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III.—On the Elateridæ of Japan

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diaphragm (*d*) in *Galeodes* from the side. *h*, heart; *a*, alimentary canal; *n*, nerve-cords passing through *d*; *c*, small plates attached by tendons to the endosternite and outer cuticle (cf. text, p. 20).

Fig. 11. Diagram showing the relative positions of the endosternite and diaphragm (*d*) in *Scorpio*. Lettering as in fig. 10. The line of section of fig. 9 is also indicated.

III.—On the Elateridæ of Japan. By G. LEWIS, F.L.S.

THE first object of this paper is to describe as simply as possible the new species of Elateridæ brought from Japan by the writer in 1882; the second and minor object is to adjust certain synonymy, to revise some previous work on the fauna, and to note and reject species which have been erroneously introduced to the Japanese catalogue. The arrangement of Candèze has been followed as closely as possible, but in two cases I have given full rank to genera merged in others by Candèze. It is also to be noted that some of the species described are very similar to American and European forms, and others again resemble species from the islands and various countries of the Asian continent, yet after a careful examination it appears that only one or two are identical.

By the kindness of Mr. Godman I have had access to the collection made by the late Mr. E. W. Janson, and this has been of considerable assistance to me; the collection also in the National Museum has been of material aid, while the specimens returned to me by Dr. Candèze, after writing his paper on the Japanese species in 1873, are of course in my possession and are now amalgamated with the more recently gathered specimens.

Some species of Elateridæ are extremely local, remaining at times as a little colony in or near one tree for many generations, so that there can be hardly any doubt that the number of species yet to be discovered must be very considerable. *Athous desertor*, Cand., is a case in point; I found two or three specimens in a glen on Maiyasan, near Kobé, in 1871, and on returning there in 1881 I found a few more, and these are, I believe, the only examples known.

The localities given are selected to furnish some information regarding the distribution of the species at present known to me; but no names are given of places which are not registered in my itinerary and do not also appear on the map published with it in the Trans. Ent. Soc. Lond. 1883. Authors in describing species would do well to remember

that "Japan" for a locality of a species, in the present state of our knowledge of the fauna of the islands, is not sufficient, and, when possible, more precise information is needed. Japan is a country which is subtropical in the south, and on a large part of the northern area and on the mountains of Central Japan snow lies to a great depth five months in the year; and whether a species comes from one or the other it is important to know.

There are five species, viz. *Elater azurescens*, Cand., *Melanotus niger* and *laticollis*, Motsch., *Cardiophorus vulgaris*, Motsch., and *Agriotes ferruginipennis*, Motsch., which are not recognizable by the published descriptions; and there are nine species which have been introduced to the Japanese Catalogue in error, viz. *Lacon trifasciatus*, Cand., *Elater Ryei*, Lew., *Melanoxanthus zebra*, Wiedm., *Limonius cylindricus*, Payk., *Cardiophorus sobrinus*, Lap., *Corymbites tessellatus*, L., *Corymbites tristis*, Cand., *Corymbites lateralis*, Lec., and *Corymbites sericeus*, Gebl. Some of these are noted in the body of this paper, but their names are not admitted to the list at the end of it. The list contains 181 species, of which 104 are considered novelties.

Adelocera Mäklinii, Cand.

Adelocera Mäklinii, Cand. *Elat. nouv.*, *Mém. Acad. Belg.* 1865, p. 6;
Mém. Liège 1873, p. 1.

Hab. Kobé, Wada-toge, Sapporo, and Junsai.

This species and some others are inserted in this paper to give, when it seems desirable, additional localities to show their distribution.

Adelocera antennata, sp. n.

Rufo-brunnea, parum nitida, pilosula; fronte triangulariter impressa; thorace canaliculato; elytris striis obsoletis, punctatis, interstitiis externis convexis; antennis articulis brevibus et compressis.

L. 14 mill.

Rather parallel, reddish brown, little shining, clothed with golden-grey hair; the head triangularly impressed between the antennæ, rather closely punctured; the thorax channelled in the middle, narrowest in front, and gradually and slightly widening to the hind angles, hind angles slightly turned outwards and rather more acute than those of *A. Mäklinii*, Cand., punctuation like that of the head; the elytra, striæ obscurely impressed or obliterated by the punctuation, interstices 3-6 more visibly convex than the others; the antennæ

and legs reddish brown, the first with compressed articulations, somewhat like those figured for *Scaphoderus Riehlü*, Cand., but the second and third joints correspond closely to the third and those following; all are broader than long, not serrate.

The above is extremely like a pale variety of *A. Mäklinii*, Cand., but the thorax is not sinuous before the hind angles and the peculiar antennæ are very curious and unlike any other species in this series.

Hab. Sapporo. One example.

Adelocera parallela, sp. n.

Elongata, parallela, obscure brunnea, griseo-vestita; elytris striis obsoletis, interstitiis seriatim punctatis; antennis pedibusque concoloribus.

L. 12 mill.

Elongate, parallel, dull brown, clothed with stiffish grey hairs; the head concave between the antennæ, punctate, punctures deep, circular, and somewhat closely set; the thorax punctured like the head, slightly narrower than the elytra, sinuous before the hind angles; the elytra, striæ obsolete, interstices with punctures distinctly smaller than those of the thorax, set in rows, the rows close to the suture not well-defined, the next eleven or twelve rows well-marked, those nearer the outer edge somewhat obscure and irregular; the antennæ and legs dull brown.

This insect is much smaller than *A. Mäklinii*, Cand., and the elytral sculpture is wholly different.

Hab. Sapporo.

Lacon murinus, Linn.

Candèze reported this species from Japan (Elat. nouv. i. p. 10), but later (Mém. Liège, 1873, p. 2) he considered the examples belonged to *L. binodulus*, Motsch.

Lacon quadrinodatus, sp. n.

Elongatus, subparallelus, pilis aureo-rufis dense vestitus; fronte concava, capite punctato inter oculos canaliculato; thorace 4-nodato; elytris dense punctatis, haud striatis.

L. 15 mill.

Elongate, rather parallel, densely clothed with golden reddish, short and stiff hairs; the head, forehead with a circular concavity between the antennæ, which joins poste-

riorly the canaliculation between the eyes, densely punctate like the thorax, latter arched at the sides, anterior edge behind the neck a little raised, and immediately behind are two conical elevations, separated from each other by a median channel, which reaches the base of the thorax; midway between the conical elevations and the base are two more elevations with larger bases, but not so high; the elytra are somewhat densely punctate and without striation, the sculpture being, however, obscured by the density of the pilosity.

I do not know any species resembling this.

Hab. Oyayama. One example.

Lacon brunneus, sp. n.

Brunneus, nitidus, griseo-vestitus; fronte punctata, in medio distincte impressa; thorace disco convexo; elytris punctatis; antennis pedibusque concoloribus.

L. 5 mill.

Brown, with greyish hairs; the head coarsely and densely punctate, with a median impression; the thorax very convex on the disk, at the sides punctate like the head, but less closely in the middle, arched behind the anterior angles, sides then parallel to the base, hind angles straight and not produced, at the base before the scutellum is a nodulous elevation; the scutellum clearly punctured, semicircular behind; the elytra widen out over the posterior femoral groove, punctate, punctures set in somewhat irregular rows, interstices smooth, apices obtuse; the legs and antennæ brown.

This insect should be placed next to *L. tumens*, Cand., which also has a conspicuous antescutellar elevation.

Hab. Oyama. One example.

[I took a species in Ceylon closely similar to the above, but the anterior edge of the thorax is, amongst other minor differences, oblique not arched.]

Lacon difficilis, sp. n.

Lacon trifasciatus, Cand. Mém. Liège, 1873, p. 1.

This species is larger than *L. trifasciatus*, Cand., and it is broader and more generally robust, darker in colour, infusate on the disks of the thorax and dorsum, and the elytral fasciæ are more diffused. In other respects Candèze's description as above will serve. In *L. trifasciatus*, Cand., there is a fine carina within the humeral angle, short but distinct; this is absent in *L. difficilis*.

Hab. Nagasaki. Common on an evergreen oak.

Meristhus niponensis, sp. n.

Nigricans; fronte, thoracis margine, elytrorum limbo punctisque albido-squamulosis; thorace in medio canaliculato, extus crenato; elytris punctato-striatis, apice distincte crenatis.

L. $4\frac{3}{4}$ mill.

Brownish black, and in appearance extremely like *M. 4-punctatus*, Cand. The thoracic angles are very peculiar; from a point behind the carina is a short emargination which separates a rather prominent projection, which seems to represent the normal angle. The carina is nearly straight.

The species is shorter and broader than *M. 4-punctatus*, Cand., from Sylhet and Assam, and the scales are white, not golden.

Hab. Niigata. Several specimens.

The species of this genus inhabit places with extensive sand-banks and dunes, but are not found on the immediate sea-border.

Meristhus scobinula, Cand.

Meristhus scobinula, Cand. Mon. Elat. i. p. 164, pl. ii. fig. 26.

Candèze says this species is found in China and Mexico, but it appears to be clear that his type example came from China. Specimens I have seen in the Godman collection from Central America are very similar to those from Japan, but the elytra are relatively longer and, I think, the heads are broader. They are very difficult insects to differentiate.

Hab. Nagasaki. Occurs on bare and stony places; its saltatory powers are remarkable; my specimens measure barely 2 mill., but when disturbed jumped 10 or 12 inches high.

Alaus pini, sp. n.

Fuscus, squamulis griseo-brunneis dense vestitus; thorace infuscatobipunctato; elytris, macula laterali infuscata, apice emarginatis.
L. 26-34 mill.

Brownish, densely clothed with greyish-brown scales; the head concave in the middle and on the anterior edge, with sides before the eyes rounded off and elevated; the thorax laterally not quite parallel, anterior angles obtuse, posterior angles blunt and slightly turned outwards, longitudinal median ridge a little elevated and free of scales, dark coloured, with scattered punctures; on each side of the ridge nearer to the head than the base is an oblong dusky spot formed by con-

gested black scales, immediately before the scutellum on the basal edge is a small nodule; the elytra punctate-striate, variegated with ashy and brown scales; near the middle on the lateral edge is a large dusky spot, semicircular on the inner side and on the sixth and seventh interstices densely black, apices widely emarginate and obtusely pointed at the fourth interstice.

This species approximately resembles *A. putridus*, Cand., but it is much more robust, frontal protuberances not pointed, thorax less parallel, and the apices of the elytra widen out more and correspond more to those figured for *A. lateralis*, Cand. (Cand. Mon. 1857, pl. iv. fig. 16). There is an undescribed species in the British Museum from N. China which resembles it more closely than *A. putridus*.

Hab. Nagasaki, Kumamoto, Konose, and Hagi (*Hiller*). I found this species not uncommonly in Higo under bark of firs (*Kuromatzu*). *Alaus berus*, Cand., occurs in the same fir and is common everywhere, especially at *Bukenji*, near *Yokohama*, in early summer.

Tetrigus Lewisii, Cand.

Tetrigus Lewisii, Cand. Mém. Liège, 1873, p. 6.

Tetrigus grandis, Lew. Ent. Month. Mag. 1873, p. 155.

Candèze's type is an example from *Kobé* measuring 25 mill. only. Ordinary examples measure 30–31 mill., and one of these I mistook for a new species.

Hab. Nagasaki, *Kobé*, and *Sapporo*.

Pectocera Fortunei, Cand.

Pectocera Fortunei, Cand. Mém. Liège, 1873, p. 6.

This species is of crepuscular habit. I saw the males in June flying in circles at *Nikko* near oak trees, far out of reach; but the females are very sluggish. The pectination of the antennæ in insects of this description assists in balancing the body during flight, the females with slender articulations being unable to float in mid-air.

Hab. Nagasaki, Kumamoto, *Nikko*, and *Chiuzenji*. Common.

Anchastus mus, sp. n.

Aterrimus, subopacus, griseo-pubescent; capite parvo, parum dense punctato; elytris striis tenuiter impressis, interstitiis rugoso-punctulatis; antennis pedibusque nigris.

L. 8 mill.

Densely black, little opaque, with short griseous pubescence; the head small, rather densely punctured; the thorax opalescent, punctured like the head at the sides, less closely and more finely on the disk, somewhat elongate, feebly widening out behind the middle, base markedly excavated; the elytra punctate-striate, striæ lightly impressed, interstices flat and rugosely punctulate; the antennæ densely black, second joint very small, third narrower and slightly longer than the fourth; the legs black, knees and claws reddish, lamellar process on the third joint of the tarsus pale.

Hab. Miyanoshiba. Two specimens.

Anchastus rufipes, sp. n.

Ater, subnitidus, fulvo-pubescent; capite parvo; thorace parum elongato, azureo-micante, leviter punctulato; antennis rufobrunneis; pedibus rufis.

L. 7-7 $\frac{1}{4}$ mill.

Black, little shining, with tawny pubescence; the thorax somewhat long and narrow, gradually widening out to the base, evenly but sparingly punctulate, opalescent; the scutellum obtuse behind, obscurely and rugosely punctured, depressed in front; the elytra, striæ finely and clearly punctured, interstices rugose; the antennæ reddish brown, second joint very small, third similar in size and shape to the fourth; the legs clear red.

In outline *A. mus* is very similar to this species, but the colours of the antennæ and legs are conspicuous distinctions.

Hab. Nikko and Yuyama. Two examples.

ELATER, Linn.

Section I. Thorax and elytra differ in colour.

Elater niponicus, sp. n.

Ater, nitidus, nigro-pubescent; thorace subtiliter punctulato; elytris luteis punctato-striatis, quarta parte postica nigris.

L. 10 $\frac{1}{2}$ -14 $\frac{1}{2}$ mill.

Densely black, shining, with black pubescence; the head punctured evenly, not coarsely nor densely, frontal carina depressed in the middle; the thorax with an opalescent tint, finely and thinly punctulate, especially on the disk; the elytra clear yellow, apices black, the two markings together forming a cordate spot, near the scutellum on the third and fourth interstices are two small, nearly obsolete, discoloured disks; the legs and antennæ densely black, claws reddish.

Similar to *E. signatus*, Gyll., but the fine punctuation of the thorax and the absence of the black spots on the bases of the wing-cases distinguish it at once.

Hab. Chiuzenji, Miyanoshita, Kiga, and Oyayama. Six examples only.

Elater optabilis, sp. n.

Niger, nitidus, longius fulvo-pubescens; thorace subtiliter punctulato, conspicue azureo-micante; elytris rufis; antennis infuscatis, articulo tertio quam secundus longiore; pedibus infuscatis, tarsis obscure brunneis.

L. 14–15 mill.

Black, shining, with long tawny pubescence; the head evenly and rather densely, not coarsely punctured, frontal carina semicircular; the thorax narrowest anteriorly, gradually widening to base, punctuation very fine and much less thickly set than on the head, punctures laterally similar to disk, but larger close to the anterior angle; the scutellum obtusely acuminate behind and sometimes feebly carinate at the tip; the elytra punctate-striate, sutural stria most lightly impressed, interstices 1–3 equal in breadth and flatter than those outside of them, all interstices finely punctulate, those near the humeral angle slightly rugose; the antennæ infuscate, not black, with the second and third joints piceous, third joint one third as long again as the second; the legs dusky, tarsi brownish.

This is the largest species of the genus known from Japan; in general facies it agrees with *E. orientalis*.

Hab. Subashiri, in pines on the plain of Fujisan, Omine, and Oyayama.

Elater orientalis, sp. n.

Niger, nitidus, griseo-vel fulvo-pubescens; thorace subtiliter punctulato; elytris læte brunneis; antennis infuscatis (basi excepta); pedibus infuscatis vel obscure brunneis.

L. 10½–11 mill.

Black, shining, with grey or fulvous pubescence; the head evenly and rather densely punctured, carina semicircular; the thorax with fine and much less closely set punctures, not opalescent, narrowest anteriorly, gradually widening to base; the scutellum obscurely punctured, obtusely acuminate behind; the elytra clear brown or reddish brown, sutural stria fine and scarcely punctate, second more clearly, the rest distinctly punctured, interstices feebly punctulate, second,

third, and fourth equal in width and rather wide at the base, narrowing gradually to the apex; the antennæ—third joint distinctly longer than the second, three basal joints usually reddish, others infuscate; the legs are dusky or obscure brown.

In the Japanese series this species closely resembles *E. fagi*, Lew., but it differs in size, colour of legs, and pubescence.

Hab. Miyanoshita, Hakone, Nikko, and Kashiwagi. Common in beech trees.

Elater fagi, sp. n.

Infuscatus, nitidus, longius fulvo-pubescentis; thorace subtiliter punctulato; elytris luteo-brunneis; pedibus concoloribus; antennis infuscatis, articulis 1^a–3^m brunneis.

L. 10–12½ mill.

Blackish, shining, with remarkably long tawny pubescence; the head evenly, not closely punctate, carina feebly sinuous anteriorly; the thorax narrowest anteriorly, widening out to the base, not opalescent, punctuation on disk fine, but at the anterior angle it resembles that on the head, median channel very faint, not visible in one example; the scutellum obscurely punctured, obtusely acuminate behind; the elytra clear yellowish brown, sutural stria fine and scarcely punctulate, the external striæ become gradually deeper and more punctate until after the sixth, interstices 2–4 rather wide and flat, all finely punctulate; the antennæ—three basal joints brownish, third joint one third longer than the second, dilated joints infuscate; the legs concolorous with the elytra.

The thorax is more closely punctured than in *E. orientalis*, the third joint of the antenna is longer, and the pubescence longer and more tawny.

Hab. Subashiri and Hakone, in beeches at high elevations. Three examples.

Elater convexicollis, sp. n.

Niger, nitidus, griseo-pubescentis; thorace conspicue convexo, subtiliter punctulato; elytris rufo-brunneis; antennæ pedibusque infuscatis.

L. 8¾ mill.

Black, shining, with greyish pubescence; the head somewhat coarsely and rather closely punctured; the thorax finely punctulate on the disk, at the sides punctate like the head, very convex, arched behind the anterior angle, as wide in the middle as at base; the elytra reddish brown, sutural

and second stria very fine, all punctate-striate, interstices obscurely and thinly punctulate; the antennæ infusate, second and third joints nearly equal, the second is somewhat long for this genus; the legs infusate, tarsi paler.

Hab. Nikko, in June. Two examples.

Elater scutellaris, sp. n.

Ater, nitidus, longius nigro-pubescent; thorace subtiliter punctulato; elytris rufis, apice minute infuscatis, punctato-striatis, interstitiis punctulatis; scutello postice acuminato, antice per-depresso; antennis pedibusque nigris.

L. 11 mill.

Densely black, with rather long black pubescence; the head somewhat densely and little coarsely punctured, carina well marked and semicircular; the thorax opalescent, narrowest anteriorly, gradually widening to base, very finely, evenly, and rather thinly punctured on the disk, at anterior and posterior angles punctured like the head; the scutellum is nearly vertical and distinctly acuminate behind; the elytra reddish brown, apices minutely infusate, evenly punctate-striate, interstices slightly concave and feebly punctulate; the antennæ and legs black, tarsi pitchy.

The almost perpendicular position of the scutellum in this species distinguishes it from all the others in this series.

Hab. Chiuzenji, Niohozan, and Sapporo. Eight examples.

Elater ainu, sp. n.

Ater, nitidus, nigro-pubescent; thorace vix dense punctulato; elytris rufis, striis internis leviter impressis, interstitiis tenuiter transverso-rugosis; antennis pedibusque nigris.

L. 11 mill.

Densely black, with black pubescence; the head rather coarsely and rather densely punctured, carina well-marked and semicircular; the thorax densely black, not opalescent, somewhat wide, convex on disk, arched at the sides, punctured laterally like the head, disk-punctures finer and less close, but not densely set, hind angles between the carina and outer edge thickly, coarsely, and somewhat rugosely punctate; the scutellum punctate, somewhat wide and obtusely acuminate behind; the elytra red (not very bright), interstices rather broad and flat, feebly and transversely rugose, striæ 1-3 fine and lightly impressed, scarcely punctate, external striæ deeper and distinctly punctate; the antennæ densely black, third joint obconical and longer than the second, dilated joints relatively robust; the legs black, tarsi pitchy.

This *Elater* agrees in many respects with *E. rubridorsus*, Lew., but in the latter the thorax is much more strongly punctured, the interstices of the elytra convex, and there is a fovea between the eyes.

Hab. Ishikari River. Four examples.

Elater Ryei, Lew.

Elater Ryei, Lew. Ent. Month. Mag. 1879, p. 156.

This species was given to me on the supposition that it came from Tsushima; the correct locality is Tangiers. It is a good species, and differs from *Elater sanguinolentus*, Schrank, in having a more convex thorax and more robust antennæ and tarsti. The type specimens are now in the British Museum.

Elater chlamydatus, sp. n.

E. montano simillimus, sed thorace magis elongato; scutello cordiformi; elytris interstitiis rugosis; antennis pedibusque nigris. L. $9\frac{1}{2}$ mill.

Black, shining, with long black pubescence; the head evenly, not coarsely nor thickly punctured; the thorax relatively longer than any in this series, with red elytra, narrowest in front, broadest at base, very finely punctured except at the anterior angle and in the interstice of the margin and the basal carina; the elytra dull red, punctate-striate, interstices transversely rugose, apex narrowly infusate; the antennæ and legs densely black, third joint of former scarcely longer than the second.

Very similar to *E. montanus*, Lew., but the length of the thorax and rugose interstices serve to distinguish it, as well as the form of the scutellum and the basal joint of the antennæ.

Hab. Kadzusa, an island off Yokohama. One example.

Elater montanus, sp. n.

Ater, nitidus, longius nigro-pubescent; thorace subtilissime punctulato; elytris brunneo-rufis, apice minute infuscatis; antennis pedibusque nigris. L. $8-9\frac{1}{2}$ mill.

Densely black, shining, with long black pubescence; the head clearly, rather finely, not closely punctured, frontal carina depressed in the middle; the thorax not opalescent, very finely punctured (much more so than the head) on the disk,

and even between the carina and the hind angle the punctuation is not conspicuous; the scutellum is depressed in front, obtusely acuminate behind; the elytra lightly punctate-striate, interstices finely punctured, apices minutely infuscate; the antennæ black, third joint obconical and larger than the second, 4-9 triangular and very similar to each other; the legs black, tarsi pitchy.

Hab. Nikko and the higher forests in its vicinity. Six examples.

Elater pumiceus, Lew.

Elater pumiceus, Lew. Ent. Month. Mag. 1879, p. 156.

Ater, nitidus, nigro- vel griseo-pubescentis; capite confertim punctato; thorace parum angustato, antice lateribusque fortius et crebrius punctatis; elytris coccineis, profunde punctato-striatis, interstitiis convexis; antennis pedibusque nigris.

L. 10-11 mill.

Densely black, shining, with black or griseous pubescence, grey when the insect faces the eye and reversely black; the head evenly, rather densely, and somewhat coarsely punctured; the thorax narrowest in front and gradually widening to base, punctures on the disk rather fine, not closely set, anteriorly and on the lateral border the punctures are rather strong and much more dense, and behind the eye the punctures are obscurely ocellate; the elytra bright red, punctate-striate, interstices convex, finely punctulate, interstices 2, 3, 5 wide, especially the third; the antennæ—third joint obconical, larger than the second, and with the legs densely black, claws reddish.

Differs from *E. canalicollis* in the punctuation of the thorax and in the absence of the median channel.

Hab. Awomori, Sannohe, and Noheji, places not far distant from each other. Three examples.

Elater miles, sp. n.

Ater, nitidus, subrobustus, nigro- vel griseo-pubescentis; thorace parum lato, in medio subtiliter, ad angulos parum dense, punctato; elytris coccineis; antennis pedibusque nigris.

L. 11-11½ mill.

This species is extremely like *E. pumiceus*; the thorax is more convex and much broader, especially in the middle, with an opalescent tint; the elytra are feebly rugose and relatively shorter; the tarsi are more robust and the third joint of the antenna longer and less obconical.

Hab. Oyayama. Five examples.

Elater canalicollis, sp. n.

Ater, nitidus, nigro-vel griseo-pubescentis; thorace in medio longitudinaliter canaliculato, disco subtiliter punctulato, lateribus punctis vix differentibus; elytris coccineis; antennis pedibusque nigris.

L. $10\frac{1}{2}$ –13 mill.

Black, shining, with a black or griseous pubescence; the head evenly, somewhat coarsely, and rather densely punctured; the thorax sometimes with an opalescent tint, finely punctured on the disk and sides, at the angles the punctuation is narrowly larger, in the female the punctuation is generally larger than in the male, median channel well-marked, evanescent behind the neck; the elytra punctate-striate, interstices usually rugose; the antennæ—third joint longer than the second and more cylindrical than that of *E. pumiceus*, and with the legs densely black, claws reddish.

Hab. Bukenji (common), Oyama, and Miyanoshita; under bark of an *Abies* (Kuromatzu).

The three preceding species, with perhaps two others from the Korea, form a section in the genus peculiarly Eastern.

Section II. Thorax and elytra correspond in colour.

Elater hypogastricus, Cand.

Elater hypogastricus, Cand. Mém. Liège, 1873, p. 9.

The abdominal segments are sometimes black.

Hab. Nagasaki, Miyanoshita, Oyama, Sado, and Junsai.

Elater nigroventris, sp. n.

Ater, nitidus, fulvo-pubescentis; thorace parce punctulato; abdomine nigro; antennis infuscatis; pedibus rufo-brunneis.

L. 12 mill.

Black, shining, with tawny pubescence; the head rather wide, rather densely punctured, carina well-marked above the antennæ; the thorax also rather wide, widening to the base gradually from anterior angle, feebly and sparingly punctulate on the disk, punctures larger and closer laterally, median channel feeble and not visible beyond the middle; the scutellum rather wide, not acuminate behind, very obscurely punctured; the elytra, striæ 1 and 2 somewhat lightly impressed and punctures scarcely visible, outside striæ clearly

punctate, interstices punctulate, second and fourth widest, all rather flat; the antennæ—three basal joints reddish brown, others infusate, third joint longer than the second; the legs reddish brown.

This species should be placed next to *E. hypogastricus*, Cand., but the head and thorax are broader, with much finer punctures, thorax not opalescent, the elytral interstices rather flatter and distinctly wider, and the form of the insect generally more parallel. In *E. hypogastricus*, Cand., the scutellum is relatively small and acuminate behind.

Hab. Miyanoshta and Oyayama.

Elater vestitus, sp. n.

Parum niger, nitidus, densissime fulvo-pubescent; capite dense punctato; antennis pedibusque obscure rufis.

L. $11\frac{1}{2}$ mill.

Blackish, shining, very densely covered with a tawny pubescence, especially on the elytra; the head densely and rather coarsely punctured; the thorax narrowest anteriorly, feebly widening at the middle, punctured like the head in the female, punctures less dense in the male, median channel faint and evanescent in front; the scutellum obscurely punctured, obtusely acuminate behind; the elytra punctate-striate, two striæ next the suture somewhat fine, interstices punctulate and feebly convex; the antennæ rather dark reddish brown, third joint a little longer than the second; the legs clear reddish brown, lighter in colour than the antennæ.

In looking at this species in certain lights the sculpture and striæ are entirely obscured by the pubescence. This remark does not of course apply to abraded examples, of which I have several.

Hab. Miyanoshta, Hakone, Hitoyoshi, and Yuyama. Apparently common.

Elater tenuistriatus, sp. n.

Niger, nitidus, infusato-pubescent; thorace subtiliter punctulato; elytris striis internis tenuiter impressis; antennis pedibusque nigris, tarsis brunneis.

L. 10–11 mill.

Black, shining, with dusky pubescence; the head somewhat densely punctate; the thorax widens out a little behind the middle, at the sides narrowly punctured like the head, on the disk very finely and sparingly punctulate; the scutellum feebly punctulate, a little obtusely acuminate; the elytra,

striæ 1 and 2 very fine and scarcely punctured, outside striæ more visibly so, interstices flat, lightly punctured, and feebly rugose, 2-4 rather wider than the others; the antennæ rather slender, articulations a little lax, black, third joint one fourth longer than the second; the legs also black, tarsi and claws reddish brown.

Hab. Kiga, Miyanoshita, Chiuzenji, Nikko, and Yuyama. Common.

Elater rufipes, sp. n.

Ater, nitidus, griseo-pubescent; capite vix dense punctato; thorace disco subtiliter punctulato; antennis infuscatis, articulo primo rufo; pedibus læte rufis.

L. 7-8 mill.

Black, shining, with griseous pubescence; the head clearly but not closely punctured; the thorax widens out a little before the posterior angles, punctured narrowly at the sides like the head, disk lightly and sparingly punctulate; the scutellum punctured, obtusely acuminate behind; the elytra punctate-striate, sutural stria finest, interstices subrugose, punctulate; the antennæ, articulations less lax than those of *E. tenuistriatus*, basal joint red, second and third nearly equal, piceous, the others infuscate; the legs clear red.

Hab. Miyanoshita, Hakone, Oyama, Yuyama, and Konosé.

Elater carbunculus, Lew.

Elater carbunculus, Lew. Ent. Month. Mag. 1879, p. 156.

Ater, nitidus, longius nigro- vel cinereo-pubescent; antennis pedibusque concoloribus; capite punctato; thorace disco subtilissime punctulato; elytris punctato-striatis, interstitiis a basi latissimis. L. 7 mill.

Densely black, shining, with blackish or ashy pubescence; the head clearly but not very densely punctured; the thorax, disk very lightly punctulate, sides more distinctly, but the punctures are not so large as those of the head; the elytra punctate-striate, striæ clearly but not deeply impressed, interstices widest at the base; the antennæ rather long, especially in the male, with articulations somewhat lax, entirely black, second joint very small, third widens out triangularly and is scarcely smaller than the fourth. This last character seems to be a transitional one between *Elater* and *Ischnodes*.

Hab. Miyanoshita, Hitoyoshi, and Oyayama. Chiefly from the flowers of *Deutzia* and an arboreal *Spiræa*.

Elater bicarinatus, Cand.

Elater bicarinatus, Cand. Mém. Liège, 1873, p. 9.

This species is met with in old trees, and has never been found away from them; it is of nocturnal habit and sluggish.

Hab. Nagasaki, Maiyasan (Kobé), and Sapporo.

Elater rugipennis, sp. n.

Piceus, nitidus, robustus, brunneo-pubescent; thorace punctulato, a basi bicarinato; elytris interstitiis conspicue rugosis; antennis pedibusque rufo-brunneis.

L. $11\frac{1}{2}$ –12 mill.

Piceous, shining, with brownish pubescence; the head somewhat densely punctured; the thorax narrowest anteriorly, little arched at the sides, punctures laterally very similar to those of the head, punctures on disk more scattered and much finer, median channel feeble, evanescent in front; the scutellum visibly punctate, not acuminate behind, striæ all well-impressed, punctate, interstices markedly transversely rugose, sutural interstices widest; the antennæ and legs dull reddish brown. In one example the hind angles of the thorax are reddish.

The peculiar colour of this species resembles that of *E. bicarinatus*, Cand., and it agrees with the latter in having an intermediate carina on the thoracic angle and in its slender lax articulations of the antennæ; but it is much larger and very robust. *E. bicarinatus* is a slender species.

Hab. Kioto and Oyama. Two examples.

Elater parvulus, sp. n.

Ater, nitidus, griseo-pubescent; capite thoraceque subtiliter punctulatis; antennis pedibusque nigris, tarsis rufis.

L. $5\frac{3}{4}$ mill.

Black, shining, with greyish pubescence; the head finely and sparingly punctulate; the thorax punctured like the head, widest behind the middle; the scutellum obscurely punctulate, acuminate behind; the elytra evenly punctate-striate, interstices scarcely flat and punctulate; the antennæ moderately serrate, wholly black, second joint a little shorter than the third, third joint obconical; the legs and basal joint of the tarsus black, claws and other joints reddish.

In form somewhat like *Elater erythrogonus*, Müll.

Hab. Yuyama. One example.

Elater pauxillus, sp. n.

Niger, nitidus, griseo-pubescent; capite distincte punctulato; elytris punctato-striatis; antennis pedibusque rufis.
L. 5 mill.

Black, shining, with a greyish pubescence; the head clearly but not densely punctulate, eyes a little prominent; the thorax widest near the middle, disk more finely punctulate than the head; the scutellum obscurely punctulate, obtuse behind; the elytra, striæ punctate-striate, striæ 1-3 very fine, outside striæ more deeply impressed, interstices flat and finely punctulate; the antennæ red, not serrate, second joint stouter and a little shorter than the third; the legs also wholly red.

This is the smallest species known from Japan. The head is smaller than that of the last species and the eyes more prominent.

Hab. Nikko. One example.

Elater gracilipes, sp. n.

Elongatus, angustatus, infuscatus, fulvo-pubescent; thorace subtilissime punctato; elytris parallelis, angulis humerali obscure brunneis.
L. 9½ mill.

Elongate, rather narrow, dusky brown, with tawny pubescence; the head rather small, not thickly nor coarsely punctured; the thorax little narrowed anteriorly from the middle, posterior carina feeble, punctuation scarcely visible on the disk, more apparent at the sides and angles; the scutellum obsoletely punctured, obtuse behind; the elytra long and parallel at the sides, faintly punctate-striate, sutural stria finest, interstices flat, rugose, and rather wide, humeral angle obscurely brown; the antennæ reddish brown, slender, serration feeble, articulation somewhat lax, third joint less robust, slightly longer than the second; the legs dusky brown, tibiæ and tarsi slender, latter reddish brown.

A second example has the elytra reddish brown, with the sutural margin broadly, and the outer margin narrowly, infuscate.

Hab. Chiuzenji. Two examples.

MEGAPENTHES, Kiesenwetter.

In the following species the apices of the elytra are peculiar.

Megapenthes opacus, Cand.

This species was described from a single specimen taken at Kobé; but in August 1880 I obtained five more examples from elder-flowers near the lake of Junsai, in S. Yezo. The thorax is red in both sexes, the second and third joints of the antenna are short, equal, and robust, the apices of the elytra are emarginate outside the first stria.

Hab. Kobé and Junsai.

Megapenthes bicarinatus, sp. n.

Elongatus, infuscatus, subnitidus, fulvo-pubescent; thorace dense punctato, angulis posticis bicarinatis; elytris a basi obscure brunneis; antennis pedibusque concoloribus.

L. 11 mill.

Dusky brown, rather shining, pubescence fulvous; the head coarsely and closely punctured, punctures subocellate, frontal carina arched; the thorax closely but less strongly punctate, elongate, somewhat parallel at sides, widest posteriorly, angles rather long and acute, slightly turning outwards, conspicuously bicarinate; the scutellum elongate, punctured like the thorax, narrowed from the middle and pointed, but not acutely, behind; the elytra punctate-striate, interstices markedly scabrous, reddish brown at base and the apices at the first and second interstices are truncate; the antennæ very long and reddish brown, like the legs.

M. luteipes, Hope, from China, appears to be similar to this species, which I have been able to notice through the courtesy of Mr. Godman, the type being in the Janson collection.

Hab. Japan (*Moore*). Probably from Nagasaki, as I believe I was with Mr. Moore at the time of capture.

In the species following (excepting *M. versipellis*) the apices of the elytra are of ordinary form.

Megapenthes higonius, sp. n.

Parallelus, ater, opacus, griseo-pubescent; thorace confertissime et parum grosse punctato, ante scutellum impresso; elytris punctato-striatis, interstitiis rugosis; tarsis infuscatis.

L. 10-10½ mill.

Parallel, densely black, opaque, with griseous pubescence; the head closely punctate, punctures somewhat coarse, frontal carina well-marked anteriorly, straight, strongest over the

basal joint of the antenna ; the thorax very closely punctured, punctures circular and mostly finely ocellate, especially behind the neck, channel before the scutellum very feeble, the posterior angles and carina rather long ; the scutellum subacuminate ; the elytra punctate-striate, interstices markedly rugose ; the antennæ—second and third joints equal and rather long, two basal joints sometimes piceous ; the tarsi brownish, legs infusate.

This insect in colour is somewhat like *M. insidiosus*, but it is longer, more parallel, punctuation coarser, and hind angles of the thorax straighter.

Hab. Ichibosayama and Oguma, in May. A small series.

Megapenthes insidiosus, sp. n.

Aterrimus, opacus, griseo-pubescentis ; thorace confertissime punctato ; antennis nigris, articulo 1° rufo ; pedibus obscure brunneis. L. 8 $\frac{3}{4}$ mill.

Densely black, opaque, with griseous pubescence ; the head very closely punctured, carina well-marked, anteriorly straight ; the thorax punctured like the head, narrowest anteriorly, and gradually widening to the posterior angles, hind angles carinate and slightly turning outwards ; the scutellum subacuminate behind ; the elytra finely punctate-striate, interstices rugose and visibly broader than in *M. higonius* ; the antennæ rather short and serrate, third joint scarcely as long as the second, black, basal joint reddish ; the legs brownish, thighs dusky.

Less densely black than *M. higonius* and much less elongate and less parallel ; antennæ shorter, articulations more compressed, serration more distinct.

Hab. Chiuzenji and Niohozan. Ten specimens, some taken from a tree-trunk imbedded in snow as late as June.

Megapenthes fugisanus, sp. n.

Æneo-niger, subopacus, vix pubescens ; capite parum dense punctato, in medio leviter impresso ; thorace confertissime ocellato-punctato ; antennis nigris ; pedibus piceis.

L. 7 mill.

Bronzy black, scarcely pubescent ; the head rather thickly, rather coarsely punctured, with a median impression between the eyes, frontal carina obsolete ; the thorax very clearly and very closely punctured, punctures not very large but distinctly ocellate, on either side behind the middle there is a feeble circular impression, sides narrowed anteriorly, gradually,

but not much, widening out to the base, hind angles not acute, interspace between the margin and carina relatively somewhat wide; the scutellum not acuminate; the elytra, striæ fine, interstices rather wide and rugose, the rugosities apparently obliterating the punctures usual in the elytral striæ in *Megapenthes*; the antennæ black; the legs piceous or obscure red, thighs darker.

Hab. Subashiri and on the plain of Fujisan. Two examples.

Megapenthes bifoveolatus, sp. n.

Æneus, subnitidus, fulvo-pubescent; thorace bifoveolato; antennis articulis 1^o-3^m pedibusque rufo-brunneis.

L. $9\frac{3}{4}$ - $10\frac{1}{2}$ mill.

Æneous, somewhat shining, with short tawny pubescence; the head rather closely punctate; antennæ infusate, with three basal joints reddish brown, longer in male than in female; the thorax—disk punctured like the head, sides more closely and slightly rugose; before the middle in a line with each eye are two well-marked foveæ, deeper and larger in female than in male, there is a median longitudinal channel also, which is more distinct in female than in male; the elytra, striæ rather fine and not conspicuously punctured, interstices flat and rugose; the legs are a clear reddish brown and the abdominal segments sometimes reddish.

This species is remarkable for its colour and thoracic foveæ.

Hab. Oyayama, Ichiuchi, Oyama, Chiuzenji, Nikko, and Miyanoshta.

Megapenthes cariniceps, sp. n.

Niger, nitidus, nigro-pubescent; capite in medio longitudinaliter conspicue carinato; thorace sparse punctulato; antennis nigris, pedibus infuscatis.

Rather densely black, shining, with black pubescence; the head sparingly punctulate, with a very conspicuous carina in the middle, which anteriorly passes beyond the frontal carina, and posteriorly it is well-shortened before the neck; the thorax punctured like the head, narrowest anteriorly, hind angles not long but acute, carina well-marked; the elytra rather deeply and very regularly punctate-striate, interstices obscurely punctulate and somewhat scabrous; the antennæ black; the legs dusky.

The facies of this species somewhat resembles that of *M. tibialis*, Lac., but the longitudinal carina on the head at once separates it from all in this series.

Hab. Kiga. One example.

Megapenthes gracilis, Cand.

Megapenthes gracilis, Cand. Mém. Liège, 1873, p. 10.

The males of this species are very different to the females; the thorax is longer, more parallel, and usually infusate, punctures thickly set and finely ocellate; the antennæ also darker, with joints 4-11 one third longer.

L. 7-8½ mill.

Hab. Kiga, Yokohama, Kioto, and Kumamoto. Abundant at times in flowers of *Viburnum* and *Deutzia*.

Megapenthes pallidus, sp. n.

Elongatus, testaceus, subopacus, fulvo-pubescens; thorace lateribus parallelis, angulis posticis brevissimis; antennis pedibusque concoloribus.

L. 7 mill.

Elongate, pale testaceous, rather opaque, and similar to *M. gracilis*, Cand., but the hind angles of the thorax are very short, the sides very parallel; the head not densely but clearly punctured; the thorax less distinctly punctured, wider behind than in front, sides straight, angles very short and blunt; the elytra punctate-striate, interstices rugose and punctulate; the antennæ and legs concolorous, the former with the third joint distinctly one third longer than the second, which is short and obconical.

Hab. Natakugawa and Nikko. Three individuals only.

Megapenthes insignitus, sp. n.

Aterrimus, subopacus, fulvo-pubescens; capite thoraceque confertissime punctatis; elytris 4-maculatis; antennis brunneis; pedibus testaceis.

L. 5¾-6 mill.

Black, somewhat opaque, with a tawny pubescence; the head and thorax very closely punctured; the elytra, behind the humeral angle there is a longitudinal testaceous blotch, nearly the length of one third of the elytra, occupying part of interstices 3-8, behind the middle is an oblong spot a little smaller in size on interstices 3-7, the striæ are evenly punctate, with the interspaces rugose; the antennæ darkish brown, the legs testaceous.

There is a variety in which the maculations are very small.

Hab. Miyanoshta and Yokohama. A small series at both places.

Megapenthes versipellis, sp. n.

Niger, fulvo-pubescent, ♂ thorace nigro, ♀ thorace rufo; elytris flavo-maculatis, apice obtuse productis; antennis nigris; pedibus flavis.

L. ♂ 6-6½, ♀ 6½-7 mill.

Black, rather opaque, with tawny pubescence.

♂. The head and thorax black and closely punctured, latter gradually widening out to base, posterior angles somewhat acute; the elytra, striæ fine and obscurely punctulate, interstices rugose, at the base and extending over rather more than one third of the elytral length is a yellow fascia, which leaves the humeral angle and two interstices next the scutellum black, and in extending backwards it is narrowed in the middle on the first to fourth interstices, between the middle of the dorsum and the apex is a small transverse yellow spot, the apices are obtusely produced at the ends of the fourth to fifth interstices.

♀. Thorax bright red and convex; the elytral fasciæ wider and more conspicuous than in the male; the antennæ, joints 2 and 3 small and equal, 4-10 serration well-marked in both sexes, but especially strong in male; the legs pale in both sexes.

The male varies much more in colour than the female; in one male the elytral markings are almost obliterated.

Hab. Chiuzenji, Kashiwagi, Junsai, Sapporo, and Otaru, in flowers of *Sambucus* and *Angelica*. Sometimes abundant.

Megapenthes ornatus, sp. n.

Niger, nitidus, griseo-pubescent; thorace vix dense punctato; elytris macula humerali alteraque ultra medium, pedibusque testaceis.

L. 5 mill.

Black, shining, with greyish pubescence; the head rugosely punctured; the thorax narrowest anteriorly, gradually but very moderately widening to the base, hind angles short but acute, surface rather thickly but not closely punctured, punctures in places running into transverse rows; the elytra, striæ fine, scarcely punctured, interstices rugose, humeral angle and the base up to the second interstice yellow, the spot extending backwards for about a fourth of the elytral length, about the middle of its course it is encroached upon by the third and fourth interstices being dark-coloured, behind the middle there is a small spot on the fifth, sixth, and seventh interstices; the antennæ, three basal joints reddish brown,

second and third small and equal in size, fourth to the tenth infusate and strongly serrate on the inner edge; the legs entirely pale.

Hab. Yuyama. Two male examples.

Melanozanthus pictipennis, sp. n.

Niger, nitidus, fulvo-pubescent; thorace angulis flavis; elytris macula basali recta, posticis fasciis duabus luteis; antennis (basi excepta) infuscatis; pedibus flavis.

L. 5-6½ mill.

Elongate, somewhat parallel, with short tawny pubescence; the head black, convex, densely punctured; the thorax similarly punctured at the sides, more finely and much less thickly on the disk, anterior angles minutely and triangularly yellow, posterior angles more broadly yellow and somewhat acutely produced; the elytra black, with a longitudinal vitta at the base, occupying part of the third and fourth interstices and more shortly part of the fifth, before the middle of the dorsum a transverse fascia commences on the second interstice, widening out on the third, narrowing on the fifth and sixth, then again widening out to the margin, and extending along the epipleura almost to the humeral angle, midway between the middle and the apices of the elytra is another yellow band, nearly regular in width, and not touching the sutural interstice nor the outside edge of the wing-case, the striæ are rather fine and punctulate, the interstices flat and relatively wide, and somewhat rugosely punctulate; the legs are yellow; the antennæ yellow at the base, and from the fourth or fifth joint infusate.

A variety of the species has the anterior angles of the thorax black, and the median fascia interrupted on the fifth and sixth interstices.

Hab. Fukushima and Natakugawa. Two examples only.

[To be continued.]

IV.—*On the Land-Shells of the Sulu Archipelago.*

By EDGAR A. SMITH.

[Plate IV.]

OUR knowledge of the terrestrial Mollusca of the Sulu Archipelago is at present very limited, and the species about to be enumerated will form a considerable addition to the list of those already recorded from these islands.