

acute an observer as Dr. Prout should have overlooked the characters of Prof. King's genus *Synocladia*. Our Scotch form and *S. cestriensis*, Prout, agree very closely, so far as I can judge from descriptions and figures, and appear to differ only in a much greater irregularity of branching in the case of *S. carbonaria*, and also in its having, as in *Synocladia*, the cell-apertures arranged in two rows on the interstices. Dr. Prout's figure does not give a good idea of this peculiar polyzoon; but I have been favoured by Prof. King with extracts and photographs from a letter to himself from Mr. F. B. Meek, of Springfield, Illinois, regarding the question of *Septopora* and *Synocladia*. These photographs show that the American specimens are in a much better state of preservation than the Scotch; and although the points of difference between the two are slight, I think they are of sufficient importance to warrant a specific separation; however, should Mr. Meek have previously elsewhere described any form nearer *S. carbonaria* than *Septopora cestriensis*, my designation can give place to his; in the mean time I retain for the Scotch fossil the name of *S. carbonaria*. Mr. Meek states that fuller descriptions and figures will be given in the forthcoming fifth volume of the 'Geological Survey of Illinois.'

Edinburgh, August 11, 1873.

XXV.—On the Longicorn Coleoptera of Japan.

By H. W. BATES, F.L.S.

[Continued from p. 156.]

Fam. Cerambycidæ.

Section B. *Eyes finely faceted. Habits diurnal.*

Toxotus cæruleipennis, n. sp.

T. elongatus, subparallelus (♂), niger, thoracis margine antico vitætaque laterali, et annulo basali femorum anticorum flavo-testaceis; elytris saturate cæruleis, planis, confertim ruguloso-punctatis, interstitiisque subtilissime coriaceis, apice truncatis, angulo suturali dentato, exteriore late rotundato. Long. 9 lin. ♂.

Japan? (*Fortune*). Possibly from North China, as Mr. Fortune's collections from the two countries were mixed together when I saw them.

Elytra more elongate than in the same sex of *T. meridianus*, and of quite different shape, being broad and rectangular at the base, then slightly narrowing to beyond the middle, and widening again before the apex; the whole surface roughly, but not very coarsely, sculptured. The thorax is much more strongly tuberculated, glabrous on the disk; there are two strong rounded tubercles on each side the median sulcus, and

the lateral tubercle is much larger and more conical. The antennæ are more slender, but the proportions of the joints are very similar.

Mr. Lewis did not meet with this species.

Acmaeops criocerinus, n. sp.

Pachyta minuta, Gebler, Nouv. Mém. Moscou, ii. 1832, p. 69?

A. parvus, *Crioceri puncticolli* similis, niger, nitidus, sparsim subtiliter setosus, elytris cyaneis; capite et thorace sparsim punctulatis, hoc convexo, lævi, medio haud dilatato sed antice valde angustato; elytris breviter oblongo-ovatis, apice rotundatis, supra sparsim setifero-punctulatis; corpore subtus, pedibus et antennis cinereo-pubescentibus; antennis (♂) corpore multo longioribus. Long. 3 lin.

Awomori, Nipon (*Mr. Moor*).

Distinguished from *Acm. collaris* by its shorter and broader form and much finer and scantier pubescence, as well as by its colour. It agrees with Gebler's description of his *P. minuta*, except in the scutellum—black and glabrous in *A. criocerinus*, and "albo-tomentosum" in *P. minuta*.

Mr. A. Adams obtained a species from the coast of Manchuria considerably larger (4 lines) and rather more strongly punctured, which can scarcely be separated from the present one.

Leptura scotodes, n. sp.

L. cinctæ forma simillima, nigra, opaca, subtus cinereo-pubescent, ♀ elytrorum basi sanguinea; capite et thorace confertissime reticulato-punctatis, illo postice ante collum recte truncato, hoc antice sensim angustato, lateribus ♂ vix, ♀ paulo, rotundatis, angulis posticis rotundatis, basi transversim modice depresso, linea dorsali obsoleta; scutello cinereo-tomentoso; elytris apice recte truncatis, supra confertim punctatis, punctis singulis seta minuta ferentibus. Long. $4\frac{1}{2}$ –6 lin.

♂ segmento ultimo ventrali late sinuatim truncato et concavo; tibiis posticis rectis.

♀ pygidio elongato-triangulari, apice obtuso; segmento ultimo ventrali late rotundato, apice depresso; elytris basi fascia angusta sanguinea, supra callum humerale dilatata, marginem haud attingente.

Three examples, Nagasaki.

Leptura tenuicornis, Motsch.

Leptura tenuicornis, Motsch. Etudes Entom. 1861, p. 23.

Nagasaki; many examples.

Motschulsky's description applies tolerably well to the ♀ of

one of Mr. Lewis's species, which appears not uncommon in Japan. It is closely allied to *L. atra* (Laich.), the ♂ having similar flexuous hind tibiæ; but it is longer, and has the elytra of a tawny-testaceous hue, with the shoulders, tips, and sutural edge dusky. The thorax has the same form as in *L. atra*, but is clothed with tawny-golden pile. The antennæ of the male are very long and black; of the female almost equally long and slender, and generally of a tawny-testaceous hue, but sometimes nearly black, except the three or four apical joints. It is in this latter point that the chief discrepancy with Motschulsky's description lies; for he states "articulis duobus penultimis albidis." On the twofold consideration that the antennæ are variable in colour in the female, and that Motschulsky's descriptions are well known to be recklessly inaccurate, I do not venture to give a new name to the species.

Var. ♂. Mr. Lewis has a male variety in which the elytra are blackish, with a curved streak on each side of the scutellum and a fascia near the apex tawny yellow. The anterior and middle femora and tibiæ are also varied with tawny yellow, thus resembling the female, in which yellow is the prevailing colour.

Leptura dimorpha, n. sp.

L. atra (Laich.) simillima, differt solum thorace feminae supra rufo. Nigra, vix nitida, supra breviter nigro-setosa, infra griseo-pubescent³; capite thoraceque confertim punctatis, hoc convexo, juxta basin fortiter depresso, angulis posticis productis; elytris apice sinuatim truncatis, angulis externis productis, supra crebre punctulatis.

♂ tibiæ posticæ versus apicem dilatatae et intus flexuoso-carinatae; segmentum ultimum ventrale quadratum, apice late rotundatum, medio late sulcatum.

♀ thorax supra et lateraliter saturate rufus.

Many examples.

L. atra (Laich.) is apparently common in Eastern Siberia. I have several examples from Maack's collection which do not differ from German specimens. *L. aterrima* (Motsch. Schrenck's Reisen, Coleop. p. 147) is no doubt the same species; in fact the author indicates no difference of the slightest importance in his description.

Leptura xanthoma, n. sp.

L. nigrae (Lin.) forma similis, at major. Elongata, supra longitudinaliter convexa, nigra, nitida, pubescens, humeris macula subquadrata, femoribusque et tibiis anticis subtus flavis, palpis rufo-testaceis; capite medio usque ad collum sulcato, punctulato; thorace elongato, ad trientem anticum rotundato-dilatato, deinde sinuatim angustato, angulis posticis longe productis, supra juxta

basin transverse (lateraliter profundius) impresso, subsparsim punctulato, fulvo-pubescente; elytris postice gradatim attenuatis, apice oblique truncatis, punctulis nigro-setiferis passim impressis, corpore subtus cinereo-pubescente. Long. 6 lin. ♂.

One example.

Leptura ochraceofasciata, Motsch.

Leptura ochraceofasciata, Motsch. Etud. Entom. 1861, p. 21.

Taken by Mr. Lewis in great abundance. A handsome species, allied to *L. quadrifasciata* (Linn.), but with head and thorax densely clothed with golden pubescence, and elytra with four golden-yellow pubescent belts.

♂ tibiæ posticæ flexuosæ, a medio abrupte dilatatæ, intus flexuose carinatæ. Segmentum ultimum ventrale apice truncatum, angulis rotundatis, medio vix concavum.

In Nipon and on the hills the antennæ are always, as Motschulsky describes, black; but in the plains near Nagasaki they have the five terminal joints tawny (var. *ochrotela*). I can discover no other differences.

Leptura anaspidoïdes, n. sp.

L. figura Anaspidis (Sectionis *Heteromerorum*), elongata, subparallela, convexa; capite et thorace brevissimis; antennis elongatis, robustis; nigra, elytris fusco-rufis, pilis elongatis decumbentibus rufis vestitis; thorace campanuliformi, angulis posticis productis, subtiliter punctulato, fulvo-pubescente; elytris oblique obtusissime truncatis, subtiliter punctulatis. Long. 5-7 lin. ♀.

Segmentum ultimum abdominale longe productum; pygidio et segmento ventrali apice late obtuse truncatis.

Two examples.

Thranius variegatus, n. sp.

T. fusco-obscurus, opacus; corpore subtus medio, femoribus subtus, tibiis et tarsis, fascisque duabus elytrorum (prima prope basin latiore et valde irregulari) fulvo-testaceis; thorace disco antice compresso-gibboso, cum capite punctato-scabroso, cinereo-tomentoso. Long. 9 lin.

One example, found in the window of a house, Nagasaki.

In the gibbosity of the thorax resembling *Thr. gibbosus* (Pascoe) of Ceylon. The anterior tawny fascia of the elytra is irregular, and may be described as a broad basal belt, indented from the base by a bicuspid black spot on each side of the scutellum. The second fascia is very narrow and transverse. The elytra are each narrowed from the base to the

middle, thence continuing as a narrow blade to the apex, which is pointed; their surface is thickly punctured throughout, with a faint raised line down the middle. The abdomen is prolonged much beyond the tip of the elytra (female?), the pygidium being very long, convex, and sinuate at the apex; its surface, as well as that of the preceding segment, is fulvous. The antennæ are three fourths the length of the body, filiform, stout, and ruddy brown.

Pyrestes cardinalis, Pascoe.

Pyrestes cardinalis, Pascoe, Journ. Entom. ii. p. 50.

Three examples. Found also at Hongkong.

Erythrus congruus, Pascoe.

Erythrus congruus, Pascoe, Journ. Entom. ii. p. 51.

One example; Hiogo. Found also at Hongkong.

Callichroma (*Chloridolum*) *tenuatum*, n. sp.

C. angustum, elongatum, quoad colorem et elytrorum sculpturam *Aromia moschata* simillimum, sed antennis ut in gen. *Chloridolo* gracillimis; viride, subtus subtiliter cinereo-tomentosum, antennis pedibusque violaceis; thorace angusto, tuberculis laterilibus validis, supra passim transversim et oblique strigoso; elytris creberrime subtiliter scabrosis, lineis duabus tenuibus elevatis; pedibus elongatis, gracilibus, tarsis posticis articulo primo longissimo. Long. 8 lin. ♂ ♀.

Kobe, several examples; also taken by Mr. Fortune on the island of Nipon.

This remarkably slender species differs from *Chloridolum* in having the fourth antennal joint distinctly shorter than the third, instead of being of the same length. It does not agree either with *Leontium*, having the antennæ long and slender, instead of robust, and serrate or spinose. The antenniferous tubercles, however, are obtuse, as in *Leontium argentatum*. In the naked and finely scabrous elytra, and also in colour, it agrees with *Aromia moschata*; but it differs in its antennæ and long slender hind legs and tarsi. As the genera allied to *Callichroma* are at present very unsatisfactorily defined, I hesitate to add to the confusion by instituting a new one for this insect.

Sympiezocera japonica, Lacord.

Sympiezocera japonica, Lacord. Genera des Coléopt. ix. p. 47.

Rare, in pinewood, on Maiyasan, Hiogo.

Semanotus rufipennis, Motsch.*Callidium rufipenne*, Motsch. Etudes Entom. 1860, p. 19.

Many examples. Varies in size from $3\frac{1}{4}$ to 6 lines. The prosternal process is much narrower, and the mesosternum more attenuated behind, in the male than in the female; but their breadth in the former sex is much greater than in the genus *Callidium*. The femora are less clavate, especially in the female, and the thorax less dilated in the middle than in *Rhopalopus*. Breeds in fir rails, and appears in first warm days in March.

Phymatodes albicinctus, n. sp.

P. vario (Fab.) affinis, at differt colore nigro, elytris fascia angusta alba. Niger, pubescens, elytris medio fascia angusta alba; capite retractili, fronte et vertice planis, punctulatis; thorace creberrime sed discrete punctulato; elytris planatis crebre punctulatis. Long. $3\frac{1}{4}$ lin. ♀.

One example; Omura.

Closely resembling in size and form the North-American *P. varius*. The pubescence is much shorter and more adpressed; the thorax is narrower, rather more narrowed behind than in front, very evenly punctulated over its entire surface. The elytra have in the middle a nearly straight, narrow, pure white belt.

Clytanthus notabilis, Pascoe.*Clytus notabilis*, Pascoe, Journ. Entom. i. p. 360.*Clytanthus alphabeticus*, Chevr. Clytides d'Asie et d'Océanie (1863), p. 56 (*Anthoboscus*).

Many examples. Taken by Mr. Fortune also at Yokohama.

Clytanthus oppositus, Chevr.*Clytanthus oppositus*, Chevr. Clytides d'Asie et d'Océanie, p. 52.*C. japonicus*, id. p. 46?

Many examples. Abundant in June.

The markings agree best with Chevrolat's description of *C. oppositus*; but they vary a little in the direction of *C. japonicus*, and I suspect the two to belong to one and the same species.

Clytanthus quinquefasciatus, Lap. & Gory.*Clytanthus quinquefasciatus*, Lap. & Gory, Mon. p. 101, t. 19. f. 120.

Many examples.

Clytanthus muscosus, n. sp.

C. elongatus, gracillimus, pube viridi-grisea vestitus; elytris utrinque maculis duabus transversis nigris, una mox pone medium, altera

inter medium et apicem; antennis pedibusque plus minusve obscure rufescentibus. Long. $5\frac{1}{2}$ lin. ♀.

Hiogo, three examples.

Of the same ashy-green colour as *C. 4-punctatus*, F., but of much narrower and more cylindrical form. The antennæ are slender and half the length of the body in the female. The thorax is long, very gradually narrowed in front and abruptly narrowed near the base. The elytra are sharply and obliquely truncated, with the exterior angle dentiform; each has, behind the middle, two transverse black spots, the first a little after the middle, and the second nearly midway between the first and the apex; near the base there are also two small black specks, one near the scutellum, the other on the humeral callus. The legs are long and slender; and the hind femora reach the tips of the elytra.

Clytanthus diminutus, n. sp.

C. parvus, cylindricus, angustus; niger, elytris macula communi pone scutellum, altera utrinque discoidali longe ante medium, fascia pone medium et margine apicali griseo-albis; antennis pedibusque piceo-rufis. Long. 2 lin.

Nagasaki, two examples.

Smaller and much narrower than *C. massiliensis*, Linn., more cylindrical. Antennæ filiform, as long as the body; third joint twice as long as the fourth. Front broad and plane, without ridges; antenniferous tubercles slightly elevated. Thorax oblong-ovate, rather more narrowed behind than in front, closely punctured; the base on each side bordered with light grey. Scutellum black. Elytra cylindrical, transversely truncated, exterior angle dentiform; a sutural spot behind the scutellum, a discoidal spot behind, a fascia remote from this behind the middle, and the apical border light grey. The sides of the breast and abdomen are spotted with light grey. The legs are moderately elongated, the thighs rather thickened.

Clytanthus annularis, Fab.

Clytanthus annularis, Fab. Ent. Syst. ii. p. 337.

This widely distributed eastern-tropical insect is abundant in Japan after the second week of August.

Xylotrechus Grayii, White.

Xylotrechus Grayii, White, Cat. Long. Col. Brit. Mus. p. 261, pl. vi. f. 4.

Nagasaki; also taken by Mr. Lewis at Shanghai.

Xylotrechus pyrrhoderus, n. sp.

X. elongato-oblongus, niger, thorace globoso-ovato, rufo, grosse reticulato-punctato, sparsim nigro-pubescente; elytris regione scutellari fulva, fasciisque duabus flavis, prima paululum obliqua (ad suturam versus scutellum ascendente), altera longe post medium recta. Long. 5-6 lin.

Nagasaki; Yokohama.

Belongs to that section of *Xylotrechus* which has only the marginal ridges of the forehead distinctly raised; the whole head is coarsely scabrose-punctate. The antennæ are rather short and much thickened from the fifth joint; velvety black, with the basal part inclining to piceous. The thorax is oblong-ovate, as broad as the elytra, strongly convex and rounded on the sides; it is blood-red above and beneath; its vestiture consists in very short black bristles planted in the large closely packed punctures. The scutellum and a patch around it are tawny testaceous. The apex of the elytra is obtusely rounded; but the exterior angle is marked by a strong pointed tooth. The legs are black; all the femora gradually thickened, not clavate. The mesosternum is red, like the prothorax; the metasternum and abdomen are deep black, coarsely punctured; the episterna and the second (sometimes also the first) abdominal segment have a stripe of whitish tomentum.

Clytus caproïdes, n. sp.

C. caprae (Germ.) proxime affinis, at differt elytrorum humeris late fulvo-testaceis etc. Valde elongatus, parallelus, nigro-fuscus, fulvo-hirsutus, fronte vittis duabus, thoracis marginibus anticis et posticis, fasciisque duabus elytrorum (antica valde obliqua, angulata, abbreviata) læte flavis; elytris humeris plaga magna fulvo-testacea; antennis et pedibus testaceo-rufis. Long. $7\frac{1}{2}$ lin.

Two examples, Ipongi.

Of very similar shape to *C. capra*; elongate and parallel. Body and limbs rather less densely clothed with long pale hairs. Thorax globose-ovate, rather narrower than in *C. capra*; very densely granulate-punctate. The humeral tawny patch of the elytra is triangular, obliquely defined posteriorly, and not extending to the humeral margin; it encloses in the middle a dusky spot (and there is no oblique yellow linear fascia as in *C. capra*); behind this, on the margin, is a short yellow streak, as in *C. capra*; the oblique yellow stripe towards the middle is much shorter than in *C. capra*, and is bent in the middle; the posterior belt is much widened towards the margin; and there is no yellow apical

fascia. The femora, as well as the tibiæ and tarsi, are rufous. Beneath, the colour of the abdomen is shining black, with yellow belts across the segments.

Dere thoracica, White.

Dere thoracica, White, Cat. Long. Col. Brit. Mus. p. 249, pl. 8. f. 1.

On flowers in June. Found also in N. China.

Purpuricen *Temminckii*, Guérin-Ménév.

Sternoplistes Temminckii, Guérin-Ménév. Icon. R. A. Ins. texte, p. 224.

P. sinensis, White, Cat. Long. Col. Brit. Mus. p. 139.

P. japonus, Motsch. Etud. Entom. 1857, p. 37.

Not uncommon in Japan; also N. China.

The conical tubercle of the mesosternum being present in other species of the genus, there is no reason for retaining *Sternoplistes* of Guérin. As to the form of the thorax, short and transverse, *Purpuricen* including a great diversity of form of this organ (e. g. *P. Angasii*, White), this character is quite insufficient as a generic difference.

Purpuricen *spectabilis*, Motsch.

Purpuricen *spectabilis*, Motsch. Etud. Entom. 1857, p. 36.

Mr. Lewis did not meet with this species (or variety?), which is distinguished from *P. Temminckii* (according to the description) only by the suture and a point on the posterior disk of the elytra being black. I have a specimen of *P. Temminckii* possessing the black discoidal point, but none in which the suture is black.

[To be continued.]

XXVI.—On the Primary Divisions of the Brachiopods.

By THEODORE GILL, M.A., M.D., Ph.D.

THE article in the July number of the 'Annals & Magazine of Natural History' (xii. pp. 1-17), by Prof. King, on *Lingula*, exhibits the insight into relations and skill in discussion characteristic of its author; and his views respecting the classification of the Palliobranchs or Brachiopods into two primary groups will probably be accepted. Indeed they had already been quite generally adopted; but as Prof. King had overlooked the fact, it is presumed that it is not as well known as might have been supposed; and the object of this note is to direct attention to the anticipation by others of Prof. King's views. The essential distinctions of Prof. King's groups are that in one (*Tretenterata*) the intestine has an anal aperture,



Bates, Henry Walter. 1873. "On the Longicorn Coleoptera of Japan." *The Annals and magazine of natural history; zoology, botany, and geology* 12, 193–201.

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