.*	107
Euspiza rutila, *Pall.*	108
.....	
—— sulphurata, *T. & S.*	109
.....	
Emberiza spodocephala, *Pall.*	110
—— ciopsis, *Bp.*	111
—— rustica, *Pall.*	112
—— fucata, *Pall.*	113
—— variabilis, *Temm.*	114
—— elegans, *T. & S.*	115
.....	
.....	
Schœnicola passerina (*Blakiston*)	116
.....	
.....	
Sturnus cineraceus, *T. & S.*	117
Hetærornis pyrrhogenys, *T. & S.*	118
.....	
Pica caudata, var.	119
.....	
.....	
Cyanopica cyanea, var.	120
.....	

Formosa.	No.
.....	
.....	
.....	
.....	
.....	
.....	
Munia acuticauda, *Hodgs.*	91
—— topela, *Swinhoe*	92
Passer montanus, *L.*	93
—— russatus, *T. & S.*	94
.....	
Euspiza aureola, *Pall.*	95
—— sulphurata, *T. & S.*	96
.....	
Emberiza spodocephala, *Pall.*	97
—— ciopsis, *Bp.*	98
.....	
—— fucata, *Pall.*	99
.....	
.....	
.....	
.....	
.....	
.....	
.....	
Sturnus cineraceus, *T. & S.*	100
Hetærornis sinensis, *Gmel.*	101
Acridotheres cristatellus, *L.*	102
Pica media, *Blyth*	103
Urocissa cærulea, *Gould*	104
Dendrocitta sinensis, var.	105
.....	
.....	

Amoorland.	No.
Garrulus brandti, *Eversm.*	116
Lycos dauricus, *Pall.*	117
—— neglectus, *Schleg.*	118
Corvus sinensis, *Gould*	119
—— japonensis, *Bp.*	120
—— corax, *L.*	121
—— pastinator, *Gould*	122
Nucifraga caryocatactes, *L.*	123
Turtur rupicola, *Pall.*	124
—— risoria, *L.*	125
Lagopus alpinus, *Nilss.* (*Midd.*)	126
—— albus, *Gmel.*	127
Tetrao urogallus, *L.* (*Pallas*)	128
—— urogalloides, *Midd.*	129
—— tetrix, *L.*	130
—— franklinii, *Dougl.*	131
—— bonasia, *L.*	132
Phasianus torquatus, *Gmel.*	133
Thaumalea picta, *L.*	134
Otis tarda, *L.*	135

Japan.	No.
Garrulus brandti, *Eversm.* (*Blakiston*)	121
—— japonicus, *T. & S.*	122
Lycos dauricus, *Pall.*	123
—— neglectus, *Schleg.*	124
Corvus sinensis, *Gould*	125
—— japonensis, *Bp.*	126
—— pastinator, *Gould*	127
Nucifraga caryocatactes, *L.* (*Blak.*)	128
Columba rupestris, *Pall.* (*Temm.*)	129
Turtur rupicola, *Pall.*	130
Vinago sieboldii, *T. & S.*	131
Carpophaga ianthina, *T. & S.*	132
Lagopus mutus, *L.* (*Schlegel*)	133
Tetrao bonasia, *L.* (*Blakiston*)	134
Phasianus versicolor, *T. & S.*	135
—— sömmeringii, *Temm.*	136
!! Thaumalea picta, *L.* (*Temm.*)	137
!! Perdix rubra, *Briss.* (*Temm.*)	138
Coturnix dactylisonans, var.	139

Formosa.	No.
Garrulus insularis, *Gould*	106
Corvus sinensis, *Gould*	107
Turtur rupicola, *Pall.*	108
—— chinensis, *Scop.*	109
—— humilis, *Temm.*	110
Treron formosæ, *Swinhoe*	111
Phasianus torquatus, var.	112
Euplocamus swinhoii, *Gould*	113
Bambusicola sonorivox, *Gould*	114
Coturnix dactylisonans, var.	115
Excalfactoria chinensis, *L.*	116
Turnix ocellatus, *Scop.*	117

By a comparison of these three lists, it will be seen that China, so far as it is yet explored, presents an advantage in land-birds of 115 species over Amoorland, and of 111 species over Japan. But much remains yet to be done in all three countries. The ornithology of China proper may perhaps with propriety be classed under two regions, palæarctic and semitropical,—the former comprising the country north of the Yangtsze, and the latter the land south of this river. Of the European forms of *land*-birds that range the Chinese coast, a few are identical with those of the West; but the majority have sufficiently changed in characters to be classed in some cases as varieties, in others as species. The Indian birds that occur in China are, with a very few exceptions, summer visitants. The migrations of many of the species deserve special notice. But large as my data are, as compared with former investigations, I think they are scarcely sufficient to enable me to draw statistical conclusions of any value. As I am shortly about to return to China, and hope to have further opportunities for verifying my observations, I will not now commit myself by making any general remarks which future research may compel me to retract. I therefore leave the scientific reader, after the perusal of the lists and the notes given with each species, to draw his own general inferences and come to his own conclusions.

9. Review of Prof. C. B. Adams's 'Catalogue of the Shells of Panama'*, from the Type Specimens. By Philip P. Carpenter, B.A., Ph.D.

A résumé of this important contribution to our knowledge of local faunas, and a comparison with the British Museum 'Descriptive Catalogue of the Reigen Collection of Mazatlan Mollusca,' is given in the 'Report of the British Association' for 1856, pp. 265–281. Full series of the old species, and the first specimens of the new, were deposited by Prof. Adams in the Museum of Amherst College, which also contains similar series of the Professor's Caribbean collections. The second specimens of new species were sent to Mr. Cuming, and through his kindness were freely used in preparing the Mazatlan Catalogue, thus avoiding the necessity of many synonyms. An instructive lesson in candour and forbearance may be learnt by comparing together the works of any two naturalists of equal celebrity, or by comparing either of them with the types. With the best desires for accuracy, and the greatest care, it is hardly possible for an author to describe so that his readers shall see shells as he sees them. If this be true of such full and precise diagnoses as those of Adams and Gould, how much greater must be the difficulty to foreigners of recognizing shells from the brief descriptions of Broderip, Lamarck, and the older writers generally. The careful

* Catalogue of Shells collected at Panama; with Notes on their Synonymy, Station, and Geographical Distribution: by C. B. Adams, Professor of Zoology, &c., in Amherst College, Mass. Reprinted from the 'Annals of Lyceum of Nat. Hist. N. Y.,' vol. v. New York, 1852.

preservation of types therefore, and the interchange of specimens named from types, is of the first importance to save the time and ensure the accuracy of succeeding writers. The Smithsonian Institution has fully recognized this principle by directing that the first available duplicate of all type species described from its collections shall be deposited in some museum open to students on the other side of the Atlantic.

As the authorities of Amherst College had not taken any steps to figure their unique specimens, and as Prof. Adams's determinations of old species had not been verified, I made it my business (when visiting America to deposit the first duplicate series of the Mazatlan Shells in the New York State Museum at Albany) to compare Prof. Adams's collection, on the spot, with his published book, in my copy of which I made my notes and sketches at the time. Every facility was afforded me by the Curator. I was allowed freely to handle the specimens in the presence of his assistant, and to draw the minute species under my microscope*. I took with me for comparison the drawings of the minute Mazatlan shells in the British Museum. The species being numbered in both the Panama and the Mazatlan lists, it is easy now to institute a comparison between them. They are here distinguished by the initials P. and M.

P. 1. *Ovula avena.* May be distinct from *Radius variabilis*, M. 435, being much more stumpy, with a thicker lip; but the few specimens are in poor condition, and the differences may be accidents of station.

2. *Ovula emarginata=Carinea e.* Quite distinct from its Caribbean analogue *C. gibbosa.*

3. *Ovula neglecta*, C. B. Ad., is probably a small variety of *Radius variabilis.*

4. *Ovula variabilis*, C. B. Ad.=*Radius v.*, M. 435.

5. *Ovula*, sp. ind., probably=*variabilis*, jun.

6. *Cypræa arabicula=Aricia a.*, M. 438.

7. *Cypræa cervinetta=C. exanthema*, M. 436. Having now examined a multitude of specimens from different stations on the west coast, which differ from each other quite as much as they do from the typical Caribbean forms, I am confirmed in the belief of their identity.

8. *Cypræa punctulata=Aricia p.* Erroneously given, in M. p. 374, as a probable synonym of *A. arabicula.* It is less thickened at the sides, with smaller spots. Although specimens of *arabicula* graduate into it at the back, it may always be known by the mouth, which has its teeth much further apart.

9. *Cypræa pustulata=Trivia p.*, M. 439.

* The week which this work occupied was spent with the widow of the late Professor, who undertakes the duty of boarding students. Her two oldest sons were, alas! among the early victims of the civil war.

10. *Cypræa radians*=*Trivia r.*, M. 440.

11. *Cypræa rubescens*=dead sp. of *Trivia sanguinea*, M. 442.

12. *Cypræa sanguinea*=*Trivia s.*, M. 442.

13. *Erato scabriuscula*. Stet.

14. *Marginella minor*. Stet, M. 587.

15. *Marginella sapotilla*. The Panama specimens collected by Prof. Adams, and abundantly by others, more closely resemble *M. prunum* than the type *M. sapotilla* of Hinds, which is a much smaller shell. The Caribbean shells (which are found across the Isthmus at Aspinwall) differ only in having a sharper angle in the labrum at the posterior notch. Adanson's habitat, doubted by Prof. Adams (note, p. 41), is confirmed by specimens in the Bristol Institution brought from Sierra Leone by Chief Justice Rankine. The Pacific shells are probably conspecific, sufficient evidence being now in our possession that the two oceans were united at least as late as the Miocene epoch*.

16. *Mitra funiculata*. Stet.

17. *Mitra lens*, M. 585.

18. *Mitra nucleola*. Closely resembling young specimens of the Caribbean *M. granulosa*.

19. *Mitra solitaria*, C. B. Ad.=*Zierliana s.* Other specimens have since been found of this characteristic species. The "transverse ribs" can scarcely be said to be "obsolete anteriorly."

20. *Mitra tristis*=*Strigatella t.*, M. 586.

21. *Terebra elata*=*Myurella e.*

22. *Terebra larvæformis*=*Myurella l.*

23, 24. Stent.

25. *Terebra tuberculosa*=*Myurella t.*

26. *Terebra varicosa*. This may possibly be a very young specimen of *Subula v.*; but I think it distinct.

27–31. Sp. ind. A specimen of *Euryta fulgurata*, M. 455, is in the museum, as from Panama, but not of Prof. Adams's collecting.

32. *Oliva angulata*, M. 590.

* The specimens in the Cumingian Museum, named *M. cærulescens* at the time of the British Association Report, are now labelled "*sapotilla*, Hds., 5–13 fathoms sandy mud, Panama, H. C." Another set of Pacific shells (notch-angle rounded) are given as "*Marginella* n. s., Panama," "San Domingo" having been erased. The large West-Indian form (notch-angle sharp) is given as "*cærulescens*, var., Lam., 10 fathoms sandy mud, Panama." Another set of large shells, with sharp angle, and labrum tinted behind, is given as "*cærulescens*, Lam., Panama," but without authority. The small West-Indian form (like the typical *sapotilla*) is given as "*glans*, Mke." Either in this, as in other instances, error has crept into the locality-marks, or else even the distinction pointed out by Mr. Redfield (who has given peculiar study to this genus) cannot be relied on for separating the species geographically.

33. *Oliva araneosa*=*O. melchersi*, M. 591. Prof. Adams's shanty specimen can scarcely be distinguished from that which he marked "*O. literata*, Alabama." But the ordinary aspect of the shells *O. reticularis* from the Caribbean Islands, *O. literata* from the coast of the Southern States, and *O. melchersi* from the Pacific, is sufficiently distinct (for the genus).

34. *Oliva inconspicua*, C. B. Ad.=*Olivella i.*, M. 599. Some of the shells referred to this species from Panama, Mazatlan, and Cape St. Lucas graduate into the Caribbean *O. oryza*; others into dwarf forms of *O. gracilis*. The species either needs revision from fresh specimens, or should be merged into *O. gracilis*.

35. *Oliva pellucida*, C. B. Ad. Dead specimen; differs from *Olivella p.*, Rve.

36. *Oliva porphyria*. Stet.

37. *Oliva semistriata*=*Olivella s.* Closely resembles *O. columellaris*.

38. *Oliva testacea*=*Agaronia t.*, M. 602.

39. *Oliva undatella*=*Olivella u.*, M. 595.

40. *Oliva venulata*. This shanty specimen is *O. angulata*, jun. The *O. venulata*, M. 593, is named by Prof. Adams *O. julietta*, as also by Mke. (non Ducl.). The true *O. julietta* (Guacomayo, Mus. Smiths.) is the Pacific "analogue" of *O. fusiformis*.

41. *Oliva volutella*=*Olivella v.* It is surprising that this species, so immensely common at Panama and up the coast, should not reach the Gulf, and that the equally common *O. tergina* of Mazatlan and *O. gracilis* of Cape St. Lucas and Acapulco should be rare elsewhere, while the larger Olives are found from Guaymas to the equator. *O. dama* (=*lineolata*, Gray, C. B. Ad.), abundant at Mazatlan, was bought, not collected, by the Professor at Panama.

42. *Planaxis planicostata*. Stet. Also immensely common at Panama, though absent from Mazatlan.

43. *Nassa canescens*, C. B. Ad. Having compared this unique specimen with P. 50, q. v., I can speak to their complete identity. The "pale grey" of the "interspaces" is due to the shell being dead.

44, 45. Stent.

46. *Nassa gemmulosa*=M. 631, exactly.

47. Stet.

48. *Nassa luteostoma*=M. 623.

49. *Nassa nodifera*. Also found at Guaymas.

50. *Nassa pagodus*, C. B. Ad. (+*N. canescens*, P. 43)=*N.* (?*pagodus*, var.) *acuta*, M. 625. It is certainly the *N. decussata* of Kien., but probably not of Lam. Whether it is the *Triton pagodus* of Rve. I am still unable to say, the type being apparently lost. We are bound to suppose that Mr. Reeve could not mistake so de-

cided a *Nassa* for a *Triton*; so that if Lamarck's is a similar Eastern species, the West American may stand as *N. acuta*.

51. *Nassa panamensis*, C. B. Ad. The Professor rightly marked his duplicates "*exilis*, Pws." This abundant shell, having a Pisanoid, not a Nassoid operculum, probably belongs to *Phos*, *Northia*, or some genus not yet eliminated. *N. obsoleta*, Say, has a similar operculum, and appears nearly related.

52. *Nassa proxima*. The unique specimen appears to be an extreme form of *N. versicolor*, P. 55.

53. *Nassa ? scabriuscula*, C. B. Ad. (non Pws.)=*N. complanata*, Pws.: v. P. 56.

54. *Nassa striata*, C. B. Ad. The two type specimens, one young, the other adult, both belong to a variety of *versicolor*. The phrase, "last whorl spirally canaliculate on the left side," simply expresses the ordinary character of *Nassa*. The specimens in Mus. Cuming., however, from another source, differ somewhat in the nucleus from the small form of *N. versicolor*. These=*N. paupera*, Gld., teste Cuming, and should take that name.

55. *Nassa versicolor*, C. B. Ad., M. 632. The revolving striæ vary so greatly in this species, as well as the size, obesity, and colour, that it is hard to assign its limits. The specimens marked *versicolor* by the Professor vary much more among themselves than the extreme ones do from his *proxima* and *striata*. The apex and early whorls of each are exactly the same under the microscope. It is possible that the unique *crebristriata*, M. 633, is also an extreme variety.

56. *Nassa wilsoni* appears to be only a dwarf form of P. 53, *N. complanata*.

57. *Buccinum crassum*=*Phos c.*

58. *Buccinum distortum*=*Clavella d.*

59. *Buccinum insigne*=*Pisania i.*, M. 659.

60. *Buccinum lugubre*, C. B. Ad. The Professor marked this shell on his card "*Murex* ? ?"; then "*Fusus* ?"; then "*Fusus nodulosus*, Ad., n. s."; then "*Buccinum* (?) *lugubre*, Ad., n. s."; so that the old genera were sometimes as badly defined as the new ones. It may rank with *Pisania*.

61. *Buccinum pagodus*=*Pisania p.*

62. *Buccinum pristis*=*Northia serrata.*

63. *Buccinum ringens*=*Pisania r.*, M. 663.

64. *Buccinum sanguinolentum*=*Pisania s.*, M. 662.

65. *Buccinum stimpsonianum*=*Nassa st.*

66. *Dolium ringens*=*Malea r.*

67. *Monoceros brevidentatum*. This species, very common at Panama, has been transported over (not through) the Pacific, to San Francisco and Monterey: v. P. page 75.

68. *Monoceros cingulatum*=*Leucozonia c.*, M. 583.

69. *Purpura carolensis*=*P. triangularis*, M. 608.

70. *Purpura foveolata*=*Cuma costata*, M. 610, probably; but the markings have been too much obliterated to decide with confidence.

71. *Purpura kiosquiformis*=*Cuma k.*, M. 609. There are in the collection three shells, labelled by the Professor "*P. purpuroides* (*Fusus*), Orb., Panama" = *Pisania d'orbignyi*, Rve. No authority is given, and they probably came from Peru.

72. *Purpura*, sp. ind. This shell is not to be found. It has probably been put with the last, of which it is no doubt a variety: v. M. p. 482.

73. *Purpura melo.* Stet.

74. *Purpura osculans* appears to be the young of *Rhizocheilus nux*, M. 611; of which *R. distans*, Cpr., and probably *R. californicus*, A. Ad., are only varieties.

75. *Purpura tecta*=*Cuma t.*

76. *Purpura undata*=*P. biserialis*, M. 606.

77. *Columbella atramentaria*=*Anachis a.*

78. *Columbella bicanalifera*=*Strombina b.*

79. *Columbella boivinii.* This species must rank with (*Anachis* or) *Engina**, the operculum being Pisanoid.

80. *Columbella conspicua*=*Anachis c.*

81. *Columbella costellata*, C. B. Ad.=*Anachis scalarina*, Sby., M. 645; not *A. costellata*, Sby., M. 646.

82. *Columbella diminuta*=*Anachis d.*

83. *Columbella dorsata*=*Strombina d.*

84. *Columbella fluctuata*=*Anachis fl.*

85. *Columbella fulva*=*Anachis f.*, M. 648.

86. *Columbella fuscata*, M. 617. The small var. is *C. festiva*, Kien.

87. *Columbella gibberula*=*Strombina g.*

88. *Columbella gracilis*=*Anachis g.*

89. *Columbella guttata*=*Nitidella cribraria*, M. 613.

90, 91, 92. Stent.

93. *Columbella lyrata*=*Anachis l.*

94. *Columbella major*, M. 615.

95. *Columbella modesta*=*Truncaria m.* It might be convenient to leave this genus as arranged by Messrs. H. and A. Ad. Mr. Henry Adams desires to restrict it to the type species, in which

* Of the shells called by French authors *Semi-Ricinula*, those with a Purpuroid operculum may be retained as *Sistrum*, while those with Pisanoid operculum should be removed as *Engina*, with *Anachis*, to the *Muricidæ*.

case this and similar species must be moved to *Nitidella*, if the operculum be (as is presumed) Purpuroid; or to *Amycla*, if Nassoid.

96. *Columbella mœsta*=*Anachis m.*

97. *Columbella nigricans*=*Anachis n.*

98. *Columbella parva*. This appears to be only a dead specimen of *C. pygmæa*, P. 100.

99. *Columbella pulchrior* is probably a *Nitidella*.

100. *Columbella pygmæa*=*Anachis p.*, M. 651.

101. *Columbella rugosa*=*Anachis r.* This appears to be the commonest and most variable species of the genus. The typical specimens are somewhat stumpy, with stout knobs. Then the knobs pass into long, compressed ridges, and finally change into narrow bars. These are wide apart, or close, or nearly evanescent on the back. The shape passes from the stumpy to an acuminate form like *costellata*. Some adults are more than twice the size of others; but the same variations are found in both extremes. The colours are generally laid on in patches on the knobby specimens; in fine flames, on the smoother ones. In all varieties, it is known from *fluctuata* by the spiral striæ over the whole surface; and from *varia* by the shoulder, more or less developed into a keel, on the whorls of the spire.

102. *Columbella strombiformis*, M. 616.

103. *Columbella tessellata*, C. B. Ad. (non Gask.)=*Anachis guatemalensis*, Rve.

104. *Columbella turrita*=*Strombina t.*

105. *Columbella varia*=*Anachis v.*

106. *Columbella* sp. ind. is the young of a species in Mus. Cuming., resembling *harpæformis*.

107. *Ricinula carbonaria*=*Engina c.*

108. *Ricinula jugosa* may be an *Engina*, but has more the aspect of the Pacific group *Peristernia*.

109. *Ricinula reeviana*=*Engina pulchra*, Rve.

110. *Cassis abbreviata*=*Bezoardica a.* On comparing a large series of specimens from Cape St. Lucas with a similar series of *C. inflata* from Texas, I was unable to discover any specific differences. It varies greatly, from each ocean, in painting, sculpture, height of spire, &c.

111. *Cassis coarctata*=*Levenia c.*

112, 113, 114(=M. 480), 115, 116 (=M. 481), 117, 118* (=M. 476), 119* (=M. 477), 120 (=M. 475), 121, 122 (=M. 381, *galeatus*), 123 (=M. 449), 124 (=M. 448), 125. Stent.

* Having now examined a large number of specimens of these two forms, I have no hesitation whatever in regarding *Conus regalitatis* as simply a variety of *C. purpurascens*. Similar differences may be observed in comparing large series of almost all Cones.

126. *Triton chemnitzii=Argobuccinum nodosum*, M. 580. These shells are small and turreted. Those Prof. Adams marked "*T. cingulatum*, Lam., E. Indies," are much more like the Mazatlan shells.

127. *Triton constrictus=Distortio c.* The specimens of this group from the Pacific Coast, from the Gulf of Mexico, and from the China Seas are very difficult to discriminate.

128. *Triton fusoides.* This unique and very elegant shell can scarcely be called a *Triton*, even of the *Epidromus* type. It may perhaps rank with *Euthria*, but is peculiar in possessing a distinct anterior sinus, near the canal, like *Rostellaria*.

129, 130, 131, 132*, 133, 134*, 135. Stent.

136. *Murex dubius=Muricidea dubia*, M. 673.

137. *Murex erosus=Muricidea e.*

138. *Murex radix=Phyllonotus r.* The Professor's specimens of this species are remarkably fine, more nearly resembling the Gulf *nigritus* than the heavy stumpy shells usually seen. His young specimens are heavier, but more turreted, than the young *nigritus*. The opercula appear to have fewer frills; but such differences may be due only to station. The specimens he marked *ambiguus* (without locality) belong to the typical *nigritus*. *Phyllonotus radix* and *nigritus* graduate into each other almost as freely as the latter does into *ambiguus*: v. M. 666.

139. *Murex rectirostris.* This and kindred species run into each other too closely, when adult, to speak with any confidence on so young a specimen in bad condition.

140. *Murex recurvirostris.* This specimen is also far too imperfect to affiliate: v. M. 665.

141. *Murex regius=Phyllonotus r.*, M. 670.

142. *Murex salebrosus=Vitularia s.*, M. 612. The curious group of Muricoid Purpurids culminates on the West American shores. It is represented in the north temperate regions by *Cerastoma*, on the warmer shores by *Chorus*, and in the tropical regions by *Vitularia*. The Lower Californian *Murex belcheri*, Hds., belongs to the group. Dr. Alcock (who has succeeded the late Capt. Brown as Curator of the Manchester Natural History Museum) has pointed out very well-marked physiological distinctions between the two families, which are coordinate with the differences in the opercula.

* Dr. Gray (Guide to Mollusca, pp. 39, 42) leaves the round-variced Ranellids, as *Apollon*, in the *Tritonidæ*, "operc. annular, nucleus subapical, within the apex;" but removes the sharp-variced species, as *Ranella*, to the *Cassididæ*, and figures the operculum like *Bezoardica*, "half-ovate, nucleus central, lateral, internal." The operculum of *R. cælata*, No. 132, is almost identical with *Murex*, and the shell accords with *Apollon*; but *R. nitida*, No. 134, which has very sharp varices, has its operculum widely removed from *Bezoardica*. It is closely related to that of *Cerastoma*, *Rhizocheilus*, and some of the *Œcinebræ*; nucleus near the anterior end of the labrum; labral portions of the annular layers eroded; scar as in Purpurids, with about three roughly angular ridges of growth.

143. *Murex vibex*. This Peruvian species also probably belongs to the Purpurid group.

144. *Murex vittatus*=*Muricidea v.*

145. (=M. 638), 146 (=M. 579). Stent.

147. *Fusus bellus*, C. B. Ad. This is a pretty little shell, resembling a young *Metula*, and is probably one of the species assigned with doubt to that genus, M. 619–622, or to *Fusus*, M. 642. I should erase the words, "some of which are varicoid" (referring to the radiating ribs), as my glass did not enable me to detect a single one.

148. *Fasciolaria granosa*. A minute specimen is of the size and general appearance of the fry of *Chrysodomus antiquus*, with one and a half irregular nuclear whorls. An adult has its operculum broken and mended from a subcentral nucleus—a mode of proceeding which I have now observed in such a multitude of species belonging to different families of Proboscidifers and Toxifers that I venture to assign it as the original type of their opercula, from which the special family forms are modifications of high development. Of the spiral Rostrifers there is not yet sufficient evidence to speak*.

149. *Turbinella cæstus*, M. 581.

150. *Turbinella castanea*=*Latirus c.*

151. *Turbinella cerata*=*Latirus c.*, M. 582.

152. *Turbinella rudis*=*Latirus r.*

153. *Turbinella spadicea*=*Latirus s.*

154. *Cancellaria affinis*. Very closely allied to *C. urceolata*, M. 445.

155, 156, 157 (=M. 446), 158, 159. Stent.

160. *Cancellaria pygmæa* is simply a young specimen of *C. goniostoma*, no. 157.

161, 162. Stent.

163. *Pleurotoma aterrima*=*Drillia a.*

164. *Pleurotoma atrior*. This is a fine specimen, not quite mature in the lip, of *Drillia aterrima*, var. *melchersi*, M. 461.

165. *Pleurotoma bicanalifera*=*Clathurella b.*

166. *Pleurotoma collaris*=*Drillia c.*

167. *Pleurotoma concinna*=*Cithara c.*

168. *Pleurotoma corrugata*=*Drillia c.*

169. *Pleurotoma discors*=*Drillia d.* Probably a finely developed variety of *aterrima*.

* When at Charleston, S. C., I had an opportunity of examining many very fine specimens of the giant *Fasciolaria*, so seldom seen in this country, of which a broken specimen in my collection measures 20 in. In sculpture, colour, and general appearance some were so very like *F. princeps*, M. 584, that I was tempted to consider the latter a degraded local variety, till I found the operculum, which is destitute of the singular grooving of the Gulf species.

170. *Pleurotoma duplicata*=*Drillia d.*

171. *Pleurotoma excentrica*=*Drillia e.* I cannot endorse this and some other determinations of critical species of Pleurotomids, not being able to remove the specimens for comparison with types. Even the types in Mus. Cuming. do not always present satisfactory diagnostic characters.

172. *Pleurotoma exigua*=*Mangelia e.* I could not discover "the rest in pairs."

173. *Pleurotoma gemmulosa*=*Mangelia g.*

174. *Pleurotoma grandimaculata*=*Drillia g.*

175. *Pleurotoma incrassata*=*Drillia i.*, M. 459. The collection contains *D. luctuosa*, M. 467, as from Panama, but not of the Professor's collecting.

176. *Pleurotoma nigerrima*=*Drillia n.*

177. *Pleurotoma obeliscus*=*Drillia o.* Very worn and doubtful.

178. *Pleurotoma olivacea.* Closely resembles *P. funiculata*, M. 457.

179. *Pleurotoma pallida*=*Drillia p.*

180. *Pleurotoma rigida*=*Clathurella r.*

181. *Pleurotoma rudis.* It is probable that this is not the true *Drillia rudis*, being distinguished by white spots on the knobs: v. M. 460.

182. *Pleurotoma rustica*=*Drillia aterrima*, var. *melchersi*, M. 461. These specimens being very worn, their specific identity with P. 164 was not recognized by the Professor. One shell, marked "*rustica*, var.," may be the true *rustica*—a species by no means satisfactorily distinguished.

183. *Pleurotoma striosa*=*Drillia s.*

184. *Pleurotoma zonulata*=*Drillia z.*, M. 463.

185. *Pleurotoma*, sp. *a.* A small, dark, purple-brown *Mangelia*, of the *leufroyi* type.

186. *Pleurotoma*, sp. *b.* A slender, pure-white, ribbed shell; probably a *Cithara.*

187. *Mangelia*, sp. *c.* A young *Daphnella.*

188. *Mangelia*, sp. *d.* A very worn, black shell; with white, knobby ribs.

189. *Mangelia*, sp. *e.* A very small, white shell; resembling a young *Bela turricula.*

190. *Mangelia*, sp. *f.* A very small, white *Drillia*, with distinct posterior notch; spirally striated, with rather sharp ribs.

191. *Mangelia neglecta.* Of the "elevated spiral line on the middle of the whorls" I could discover no trace, except of colour. It is therefore probable that it=*M. acuticostata*, M. 473.

192. *Mangelia sulcosa* is the true *Columbella s.* of Sby.

193. *Cerithium adustum*=*C. maculosum*, M. 381.

194. *Cerithium assimilatum*=*Cerithiopsis a.*, M. 563.

195. *Cerithium bimarginatum*=*Cerithiopsis b.* A good species; but I could not detect the "intermediate raised line." The apical whorls are almost smooth. The "prominent spiral fold" on the columella is simply that which bounds the recurved canal.

196. *Cerithium famelicum.* Confusion has arisen from the Professor having sent to Mr. Cuming as his type a shell which does not answer to the diagnosis, and which is described as (? var.) *mediolæve*, M. 382. Ten specimens are retained in the Amherst Museum, of which eight are of the *uncinatum* type, =M. 383, and two of the Cumingian. *C. uncinatum*, being an old species, is probably from the Atlantic or E. Indies: if this should prove identical, the name *famelicum* must be dropped; if distinct, retained for the west coast uncinoids, according to the diagnosis. After an examination of a large series of specimens collected by Mr. Xantus at Cape St. Lucas, I am confirmed in the belief that the Cumingian shell is a distinct species, which must stand as *C. mediolæve.*

197. *Cerithium gemmatum*=*Rhinoclavis gemmatus*, M. 389. So much confusion has arisen from raising specific names to the generic peerage, that whenever a good distinct name has been given, it appears best to retain it—the unbending rule of mere priority for work which is sometimes slovenly, and therefore best forgotten, notwithstanding.

198. *Cerithium ? interruptum*, C. B. Ad. (non Mke.=M. 388). Great confusion has arisen from this erroneous determination, as may be seen by comparing the Maz. Cat. *in loco* with the monograph of Sowerby, jun., who has redescribed the southern, highly sculptured forms of the true *interruptum* as *C. galapaginis.*

198 and 199 are regarded by Messrs. Cuming and Sowerby as varieties of

200. *Cerithium irroratum*, C. B. Ad. (Gld. ipse et MSS., non Gld. in Expl. Exp.)=*C. stercusmuscarum*, M. 387. The aspect of the Panama shells is so different from that of the Mazatlan specimens that I did not wonder at Dr. Gould's opinion that they were distinct. He was, however, misled in affiliating the former to his *C. irroratum*, of which I fortunately discovered the figured type in the Smithsonian Institution, and which proves to be (according to Mr. Cuming) the *C. obesum* of Sby. sen., from the Philippines. It is fortunate therefore that the name may be entirely dropped. Some of the specimens of no. 198 graduate sufficiently closely to the Mazatlan form; those of no. 199 are intermediate; while those of no. 200 present a stronger but smaller shell, well armed with small nodules, which are not to be seen in the fine Gulf specimens.

201. *Cerithium neglectum*=*Cerithiopsis n.*

202. *Cerithium pacificum.* Stet.

203. *Cerithium pauperculum* is a good, new species of *Chrysallida*. The Professor probably did not recognize the Chemnitzoid apex and the Odostomoid plait. The following alterations may be made in the diagnosis:—Shell pale orange [not horn], with six [not five] keels on the spire; spiral ridges anteriorly fainter [not obsolete]; apex sinistral [not acute], of three Paludinoid whorls, the last large in proportion; columella effuse [not canaliculated], with a long, slender, slanting plait.

204. *Cerithium pulchrum*=*Cerithidea p.* A distinct and truly beautiful species, seldom obtained by collectors.

205. *Cerithium reevianum*=*Cerithidea montagnei*, M. 394.

206. *Cerithium validum*=*Cerithidea varicosa*, M. 395. The Southern shells, in all their changes, present such a different aspect from the Gulf specimens, that I am inclined to regard the form *Mazatlanica* as distinct, of which *C. albonodosa* may prove a variety.

207. *Triphoris alternatus*, M. 391.

208. *Triphoris inconspicuus* is scarcely even a variety of the last; and does not differ so much as the specimens described under the same name, M. 392.

209. *Triphoris infrequens* is not the shell described, under the same name, M. 393, but is the *Cerithiopsis tuberculoides*, M. 557. It would have been strange if I had recognized the shell from the diagnosis; for *both of the specimens are dextral.* The apex is nearly smooth. I forbear to redescribe nos. 392, 393 of the Maz. Cat., as they were separated principally in deference to Prof. Adams's authority, until more numerous specimens should have been examined.

210. *Turritella banksii*=*T. goniostoma*, jun., M. 379.

211. *Cæcum diminutum*=*Cæcum firmatum*, jun., with numerous close rings. All the Professor's specimens of this genus were dead; most of them pierced by Proboscidifers. They fully confirmed the judgments I ventured to form of them in the Maz. Cat. and in the "Monograph of the Cæcidæ," P. Z. S. 1858, p. 413 *et seq.*

212. *Cæcum eburneum*=*C. firmatum.* The rings vary from twenty-six to thirty-three.

213. *Cæcum firmatum*, M. 368. Add to the diagnosis in Maz. Cat. p. 320, last line, "*operculo vix concavo, suturis minus definitis.*"

214. *Cæcum læve.* The two specimens are too worn for identification, but will pass sufficiently for the species described under the same name, M. 372.

215. *Cæcum laqueatum.* A good species of the *Elephantulum* group: v. Maz. Cat. p. 315, and P. Z. S. *loc. cit.* p. 420.

216. *Cæcum monstrosum*=*C. firmatum* in the adolescent stage.

217. *Cæcum parvum* turns out, as was expected, to be=*C. undatum*, M. 371. The unique specimen is stunted and dead.

218. *Cæcum pygmæum* is a small but nearly adult *C. firmatum.*

219. *Chemnitzia aculeus*, M. 521.

220. *Chemnitzia acuminata* is a true *Chemnitzia*, and not a *Chrysallida*, as supposed in the Br. Assoc. Report, p. 334. The name misleads, as it is a peculiarly broad species. The vertex consists of three Paludinoid whorls, of which the apex is visible, projecting a little beyond the spire. The ribs, instead of "terminating abruptly on the periphery of the last whorl," become gradually evanescent round the base *.

221. *Chemnitzia affinis*. Comp. M. 523, which was identified from Mr. Cuming's specimen. The diagnosis needs the following corrections from the type. The "ribs terminate" not very "abruptly at the periphery." Anteriorly very finely striated [not "smooth"]. "Last whorl" not "angular at the periphery." Base prolonged. It is probably the adult form of my *Chemnitzia undata*, M. 531, the characteristic fine, waved, spiral striæ having escaped the Professor's notice. The only difference is that the ribs evanesce more suddenly in the Panama than in the Mazatlan shell, which may be due simply to age.

222. *Chemnitzia clathratula*, part. = *Chrysallida clathratula*, M. 513, which was identified from the Cumingian specimen. The specimens preserved as types contain, along with this species, one of *Chrysallida communis*, one (almost certainly) of *Chrysallida effusa*, M. 510, and one of *Dunkeria subangulata*, M. 537. Some parts of the description appear taken from the latter species: *e. g.* the "five or six" spiral lines, of which there are only four in the *Chrysallida*; and the angle on the "upper part" of the whorls, which in the latter are well rounded.

223. *Chemnitzia communis*, M. 507. This is the type of the genus *Chrysallida*: v. M. pp. 416, 420. Prof. Adams's tray contains also one specimen of *Chrysallida effusa*, M. 510; one of *Chrys. telescopium*, M. 508; one of *Dunkeria subangulata*, M. 537; and one which may be a variety of the latter, or a distinct species.

224. *Chemnitzia gracilior*. The "well-impressed spiral line" is only seen in some of the whorls.

225. *Chemnitzia major* belongs to the section *Dunkeria*. I counted eighteen (not twenty-four) ribs.

226. *Chemnitzia marginata* is a good species of *Chrysallida*; but I could not find the "spiral, compressed ridge."

227. *Chemnitzia panamensis*, M. 518. I counted twenty-four (not twenty-seven) ribs. The tray also contains one specimen of

* As several errors are here pointed out in the diagnoses of small shells, it is right to state that Prof. Adams had not the advantage of a microscope during a considerable portion of the work; nor was the instrument a good one when obtained. Moreover the incessant demands on his attention as Professor of Astronomy and Mathematics, as well as of Natural History, and his duties as State Geologist of Vermont, did not leave him much time for original research. What he accomplished during his short life is marvellous. Had that life been spared to revise his works, the necessity for this friendly criticism would not have arisen.

Ch. C-B-Adamsii, M. 519, with straight ribs; and one with spiral sculpture, which may belong to *Ch. gracillima*, M. 530, but wants the produced apex.

228. *Chemnitzia similis*. This species most nearly resembles *aculeus*, but is broader, larger, and with more ribs, of which I counted from twenty to twenty-two (not twenty-six). I should not call the whorls "convex." They are, however, more rounded, and the base is more produced, than in the shell called "? *similis*," M. 520, which is perhaps a variety of *panamensis*.

229. *Chemnitzia striosa*. The early whorls are very slender. The spiral striæ are on the tops of the ribs, of which I counted from twenty-four to thirty-two (instead of "about forty").

230. *Chemnitzia turrita*. This species includes the "*Rissoa*, sp. ind." no. 251.

231. ? *Littorina angiostoma* is a *Fossarus*.

232. *Littorina aspera*, M. 397. The Mazatlan periwinkles, being in good condition, divide themselves very naturally into three species. The Panama specimens, being generally eroded, are not so easily dealt with. Of Prof. Adams's specimens here retained, the majority belong to *aspera*, although several of the smaller ones are *philippii*, M. 398. The young appear to be of both species mixed. The "variety" consists of the abnormal tall specimens of *conspersa*, M. 396, with a few very large *philippii* intermixed.

233. *Littorina atrata*. This abundant little shell is a *Fossarus*, of which the Professor's ?*Adeorbis abjecta*, no. 257, is a more advanced form. It is possible that one of the *Fossari* described in Maz. Cat., nos. 404, 405, may be conspecific; but among the multitude of specimens I could not find one with the nuclear whorls sufficiently perfect to decide. The shells vary extremely in shape and sculpture.

234. *Littorina conspersa*, M. 396. Smaller and generally more stumpy than the Mazatlan shells, but containing a few specimens of the same extreme forms.

235. ? *Littorina excavata*=*Fossarus e*.

236. *Littorina fasciata*, M. 400. The specimens of this species and of *L. varia* graduate rather closely towards each other.

237. ? *Littorina foveata*. A good species of *Fossarus*. Read, "Last whorl angular" at the umbilicus [not "below the middle"].

238. ? *Littorina megasoma*. This is also a good species of *Fossarus*. The Professor was doubtful whether to refer these forms to *Littorina* or to *Narica*.

239. *Littorina* ? *parvula*, C. B. Ad. This is not Philippi's *L. parvula*, but is a dwarf form of the *L. philippii*, M. 398. The Professor suggests the name *L. dubiosa* for this sufficiently well-marked species; but as he catalogued and distributed his specimens under ? *parvula*, and kept others under *aspera*, it may be best to retain

the name *philippii* under which it has been very extensively circulated.

240. *Littorina pulchra.* A very rare species, belonging (with *fasciata* and *varia*) to the *Melaraphe* group.

241. *Littorina puncticulata.* This is the normal state of *L. conspersa*: v. M. 396.

242. *Littorina varia*: v. note on P. 236.

243. *Rissoa clandestina.* Three specimens appear of this species of *Rissoina*, closely resembling *R. woodwardii*, M. 410, but with more ribs, and not displaying the intercostal striulæ.

244. *Rissoa firmata.* Another species of *Rissoina*, resembling *R. stricta*, M. 408, but smaller. The Professor did not observe the fine spiral sculpture, as described in no. 250; q. v.

245. *Rissoa fortis.* A good species of *Rissoina*, differing from *R. janus* in the absence of spiral punctures.

246. ? *Rissoa inconspicua*, C. B. Ad., non Alder. The name being preoccupied, it is fortunate that the unique shell proves identical with *Alvania tumida*, M. 414. I found twenty (not "twelve or fourteen") ridges, which are not "obsolete," but become fainter anteriorly. The two upper whorls are very finely cancellated.

247. *Rissoa infrequens.* The unique specimen of this *Rissoina* is too much worn for description. It has more than the sixteen ribs; and the diagnostic marks must be received with caution.

248. *Rissoa janus.* The description of this *Rissoina* is drawn from a very small, dead, broken specimen, from which the sculpture is almost entirely worn away. The "var. *a*" should be considered as the type, being in perfect condition, and the diagnosis be altered as follows:—The "fine crowded spiral striæ" are seen all over, as are also the "ribs," which on each whorl "appear as striæ," and are not "obsolete near the periphery." The diagnostic character is that the spiral striæ are composed of rows of minute dots.

249. *Rissoa notabilis.* After drawing this unique shell carefully under the microscope, and making copious notes on the diagnosis from the specimen, an untoward cough lodged it among the meshes of the Curator's carpet, whence I endeavoured in vain to extricate it. This unfortunate accident is, however, the less to be regretted, as I can state with perfect confidence that it was exactly identical with another shell in the collection, P. 255, q. v.; and with M. 498, *Parthenia quinquecincta.* The "concave summits" of the ribs imply that the ribs are sharp, with concave interstices; and the "upper keel" is simply due to the angulation of the whorls. Though the lip was broken, the columellar plait, as well as the sinistral apex, escaped the Professor's notice.

250. *Rissoa scalariformis.* This unique specimen is simply the young of *Rissoina firmata*, P. 244; and probably = *Rissoina*, sp. ind., M. 409.

251. *Rissoa*, sp. ind. This is a broken specimen of *Chemnitzia turrita*, P. 230.

252. ? *Cingula inconspicua*. This unfortunate name, liable to be confounded with *Rissoa inconspicua*, Alder, and ?*Rissoa inconspicua*, C. B. Ad., will not be needed, as the type belongs to another sub-order, and = *Chrysallida ovulum*, M. 512. The Professor did not observe its close relationship with his *Chemnitzia communis*.

253. *Cingula paupercula*, C. B. Ad. A good species.

254. ? *Cingula terebellum*=*Parthenia exarata*, M. 501. Although I took every pains, in preparing the Maz. Cat., to identify Prof. Adams's species, I was not prepared, in the writings of so careful a naturalist who had devoted special attention to the minute species, to find a Pyramidellid under Trochidæ, especially with the mark "apex subacute." The finding of a more perfect Mazatlan specimen enables me to add to the diagnosis:—"*vertice nucleoso parvo, satis extante, decliviter sito; interstitiis carinarum transversim rugulosis; labro solidiore.* Long. ·087, long. spir. ·057, lat. ·038."

255. ? *Cingula turrita* (+P. 249, *Rissoa notabilis*)=*Parthenia quinquecincta*, M. 498. When a shell is described under two genera in the same sheet, the advocates of unbending priority will find it difficult to decide. As each name belongs to a widely removed family, that last given is at least the most correct and distinctive.

256. ? *Litiopa saxicola*. The Professor states that this "shell has the appearance of a *Litiopa*;" but it wants both the peculiar nucleus and the semitruncated columella; also that the "labium has a distinct deposit," of which I could not see any trace in either of the specimens. It is probably a *Cingula*.

257. ? *Adeorbis abjecta*. This is the adult form of the shell, of which P. 233, *Littorina atrata*, is the young. The striæ are seen on the lower as well as the "upper part of the whorls." The umbilicus, though "small" for an *Adeorbis*, is rather large for a *Fossarus*, to which genus the species undoubtedly belongs.

258. *Vitrinella concinna*. I could not find the "more or less distinct ridge between the first two keels."

259. *Vitrinella exigua*=M. 305. The omissions in the Professor's diagnoses of this and other species, being supplied in the Maz. Cat., need not be repeated here: v. M. pp. 236–247.

260. *Vitrinella janus*. The Professor does not mention the fifth keel, which bounds the umbilicus, and within which are the "minute spiral striæ." The "transverse striæ" are strong between keels 2, 3, and 4; faint between 4 and 5, and between 1 and 2; and evanescent near the suture.

261. *Vitrinella minuta*. The original type of this species accords better with *Ethalia* than with *Teinostoma*, to which I had referred the Cumingian type.

262. *Vitrinella modesta*. The "modesty" of this unique shell is

coordinate with considerable attrition, and an umbilicus filled with dirt. It appeared to me regularly rounded, without any keel. The "few spiral striæ" are probably the remains of what once covered the whole surface.

263. *Vitrinella panamensis*=M. 295.

264. *Vitrinella parva*=M. 296.

265. *Vitrinella perparva*=M. 304. The coronation of the upper keel is seen (though not described) in the type specimen.

266. *Vitrinella regularis*. The unique shell can hardly be called "subdiscoidal," since the "spire is convex, moderately elevated." I could not find the "impressed spiral line." It belongs to *Ethalia*.

267. *Vitrinella seminuda*. The unique type of this species also is much worn. I could not discover the "minute striæ of growth." Beneath, there are five spiral liræ, and a few spiral striæ near the mouth. The umbilical region and the base have fine radiating distant striæ. It comes nearest to *V. carinulata*, M. 309, but is distinct.

268. *Vitrinella tricarinata*. This unique type is also worn. The spiral keels are scarcely "prominent," that on the periphery being decidedly faint. The "transverse striæ" are between the suture and the nearest rib. The umbilical striæ are very faint.

269. *Vitrinella valvatoides*. This species probably belongs to *Ethalia*. Beside the keels, there are three obsolete spiral liræ—two on the base, and one above the periphery. The umbilicus is bounded by a long, thin callosity, which gives a character to the shell intermediate between the two genera.

270. *Solarium*, sp. ind. *a*. Of the form represented by this species and the next I have been able to examine a large number of specimens collected at Cape St. Lucas by Mr. Xantus, and in the Gulf of Mexico. I know of no mark by which to distinguish the shells from the two oceans. From each locality they vary greatly in the size of the umbilicus, and in the strength of sculpture, number of knobs, &c. I should consider them all as varieties of *S. granulatum*, Lam. *S. quadriceps*, Hds., appears distinct, though it may only be an extreme variety.

271. *Solarium*, sp. ind. *b*. This contains the specimens with coarser sculpture than the last.

272. *Solarium*, sp. ind. *c*. This is a distinct species of *Torinia*, having the size and general aspect of *Helix rotundata*.

273. *Trochus catenulatus*=*Modulus c.*, M. 401.

274. *Trochus coronulatus*=*Omphalius c.* This species reappears at Cape St. Lucas, and is closely allied to *O. ligulatus*, M. 293.

275. *Trochus leanus*=*Calliostoma l.* This distinctive generic name is strongly to be preferred to the specific *Ziziphinus*.

276. *Trochus lima*. This shell exactly accords with *Calliostoma antonii*, Koch, in Mus. Cuming.

277. *Trochus lividus*=*Modulus disculus*, M. 403.

278. *Trochus panamensis*=*Omphalius p.* A good species, though apparently very rare; for I had the pleasure of adding it to the Cumingian collection.

279. *Trochus pellis-serpentis*=*Tegula p.*

280. *Trochus reticulatus*=*Omphalius viridulus*, M. 292. This is the common Trochid of the Panama region, as is *ligulatus* of the Mazatlan.

281. *Turbo buschii*=*Uvanilla inermis*, M. 287. This shell appears to replace *U. olivacea* in the southern fauna. Besides the differences indicated in Maz. Cat. p. 229, the operculum is quite distinct.

282. ? *Turbo phasianella*=*Collonia ph.*: not (*Melaraphe*) *phasianella*, Phil.

283. *Turbo rutilus.* The unique type is in miserable condition, to which the "bright red with pale streaks" is owing. The shell may possibly have been originally a *Pomaulax undosus*, which is truly a Lower Californian species. It appears, however, to be a favourite with sailors, as specimens are continually appearing, not only high and low on the West Coast, but also from the Pacific Islands. The specimens brought by Comm. Wilkes's U.S. Expl. Exp. were obtained in N. S. Wales! Prof. Adams's fragments were probably due to ballast.

284. *Turbo saxosus*=*Callopoma saxosum.* This replaces the *C. fluctuosum* of the Gulf, M. 282, and the *C. tessellatum* of Lower California. The "var. *depressum*" of P. Z. S., 1855, I believe to be really a *Senectus* from the Pacific Islands.

285. *Scalaria hexagona*, C. B. Ad.: non Sby., M. 564. The Professor's shell is (I think) one of the species I described in P. Z. S. from Mr. Bridges's collection; but the distinctions in this genus are too critical to decide without comparison of types. This shell is broad; whorls very separate; varices long and sharp; spirally finely striated.

286. *Scalaria obtusa*, C. B. Ad.; ? non Sby. This also appeared to me one of Mr. Bridges's species. It is a very pretty shell, with close, sharp, coronated varices.

287. *Scalaria*, sp. ind. *a.* Like the next, but larger, and with spiral striæ between the extremely crowded, sharp varices.

288. *Scalaria*, sp. ind. *b.* Of the *Clathratula* type, without spiral sculpture.

289. *Scalaria*, sp. ind. *c*, is probably the young of *Cirsotrema funiculatum*, M. 569, which, with its congeners, may be removed to *Opalia*.

290. *Eulima iota.* This shell, which is a *Leiostraca* (not "? *Stylifer*"), is probably distinct from the Mazatlan form, M. 555, which should stand as *L. retexta.*

291. *Eulima recta.* The type is a very good species of *Leiostraca*; but I doubt its identity with the Cumingian specimen, with which the Mazatlan shell, M. 550, was compared. It most resembles the *L. linearis*, M. 554, with which it agrees in divergence and general shape; but that is very much smaller, with the upper whorls more tumid. In the Professor's type of *L. recta*, I searched in vain for traces of the "two brown spots." They were probably thrown by defective light. The "two opaque spiral bands" are simply the effect of the suture, and the previous whorl showing through. For the Mazatlan shell, M. 550, I propose the name of *L. involuta*.

292. *Eulima solitaria.* This also is a *Leiostraca*, not "? *Stylifer*," and accords exactly with the *Leiostraca*, sp. ind. *a*, M. 552, but not with the supposed *L. solitaria*, M. 551. The latter agrees in shape with the unique Panama shell, whorl for whorl; but its base and labrum are much more produced anteriorly. For this reason, it may be known as *L. producta*.

293. *Pyramidella*, sp. ind. This is probably the *Obeliscus* described in Maz. Cat. no. 486.

294. *Pyramidella conica* = *Obeliscus conicus*, C. B. Ad., not M. 486.

295. *Natica chemnitzii*=*N. maroccana*, M. 570. The Professor first labelled these shells "*N.* ? *maroccana*, Chem.," but crossed it off in pencil. Another tray appeared (without number) labelled "? *unifasciata*, Lam." They all belong to the large West Coast form of *maroccana*. [N.B. The shells described in P. Z. S. as "var. *californica*," on the authority of the late Mr. Nuttall, are (with others from the same source) undoubtedly from the Sandwich Islands. The Pacific specimens (of which I have examined many thousands, brought by Comm. Wilkes's E. E.) present a very different type from those of the west coasts of Africa and America; but are regarded by Mr. Cuming as only a local variety.]

296. *Natica* ? *lurida*. These shells are simply a pale variety of *N. maroccana*.

297. *Natica otis*, C. B. Ad. (not Brod. & Sby.). These shells appear to be the young of *Polinices* "*salangonensis*," P. 298.

298. *Natica* ? *salangonensis*. I had no opportunity of comparing this *Polinices* with the species of Récluz.

299. *Natica souleyetiana*. The shells closely resemble *N. maroccana*, but with a larger umbilicus.

300. *Natica* ? *virginea*, C. B. Ad. (not Récl.) = *Polinices uber*, M. 576.

301. *Natica*, sp. ind. *a*. There is no ticket answering to this number, which was probably intended for the *N. maroccana*, var. "*unifasciata*."

302. *Natica*, sp. ind. *b*. The shells are marked *e*, and are the young of *Polinices uber*, P. 300, M. 576.

303. *Natica*, sp. ind. *c*. The shell is marked *f*, and is probably =*N. haneti*.

304. *Nerita scabricosta*=M. 326. After examining a multitude of specimens from different parts of the coast, I have not the slightest doubt of the identity of the forms called *ornata* and *deshayesii*.

305. *Nerita*, sp. ind. *a*=*N. bernhardi*, M. 327.

306. *Neritina guayaquilensis*. Stet.+*N. intermedia*, Sby.

307. *Neritina picta*=M. 329.

308–316. Stent. The shells described as "*Auricula*" belong to *Melampus*.

317. *Truncatella bairdiana*. A good species.

318. ?? *Truncatella dubiosa*. This belongs to *Hydrobia* or some similar Rissoid.

319. *Bulla* (*Tornatina*) *infrequens*=*Tornatina i.*, M. 222.

320. *Bulla* (*Cylichna*) *luticola*=*Cylichna l.*, M. 221. The Mazatlan shell is much more constricted than most of Prof. Adams's specimens.

321. *Bulla punctulata*=*B. adamsi*, M. 224. The *B. punctata*, A. Ad.=*B. punctulata*, A. Ad., but is not the *B. punctulata*, C. B. Ad.=*B. puncticulata*, C. B. Ad., MS. on ticket.

322. *Bulla*, sp. ind.=*Tornatina carinata*, M. 223.

323. *Vermetus ? glomeratus*, C. B. Ad. (not *Bivonia glomerata*, Lam.)=*V. eburneus*, M. 354. The shells sometimes assume a rufous tint in the later whorls, in which state (if the Turritelloid apex be concealed) it is liable to be confounded with *Aletes centiquadrus*. Some of the Professor's shells belong to the latter species.

324. *Vermetus panamensis*, C. B. Ad. (? Rouss.)=*Aletes centiquadrus*, M. 352.

325. *Stomatella inflata* is a *Lamellaria* with broken lip and very much curved columella: v. M. 577. [A *Sigaretus*, with somewhat sharper columella than the ordinary W. Indian form, was found among the Professor's duplicate Panama shells; but as it does not occur either in the catalogue or the collection, it was probably dropped in from the Jamaica series.]

326. *Hipponyx*, sp. ind. Of the Professor's "two small specimens" marked "*subrufa*, jun.," one is *H. grayanus*, jun., M. 350. The other may be the same, but is probably the young of *H. barbatus*. Neither are sufficiently perfect to determine with confidence.

327. *Hipponyx ? barbata*. Part of these specimens belong to *H. barbatus*, M. 349; part to *H. grayanus*; part are too much worn to determine; and one is a valve of *Discina cumingii*.

328. *Hipponyx panamensis*=*H. antiquatus*, M. 347. The species is very widely diffused, and varies greatly in each locality.

329. *Hipponyx radiata*=*H. grayanus*, M. 350. The collection

also contains a tray labelled "Panama: C. B. Ad. don.," in which are *Hipponyx serratus*, M. 346, *H. barbatus*, and *Gadinia pentagoniostoma*, M. 270. This last name should be dropped, except as a variety of *G. stellata*, Sby., which is the normal state: v. B. A. Rep. 1857, pl. 7. f. 3, *a–g*.

330. *Calyptræa aberrans*. The Professor candidly allows that "in texture this shell much resembles a valve of an *Anomia*," which it undoubtedly is, the supposed "probably imperfect cup" being the ligamental pit. The large muscular scar is very clearly developed; but the others are faint, as is customary in young shells, and might stand for either *Anomia* or *Placunanomia*. The valve is thin and glossy inside. The outside is smooth, excepting the lines of growth, and is encrusted with beautiful zoophytes. A tiny *Serpula*, which has coiled itself close to the umbo, carries out the idea of a Calyptræid spiral apex; but a careful microscopic examination displayed the true Anomoid nucleus, at a little distance from the margin, as is common in the Mazatlan specimens of *A. lampe*, M. 219.

331. *Calyptræa* (*Syphopatella*) *aspersa*=*Galerus conicus*, very worn and young, with the lamina broken away. One of the specimens may perhaps be *mamillaris*.

332. *Calyptræa cepacea*=M. 345.

333. *Calyptræa conica*. These are dead specimens, of which a few may be the true *Galerus conicus*, M. 332. But most of them belong to the brown-tinted variety of (the Professor's *G. regularis*=) *mamillaris*: v. no. 340.

334. *Calyptræa dentata*=*Crucibulum imbricatum*, M. 343.

335. *Calyptræa hispida*=*Crucibulum spinosum*, M. 344.

336. *Calyptræa imbricata*. The two specimens are too much worn to affiliate with confidence, the cups being broken out. The outside is ribbed, with arrow-headed striæ between the ribs. They probably =*Crucibulum i.*, var.

337. *Calyptræa maculata*=*Crucibulum spinosum*, M. 344. See the attempt to unravel the confusion in the synonymy of this family in Maz. Cat. pp. 264–295. Three specimens marked by the Professor "*C. maculata*, var.," are young, dead *radiata*, no. 339.

338. *Calyptræa planulata*. This unique shell is simply a young, flat *C. cepacea*, with the cup prominent, and the outside sculpture faintly developed, from living in a hollow place. The striæ are not "obsolete around the apex."

339. *Calyptræa radiata*=*Crucibulum r.* This rare and beautiful species is quite distinct, even in the early stages, from all varieties of *C. spinosum*.

340. *Calyptræa* (*Syphopatella*) *regularis*=*Galerus mamillaris*, M. 333.

341. *Calyptræa umbrella*=*Crucibulum u.* (=*C. rudis*, Brod.).

342. *Calyptræa ?unguis*, C. B. Ad.=*Crucibulum spinosum*, jun. (not *Galerus unguis*, Brod.).

343. *Crepidula cerithiicola*. Most of the specimens are the young of *C. onyx*, M. 340; but a few are of *C. incurva*, M. 339.

344. *Crepidula echinus*=*C. aculeata*, M. 334.

345. *Crepidula excavata*, M. 337.

346. *Crepidula ? hepatica*=*C. onyx*, M. 340.

347. *Crepidula incurva*, M. 339. A very interesting series of specimens; of which two or three are probably the twisted form of *C. onyx*. One tray contains specimens adhering to other shells. One, fixed diagonally on a *Calliostoma*, takes exactly the arrow-headed sculpture of the var. *Cal. imbricata*, Brod. Another, grown diagonally on *Pisania gemmata*, has the general aspect of a *Chiton*. One, fixed on the back of its neighbour which has grown on a *Calliostoma*, has the granular interruptions of the ribs transmitted *through* the first specimen. The same is true of one which has grown on another which was planted on a *Pisania*. One specimen, which had established itself on a *Calliostoma*, and began with normal ribs, is losing these at the margin, adopting the sculpture of the Trochid. An extremely twisted specimen in the tray of separate shells has a bifid deck. A young one had edged itself into the apical part of the deck, as into a maternal pouch; so the old one made a fresh deck over it.

348. *Crepidula lessonii*. Most of the specimens are of *C. nivea*, var., M. 341. Two shells, which have the apex perfect, display the characteristic nuclear riblets. One dark-coloured specimen may be a hybrid, and another (though too much worn for confident affiliation) appears to be *C. unguiformis*. Among the duplicates, all the specimens which were perfect at the apex presented the niveoid nucleus, though white; but generally the riblets were more or less worn off.

349. *Crepidula squama*. These are the flat form (mostly dead and worn) of *C. nivea*, M. 341. Some of them pass into *lessonii*. Some are highly coloured, and may be the young of *C. onyx*; one even of *C. incurva*. One of the young shells in phial appears to be *C. onyx*; but whenever the apex is perfect, it presents the typical riblets: v. Maz. Cat. *in loco*.

350. *Crepidula unguiformis*. The apex being hidden in dead shells, which I was not at liberty to break away, I could only examine one specimen, which appeared to be a *C. nivea*, var., as supposed in Maz. Cat. p. 285. Of the loose specimens, scarcely any are sufficiently perfect at the apex to speak with confidence. Most of them, however, have the characteristic painting of the variety *squama*; and all may belong to the common species (*C. nivea*), except one which is a true *C. unguiformis*, M. 342, on the back of another shell, and a few which are probably *C. onyx*, var. Of the duplicates, which I was at liberty to extract from the dead shells,

some are undoubtedly *C. nivea*; others truly *C. unguiformis*; and others probably *C. nivea*, but with the riblets worn away by the crabs.

351. *Crepidula nivea*, M. 341. The specimens are small and poor; mostly rough, of the variety *striolata* passing into *lessonii*. Wherever the apex is perfect, it presents the characteristic riblets, but is generally white, not brown as in most of the finely grown Mazatlan shells.

352. *Crepidula osculans*. This is a perfect and extremely beautiful specimen of *Scutellina navicelloides*, M. 269. The Professor did not observe the non-spiral patelloid apex, and regarded the "navicelloid" columella as an extremely narrow deck. To the diagnosis in the Maz. Cat. may now be added "*apice obtuso, sublævi; vertice haud spirali, vix conspicuo.*"

353. *Crepidula rostrata*=*C. adunca*, M. 338, ?non Sby. The examination of a large series of specimens from the temperate fauna has led me unexpectedly to confirm Mr. Reeve's opinion that they are distinct. The northern shell is *C. adunca*, Sby. (=*Garnotia* [Gray] *solida*, Hds.=*C. rostriformis*, Gld.); and the tropical shell must take the prior name, *C. uncata*, Mke. (=*C. rostrata*, C. B. Ad., Rve.=*C. adunca*, Maz. Cat., non Sby.).

354. *Fissurella æqualis*=*Fissurellidæa æ.*

355. *Fissurella alta*=*Glyphis alta*, M. 280.

356. *Fissurella macrotrema*. Stet.

357. *Fissurella microtrema*. These are dead specimens, of which some are *F. rugosa*, var., M. 273.

358. *Fissurella mus*=*Glyphis inæqualis*, var., M. 279. These shells are intermediate between the typical form and *pica*.

359, 360. Stent.

361. *Fissurella virescens*. It is doubtful whether any of the specimens are of the true *virescens*, M. 271, as they run into *nigropunctata* by insensible gradations. Perhaps both species may prove identical.

362. *Siphonaria characteristica*=*S. gigas*, var.

363, 364, 365. Stent.

366. *Siphonaria ?pica*. These are young dead limpets (not *Siphonariæ*).

367. *Lottia ?patina*, C. B. Ad. (non Esch.). These shells differ from *Acmæa mesoleuca*, M. 263, in being black instead of green, and are prettily striped.

368, 369, 370. *Lottia*, sp. ind. There may be two or even more species of *Acmæa*, but it is not impossible that there is only one among the Professor's *Lottiæ*, some of the specimens being the young of *?Patella*, no. 371.

371. ? *Patella*, sp. ind. This has the general appearance of *P. vulgata*, but may be an *Acmæa*.

372. *Chiton clathratus*. (Genus indet.)

373. *Chiton dispar*, C. B. Ad.; not *Lophyrus dispar*, Sby. I doubt whether any of the Professor's specimens belong to Sowerby's species, which is black mixed with grey; area-sculpture very faint; and sides imbricated, not rugulose. Among the duplicates were two (if not three) species:—the principal one with side-sculpture in lobated knobs, which may be named *Lophyrus adamsii*; a ?variety with simple knobs; and a well-marked species without distinct side areas, which may be called *Lophyrus tenuisculptus*.

374. *Chiton ?luridus*. Probably correct.

375. *Chiton pulchellus*=*Callochiton p.*+*C. elenensis*.

376. *Chiton stokesii*=*Lophyrus s.*

377. *Anomia lampe*, C. B. Ad. It is doubtful whether this is identical with the northern species, M. 219.

378. *Anomia tenuis*. This is probably the young of the last species, and may give it a name, if new. It is doubtful how the diagnosis of the scars was made out; as they were not visible in either of the specimens retained, being encrusted with dead animal matter. They were not distinct even after its removal.

379. *Anomia*, sp. ind. *a*. Probably the same species as the two last, although far too dead, worn, and young to decide. See notes on the variations of *A. lampe*, Maz. Cat. p. 168.

380. *Ostrea*, sp. ind. *a*. The hinge notches of the upper valve fit between corresponding teeth in the lower. Inside rather flesh-coloured; white, round margin. Scar kidney-shaped, dark in one valve, light in the other. A young valve is white, and as pearly as *O. iridescens*, M. 211. The species is best known by its tendency to make a very broad limb in the exterior coloured part, spreading out into palmations. A very young specimen, though covered above with *Membraniporæ*, shows the characteristic corrugations through. It may stand provisionally as *O. panamensis*.

381. *Ostrea*, sp. ind. *b*. This is probably a variety of *O. panamensis*, but more coarsely grown, so that there is a smaller limb, without palmations. Wherever the sculpture appears, there are evident traces of the peculiar corrugations. The inside has the same characters, both of hinge, colour, iridescence, and scar.

382. *Ostrea*, sp. ind. *c*. Rather square hinge, without plications; one shell with an umbonal cavity. Pearly white. One specimen is tinted on the scar, which may become coloured in the adult. It is by no means "pentangular," and is more probably=*O. rufa*, Gld., than *O. columbiensis*, M. 213.

383. *Ostrea*, sp. ind. *d*. The shells are broader than the Mazatlan specimens of *O. virginica*, M. 212, probably from not growing on twigs. The younger shells are very like *O. edulis*; the older ones

have hollow umbos. One long shell, first marked *e*, but altered to *d*, is the adult form; several of the younger shells are doubtful.

384. *Ostrea*, sp. ind. *e.*=*Ostrea*, M. 215. Being a good species, I propose the name of *O. amara*. The Professor's "small var." is not plicated, and appears to belong to *O. conchaphila*, M. 214. [N.B. Additional specimens confirm me in the belief that *O. palmula*, M. 214 *b*, is a distinct species.]

385. *Spondylus lamarckii*, C. B. Ad.=*S. calcifer*, M. 208.

386. *Spondylus*, sp. ind. *a*=*Plicatula penicillata*, M. 210.

387. *Pecten inca*=*P. ventricosus*, Sby., as in errata.

388. *Pecten tumbezensis*=*P. aspersus*, Sby., Hanl. (? Lam.).

389. *Lima angulata*. Shells inflated, not gaping.

390. *Lima pacifica* (=*L. arcuata*, Sby., Hanl.). Young shells, species uncertain.

391. *Avicula ?margaritifera*=*Margaritiphora fimbriata*, Dkr., M. 204=*M. mazatlanica*, Hanl.=*M. barbata*, Rve.

392. *Avicula sterna*, M. 203. *A. libella*, Rve., appears to me the young of this species.

393. *Perna*, sp. ind. *a*=*Isognomon chemnitziana*, M. 205.

394. *Perna*, sp. ind. *b*=*I. chemnitziana*, var. Rather more finely grown, and with less colour, but certainly the same species. The Professor's Jamaica specimens are labelled "*bicolor*, Ad."

395. *Pinna maura*, M. 200.

396. *Pinna tuberculosa*. Three of the specimens appear to me =*P. maura*, jun. The other may be the same, but is worn nearly smooth.

397. *Mytilus*, sp. ind. *a*. Resembles the young of *Modiola brasiliensis*, but with a few hinge-teeth, as in *M. edulis*.

398. *Lithodomus*, sp. ind. *a*. Most of these specimens are of *Lithophagus aristatus*, M. 176; one (perhaps two) are *L. attenuatus*, M. 173 (which is found from Lower California to Chili); and one appears to be *L. plumula*, M. 175; but they are too young to decide with confidence.

399. *Modiola ? semifusca*. These specimens all belong to the *M. brasiliensis*, M. 171, but are much more like the ordinary Brazilian specimens than are those from Mazatlan. As compared with the latter, the Panama shells are more rounded, with stronger posterior grooving, and with the angular ridge less marked. A similar shell, undoubtedly from New Zealand, is considered by Mr. Cuming conspecific.

400–404. *Modiola*, sp. ind. *a*, *b*, *c*, *d*, *e*. I could find no *a* or *e* in the collection; but there were two trays marked *f*. Tray *b*=*M. capax*, M. 170. *c* contains several specimens of *Mytilus multiformis*, M. 168, strongly ribbed variety, perhaps intended for *b*, no. 401.

d contains parts of six specimens, and perhaps should be *a*, no. 400. They appear to be a variety of *Lithophagus cinnamomeus*, M. 177, but with broken shells, &c., agglutinized on the posterior side. *f* (1) contains four specimens of *M. multiformis*, the semigreenish variety (Maz. Cat. p. 119), and are probably intended for *c*. *f* (2) contains two specimens of the same variety of *M. multiformis*, in the burrow of a *Lithophagus*, and may stand for *d* or *e*.

405. *Chama buddiana*=*C.* (*? frondosa*, var.) *fornicata*, M. 121, *b*. Additional specimens confirm me in regarding this species as distinct from all varieties of *frondosa*. The Professor's shells not being very characteristic, the diagnoses do not exactly accord. The shell stands as *C. buddiana*.

406. *Chama ? corrugata*. The large valve appears a dead reversed *C.* (*frondosa*) *mexicana*, M. 121, with the teeth perforated by *Lithophagi*. The other may be *corrugata*, very dead, of sienna-tint, very pointed dorsally.

407. *Chama echinata*. These appear to me to be the young, partly of *C. buddiana*, but principally of *C. mexicana*.

408. *Nucula elenensis*=*Leda e.*, M. 199.

409. *Nucula exigua*, M. 198.

410. *Nucula polita*=*Leda p.* With semidiagonal lines.

411. *Pectunculus assimilis*+*P. inæqualis*, M. 196.

412. *Pectunculus ?maculatus*. Stet.

413. *Arca alternata*=*Barbatia a.*, M. 188.

414. *Arca ?aviculoides* appears a young *Scapharca*.

415. *Arca emarginata*=*Scapharca e.*, M. 187.

416. *Arca gradata*=*Barbatia g.*, M. 194.

417. *Arca grandis*, M. 180.

418. *Arca mutabilis*=*Byssoarca m.*, M. 190.

419. *Arca* (*Byssoarca*) *pholadiformis*. This is simply an elongated form of *Barbatia gradata*, probably from growing in the hole of a *Lithophagus*. The umbos are "flattened" by erosion; teeth not "obsolete" under the glass; "ligament concealed" simply by the compressed and elongated growth.

420. *Arca reeviana*=*Barbatia r.*

421. *Arca reversa*=*Noetia r.*, M. 185.

422. *Arca similis*. This is scarcely a variety of *A. tuberculosa*, M. 184. The specimens are dead and oiled, with most of the epidermis abraded.

423. *Arca solida*=*Barbatia s.*, M. 195.

424. *Arca* (*Byssoarca*) *tobagensis*=*Barbatia illota*, M. 193.

425. *Arca tuberculosa*, M. 184.

426. *Arca*, sp. ind. *a*. These little shells approach the *Noetia*

type. Ribs fine, tuberculous, coarse on the angular side. Ligament very narrow, truncated.

427. *Cardita affinis.* (*Lazaria.*)

428. *Cardita laticostata*=*Venericardia l.*

429. *Cardita radiata.* (*Lazaria.*)

430. *Cardium graniferum*, M. 134.

431. *Cardium obovale*=*Hemicardia o.*

432. *Cardium planicostatum*, C. B. Ad., not Sby. This looks like a dead ballast-valve of *Hemicardia media*; but it may be *H. biangulata.*

433. *Cardium procerum*, M. 125.

434. *Cardium senticosum*, M. 126.

435. *Venus ?amathusia*=*Anomalocardia subimbricata*, M. 113.

436. *Venus discors*=*Tapes gratus*, Say, M. 110. The Professor's specimens of this species and *T. histrionicus* are somewhat intermixed.

437. *Venus gnidia*, M. 101. Dead specimens; of which one may possibly be *Chione amathusia*, M. 102.

438. *Venus multicostata.* Closely resembling the West Indian form.

439. *Venus pectunculoides*=*Tapes histrionicus*, M. 109.

440. *Venus subrugosa*=*Anomalocardia s.*, M. 112.

441. *Venus*, sp. ind. *a.* A small species with concentric laminæ, armed with one posterior row of blunt spines. Interstices with minute concentric striæ.

442. *Venus*, sp. ind. *b*=*Chione crenifera*, M. 105=*V. sugillata*, Rve. C. I. no. 43.

443. *Cytherea affinis.* Probably=*Callista concinna*, var., M. 99.

444. *Cytherea aurantiaca*=*Callista aurantia*, M. 92.

445. *Cytherea consanguinea*=*Callista c.* Messrs. H. and A. Adams have not made a subgenus to include this group of thin, inflated, almost colourless species.

446. *Cytherea radiata*=*Trigona r.*, M. 83.

447. *Cytherea squalida*=*Callista chionœa*, M. 93.

448. *Artemis dunkeri*=*Dosinia d.*, M. 90.

449. *Artemis saccata*=*Cyclina subquadrata*, M. 91.

450. *Gouldia pacifica*, M. 116.

451. *Cyrena maritima.* Stet. The collection also contains two tubes, containing a very young "*? Cyclas*" and another "*Cyrena*, jun.," marked "Panama, C. B. Ad."

452. *Lucina tellinoides*=*Felania t.* Differs from *F. sericata*,

Gray, John Edward. 1863. "June 23, 1863." *Proceedings of the Zoological Society of London* 1863, 237–369. https://doi.org/10.1111/j.1469-7998.1863.tb00393.x.

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