The Canadian Entomologist.

VOL. XX. LONDON, APRIL, 1888. No. 4

NATURAL HISTORY NOTES ON COLEOPTERA.—No. 4.

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Bembidium undulatum, Sturm. There are now about thirty-eight species of Carabidæ recognized as indigenous to North America and Europe, and some of them also to Asia. The most of these are arctic or very northern, this being one of the few that occur in temperate America, but how far northward it inhabits is unknown, as I know only of its occurrence here, though in Europe and Asia it is found in sub-arctic regions. Here it is taken abundantly in July and August under decaying vegetation in moist alluvial places subject to occasional inundation. It is a Notaphus, .20 inch long, shining, elytra obscurely rufo-piceous, paler at apex with oblique pale mark, punctures of striæ obsolete behind middle and surface undulated. Identical with European specimens, and also verified by Dr. Horn.

Bembidium assimile Gyll. (*frontale* Lec.) is found here with the preceding, but much more abundantly; I have it from Florida, and it seems to occur generally eastward from the Mississippi, and also in Kansas. In Europe and Asia it has the same distribution as *undulatum*. On comparison with European specimens no point of difference has been discovered.

Platynus pusillus Lec. Having recently examined and compared a number of *Anchomenus oblongus* Fab. from Sweden with the same number of the foregoing from Massachusetts, I conclude that Dr. Horn would have been entirely justifiable in pronouncing the species identical (Tr. Am. Ent. Soc., ix., 142), where he writes, "the only striking difference between the two being in the slightly wider thorax of our species." This difference, when a number of each is examined, is observed to be merely individual, and were I to write of the thorax, on the basis of a numerical estimate of what is before me, the statement in the above quotation would be reversed. The species has a wide distribution on this continent—Vermont, Massachusetts, New York, Canada to Kansas. In the Eastern

Hemisphere it extends across Europe, and in Asia, throughout Western Siberia.

Harpalus caliginosus Fab. The stridulation of this common beetle is referred to in Ent. Amer., ii., 239, as not recorded previously and as a discovery of Dr. Horn, and also that stridulation takes place only when the beetle is at liberty, and can not be made to do so when handled. This species and *H. pennsylvanicus* DeG. feed on ragweed *(Ambrosia artemisiæfolia)* when it is in bloom—here, in July, and both are excessively abundant. Let the entomologist visit on a calm, sultry evening, before sunset, some stubble field bordered by woods, when this weed is in flower, and he will often witness a lively and by no means quiet scene; hundreds of the former and thousands of the latter will be seen mounted on the weeds, each actively and intently employed in collecting the pollen from the flowers, or licking some delectable morsel from the leaves and occasionally evidencing its delight in a sonorous manner—a sudden squeak—somewhat like the noise made by a steel pen scratching rough paper; and so intent are they on the business in hand as to be captured before observing the approach of an enemy.

Striduiation is effected in both by the beetles rubbing the large costæ of the wings against the elytra, these costæ being coarsely transversely rugose from the base to near the apex. Stridulation is readily produced after death by pressing intermittently on the elytra, provided the costæ are in a position to be brought in proper contact with them.

H. compar and *H. longicollis* are catalogued as varieties of *H. pennsylvanicus*, but curiously enough, though abundant, they do not seem to have the same tastes, as I have never taken a single specimen of either on ragweed, though carefully sought for. I strongly suspect they are really three distinct species, notwithstanding the near approach in form of some individuals, and certainly nothing is gained by the collector by classifying them as varieties.

Graphoderes fasciatocollis Harr. was considered to be the same as the European *G. cinereus*, till separated by Dr. Sharp in his learned Monograph of the Dytiscidæ, p. 693; this separation is pronounced "unwarranted" by Dr. Horn, Tr. Am. Ent. Soc., x., 280. Two primary points of difference are given by Dr. Sharp; the first, that the male of *fasciatocollis* has "twenty-three" small pallettes on the anterior tarsus and twelve on the middle, while that of *cinereus* has "about twenty-eight" on the anterior and fourteen on the middle one; the second, that in the former

the punctuation of the elytra is dissimilar in the sexes, being in the female fine and deep at the sides and somewhat dense at the base, while those of the latter are alike in both sexes. Recently I examined several specimens of *cinereus* from Prussia and compared them with American forms, with the result of confirming Dr. Horn's opinion. Four males have each from thirty to thirty-three small pallettes on the anterior tarsus, and four have twenty-eight—all with fourteen on the middle; one has twenty-five on the anterior and twelve on the middle, with two rudimentary; one has twenty-three on the anterior and twelve on the middle, with doubtful traces of two others. As the pallettes decrease in number they increase in size and distinctness, but do not equal those in my single American male. The sculpture of the elytra in the sexes (seven females seen) might be termed uniform, though the punctuation is more pronounced in two or three females; the anterior black band of the thorax does not "always attain the front margin," but exhibits the same variableness as exists among American individuals. With the above I have compared one male and three females of *fasciatocollis* from Massachusetts and one female taken here; the male has twenty-three small pallettes on the anterior and twelve on the middle tarsus, all larger than in the European forms. Whether this number is constant, or variable as in the foreigners, would be desirable to know, that is, in a number taken together, for Dr. Horn has demonstrated the variableness when from distant localities. The three Massachusetts' females have the elytra sculptured like the male and could not be distinguished in this respect from their European sisters; but the female taken here is much coarser sculptured and punctured than ever Dr. Sharp's description requires. Both the points insisted on by the learned Doctor for separate species are shown by the above to be untenable.

Philhydrus fimbriatus Mels., one of the most common of the Hydrophilidæ, inhabits in great abundance all wet places, especially where there is mud—swamps, ponds, springy places, springs on hill and mountain sides, etc. It is variable in sculpture, size and color. The intention here is to bring to notice a dwarf race that inhabits the little rivulets that flow down hill and mountain sides from springs. While the normal form is piceous black with pale thoracic and elytral margins, and about .20 inch in length, this might be termed gray with paler margins, and in length is not over .15 inch. In summer these spring runs are often dry for long periods, and the beetles then crawl under stones and rubbish where there

is a little moisture; these long droughts and the comparative scarcity of food undoubtedly have dwarfed them, and living in clear water clinging to stones has called into exercise a potential element that seems to inhere in many insects of accommodating their colours to their surroundings. The black colour of the mud-inhabiting race would make them too conspicuous, so they have changed it to sober gray to correspond with the general colour of the stones and bottom of the brook.

Oxyporus 5-maculatus Lec. Seven other species of this genus occur here more or less abundantly from the middle of August onward, all living on various species of living mushrooms; but *5-maculatus* appears to be rare, as I have only taken it three times—two at a time, and like the others, feeding on mushrooms, but in June, and on rocky, mountainous places. It differs remarkably from the other species by having the sides of the thorax posteriorly so compressed as to elevate the disk at the middle of each side at base into a flattened tubercle in such a way as to make the expression, "thorax posteriorly concave," not inappropriate.

Dendrocharis flavicornis Guer. A specimen of this curious insect, now in the cabinet of Dr. Horn, was recently taken near St. Augustine, Florida, by Mr. Charles W. Johnson, who dug it out of a tree. This is the only native specimen in any of our collections so far as known. See figure and description, Tr. Am. Ent. Soc., xiii., 12.

Meristhus. If the definition of this genus in the Classification, "Front tarsal grooves wanting," is correct, the two species under it in the Catalogue should be placed under *Lacon*, as they have these grooves deep. I suspected a misprint of "tarsal" for tibial, but a careful examination shows the existence of these grooves quite evidently in some specimens of *cristatus*, though obsoletely so in others. There seems to be little need of the genus anyhow.

Dicerca prolongata Lec. and *D. divaricata* Say. A single character that will in all cases separate these species infallibly is something not yet in print. The prolongation and degree of divarication of the elytra are the same in both; a typical specimen of the former kindly sent me by Mr. Ulke, collected in Dakota, has the tips of the elytrons as widely separated as in *divaricata*, while on the other hand I have a specimen of the latter with the tips very prolonged and contiguous to near the end (*D. dubia* Mels.) The depth and distinctness of the thoracic channel is not a character to be depended on; my type of *prolongata* has a very deep and uninterrupted channel, but I have a specimen of the other taken

here approaching it closely, and from this are all degrees of variation to the slightest noticeable depression. No character can be derived from the spurs of the middle tibiæ of the males, for when a large number of *divaricata* are examined, this will be seen to vary from a mere tubercle to a formidable spur with long teeth on the distal edge. Colour, as a character, is not worthy of consideration. I have a specimen of *prolongata* from Canada with the upper side polished black with a purple reflection and the under coppery black. A point given me by Mr. Ulke (a character given by Dr. LeConte) is more permanent than any of those mentioned above, viz., tips of the elytrons with the angles rounded—*prolongata;* tips of the elytrons with the sutural angles terminating in a small spine—*divaricata.* This is the most constant character noticed, but by itself fails in individual cases under observation. I do not question the distinctness of the species. *Prolongata* breeds, so far as known, in conifers, and inhabits high altitudes and latitudes, while *divaricata* is more southern, being abundant in parts of Canada and all the States east of the Mississippi, breeding in diseased or dead deciduous trees, as beech, maple, apple, cherry, etc.

Dicerca obscura Fab. For a set of typical specimens of the real *obscura* as defined by Dr. LeConte, I am indebted to Mr. Ulke, who takes it quite commonly at Washington, D. C., on persimmon *(Diospyros Virginiana).* There is a tendency among collectors to confuse this with Dr. Leconte's *lurida* Fab., as defined in his Monograph, and to give the latter either name according to fancy. My observations, however, are that there are sufficient differences to keep them apart, at least as races, and to the collector this is the same as if they are separate species. In an examination of about one hundred and twenty specimens of *lurida* taken here or received from other places, I find that the thorax is in every case wider near the middle than at base, and that behind the middle the sides converge more or less to the base in a line varying from nearly straight to deeply sinuous. In *lurida* the reverse occurs, the widest part of the thorax is the base, and the convergence, though not great, is directed anteriorly, and from the middle to apex is more pronounced. The directions of Dr. LeConte in his Monograph, if strictly followed, are quite sufficient to effect a separation. *Lurida* breeds in dead and diseased hickory, and is very abundant, but I have never seen a specimen of *obscura* taken here.

Dicerca spreta Gory appears to be rare and I have it not, though

asperata Lap. & Gor. has been sent me for it by good collectors. Errors are mostly difficult to eradicate, and this one is not likely to be got rid of soon, at least not till the genus is monographed anew. The trouble is about this way. Dr. LeConte in his Monograph (Tr. Am. Phil. Soc., xi., 198) fully and clearly described a *spreta* and an *asperata*, which, of course, went so into all collections; but fourteen years afterwards Mr. G. R. Crotch (Proc. Acad. Nat. Sci., 1873, p. 85) states that the names given by Dr. LeConte should be reversed, but in his Catalogue misplaces the species, though giving the synonyms. In Mr. Henshaw's Catalogue the same order is followed, but the synonyms dropped, and now nothing points to an error in Dr. LeConte's Monograph. The error was corrected in few of the older collections, and is transmitted from them by tradition, while the latest catalogue indicates no error to one not conversant with the whole literature of the subject.

Aphodius rufipes Lin. is mentioned at page 9. Mr. Blanchard, of Mass., writes that he has a specimen collected in the mountains of North Carolina. These mountains are the Alleghany, the same as at St. Vincent's and at Deer Park. Thus, this recent discovery is already traced in a direct line over this continuously rugged country more than 400 miles.

Stenosphenus notatus Oliv. breeds in the limbs of dead hickory; it becomes a pupa the latter part of the second year and the imago is perfected before winter, but remains in the wood till the April or May following. *Neoclytus capraea* Say, which breeds in ash and often renders worthless logs cut before June, follows the same course. A manufacturer who uses this timber showed me a log in his shop in December that must have contained hundreds. When split in any direction the beetles crawled out of the opened burrows and appeared quite active.

Saperda concolor, mentioned page 8, Mr. Blanchard informs me, breeds in a low willow and in *Populus tremuloides*—in Massachusetts, the "Common Poplar," but here and everywhere west of the Alleghanies, the "Quaking Asp." How many other trees are "Common Poplar?"

Chrysomela præcelsis Rogers, when found, is in abundance, but its habitat is limited. It feeds on the leaves of Convolvuleæ (*Ipomœa pandurata* and *Calystegia sepium*) growing on the banks of rivers and moist alluvial ground, but not on the same plants when away from water. Its season of abundance is about the middle of June.

Apion herculaneum Smith occurs plentifully about the last of May on

the cymes of the maple-leaved arrow-wood *(Viburnum acerifolia)* just as they are going out of bloom. The fruit of this does not ripen till October, and some larva lives in the fleshy substance in which the thin, flat coriaceous seed is immersed, which is probably that of this *Apion*, though not yet so proven. This is one of the largest species of the genus, and when beaten into the umbrella behaves and looks so much like the worthless *Anthonomus quadrigibbus*, that till the past season it was always rejected.

DESCRIPTION OF THE PREPARATORY STAGES OF ARGYNNIS HESPERIS, Edw.

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Egg.—Conoidal, round-topped, nearly as broad at base as high, the top depressed; marked by about 19 thin, elevated, vertical ribs, one half running from base to summit, the others but four fifths or more the distance; the spaces between crossed by many low horizontal ridges; the micropyle surrounded by two or three circles of very fine depressions, outside of which are rows of very large four or five-sided depressed cells; color yellow-green. Duration of this stage about ten days.

Young Larva.—Length .06 inch; cylindrical, thickest in middle; color yellow-green; marked as in the allied species by rows of flattened tuberculous brown spots, each of which gives one or two long, tapering hairs; on dorsum of 2 a dark oval patch with a row of hairs in front, turned forward, and a shorter row behind; head obovoid, black, with many long hairs. The larva hibernates directly from the egg.

After First Moult: Length .1 inch; color green, mottled with brown over dorsum; the under side pale green; the spines in number and position as at maturity, and as in the genus, small at base, tapering little, wholly black, beset with many short black bristles; head obovoid, black, with black hairs. Duration of this stage eight days, in April and May.

After Second Moult: Length .15 inch; color brown and gray; a double indistinct gray dorsal stripe, and a similar one between dorsal and upper lateral spines; the spines black; those of the middle row have the bases on outer side pale yellow, of the lower row the bases are wholly pale yellow; head as before. Duration of this stage eight days, in May.