

On the *Buprestidæ* of Japan.

By G. LEWIS, F.L.S.

[Read 17th November, 1892.]

THIS paper is supplementary to a memoir on the Buprestidæ of Japan in the Journal of this Society, vol. xi. 1873, pp. 509–553, by Mr. Edward Saunders. In the earlier paper 36 species are recorded, and 20 are now added, and for the convenience of reference the names of all the species are brought together in a systematic list. I have struck out of the former catalogue *Buprestis Lecontei*, Saund., and *Ptosima chinensis*, Mars., having reasonable doubts as to their being Japanese; I have also rejected *Chrysochroa ocellata*, F., 1774, as I think Voet when he described it as *C. japonensis* in 1806 was in error in attributing the species to Japan. These species reduce the list slightly; but, on the other hand, there are 8 species of *Agrilus* left over, as they are only represented by specimens unfit for types.

Beyond the advantage of having Mr. Saunders' paper to guide me, I have been able to compare a considerable number of specimens with examples in the British Museum; the collection there, since the acquisition of the Saunders collection and the material more recently presented by Mr. Godman, is for the time being one of the best. I am also indebted to Mr. Waterhouse for kindly pointing out some of the characters he employed when writing on the Family for the 'Biologia.'

In the Trans. Amer. Ent. Soc. 1891, xiii. pp. 277–336, Dr. Horn has reviewed the N. American species of *Agrilus*, and refers at some length to their external sexual characters. In the Japanese series I have found several masculine characters which do not appear in the New World species; and this is quite in accordance with a familiar phase in the Coleoptera, viz., that subsidiary sexual differences are multiform, varying in different members of the same genus, and as such afford only specific characters. There is no evidence that the thoracic carina is a sexual character in the Japanese species, but it varies a little in individuals of either sex. In the American species, Dr. Horn thinks there are sexual differences in the carinæ, but under his notice of *Agrilus obtusus*, Horn, p. 288, there is a confusing printer's error, and in his description of *A. acutipennis*, Mann., he does not notice this character, although he refers to it in his preamble. In the latter species also he has "united the two forms" he



refers to, and these may be cognate species. In *A. otiosus*, Say, the male, however, is "distinctly carinate," the female "usually with a well defined carina." I think these are individual, not sexual differences.

*CHRYSOCHROA ALTERNANS*, *Waterh. Ann. & Mag. Nat. Hist.* 1888, i. p. 264.

*Hab.* Ruikiu Islands. Taken by Mr. Pryer in 1886. Type in the British Museum.

*CHRYSOCHROA HOLSTII*, *Waterh. Ann. & Mag. Nat. Hist.* 1890, v. p. 169.

*Hab.* Hachijo, an island near Yokohama. Two examples in the British Museum.

*CHYSODEMA LEWISII*, *Saund.*

*Hab.* Kiushiu and Ruikiu Islands. The original specimen came from Nagasaki, and in 1886 Mr. Pryer found it on Oshima.

*DICERCA AINO*, sp. n.

*Ænea* vel cuprea, rugosa, punctata; capite haud canaliculato; thorace tribus lineis lævibus; elytris valide furcatis; subtus aureo-cuprea. L. 18-20 millim.

Æneous or cupreous bronze. The head longitudinally rugose, not canaliculate; the thorax widest in the middle, hind angles little acute, sinuous at the base, very rugose, with two longitudinal smooth elevations in the centre having a few punctures, and two lateral elevations much broken by the intervening rugosities; the scutellum rather transverse, in one specimen longitudinally impressed; the elytra obsoletely striate, very rugose, interstices elevated, especially near the suture, broken by punctured spaces, and near the outer edge more generally interrupted by transverse rugosities, apices strongly furcate. Beneath, the coloration is brighter, golden and coppery; legs concolorous; the prosternum has the lateral margins raised, and the last ventral segment is canaliculate in the middle, apex with two incisions.

*D. amphibia*, Mars., from Siberia has the head "profoundly canaliculate" in the middle. *D. aino* is very similar to it and to *D. furcata*, Thunb.

*Hab.* Yezo. Two examples from the Ishikari River.

*DICERCA TIBIALIS*, sp. n.

Subconvexa, capite rugoso, cupreo, inter oculos leviter impresso; thorace in medio duabus lineis lævibus; elytris obscuro-æneis prave



costatis, interstitiis rugosissimis, apicalibus emarginatis; tibiis intermediis fortiter spinosis, tarsis cyaneis. L. 12 millim.

Head coppery, rugose, impressed between the eyes, with scattered whitish hair; the thorax with two broad median smooth lines or longitudinal spaces and a much shorter and broken smooth space outside of them; the thorax and elytra agree in colour with those of *Chalcophora japonica*, Gory, but the elytra have small scattered patches of whitish hairs. The elytral costæ very crooked and irregular, the interstices very rough and perforated rather than punctured; the apex of each is emarginate, the sutural and outer edge being prolonged into a denticulation. The legs coppery, tarsi cyaneous, middle tibiæ with a long spine on the inner edge projecting at right angles from just above the middle, between the spine and the tarsi the edge of the tibia is serrate.

This insect seems allied to the American species of the genus. It is similar to *D. asperata*, Lap., and *D. spreta*, Gory, as regards the apices of the elytra, and is somewhat like *D. tenebrosa*, Kirby, with respect to the tibial spine. Whether this spine is a sexual character I am unable to say.

*Hab.* Main island, on the 22nd June, 1881. A single example from a faggot of *Cryptomeria*-wood at Kashiwagi.

*PÆCILONOTA BELLULA*, sp. n.

Viridissima, lateribus auratis; elytris interstitiis nigro-vel cupreo-maculatis; antennis nigris, pedibus viridibus. L. 9-11 millim.

Bright green, with the sides of the thorax and elytra golden. The head rugosely punctate, face golden, antennæ black; the thorax widest in the middle, hind angles obtuse, bisinuous at base, a median line black, with indications of two others on each side, rugose at the sides, densely punctate on the disk; the scutellum transverse, hind angles slightly produced; the elytra punctate-striate, interstices rugosely punctured, with numerous patches or spots which are black in one light and coppery in another; apices trispinose. Beneath, more or less golden green; legs green.

This species may be placed next to *P. rutilans*, F.

*Hab.* Yezo. A small series taken at Junsai in August 1880.

*PÆCILONOTA VIVATA*, sp. n.

Viridis, subtus cyaneo-viridis; elytris 8-maculatis, maculis nigris; pedibus cyaneis. L.  $7\frac{1}{2}$ -9 millim.



Bright green above, bluish green beneath. The head densely little rugosely punctate, face impressed, antennæ nearly black; the thorax evenly and densely punctured, widest at the basal angle, base bisinuous, disk with a median black line behind the neck, with two black spots on each side of it before the base; the scutellum green, cordate; the elytra punctate-striate, interstices densely rugose; posterior margin of scutellum, two large spots over the hind coxæ, four transverse spots behind them and two others well before the apex black or purple-black; sometimes the apices are black and in these specimens there is also a black spot at the base of the elytra between the third and fourth striæ; the legs cyaneous.

This species is very similar to *P. festiva*, L., and *P. virgata*, Motsch.

*Hab.* Main island. Five examples from Kashiwagi on poles of *Cryptomeria japonica*.

*EURYTHYREA TENUISTRIATA*, sp. n.

Cyaneo-viridis. *E. micanti* proxime affinis; scutello impunctato; elytris in mediis tenui-striatis. L. 20–26 millim.

Bright bluish green, with thorax and sides of the elytra broadly golden. The head punctate, punctures rather large but not closely set, two shallow impressions between the eyes, and behind the impressions a well-marked median stria; the thorax, sides arched, feebly bisinuous behind the neck, punctures less dense than those on the head, an indistinct linear space in the middle sometimes smooth, scutellar fovea small but distinct and prolonged anteriorly as a stria; the scutellum conspicuously uneven and impunctate, semicircular behind; the elytra punctate-striate, the striæ nearest the suture being less impressed than the others, the interstices of the first being lightly punctulate, the latter slightly rugose transversely, the apices are emarginate, leaving the outer and sutural margins distinctly dentate. The under surface a bright green, with the margins of the segments and tip of the abdomen blue.

The elytral striæ are less deeply impressed than in *E. micans*, F.; the apices of the elytra agree best with those of *E. scutellaris*, Ol.; in the last the scutellum is smooth.

*Hab.* Main island. I have an example from Atami and another from Chichibu. There is a small specimen in the British Museum from Nikko.



*MELANOPHILA OBSCURATA*, sp. n.

Obscuro-ænea, dense punctata; thorace ante scutellum distincte foveolato; antennis pedibusque concoloribus. L. 11-12 millim.

Obscurely æneous, antennæ and legs concolorous, claws reddish. The head and thorax densely punctured, the latter rounded off before the anterior angle, obtuse at the hind angles, impressed with a very distinct fovea before the scutellum; the elytra rather more densely sculptured, apices obtusely and obscurely spinose and very feebly denticulate.

This insect resembles the European species *M. acuminata*, De Geer, and *M. atropurpurea*, Say, very closely, but the punctuation of the anterior angles of the thorax is clearer and the hind angles more rectangular. The species described from Mongolia is marked with yellow blotches. The species of this genus are very difficult to differentiate, but I believe this one is distinct from all the others described.

*Hab.* Yezo and Kiushiu. I caught one at Otaru and I have a second from Higo.

*CORÆBUS RUSTICANUS*, sp. n.

*C. rubi* simillimus, sed thorace elytrisque multo latoribus. Æneus, elytris albo-fasciatis. L.  $7\frac{1}{2}$  millim.

Æneous, with elytral fasciæ exactly corresponding to those of *C. rubi*, L. The head somewhat golden, canaliculate between the eyes, punctured, with vermicular sculpture; the thorax punctured behind the neck, sides with a crenulate strigosity, sides arcuate, little dilated, lateral edges rugose or subcrenulate; the scutellum wholly rugose; the elytra narrowly of a greenish hue along the suture; the dorsal sculpture is not so deep as in *C. rubi*; apices rounded off and obscurely denticulate. Legs bluish-black.

*Hab.* Yezo. One example at Junsai.

*CORÆBUS QUADRIUNDULATUS*, *Motsch.*

This species is very abundant and feeds on the common Japanese *Rubus*.

*Hab.* All the islands.

*AGRILUS CYANEONIGER*, *Saund.*

This species has no thoracic carina, and the superior part of the scutellum is triangular and ample. The marginal carina



of the connate segments of the abdomen is interrupted at a point which clearly indicates an obsolete suture. The suture can also be traced across the abdomen by a smooth line; the pygidium is carinate. The claws are robust and the inner process stout. There is a permanent variety in the northern parts of Japan which I name *A. cupreo-viridis*. The head and thorax are bright and coppery, and the elytra green.

The males have the inner edge of all the thighs densely pubescent.

*Hab.* All the islands, on the *Quercus serrata*, Thunb.

*AGRILUS SPINIPENNIS*, sp. n.

Capite vertice aureo, fronte viridi; thorace carinis brevibus, curvatis; elytris nigris, apicibus conspicue spinosis. L. 9-10½ millim.

The head golden, strigose on the summit, face rugosely punctured and bright green, with a median linear impression; the thorax golden or coppery, transversely rugose, especially on the disk, slightly constricted before the base, hind angles rather acute, carina short and curved; the scutellum bipartite, anterior portion transverse and angulate behind, inferior portion T-shaped, posteriorly very acute; the elytra black and very evenly and finely sculptured, having an appearance of opacity, apices denticulate, with the median portion of each elytron elongated and forming a conspicuous spine. The under surface and legs green with a fine greyish pubescence, abdominal suture clearly indicated; claws rather robust, inner process long. When not abraded there is a whitish pilosity on the elytra at the suture behind the middle. In the male the fore and intermediate tibiæ are bent, the latter being spinose and swollen close to the tarsi.

Similar to *A. indigaceus*, Dey., from Dorey, and like others from Singapore and the Philippine Islands.

*Hab.* Main island. Seen in abundance 24th May, 1880, between Yokohama and Oyama, on a felled *Zelkova keaki*, Sieb.

*AGRILUS IMITANS*, sp. n.

*A. spinipenni* simillimus, sed elytris haud spinosis. L. 9-10 millim.

The head æneous, strigose on the vertex; face green, without a linear impression; the thorax golden and coppery, transversely rugose, carina short and curved; the scutellum bipartite, not angulate behind, inferior portion rugose and less acutely angulate than in *A. spinipennis*. The elytra black, finely and evenly



sculptured, apices simple and denticulate. ♂. Tibiæ as in the last species.

*Hab.* Main island. Five examples at Kashiwagi.

*AGRILUS ALAZON*, sp. n.

Capite thoraceque aureo-viridibus; elytris cyaneis vel cyaneo-viridibus, octo-albo-maculatis. L. 11–13½ millim.

The head and thorax golden green; head longitudinally strigose on the summit, transversely rugose on the face, with two lobe-shaped impressions; the thorax more coarsely rugose than the face and the rugosity more distinctly transverse, carina very short and curved, sides feebly emarginate before the posterior angles; the scutellum, anterior part transverse and rounded off on either side, inferior part triangular, each angle acute: the elytra cyaneous and sometimes greenish, the sculpture is not so fine and close as in *A. cyaneoniger*, Saund., especially near the suture in the dorsal area; there are four white spots on each elytron formed by a white and dense pilosity—first spot in the basal depression, second over the hind coxæ, third at an equal distance behind, fourth just before the apex and almost touching the suture; apex clearly denticulate and somewhat acutely produced. Beneath, the colour is wholly coppery; the marginal carina of the abdominal segment slightly deviates from a straight course at the supposed suture; the claws obtusely bifid.

Belongs apparently to the same group as *A. biguttatus*, F.

*Hab.* Kiushiu. I have a long series of this species from Yuyama in Higo.

*AGRILUS FORTUNATUS*, sp. n.

Cupreus vel viridi-æneus; thorace carinis brevissimis; elytris 6-albo-maculatis subtus æneus. L. 8–9 millim.

The head, summit golden, male with acicular punctures, female somewhat strigose, face green with a white pubescence, punctured and transversely rugose; the antennæ long, with lax joints; the thorax transversely rugose, hind angles a little prominent, carina very short, curved; the elytra evenly sculptured, with three spots of white or yellow pubescence, generally white, on each elytron—first within the basal impression, next just behind the posterior coxæ, third midway between the second and the apex, the apices are rounded off obtusely. The under surface and legs æneous, abdominal suture ill-defined; the tibiæ and tarsi slender, claws with inner process short. The outer edge of the hind



tibiæ are setose in both sexes. The male has the anterior and intermediate tibiæ enlarged and obtusely produced at the tarsal end like that figured by Horn, *l. c.* pl. 8. fig. 18, for the hind tarsus of *A. otiosus*.

*Hab.* Main island. Kiga, Nikko, and Chiuzenji in June.

*AGRILUS SOSPEs*, sp. n.

Cupreus, thorace carinis obsoletis; elytris 6-maculatis; subtus, antennis pedibusque concoloribus. L. 8 millim.

Æneous, with the whole body, legs, and antennæ concolorous; the antennæ rather stout, with joints closely set; the head summit closely strigose; face rugose, with two lobe-shaped impressions; the thorax transverse, rather coarsely rugose, with a linear median impression and another, rather wider, within the middle of the lateral margin; the scutellum bipartite, anterior part finely strigose, rounded off laterally, inferior part rugose; the elytra somewhat unevenly sculptured, maculate like *A. fortunatus*, apices denticulate, rounded off on the outer edge. Beneath, the abdominal suture is indicated by two short sulci. Legs rather stout.

*A. sospes* is very similar to *A. fortunatus*, but it is much more robust, the vertex of the head clearly strigose and the antennæ shorter and compact.

*Hab.* Kiushiu. Four examples from Yuyama in Higo, 13th May, 1881.

*AGRILUS TEMPESTIVUS*, sp. n.

Æneus, capite vertice haud dense punctato, in medio distincte impresso; thorace postice 4-angulato. L. 6½ millim.

Brassy green, under surface and legs concolorous. The head summit not thickly punctured, strigosity more apparent in male than female; face rugosely punctured, with white pilosity, frontal edge of the vertex feebly channelled; the antennæ rather long, joints lax; the thorax transversely rugose, rather uneven, distinctly angulate at the base, carina curved; the scutellum, anterior portion with fine tessellate sculpture, inferior rugose, triangular and somewhat sharply produced behind; the elytra evenly sculptured, a little pilose towards the extremities, apex slightly prolonged and feebly denticulate. The abdominal suture is shown by two shallow transverse sulci.

Male with intermediate tibiæ nearly straight, but very distinctly spinose at the tarsal end.



The species is relatively longer and more parallel than the others of this list.

*Hab.* Main island. Usui-toge, Fukui, and Chiuzenji.

*AGRILUS TIBIALIS*, sp. n.

Obscure æneus; capite vertice leviter canaliculato; thorace lateribus impresso; ♂ tibiis posticis extus robustis. L.  $5\frac{1}{2}$ – $5\frac{3}{4}$  millim.

Obscurely æneous. The head, vertex strigose, face roughly punctured, with a white pilosity, feebly canaliculate on the summit; the antennæ, joints rather lax; the thorax somewhat quadrate, posterior angles slightly constricted, transversely rugose, impressed obliquely at the sides, carina short and ill-defined; the scutellum, superior part densely but finely sculptured. ♂, the thighs are very robust, tarsi short, hind tibia swollen on the outer edge before the apex; ♀, thighs much less stout, tibiæ simple.

The male characters of this species differ from all in this series.

*Hab.* Yezo. Taken commonly at Junsai and Sapporo.

*AGRILUS GRACILIPES*, sp. n.

Nigro-cyaneus. *A. tibialis* simillimus, sed pedibus gracilioribus. L.  $5\frac{1}{2}$ – $5\frac{3}{4}$  millim.

Blackish blue. The head, summit strigose, face roughly punctured, pilose, feebly canaliculate above; the antennæ rather long, joints lax; the thorax transversely strigose, carina short and curved, not well defined, posterior angles a little acute, impressed at the sides; the elytra evenly sculptured, apices obscurely denticulate; the legs and tarsi slender and rather elongate, in the male intermediate tibiæ feebly bent with the apex slightly enlarged.

There are only slight characters to distinguish this species from *A. tibialis*, except in the legs, which are very different. It is the only blue species from Japan with slender legs; in this respect it agrees with *A. fortunatus*.

*Hab.* Main island. Nikko, Nara, and Miyanoshita.

*AGRILUS DISCALIS*, *E. Saund.*

This species has a remarkable thoracic carina which extends from the base to the anterior angle and is widely sinuous in the middle of its course.

*Hab.* Kiushiu and Main island. Common in winter under the loosened bark of *Zelkova keaki*, Sieb. Taken abundantly at Bukeuji near Yokohama in March.



*AGRILUS CUPES*, sp. n.

Viridi-cyaneus, nitidus; thorace ante scutellum depresso, lateribus parum dilatato, postice obtuse angulato; elytris vix dense asperatis. L.  $5\frac{1}{2}$ –6 millim.

Bright bluish green, rather robust. Antennæ rather stout and joints compact; the head strigose above and rugose between the lines, channelled in the middle, face rugosely punctate; the thorax transversely rugose, little dilated laterally, hind angles obtuse, base sinuous, before the scutellum a somewhat deep depression circular in outline, carina short and bent; the scutellum is strigosely sculptured, with a transverse ridge in the middle, but not conspicuously bipartite as in the preceding species, *A. spinipennis*, and the three following; the elytra, sculpture not very dense, apices obtuse and obscurely denticulate. Beneath, the abdominal suture is scarcely indicated; in one specimen the colour is blue, in the other green. The first joint of the hind tarsus is short.

This is the brightest coloured species in the series.

*Hab.* Main island. Numata and Chiuzenji, two examples.

*AGRILUS BREVITARSIS*, sp. n.

Cupreus, robustus, immaculatus; antennis tarsisque brevibus, subtus pedibusque æneis. L. 8 millim.

Cupreous; the head rugose, very similarly sculptured on the vertex and face, but the sculpture on the former is arranged longitudinally, median impression conspicuous on the anterior edge of the vertex; the antennæ short and robust, joints not lax; the thorax transversely and somewhat coarsely rugose, impressed twice in the middle and once on either side within the margin, hind angles obtuse; the scutellum bipartite, upper portion truncate at the sides and thickly punctulate, inferior portion T-shaped, with the transverse piece rugose and the hinder part punctulate; the elytra immaculate, not very evenly sculptured, denticulate at the apex; the legs æneous, tarsi short, claw with inner process scarcely visible. The first joint of the hind tarsus is conspicuously shortened.

*Hab.* Main island. Found at Chiuzenji, 14th June, 1881.

Some of the American species of *Agrilus* have the fourth joint of the antennæ cylindrical; this is not the case in any species of this series.



*TRACHYS EXIMIA*, sp. n.

Aureo-cuprea, nitida; elytris dense griseo-pubescentibus in regione scutellari et apice exceptis; subtus ænea. L. 3 millim.

The outline of this pretty species agrees with *T. Lewisii*, Saund.; it belongs to a section in the genus with "the body depressed, thorax flattened out at the sides; elytra with a carina above the margin" (*l. c.* p. 519). The head is almost impunctate, forehead angularly impressed, with a median line in the impression; the thorax with large shallow, sometimes confluent, punctures at the sides, finely rugose on disk, pilose, base trisinuous; the elytra very densely and conspicuously clothed with greyish pilosity, except a triangular space round the scutellum and a smaller region at the apex. The spaces are finely rugose and of a golden-coppery colour. The legs and underside are æneous.

*Hab.* Kiushiu. Ten examples taken in the Higo forests.

*TRACHYS SAUNDERSI*, sp. n.

Suboblonga, capite thoraceque aureo-pilosis; elytris nigris, fasciis conspicue flexuosis, griseo-sericeis ornatis. L. 3-4 millim.

This species in outline and size agrees with *T. subbicornis*, Mots., but the coloration is like that of *T. auricollis*, Saund. *T. auricollis*, Saund., is very broad-shouldered, which gives it a triangular outline, and it occurs chiefly in S. Japan.

*Hab.* Main island. Sixteen examples taken at various places on the Nakasendo.

*BRACHYS SALICIS*, sp. n.

Parum convexa; capite thoraceque æneis, nitidis, vix punctatis; fronte valide excavata utrinque bifoveolata; elytris nigro-cyaneis, fasciis griseis ornatis. L. 3 millim.

The head and thorax brightly æneous, the latter a little punctate on the sides; the forehead is deeply excavated, with two small but very distinct foveæ behind the antennæ; the elytra are blackish blue, little rugose and sparsely punctate, with four griseous fasciæ, the basal fascia is sometimes obliterated, the third most flexuous, the fourth nearly straight.

This is the only species of this genus known from the Oriental region.

*Hab.* Main island. On willow at Subashiri, Miyanoshita, and Kioto.



*Systematic List of Species.**Chrysochroa fulgidissima*, Schoenh.*elegans*, Thunb.*fulgida*, Oliv.*cæruleocephala*, Motsch.— *alternans*, Waterh.— *Holstii*, Waterh.*Chalcophora japonica*, Gory.— *querceti*, Saund.*Chrysodema Lewisii*, Saund.*Dicerca aino*.— *tibialis*.*Pæcilonota bellula*.— *vivata*.*Buprestis japonensis*, Saund.*Eurythyrea tenuistriata*.*Melanophila obscurata*.*Anthaxia proteus*, Saund.*Chrysobothris succedanea*, Saund.*Coræbus rusticanus*.— *ignotus*, Saund.— *quadriundulatus*, Motsch.*Sambus quadricolor*, Saund.*Cryptodactylus auriceps*, Saund.*Agrilus cyaneoniger*, Saund.Var. *cupreoviridis*.— *spinipennis*.— *imitans*.— *alazon*.— *fortunatus*.— *sospes*.— *tempestivus*.— *trinotatus*, Saund.— *auriventris*, Saund.*Agrilus tibialis*.— *gracilipes*.— *discalis*, Saund.— *rotundicollis*, Saund.— *cupes*.— *mœrens*, Saund.— *maculifer*, Saund.— *brevitarsis*.— *subrobustus*, Saund.— *viridiobscurus*, Saund.— *pilosovittatus*, Saund.— *marginicollis*, Saund.

— 8 uniques.

*Cylindromorphus japonensis*, Saund.*Aphanisticus collaris*, Saund.— *antennatus*, Saund.— *congener*, Saund.*Trachys Lewisii*, Saund.— *eximia*.— *griseonigra*, Saund.— *elegantula*, Saund.— *auricollis*, Saund.— *Saundersi*.— *sub-bicornis*, Motsch.*griseofasciata*, Saund.— *robusta*, Saund.— *inconspicua*, Saund.— *cupricolor*, Saund.— *variolaris*, Saund.— *inedita*, Saund.*Brachys salicis*.*Paratrachys hederæ*, Saund.





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