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PROFESSOR WILLIAM SAUNDERS, F.R.S.C., F.L.S.

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PROFESSOR WILLIAM SAUNDERS, F. R. S. C., F. L. S., ETC.

We take great pleasure in presenting this month a likeness of Prof. Saunders, who must be well-known, if not personally, certainly by reputation, to every reader of the CANADIAN ENTOMOLOGIST. He was one of the founders of the Entomological Society of Ontario in 1863, and became its President in 1875, which position he held continuously till he was appointed Director of the Experimental Farms of the Dominion in 1886. From 1874 to 1886 he was the General Editor of this Magazine, and conducted it with singular ability and success. In 1883 he published his great work: "Insects Injurious to Fruits," which has become a standard volume of reference among horticulturists and economic entomologists, and which reached a second edition in 1892. The list of his publications in the Bibliography of the Royal Society of Canada covers several pages and numbers between two and three hundred. In the words of an American writer: "by painstaking study and observation he has risen to the topmost pinnacle of fame as an entomologist, horticulturist and experimental agriculturist."

No one can be more highly esteemed by all who know him, or more beloved by his friends, than PROFESSOR WILLIAM SAUNDERS. May he long be spared in health and strength to carry on his arduous and important work for the benefit of the people of this Dominion!

## OCCUPANTS OF THE GALLS OF EUROSTA SOLIDAGINIS, FITCH.

BY W. HAGUE HARRINGTON, F. R. S. C., OTTAWA.

These conspicuous spherical galls occur somewhat rarely at Ottawa upon the stems of *Solidago rugosa*, and have been found to yield only the handsome fly which produces them, and its parasite *Eurytoma gigantea*, Walsh. The 24th May last I spent at Casselman, about thirty miles southward from Ottawa, with Mr. Fletcher, and we found the galls abundant upon *Solidago serotina*, upon the banks of the South Nation. On opening one I found a pupa, apparently of a *Mordella*, in the pithy substance, and, remembering Mr. Brodie's very interesting paper (CAN.

ENT., Vol. XXIV. p. 137) upon the occupants of similar galls from Manitoba, I afterwards collected a pocketful. They were very much larger than those which are found at Ottawa, and perhaps scarcely so spherical. Many were evidently already vacated by the producing flies, but I hoped that they might still have other tenants. About a week later, as only three flies had emerged, I opened about half of them, and was rewarded by finding several inhabitants. The majority of the galls contained in the central cavity the empty puparium of the fly, but in several the larva of the fly had apparently not hatched or had soon after perished, as there was no cavity. In only one gall was found the pupa of *Eurytoma gigantea*, and in this cavity there was no puparium of the fly. In winding tunnels in the pithy substance of other galls were found a Mordellid larva and pupa, which were placed in alcohol, and a few small Chalcidid pupæ, one of which was evidently a smaller species of *Eurytoma*. Several dead larvæ of the beetles were also found in their burrows. On June 21st, as nothing had since emerged, I opened the remaining galls, and in two I found living examples of *Mordellistena nigricans*, Melsh. In each instance the central cavity of the gall contained the empty puparium of the Eurosta, which had escaped by its own exit, while the beetle was at the end of a long burrow through the solid pithy substance, and just cutting its way out. It is evident, therefore, that Mr. Brodie was mistaken in announcing this beetle as a true parasite of the fly, and as "bred from an Eurosta pupa-case." It is certainly only an inquiline, the larvæ boring in and living upon the pithy substance of the gall. Some years previously (CAN. ENT., Vol. XIII., p. 173) the late Mr. V. T. Chambers had recorded a Mordella larva (perhaps this same species) as "common in the galls of *Gelechia gallæ-solidaginis*, Riley, in stems of Solidago, eating into and through the walls of the galls, but not disturbing the larvæ or pupæ of the moth." Besides the two beetles, there were found in the galls, in the small burrows made by the beetle larvæ, three or four more of the chalcidid pupæ and two flimsy braconid cocoons, from which emerged specimens of *Sigalphus*, answering very well to the description of *S. texanus*, Cress. The small *Eurytoma* proved apparently to be *E. studiosa*, Say, while the remaining seven pupæ developed into a species of chalcidid which I have not been able to determine. The latter species, the *E. studiosa*, and the *Sigalphus* are evidently parasites, not of the gall producing Eurosta, but of the inquiline Mordellistena. We have, therefore, from these few galls examples of the fly which produces it, a true parasite thereon, an inquiline beetle, and three parasites thereof.

## NEW NORTH AMERICAN MYCETOPHILIDÆ.

BY D. W. COQUILLET, WASHINGTON, D. C.

*Platyura lurida*, n. sp. ♀. Head and antennæ black, first two joints of the latter and the mouth parts somewhat yellowish. Thorax, pleura, scutellum, abdomen and legs, pale yellow, the tarsi toward the apex brownish-yellow, the thorax marked with three reddish-yellow vittæ. Wings hyaline, slightly tinged with yellowish toward the costa, otherwise unmarked; tip of auxiliary vein nearly twice the length of the humeral cross-vein beyond the base of the third; sub-costal cross-vein nearly three times the length of the humeral beyond the latter; anterior branch of the third vein oblique, ending its own length beyond the tip of the first; sixth vein reaches the wing margin. Length, 6 mm. Washington. A single specimen from Prof. O. B. Johnson.

*Platyura Maude*, n. sp. ♀. Head and antennæ black, palpi yellowish. Thorax, pleura and scutellum bluish-black. Abdomen reddish-yellow, first two segments black, the base of the second tinged with reddish; this segment is one-half longer than broad. Halteres yellowish. Coxæ reddish-yellow, blackened at their bases, femora deep yellow, tibia brownish-yellow, tarsi black. Wings yellowish-gray, a brownish spot extends from the first vein, before its apex, to the posterior branch of the fourth vein near its base; apex of wing from midway between tips of first and third veins to apex of sixth vein grayish-brown; a brown cloud on third vein near its base; tip of auxiliary vein twice the length of the humeral cross-vein beyond the base of the third; sub-costal cross-vein one and one-half times the length of the humeral cross-vein beyond the latter; anterior branch of third vein oblique, ending nearly its own length before the tip of the first; sixth vein reaches the wing margin. ♂ same as the ♀ except that the second abdominal segment is twice as long as broad, and the anterior branch of the third vein is perpendicular, ending twice its length before the tip of the first vein. Length, 9 mm. Washington. A pair from Prof. O. B. Johnson, at whose suggestion I have named this handsome species in honour of Miss Maud L. Parker, whom he designates as "one of my most faithful collectors."

*Platyura pectoralis*, n. sp. ♀. Front, occiput and antennæ, black; first two joints of the latter, the face, cheeks and mouth parts, yellowish. Thorax and scutellum reddish-yellow, pleura and metanotum bluish-black. Abdomen reddish-yellow, the first segment black, the second three times as long as broad. Halteres yellowish. Coxæ and femora reddish-

yellow, tibiæ brownish-yellow, tarsi black. Wings yellowish-gray; a brown spot extends from costa before tip of first vein to posterior branch of fourth vein near its base; apex of wing from midway between tips of first and third veins to apex of sixth vein, grayish-brown; a brown cloud on the third vein near its base; tip of auxiliary vein opposite base of the third; sub-costal cross-vein one and one-half times the length of the humeral beyond the latter; anterior branch of third vein oblique, ending twice its length before the tip of the first vein; sixth vein reaches the wing margin. Length, 12 mm. Nevada. A single specimen from the late Mr. Morrison.

*Platyura fasciola*, Coq. Described as a *Ceroplatus*, but is best located in the present genus.

*Mycetophila Hopkinsii*, n. sp. ♂. Black, the thorax and abdomen sub-shining, not pollinose; the halteres, femora, tibiæ and base of metatarsi dusky yellow. Antennæ twice as long as the head and thorax united, densely short, whitish pubescent. Thorax and scutellum sparse, coarse, golden-yellow pilose; abdomen fine yellowish-white pilose. Front tibiæ destitute of stout bristles except at the tip, the middle and hind ones bearing numerous black bristles. Wings gray, unmarked; auxiliary vein entire, ending in the costa slightly beyond the base of the third; fourth vein forks the length of the small cross-vein beyond the latter; fifth vein forks opposite the lower end of the oblique small cross-vein; sixth vein scarcely reaching beyond the middle of the posterior fork of the fifth; costal vein reaches the first third of distance between tips of third vein and anterior branch of the fourth. Length, 4 mm. Morgantown, W. Va. A single specimen from Prof. A. D. Hopkins, after whom the species is named.

*Dynatosoma fulvida*, n. sp. ♀. Yellow, the antennæ and apices of tarsi black, tibiæ tinged with brown; an indistinct brownish fascia extends from one ocellus to the other, or the entire front and occiput are sometimes black. Wings yellowish-gray; a brown spot extends from costa to base of posterior branch of fourth vein; apex of wing from before tip of first vein to apex of posterior branch of fifth vein, brownish, enclosing a sub-hyaline spot that extends from the third vein to the middle of the third posterior cell; tip of auxiliary vein three times the length of the humeral cross-vein beyond the latter, ending in the first vein; sixth vein not nearly reaching the wing margin. Middle and hind tibiæ each bearing

outwardly three rows of stout bristles, and on the inner side with a row of smaller ones. Length, 7 mm. Washington. Two specimens from Prof. O. B. Johnson.

This is the first discovery of the present genus in this country. It is closely related to *Mycetophila*, differing principally in the course of the auxiliary vein, which terminates in the first, instead of being abbreviated, or of ending in the costa.

### ON THE SUBGLOBULAR SPECIES OF *LECANIUM*.

BY T. D. A. COCKERELL, NEW MEXICO AGRICULTURAL EXPERIMENT STATION.

The genus *Kermes* of modern authors contains about a dozen subglobular forms, found on oaks, with one exception. These insects might be taken for species of *Lecanium*, but a microscopical examination of their characters, especially in the larva, shows that they are quite distinct from that genus.

There are, however, four known subglobular species which structurally and in the larva resemble *Lecanium* and not *Kermes*; adding to these four others which I have lately received, we have altogether eight subglobular coccidæ which show true *Lecanium* characters.

Two of these live on conifers, and are placed in a genus separated from *Lecanium*, known as *Physokermes*. *P. abietis* (mod.) = *hemicyphus*, Dalm., = *racemosum*, Ratz., = *piceæ*, Schr., inhabits Europe; *P. n. sp.* (shortly to be published) lives in Colorado.

In Europe is also found *Lecanium emeriçi*, Planchon, on *Quercus ilex* and *Q. coccifera*. This I have never seen, but Signoret gives its characters in some detail. The dermis is tessellate, as in *Physokermes*.

From Montevideo comes a very large species, *L. verrucosum*, Signoret, and below I describe three from Brazil.

Finally, in Australia is *L. bacatum*, Maskell. None of these last five have the dermis tessellate.

Summing up, we thus have: (1) A distinct genus of two species,—one Palæarctic, one Nearctic,—confined to conifers. (2) A single Palæarctic species, on oaks. (3) Four Neotropical species; and (4) One Australian.

It seems probable that these insects represent old types, not late developments from normal *Lecanium*. But *L. emeriçi* and *Physokermes*

seem somewhat related to the *Eulecanium* series, which inhabits the Palearctic and Nearctic regions, and is entirely absent (except where introduced on cultivated plants) in the Neotropical and Australian. Now that the Neotropical series is increased to four, we can see (1) that it is diversified within its own limits, doubtless actually more numerous in species than present information shows, and probably, therefore, endemic; (2) that it more resembles the Australian species than those of the Palearctic or Nearctic regions.

Thus the indications are, that the Palearctic-Nearctic series of subglobular forms is altogether distinct from the Neotropical-Australian series, the resemblance being much closer superficially than in structural characters. The last-mentioned series does, however, seem to hold naturally together, and its distribution may, perhaps, be used as an argument by those who favour the hypothesis of land-connection between S. America and Australia.

The three new Neotropical species were all collected by Dr. Von Ithering, the well-known naturalist, now of the Sao Paulo Museum.

*Lecanium pseudosemen*, sp. nov.

♀. Scale globose, max. diam., about 10 mm., a moderate-sized specimen is long.  $8\frac{1}{4}$ , lat.  $7\frac{1}{4}$ , alt. 7 mm. Scale clasping twig; leaving, when removed, four small, broad stripes of white secretion. Colour coffee-brown, or reddish-brown, sometimes irregularly marked with yellowish; surface smooth, fairly shiny. Under a lens appears minutely tuberculose and finely and closely spotted with yellowish.

Boiled in caustic soda, it stains the liquid madder-brown, the pigment precipitating on standing.

Dermis (transmitted light) not tessellated; shows large, oval gland-pores.

Claw rather short, stout, curved, sharply pointed. Digitules of claw extending beyond its tip, rather slender, but with large knobs. Tarsal digitules only moderately long, slender, with small knobs. Tarsus somewhat arched; tibia also somewhat arched, but in a contrary (forward) direction; both slender, tibia about  $\frac{1}{4}$  longer than tarsus. Femur about as long as tibia, moderately stout. Trochanter with a very long hair at its end,

Antennæ 8-jointed; 1 unusually large and long, much longer than its breadth at apex, but hardly so long as its breadth at base; 2 about as long as 1, and about half as broad as long; 3 distinctly longer than 2, but not much longer; the rest are all shorter; 4 next longest, then 5 and 8, then 6, then 7. Formula 3 (12) 4 (58) 67; 1 and 2 each with two hairs near apex; 3 with a hair not far from base.

*Hab.*, Brazil, presumably S. Paulo, on twig of plant not determined (*Von Ihering*, No. 59). ♀. Scales sent, containing embryonic larvæ.

The dermis shows numerous moss-like ramifying bodies, presumably some parasitic alga. These growths are very much like the dendritic crystals of black oxide of manganese sometimes seen on slabs of limestone rock, but they are granular and frequently pigmented dark brown.

The scales look like large seeds or berries. Although a large species, this is by no means so large as *verrucosum*, from which it differs in several characters.

*Lecanium monile*, sp. nov.

♀. Scale on bark, long. 4, lat.  $3\frac{1}{2}$ , alt. about  $2\frac{1}{2}$  mm., rounded, sub-globose, moderately shiny, reddish-brown, irregularly mottled. Posterior cleft distinct.

Dermis not reticulate; with rather few small round gland-pores, but also with, at moderate intervals, *large oval or sub-circular reticulated patches*. This last is a very peculiar feature. No legs or antennæ found in adult.

Larvæ present in the scales; these embryonic larvæ have 6-jointed antennæ; 3 longest, 6 nearly as long; 1, 2, 4, 5 subequal. They also show very long and slender tarsal digitules; digitules of claw not alike, one filiform, the other moderately stout.

*Hab.*, Sao Paulo, Brazil, on plant not identified (*Von Ihering*, No. 52). Several of the scales show large parasite-holes; these, especially, look like small brown beads, the hole looking like that for the string.

*Pseudokermes*, subg. nov.

♀. Lecaniid, but the appearance suggesting a small *Kermes*; covered with a thin, glassy scale, much after the manner of *Inglisia*; antennæ and legs absent in adult; dermis not chitinous.

*Lecanium (Pseudokermes) nitens*, sp. nov.

♀. Scale smooth, ochreous, very shiny, sub-globose, divided

antero-posteriorly by a shallow groove; long.  $2\frac{1}{2}$ , alt. 2, lat. 3 mm. Glassy scale very thin, white and semi-transparent, forming sublateral low cones, concentrically but not longitudinally striate.

Dermis (after boiling) colourless, not tessellated; a marginal row of small, short spines and round gland-orifices. No vestige of legs or antennæ could be seen, although the specimens were easy to examine for such characters by reason of the transparent dermis.

Mouth parts distinct and well-developed, mentum apparently monomerous, broad, with a pair of small bristles on each side near the tip. Rostral filaments short.

Anogenital ring with several hairs. Anal plates small, their external sides meeting at about a right angle; the anterior-external side decidedly longer than the posterior-external. Immediately cephalad of the plates, and partly surrounding them, is a broad brown chitinous crescent; its breadth in the middle rather greater than the length of the plates.

*Hab.*, on *Myrtus (Blepharocalyx) tweedii*; Rio Grande do Sul, Brazil (*Von Ihering*, No. 45). I presume it infests the twigs, but the specimens sent were detached and in alcohol. The glassy covering is very fragile, and in every specimen was broken; in several altogether lost.

This remarkable coccid should form the type of a new genus, but is now placed in a sub-genus of *Lecanium* as a matter of convenience and to indicate its relationships. At first sight one would take it for a highly specialized form, the end of the branch of subglobose neotropical species. But it shows curious resemblances to several genera and species, and for this reason might be thought a primitive type.

The arrangement of the anogenital structures seems rather like that of *L. bacatum*, but that is believed to have a hairless anogenital ring.

The broadened form, with median groove, and the lack of legs in the adult, strongly suggest *Physokermes*. The derm, however, is not tessellate.

The glassy covering recalls at once *Inglisia*, but it does not show the "air-cells" of that genus. The way in which the glassy covering is formed suggests *Fairmairia*.

ON THE CABBAGE-SHAPED GALL OF *CECIDO'YIA SALICIS-BRASSICOIDES*, AND ITS OCCUPANTS.

BY C. H. TYLER TOWNSEND, BROWNSVILLE, TEXAS.

On July 9, 1892, I found in the Grand Canon, Arizona, on the Hance trail, near the Colorado River, numbers of the green galls of this species on the narrow-leaved *Salix* sp. (probably *S. longifolia*). Three that were picked on this date measure 19 to 20 mm. in length, and 11 mm. in width on widest portion near base. They preserve their light green colour, except for their whitish, thick pubescence. Some last year's galls were also found in the canon on the willows near the stone cabin. They measure 16 to 17 mm. in length, and 10 to 11 mm. in width. They are more spread out apically; therefore not conical in outline, and are reddish-brown in colour, probably from being weathered.

Three galls of this species, from West Cliff, Colorado, sent me by Mr. T. D. A. Cockerell, measure only 13 to 14 mm. in length, by 8 to 9½ mm. in greatest width, near base. They are well cone-shaped, but reddish-brown in colour save for the grayish external pubescence. These are mentioned by Mr. Cockerell in *Entom.*, 1890, p. 280.

Green galls of this cecid were found near Las Cruces, August 21, 1892, in great numbers on *Salix longifolia* along the *acequia madre* in the Alameda. They were little more than one-half inch long at this date, and were borne in numerous dense clusters of a dozen or more each. On Nov. 13 and 14, 1892, over 200 of these galls were picked from the willows in the above locality. Many of the clusters were on twigs that had died, showing that the galls kill the new growth to a considerable extent. Some were found on topmost twigs of the willow 10 feet high, while others were within 3 or 4 feet of the ground and frequently in masses. One thick bunch contained 21 galls. Eight of the smaller sizes and seven of the larger, selected from these 200 galls, measure as follows:—

		LENGTH.	WIDTH.			LENGTH.	WIDTH.
Smaller Galls.	{	6	by 6 mm.	Larger Galls.	{	15	by 10 mm.
		7	" 5½ "			17	" 11 "
		7	" 6 "			18	" 10 "
		7	" 6½ "			18	" 11 "
		9	" 6½ "			19	" 9 "
		12	" 9 "			20	" 10 "
		13	" 8½ "			22	" 10½ "
		14	" 7 "				

The above include the smallest and largest. The smallest are not fully developed, and lack the tapering tip; while the longest depend for their length on this tip being well elongated, since it will be seen that the width of the larger ones is more nearly equal. The smaller galls, while varying in length 8 mm., vary in width  $3\frac{1}{2}$  mm. But the larger ones, while varying in length 7 mm., vary in width only 2 mm.

Of these 200 galls, thirteen were opened on Nov. 13, the same day collected. Six contained the plump, perfectly white larva; while the other seven contained smaller light brown, elongate puparia enclosing a transformed hymenopterous parasite alive and ready to emerge. One of the parasites which was pulled from its puparium moved its legs and showed signs of life. The galls containing these hymenopterous puparia were the most dried ones in appearance, and were on dead branches. This parasite seems to remain transformed within its puparium in the centre of the galls all winter, issuing in the early spring. Specimens were bred and identified by Mr. Ashmead as *Platygaster obscuripennis*, Ashm. On March 16, 1893, four of the cecids were found issued and dead; while there was a number of the parasites issued, and only one or two of these dead, most of them being very active and one pair in coitu. Up to March 24, 1893, one more cecid had issued, making five cecids in all; while of the parasites ten had issued. In issuing, the cecids sometimes, if not frequently, leave their pupa-skins sticking by the abdominal portion in the tip of the cone-like gall. On April 9, 1893, 30 more cecids were found issued and dead, 2 more alive, and 2 blackish pupæ issued from galls. Not a single parasite had issued since March 24, but a live one appeared April 9.

The following are descriptions of the occupants of this gall:—Larva of *Cecidomyia salicis-brassicoides*.—Length, 2.3-5 to  $3\frac{1}{2}$  mm.; width, 1.3-5 to 2 mm. Colour perfectly pure white originally, changed by immersion in alcohol to rosy or pale orange. Oblong-oval in form, plump, fleshy, apodous, consisting of 13 segments. Head rather sunken and retracted within anterior end of body, little more than one-third width of next segment; latter hardly more than one-half width of third segment, which in turn is considerably narrower than fourth, and the fourth is narrower than fifth. These segments are all about the same length so far as length is appreciable in their partially retracted condition. Segments 6 to 8 are very slightly wider than 5, nearly equal in width,

segment 7 being the widest portion of body. Segments 6 to 10 are nearly equal in length and much longer than segment 5, but segments 7 and 8 are equal and slightly the longest in the body. Segments 9 to 11 are gradually narrowed and successively slightly shortened, 12 and 13 being much more narrowed and more or less retracted within posterior end of body. Whole integument bare, with a minutely rugose-appearing surface. Anal segment with a perpendicular median wrinkle on lower half; twelfth segment bearing above on posterior margin a pair of minute short horn-like prolongations of the integument, projecting transversely inward towards each other, the tip of each pale brownish. Mouth parts appearing as a pale brownish spot in centre of capital segment, with a minute brownish dot on each side at edge of it. Breastbone pale brownish, nearly as wide as long, or narrowed on basal half or more, with a pair of 2-jointed palpus-like organs on terminal portion, the tip of each minutely darker at the suture dividing the two joints, the basal joint stout and rather elongate subconical, the terminal joint minute and very short conical.

Described from six specimens, taken from galls on November 13th.

Puparium of *Platygaster obscuripennis*, Ashm. (containing transformed adult).—Length, 2.3-5 to 2.4-5 mm.; width posteriorly, 1 to 1.1-5 mm.; width anteriorly, about 3-5 mm. Colour light yellowish-brown, appearing dark brown where the adult shows within. Subcylindrical, gradually narrowed and subtruncate anteriorly, rounded oval posteriorly. Surface of whole integument minutely punctured. Circular surface of plate of anterior subtruncate end somewhat wrinkled and roughened, with a small central lighter-coloured tubercle, and with an organ on lower edge of plate forming part of integument and bearing a striking resemblance to the breastbone of the cecid, but probably representing the mouth parts of the hymenopterous larva.

Described from four specimens taken from galls, Nov. 13.

Adult of *P. obscuripennis*.—Length, 1.4-5 to 2.2-5 mm. Wholly shining black, legs pale brownish except most of femora and sometimes part of tibiae black. Wings nearly transparent, very faintly smoky, reaching beyond abdomen, thickly and minutely short hairy.

Mr. Ashmead also identified a second parasite bred from this cecid as *Decatoma* sp.

DESCRIPTIONS OF THE LARVÆ OF CERTAIN  
TENTHREDINIDÆ.

BY HARRISON G. DYAR, A. M. NEW YORK.

*(Continued from page 196.)*

*Eighth stage.*—Head shining black, yellowish punctured around the mouth, antennæ yellowish; eye and jaws black; width, 1.8 mm. Body ochreous yellow, 6-annulate with irregular quadrate sub-dorsal (two per segment) and lateral (one per segment) black spots, confluent on joint 13; sub-ventral ridge faintly discoloured; anal plate blackish. No white secretion. The larvæ do not feed in this stage, but seek for soft wood in which they bore their galleries for pupation.

Eight stages is probably the least number which these larvæ have. I have found them with the following widths of head:—2.2 mm., 2.45 mm., 2.9 mm. This indicates that they may have as many as eleven stages, perhaps in the case of large females.

*Acordulecera dorsalis*, Say.

Determined by Mr. MacGillivray.

Only on the very young leaves of the black oak, eating the whole leaf down irregularly. Sitting flat on the venter, but holding on by the thoracic feet, and flap up the abdominal portion when disturbed. Feet on joints 6-11, 13, but very small, nearly aborted, none of them used; thoracic feet large. Body smooth, stiff as if inflated, shining colourless, the food showing green. Segments marked into 4 annulets by creases, not incised. Sub-ventral fold prominent, in the centre of the segment, giving the outline a fluted appearance. Tracheæ very evident. Head colourless, tinged with blackish, or with brownish in the last growing stage (width, .8 mm.), especially below; a little fine pile; eye black, mouth brown.

*Last stage.*—The larvæ moult and enter the ground; colour faintly bluish, less transparent and with distinct blackish dots in three transverse rows per segment. Head grayish-tinted; width, .8 mm. Body smooth, a little shiny, sub-ventral folds scarcely prominent.

*Hylotoma McLeayi*, Leach.

I was much surprised to find that the larvæ which produced flies of this species were totally different from those described by Norton (*Trans. Am. Ent. Soc.*, IV., 78, 1872).\*

\*I have seen the larvæ which he describes, but their structure and position are like those of the species of *Emphytus* which I have bred. My larvæ died.

Larvæ abundant on wild cherry (*Prunus serotina*) at Woods' Holl, Mass., often gregarious, sitting on the edge of the leaf, the body held down close to it. The abdominal feet, though small, are used.

*Eggs.*—Laid in a series of saw-cuts along the edge of the leaf between the upper and lower epidermis, the series often extending from the middle to apex of the leaf. Incisions nearly circular, open on the edge, slightly swollen; 1.2 mm. in diameter.

There appear to be eight larval stages, but I have not observed the early ones.

*Fourth stage.*—About as in the next stage, but smaller and the tubercles quite indistinct except sub-ventrally, owing to their small size and pale colour. They hardly appear more than blackish spots. Colour pale, more of a honey-yellow than the mature larva, a greenish shade from the alimentary canal. Width of head, 1.1 mm.

*Fifth stage.*—Head shining brownish-black without depressions; width, 1.4 mm. Tubercles greenish-black, less distinct than finally. Joints 2 and 12 appear yellow, as the green shade from the alimentary canal is interrupted there.

*Sixth stage.*—Width of head, 1.75 mm. There is very little change; the tubercles gradually become larger and darker coloured.

*Seventh stage.*—Width of head of ♂, 1.75 mm.; of ♀, 2.2 mm. Much as in the next stage.

*Eighth stage.*—Head full at vertex, evenly rounded, sutures obscure; smooth, shining black with four dents in front; ocellus depressed; width: ♂, 1.75 mm.; ♀, 2.2 mm. Body large, full, with sub-ventral folded ridge. Thoracic feet large and strong, abdominal ones small, present on joints 6 to 11 and 13 with a very rudimentary pair on joint 12. Segments obscurely 3-annulate. Body orange-yellow or yellow, with a diffuse greenish shade from the alimentary canal. Thoracic feet except at joints, abdominal feet outwardly, suranal plate and the rather large (0.2 mm. diameter), round, minute setiferous tubercles, shining black. The tubercles are low, rounded, smooth, each with a central, short, black seta. They are arranged in three rows on each segment, nine on each side in a square above the sub-ventral fold, with one or two little ones just posterior to the spiracle; on sub-ventral ridge a single elongate, slightly oblique one, bearing six or more setæ; three in the anterior row ventrally, but only one in the two posterior rows. The arrangement is somewhat modi-

fied at the extremities. Spiracles black. At the end of this stage the larvæ empty their intestinal canals and spin cocoons on the surface of the ground without moulting.

*Cocoon* entirely of yellow silk, double, the outer layer of coarse meshes, the inner thinner and more compact. Larvæ in July; the flies emerged the following April. In the last moult there is no increase in the size of the head, but the larvæ feed in the last stage. The ♂ larvæ are smaller than the ♀, and their heads do not enlarge at the moult before the last, so they possess the anomalous character of having three stages without any growth of the head. I have never observed anything of this kind in the Lepidoptera, perhaps owing to their very different manner of moulting. In the saw-flies the old head is split at each moult, as in the Lepidoptera at pupation only, and the new one has to grow after the moulting instead of largely before it, as in the Lepidoptera.

*Hylotoma pectoralis*, Leach. The red-headed birch saw-fly.

A general description of this larva has been given by Rev. T. W. Fyles (CAN. ENT., XVIII., 38). I have a few details to add.

Found on the black birch (*Betula lenta*) at Woods' Holl, Mass., and Plattsburgh, N. Y.; also common on the white birch (*Betula papyrifera*) at Keene Valley, N. Y.

*Eggs*.—Laid in a series of saw-cuts along the edge of the leaf between the upper and lower epidermis, producing slight swellings 1.5 mm. in diameter. The eggs are soft and white.

The number of larval stages was not exactly determined, but what evidence I have leads me to believe that there are eight, and I shall describe them on that basis.

*First stage*.—Head reddish; width .6 mm. Body essentially as in the next stage (Keene Valley).

*Second stage*.—Head shining black, a little paler at sutures, round, about as high as wide, dented at clypeus; width, about .7 mm. Thoracic feet black, except at the joints. Body as in the next stage, but the piliferous dots much smaller and so less distinct (Woods' Holl).

*Third stage*.—Head light reddish-brown, shining, clypeus slightly indented in black; eye black in a black spot; head well rounded, rather higher than wide, full at vertex; width, .9 mm. Thoracic feet large, largely black; abdominal feet small, their bases black and corresponding spots on the apodal segments. Body shining yellowish-green, alimentary canal obscured; segments hardly annulate, but with three rows of large

black spots (three per segment), besides the oblique black mark on sub-ventral ridge and minute ventral dots anterior to the legs; all bear short, stiff, black setæ.

\*            \*            \*            \*            \*

*Fifth stage.*—Head clear light orange-red, shining, minutely sparsely black pilose; eye on black spot; width, 1.4 mm. Abdominal feet on joints 6-10 and 13, small with indications of feet also on joints 11 and 12; thoracic ones pale with slight black marks. Body as before; anal plate black.

*Sixth stage.*—Head well rounded, full at vertex, but narrowing to a central apex; sutures obsolete, but four dents in front indicate clypeus; shining light red with a few black setæ; eye black; width, 1.8 mm. Body cylindrical, of nearly even width to joint 13, which is a little smaller; abdominal feet, corresponding spots on the apodal segments and anal plate black; no cervical shield: thoracic feet pale brownish. Segments not annulate, shining green, yellowish laterally; nine large elevated rounded black spots, .2 mm. in diameter, in a square on each side above the stigmatal line on each segment, one below posteriorly to the spiracle, and several small ones on the conspicuous, obliquely divided sub-ventral ridge; a small black patch at base of abdominal feet 7-10 and minute ventral spots. Anal feet pale orange. A series of round medio-ventral orange spots, almost between the feet on joints 7-12.

*Seventh stage.*—Width of head, 2.2 mm. (1.8 mm. in male?). Much as before throughout, but the black spots are larger (.25 mm.), shining blue-black.\*

\*            \*            \*            \*            \*

*Cocoon.*—Double, open reticular, of yellow silk, the outer layer of large meshes; spun at the surface of the ground.

*Lophyrus Lecontei*, Fitch.

Gregarious, eating down the needles of the pine. When disturbed, the larvæ raise the thoracic feet and eject a white fluid from their mouths.

Head light red, eye and mouth black; width: ♂, 1.8 mm.; ♀, 2.2 mm. Thoracic feet rather small, black except at the joints. Abdominal feet present on joints 6-12 and 13 (22 feet), all well-developed. Body rather greenish-white, nearly opaque, slightly shining; segments not very distinctly 4-annulate, with rows of microscopic black spinules on the

\*The eighth stage was not noted. It probably escaped observation, as there should be no increase in size of the head, and I neglected to isolate one larva.

first, second and fourth annulets. A series of sub-dorsal, sooty black patches, tapering posteriorly, varying in different individuals. The two rows approach each other posteriorly, and on joint 13 form a single, large, quadrate patch anterior to the pale suranal rim; spots partially broken between the annulets. A similar lateral row of sub-quadrate spots; a smaller one on sub-ventral ridge, and a small spot above base of each abdominal foot, except toward the extremities of the body. Venter immaculate.

At maturity the larvæ moult, leave the trees and form their reddish-brown cocoons at the surface of the ground. Head shining sordid white with a blackish shade all over the vertex and part way down the sides, not on the clypeus; sutures evident, eye in a black spot; mouth red; width as before. Body sordid white, 6-annulate, slightly shining; alimentary canal empty. Black spots as before, but not sooty, slightly shining and minutely white-dotted. Thoracic feet slightly blackish or wholly watery-whitish.

Found on *Pinus rigida* and *P. Banksiana* at Woods' Holl, Mass. in August. Flies emerged the following spring. This was determined by Mr. MacGillivray as *Lophyrus Lecontei* (?); but as the larva corresponds with Riley's description, I have left off the mark of doubt.

*Imago*.—♂. Shining black, a ventral band and tip of abdomen rufous; all the femora, tibiæ and tarsi rufous, the anterior legs palest. Veins and stigma pale brownish; hind wings smoky outwardly; antennæ 21-jointed.

♀. Reddish; sides of thorax above wings and abdomen, except at tip, black; a black shade below sub-ventrally, especially on abdomen and on anterior femora; antennæ black, 21-jointed. Cross-nervure of lanceolate cell hardly oblique.

The following synopsis will separate the larvæ of *Lophyrus* at present described in works to which I have access:—

Larva without spots; head black (*Abies*)..... *Lophyrus abietis*.

Larva with angular black spots.

Head black, no sub-ventral spots (*Pinus strobus*)..... *Lophyrus Abbotii*.

Head red; small sub-ventral black spots (*Pinus rigida*, etc.)..... *Lophyrus Lecontei*.

## THE COLEOPTERA OF CANADA.

BY H. F. WICKHAM, IOWA CITY, IOWA.

## XII. THE HYDROPHILIDÆ OF ONTARIO AND QUEBEC (concluded).

This paper can scarcely be considered in any sense an original one, since it consists almost entirely of tables published in greater detail by Dr. Horn in his reviews of this portion of the Hydrophilidæ. By removing the extra-limital forms, I have been able in some cases to modify the synopses so as to make them a little easier to follow, and it is hoped that they will prove of use to many students of the Canadian fauna who may not see the more complete originals. With this prelude, which will place the credit where it properly belongs, we may proceed.

## PHILHYDRUS, Sol.

With this genus commences a series of less convex and usually shining black species, which are common along the edges of ponds and creeks, rising to the surface, after the manner of the Helophori, when the water is agitated. Some of them resemble each other very closely, but may be thus distinguished :

- A. Above paler, testaceous to pale piceous.
  - b. Prosternum distinctly carinate (.14-.18 in.) . . . . . *nebulosus*, Say.
  - bb. Prosternum not carinate.
    - c. Mesosternal lamina very feeble, the anterior edge without distinct angle (.14-.16 in.) . . . . . *ochraceus*, Mels.
    - cc. Mesosternal lamina prominent, with distinct angle.
      - Thorax piceous on the disk (.16-.22 in.) . . . . . *Hamiltoni*, Horn.
      - Thorax entirely testaceous (.18-.24 in.) . . . . . *diffusus*, Lec.
- AA. Above black or piceous black, margin sometimes pale.
  - d. Transversely very convex ; larger species.
    - Thorax and elytra with pale border (.26-.28 in.) . . . . . *cinctus*, Say.
    - No pale border present (.28-.32 in.) . . . . . *consors*, Lec.
  - dd. Sub-depressed ; smaller species (.16-.22 in.) . . . . . *perplexus*, Lec.

## HELOCHARES, Muls.

Contains *H. maculicollis*, Muls.: .16-.22 in. long ; yellowish or testaceous above, with a rather large piceous thoracic spot ; head more or less piceous. Elytra with two series of coarse punctures on each (situated on the fifth and ninth intervals), and with ten moderately deep impressed striæ.

## CYMBIODYTA, Bedel.

- Form very broadly oval; serial punctures of elytra distinct at sides (.26-.28 in.).....*rotunda*, Say.  
 Form oval, serial punctures distinct (.18-.22 in.).....*fibriata*, Mels.  
 Form oblong, serial punctures wanting (.16-.18 in.).....*lacustris*, Lec.

## HELOCOMBUS, Horn.

Contains a rather large species (*H. bifidus*, Lec.), .22-.28 in. long, resembling the well-known *Hydrobius fuscipes*, L., from which it may be separated by having the last joint of the maxillary palpi shorter than the preceding.

## HYDROBIUS, Leach.

This name is now applied only to the larger species thereunder included in the Check List, the small ones going into *Creniphilus*. They separate thus:

- A. Brownish, elytra tessellate with darker (.28-.30 in.)...*tessellatus*, Ziegl.  
 AA. Black or piceous above.  
   b. Form oblong, elytra striæ distinct (.26-.32 in.)...*fuscipes*, Linn.  
   bb. Form short, very convex, elytra punctate in rows.  
     Hind femora opaque and pubescent near base and along upper border (.30 in.).....*globosus*, Say.  
     Hind femora simply closely punctate near base, not pubescent (.34 in.).....*tumidus*, Lec.

## CRENIPHILUS, Mots.

Smaller than the preceding, and usually found about pools. In form they differ among themselves, but are usually elliptical in outline and very convex. In the following table the name *feminalis*, Lec., is replaced by *infuscatus*, Mots.:

- A. Form oblong, fully twice as long as wide; elytra narrowed behind, testaceous at sides (.06-.08 in.).....*suturalis*, Lec.  
 AA. Form elliptical, convex, not much longer than wide.  
   Colour above brownish to ochraceous (.08-.10 in.).....*infuscatus*, Mots.  
   Colour above black or piceous, more or less bronzed.  
     Prosternum distinctly carinate (.06-.08 in.)...*subcupreus*, Say.  
     Prosternum simple (.10-.14 in.).....*digestus*, Lec.

## CERCYON, Leach.

The species of this genus are mostly small; black or piceous, as a rule, and with more or less yellow on the tips of the elytra or sides of

the thorax. They are found on the sea-coasts under debris of various sorts, or inland about decaying animal and vegetable matter. A number of the names on the Canadian lists do not appear in the synopsis, having been reduced to synonymy as follows: the name *limbatus* gives way to *lateralis*, *flavipes* and *nigricollis* to *melanocephalus*, while *centromaculatus* becomes *nigriceps*. The figures of the metasternum are copied from Dr. Horn, and illustrate the characters on which the table is based.

A. Mesosternal area median only (fig. 14, a).

b. Thorax with incomplete basal line, elytra with large piceous post-median sutural spot (.12 in.) . . . . . *unipunctatus*, Linn.



Fig. 14.

bb. Thorax without basal line.

c. Form oval, less convex, head oblique.

d. Elytra with sharply limited yellowish apical space.

Apical spot extending along sides (.10-.12 in.) . . . . . *pratextatus*, Say.

Apical spot not extending along sides (.08 in.) . . . . . *ocellatus*, Say.

dd. Elytra indefinitely paler at apex.

Elytra rufocastaneous, tip paler (.10-.12 in.) . . . . . *lateralis*, Marsh.

Elytra piceous, paler at tip, eighth interval biserially punctured (.10-.12 in.) . . . . . *indistinctus*, Horn.

Elytra piceous, tip paler, eighth interval uniserially punctured (.08-.10 in.) . . . . . *analis*, Payk.

cc. Form very short and convex, head vertical.

Surface opaque (.06 in.) . . . . . *lugubris*, Payk.

Surface shining (.06 in.) . . . . . *navicularis*, Zimm.

AA. Metasternal area laterally extended (fig. 15, b).

e. Thorax entirely black; no basal line.

f. Elytra piceous with pale apex, varying to castaneous; surface distinctly punctulate (.10-.12 in.) . . . . . *hæmorrhoidalis*, Fabr.

ff. Elytra reddish, scutellar triangle and humeral stripe piceous.

Palpi pale, epipleuræ piceous (.08-.10 in.) . . . . . *melanocephalus*, Linn.

Palpi with last joint piceous, epipleuræ pale (.05-.08 in.) . . . . . *pygmaeus*, Ill.



Fig. 15.

- ee. Thorax pale at sides, basal line distinct. Elytra pale with transverse piceous post-median band (.05-.08 in.) . . . . . *nigriceps*, Marsh.

SPHÆRIDIDIUM, Fabr.

*S. scarabæoides*, Linn., has twice been reported from Canada, once in considerable numbers. It is a shining black insect about .25 in. long, the elytra with a reddish basal spot and a much larger terminal one. The colour varies a great deal in European specimens, but the species can easily be separated from any American Sphæridiini by its large size. The figure (fig. 16) is made from an English specimen. . .



Fig. 16.

MEGASTERNUM, Muls.

*M. posticatum*, Mann., has been (perhaps erroneously) recorded here. It is about .08 in. long, convex, blackish, subopaque, elytra paler at tip, the sides of the thorax and a humeral spot less distinctly so. Elytra finely striate, striæ punctured indistinctly at middle, plainly at sides and apex. Legs rufopiceous.

CRYPTOPLEURUM, Muls.

*C. minutum*, Fabr. (*vagans*, Lec.), represents the genus in Canada and may be known by the generic character given in the table in addition to its small size—.08 in.—rather deeply striate elytra, which are pale at apex and often also at sides, and the sparse pubescence, which is, however, often rubbed off in old or poorly-preserved specimens.

The principal works available for the study of the North American Hydrophilidæ are:—

1855. Lecote, J. L., Synopsis of the Hydrophilidæ of the United States. Proc. Acad. Nat. Sci. Phil., VII., pp. 356-375.
1873. Horn, Geo. H., Revision of the genera and species of the tribe Hydrobiini. Proc. Am. Phil. Soc., XIII., pp. 118-137.
1876. Horn, Geo. H., Synoptic tables of some genera of Coleoptera, with notes and synonymy. Tr. Am. Ent. Soc., V., pp. 246-252.
1878. Lecote, J. L., and Schwarz, A. E., The Coleoptera of Florida. Proc. Am. Phil. Soc., XVII., pp. 353-472 (*Cyclonotum* and *Ochthebius*).
1890. Horn, Geo. H., Notes on the species of *Ochthebius* of Boreal America. Trans. Am. Ent. Soc., XVII., pp. 17-26.
1890. Horn, Geo. H., Notes on some Hydrobiini of Boreal America, I. c., pp. 237-278.
1890. Horn, Geo. H., A revision of the Sphæridiini inhabiting Boreal America, I. c., pp. 279-314.

LIST OF COLEOPTERA COLLECTED AT MASSETT, QUEEN  
CHARLOTTE ISLANDS, B. C.

BY REV. J. H. KEEN.

(Continued from page 172.)

2931. *Ptenidium pullum*, Makl.—Not rare. In grass tufts in winter.
2951. *Trichopteryx xanthocera*, Matth.—Rare. Under log in February.
2952. *Trichopteryx parallelopeda*, Matth.—Rare. In grass tufts in February.
2953. *Trichopteryx diffinis*, Matth.—Common in November in seed pods of foxglove.
- Trichopteryx* (?).—Numerous.
3058. *Coccinella 9-notata*, Hbst.—Abundant in summer. Emerge from pupal state during July.
3262. *Coxelus pacificus*, Horn.—Rare under bark.
3315. *Pediacus depressus*, Hbst.—Ground; 7th May, 1891.
3316. *Cucujus puniceus*, Mann.—Occurs sparingly under bark. Flies in May.
3348. *Dendrophagus glaber*, Lec.—Not rare; under loose bark of fences.
3363. *Henoticus serratus*, Gyll.—Abundant in decaying leaves and on skins.
3366. *Cryptophagus*, sp.—One only taken on dry skin.
3382. *Atomaria planulata*, Makl.—Four only, taken in rotten grass in July.
3384. *Atomaria Kamtschatica*, Mots.—In moss in February.
- Atomaria*, n. sp.—Window; one specimen taken.
3486. *Hister foedatus*, Lec.—One only taken, under rotten crab in garden in June. [Four taken subsequently.]
- Pyromalus mancus*, Casey.—Two taken *in cop.*, March 30th, in crevice of bark of spruce stump.
3662. *Brachypterus troglodytes*, Murray.—Numerous on nettles in May and June.
3699. *Epuræa ambigua*, Mann.—Abundant in April under loose bark of felled spruce.
3707. *Epuræa fulvescens*, Horn.—Not numerous. Berry bushes in June.
3709. *Epuræa truncatella*, Mann.—Common in July, under rotten turnips.
3727. *Omosita colon*, L.—Common during summer on bones.
3765. *Rhizophagus sculpturatus*, Mann.—Not rare, under loose bark.
3767. *Rhizophagus dimidiatus*, Mann.—Under loose bark.
3768. *Rhizophagus brunneus*, Horn.—One only in June on dry log.

3779. *Stephostethus liratus*, Lec.—Common on dry skins and leaves.  
Lathridius costicollis, teste Casey.
3821. *Corticaria herbivagans*, Lec.—Rare. In moss in February; in rotten grass in April.
3848. *Peltis pippingskoeldi*, Mann.—One only in July.
3875. *Peltastica tuberculata*, Mann.—Common in larder, on bread, etc.
3880. *Amphicyrta simplicipes*, Mann.—Occasionally in moss at tree roots in winter.
3882. *Simplocaria nitida*, Mots.—Numerous in moss at tree roots all winter.
3884. *Pedilophorus acuminatus*, Mann.—Not rare. In moss during winter.
3960. *Heterocerus tristis*, Mann.—Common in summer on green patches covered by tide at high water.
3988. *Eucinetus infumatus*, Lec.—Occasionally in water-bits. Once occurred in large numbers under loose bark of decaying spruce (in January), where larvæ, pupæ and adults were all represented.
3990. *Eucinetus testaceus*, Lec. (pale specimens)—Occurred with above-mentioned *Eucinetus infumatus* colony.
4065. *Epiphanis cornutus*, Esch.—Rare. On skins in July.
4152. *Cryptohypnus musculus*, Esch.—Rare. Under driftwood.
4218. *Elater nigrinus*, Payk.—Occasionally beaten from bushes under loose bark, 17 May, 1891.
4266. *Megapenthes stigmaticus*, Lec.—Common during August.
4391. *Athous ferruginosus*, Esch.—Abundant in July and August.
4433. *Corymbites resplendens*, Esch.—Not rare. On wing during May.
4441. *Corymbites furtivus*, Lec.
4451. *Corymbites caricinus*, Germ.—Frequent in June on spruce.
4451. *Corymbites caricinus*, Germ., var. *umbricola*, Esch.—Common on wing from May onwards. Seen *in cop.*, May 19.
- Corymbites spectabilis*, M.nn.—One only taken in July on wing.
4546. *Throscus validus*, Lec.—Common in windows in June. Never taken out of doors.
4785. *Eros simplicipes*, Mann.—Occasional. Flying during May.
4901. *Podabrus piniphilus*, Esch.—Common.
4919. *Silis pallida*, Mann.—Commonly swept from grass in June.
4956. *Telephorus divisus*, Lec.—Frequent in May and June on green patches covered by tide at high water.

5274. *Hadrobregmus gibbicollis*, Lec.—Rare. Taken on wing in July. *Platycerus Keeni*, Casey.—Only one colony found, under a drift-log on sandy beach in April. A few probably immature specimens still retained a slightly reddish tinge. About a dozen were taken.
5467. *Ægialia cylindrica*, Esch.—Numerous under driftwood in May.
5471. *Ægialia crassa*, Lec.—Under log on sandy beach, April 20th. Numerous in summer, crawling on sand hills.
5476. *Psammodyus cælatus*, Lec.—Frequent under driftwood on beach.
5523. *Aphodius ruricola*, Mels.—Common in excrement.
5644. *Hoplia Sackenii*, Lec., var.—One specimen only, found on ground.
5970. *Asemum atrum*, Esch.—Not common. Under bark and on wing in May.
5983. *Opsimus quadrilineatus*, Mann.—Found under bark in January. *Opsimus quadrilineatus* (black var.).—Not uncommon; under bark of spruce fences all winter.
6232. *Rhagium lineatum*, Oliv.
6299. *Leptura oblitterata*, Hald.
6350. *Leptura Behrensii*, Lec.—Wing-cases only found. February 18; under loose spruce bark.
6367. *Plectrura spinicauda*, Mann.—Common on spruce during summer. Varies much in size.
7226. *Phellopsis porcata*, Lec.—Rare. Two specimens only taken; one under bark, the other in a window.
7501. *Phaleria globosa*, Lec.—Numerous in April, crawling on sand.
7584. *Ægialites debilis*, Mann.—Several taken together with the larvæ. *Marolia Holmburghii*.—Common from March onwards on spruce.
7723. *Rhinosimus viridiæneus*, Rand.—Frequently beaten from spruce and other trees in April.
7728. *Ditylus quadricollis*, Lec.—Common under logs on sandy beach in June and July.
7770. *Anaspis rufa*, Say.—Common during summer on Umbelliferæ.
7997. *Dendroides ephemeroides*, Mann.—Under alder bark. Not rare. Emerges from pupal form in July.
8288. *Sciopithes obscurus*, Horn.—Invariably from trees; never on the ground. (See 8297.) Common during summer. Beaten from berry bushes.

8297. *Geoderces melanothrix*, Kirby.—Under chips on the ground in great numbers and seldom on trees. (See 8288.)
8353. *Trichalophus didymus*, Lec.—Not common. Under logs and in rotten grass.
8470. *Emphyastes fucicola*, Mann.—Occurs but seldom, but then in great numbers. Under logs half buried in sand, during spring.
8471. *Plinthus carinatus*, Boh.—Our commonest weevil. Under logs.
8473. *Pissodes costatus*, Mann.—Not common. Beaten from spruce in April.
8598. *Phycocætes testaceus*, Lec.—Not rare. Under drift-logs on beach in spring.
8599. *Trachodes ptinoides*, Germ.—Common. Under drift-logs on beach in spring. Seen *in cop.*, June 2nd.
8600. *Trachodes 4-tuberculatus*, Mots.—Not common. Found in July. Occasionally in moss at tree roots in winter.
8601. *Trachodes horridus*, Mann.—Common, under logs.
9042. *Elassoptes marinus*, Horn.—Found in extensive colonies under drift-logs in May.
9044. *Rhyncolus brunneus*, Mann.—Not rare; in rotten wood.  
*Rhyncolus*, n. sp.—Rare; under driftwood on sandy beach in May and June.
9074. *Pityophthorus nitidulus*, Mann.—Not rare.
9093. *Xyloterus bivittatus*, Kirby.—Occurs sparingly on newly-cut logs and in moss at tree roots in winter.
9116. *Dryocætes autographus*, Ratz.—Under spruce bark.
9119. *Xylocleptes concinnus*, Mann.—Very numerous in newly-fallen timber.
9142. *Micracis hirtella*, Lec.—Not rare.
9165. *Hylesinus sericeus*, Mann.—Not uncommon in dead bark.
9181. *Dendroctonus rufipennis*, Kirby, var. *obesus* (black form).—Fairly numerous in bark of newly-cut timber.
9187. *Dolurgus pumilus*, Mann.—Common in spruce bark.  
*Hylurgops glabratus*.—Common under spruce.
9373. *Euscaphurus saltator*, Casey.—Common on under side of logs in damp places. [3987. *Dascyllidæ.*]



Genus *Typhlopsylla*, Tschb.

- |                                     |                                  |
|-------------------------------------|----------------------------------|
| 36. <i>T. unipectinata</i> , Tschb. | 42. <i>T. caucasica</i> , Tschb. |
| 37. <i>T. octactenus</i> , Kol.     | 43. <i>T. assimilis</i> , Tschb. |
| 38. <i>T. hexactenus</i> , Kol.     | 44. <i>T. gracilis</i> , Tschb.  |
| 39. <i>T. pentactenus</i> , Kol.    | 45. <i>T. fraterna</i> , Baker.  |
| 40. <i>T. dictenus</i> , Kol.       | 46. <i>T. alpina</i> , Baker.    |
| 41. <i>T. musculi</i> , Duges.      | 47. <i>T. americana</i> , Baker. |

## THE GENERIC TYPES INCLUDED IN APATELA.

BY A. R. GROTE, A.M., HILDESHEIM, GERMANY.

In 1875-6 I pointed out that the earliest name for the genus, which is commonly called "*Acronycta*" by authors, is *Apatela*, Hubn., 1806; the type and sole species cited in the Tentamen being the European *A. aceris*. My attempts to group the American species and bring them into correspondence with the European forms under subgeneric titles are unsatisfactory, as I have not been able to compare sufficiently the European species in all stages with our own. I have thought it useful to give here a list of the generic names used by me with their types. These latter must be carefully studied in any revision of the group, so that the natural limits of the divisions can be ascertained. In view of the fact that the larvæ differ quite strongly in different species, these peculiarities having probably arisen under adaptation to mode of life and environment, also from mimicry, it will be interesting to correlate the groups by characters drawn from all the stages. At the same time it will be safer to found subgeneric divisions only upon peculiarities, however slight, offered by the moths alone.

## APATELA.

1806. Hubn., Tent. 1, *aceris*. Sole species and therefore type.  
 1816. Ochs. 4, 62, refers *aceris* with thirteen other species to the genus *Acronycta*, and cites Hubner's *Apatelæ* as synonymous. Afterwards the name is credited to Stephens or Ochsenheimer, and Hubner's connection with the name is overlooked.  
 1875. Grt., Bull. B. S. N. H. 2, 213, refers the N. Am. species hitherto placed under *Acronycta* to *Apatela* and designates *aceris* as the type.

## ACRONICTA.

1816. Ochs. 4, 62: *leporina* with thirteen other species.  
 1818. Hubn., Verz. 201: *leporina* and *bradyporina* alone, thus restricting the term.

1874. Grt., List Noct. 7, takes *leporina* as the type.

This name, altered in spelling to "*Acronycta*," is used generally by authors for the entire genus, but it should be restricted to the group indicated by me, Papilio, 3, 68, of which the European *leporina* is typical, and to which our American *lepusculina*, *felina* and *vulpina* appear to belong.

## HYBOMA.

1818. Hubn., Verz. 200: *strigosa* and *unicornis*.

The latter is a Notodontian belonging to *Schizura*, and *strigosa* should apparently be taken as type. I have not compared the species and do not know whether it has allies in the American fauna or not.

## TRIAENA.

1818. Hubn., Verz. 200: *psi*, *cuspis*, *tridens*, *tritona* and an undescribed species.

1883. Grt., Papilio, 3, 67: designates *psi* as type and refers here as well a number of American species. This group has been treated by some European authors as of structural value (consult Guen. Spec. Général). *Occidentalis* is a typical representative American species.

## JOCHEAERA.

1818. Hubn., Verz. 201: *alni*. Sole species and therefore type.

1883. Grt., Papilio, 3, 111: designates *alni* as type and refers here our North American *funeralis*.

## PHARETRA.

1818. Hubn., Verz. 202: *Auricoma* and *menyanthidis*.

The type may be taken as *auricoma*. By a singular error I have taken this species as the type of the subgenus *Apatela* in Papilio, 3, 115, repeating the mistake in CAN. ENT., XVII., 94, where I have written "*auricoma*" in the text instead of "*aceris*" on page 94, the latter species being, from the context, evidently the one intended. In the list of species (p. 96) I have again wrongly used *Apatela* for the subgenus instead of *Pharetra*. The species in our fauna there cited are assumed by me to belong to the group of *auricoma*, and this seems certainly to be in part probable.

## ARCTOMYSCIS.

1818. Hubn., Verz. 202: *aceris*, *euphorbiæ*, *esulæ*, *euphrasiæ*, *cyparissiæ*, *megacephala*.

1883. Grt., Papilio 3, 113, takes *euphrasie* as type, and refers the North American *sperata* as belonging here.

The genus, as proposed by Hubner, has mixed contents, and it seems quite certain that *aceris* is not structurally identical with *euphrasie*.

Two names proposed by myself: *macrolonche* with the type *spinea*, and *Eulonche* with the type *oblivita*, may be assumed, with but little doubt, as being of generic importance. There remain to be considered *Megacronicta* with the type *americana*, probably distinct structurally from either *aceris* or *leporina*; *Lepitoreuma* with the type *ovata*, and *Mastiphanes* with the type *xyliniformis*. None of these groups seem to be represented in Europe, so far as my studies of the European species allow me to judge at present. The larval forms of these subgeneric types will throw some light on the phylogeny of the group, but are perhaps chiefly interesting as illustrating the range of character shown by the independent larval stage.

#### BOOK NOTICES.

RAMBLES IN ALPINE VALLEYS, by J. W. Tutt, F.E.S.; 208 pages, 5 plates. London: Swan, Sonnenschien & Co. (Price, 3s. 6d.)

The editor of the "Entomologist's Record and Journal of Variation" has added another to his popular books on the beauties of Nature. This time he takes the reader abroad to the lovely scenery of Switzerland, on the Italian slopes of Mont Blanc, where he wanders for the most part out of the beaten track of the ordinary tourist. Much of the volume is filled with charming pen-pictures of the infinite variety of grandeur and beauty to be found among the lofty mountain tops, the towering crags, the densely-wooded ravines and the dashing torrents of this secluded Alpine region. The eye of the naturalist does not fail to observe the marvellous variety of animal and vegetable life that is to be found in this limited area, and the author describes many a plant and flower, and especially the gay butterflies and pretty moths with which the region abounds. Some of the most interesting passages are those that deal with the phenomena of variation caused by environment, the results of the glacial epoch in the distribution of species, the effect of altitude on plants and insects, the evolution of the genus *Colias*, the production of colours, the causes of hibernation, and other topics which arise from time to time as the author rambles through the valleys or climbs the Alpine hills. The perusal of such a book as this must help the reader to see and observe, and lead him on to think out for himself the causes and the objects of the life that everywhere surrounds him.

LIST OF NORTH AMERICAN EUPTEROTIDÆ, PTILODONTIDÆ, THYATIRIDÆ,  
APATELIDÆ AND AGROTIDÆ: BY A. RADCLIFFE GROTE, A. M.,  
ABHANDLUNGEN DES NATURINSSCHAFTLICHEN VEREINS ZU  
BREMEN., VOL. XIV., 1895.

In this list are given, besides the usual series of names and synonyms, the habitat of each species, the dates of the genera with their synonyms, and the family and generic types. "The present list aims to give the proper application of the oldest generic names and to fix the exact type." Therefore, certain changes are made from the accepted nomenclature, which we may briefly notice. Ptilodontidæ for Notodontidæ, from the Ptilodonte of Hubner, which appears to be the oldest application for this family. In the family certain generic changes are made. Chatfieldia, Grt., n. gen. to include *Phersia simplaria* and *P. basitriens*; Ptilodon, Hubn., to replace Lophopteryx, Steph.; Eunystalea, Grt., n. gen. to include *Nystalea indiana*. Lochmaeus and Seirodonta are recognized as valid genera.

In the Thyatiridæ, Persiscota, Grt., n. gen. to include *Euthyatira lorata*, *semicircularis* and *candida*. The Apatelidæ include those genera formerly known as Bombycoidæ. The definition of the family appears to rest upon larval characters, and we should expect to find in it only those species of noctuidæ which have "Bombycid" (*i. e.* Arctian) larvæ—that is, with the abdominal feet equally developed and the tubercles converted into warts. The larvæ of several of our genera are still unknown, but Mr. Grote includes *Raphia* among his Apatelidæ, though the larva has the two anterior pair of feet smaller than the other, and the setæ perfectly simple and single throughout its life-history. On the other hand some of the genera at the head of the next family should probably be placed among the Apatelidæ. This is certainly the case with *Microcoelia fragilis*, the larva of which I discovered last year. Mr. Grote uses the name *Apatela*, Hubn., instead of *Acronycta*. The name Agrotidæ is proposed for the customary Noctuidæ, as the term *Noctua* is preoccupied in Birds. The list is not complete in this family. "The subfamilies *Catocalinæ* and *Deltoidinæ* are not given." Under *Agrotis* the generic divisions of Prof. Smith are given subgeneric value only, a proceeding which commends itself to the present reviewer. For *Noctua*, the Hubnerian term *Amathes* is employed; for *Rhizagrotis*, Smith, *Ogygia*, Hubn. For further details the list itself may profitably be consulted.

HARRISON G. DYAR.

BEETLES OF NEW ENGLAND AND THEIR KIND; a guide to know them readily. By Edward Knobel. Boston: Bradlee Whidden, 18 Arch street. (Price, 50 cents.)

Every collector of insects naturally desires to obtain the names of the specimens that he has procured. Any work that will help him in this respect is to be welcomed, and no doubt many a beginner will be glad to know of this cheap "Guide to Beetles," whose brief descriptions and hundreds of wood cuts will enable him to identify many of the conspicuous specimens that he meets with. It is a praiseworthy attempt to popularize the collecting of insects, and will, we trust, encourage many after they have found out the names to go on and study the life-history and structure of these interesting creatures. It implies a singular want of care to find that so many of the names are incorrectly spelt, when a reference to Henshaw's List would so easily have prevented a defect of this kind.

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#### NOTES ON BUTTERFLIES.

Years ago, when Mr. Edwards made his interesting experiments with chrysalids of *Phyciodes tharos* by exposing them to a low degree of temperature, artificially produced, the results obtained in the way of suffusion in the butterflies emerging from them led one to look for like results from similar out-of-door exposure. The climatic conditions this year in this locality were especially favourable for such results. A period of unprecedented heat, from May 13-18, was followed by a cold wave of a week's duration, accompanied by two frosts.

On the second of June I found a specimen of *P. tharos* fresh from the chrysalis and much suffused, the ground colour of the wings above being almost black, with a thin sprinkling of orange-coloured scales and two or three orange-coloured spots near the base of each, and a sub-marginal row of orange-coloured crescents on the secondaries. It is considerably darker than any figured by Mr. Edwards on Plate II. of *Phyciodes* in his "Butterflies of North America." The capture is interesting, as the specimen must have been in the chrysalis state during the cold period.

On the 30th of May I took a fresh specimen of *Feniseca Tarquinius* in Malden, and another on the 17th of June in Wollaston. Both of these localities are within three miles of Boston. So far as I know these are the first instances of its capture in Mass., east of the Connecticut River valley.

During June, I also took in Wollaston three specimens of *Amblyscirtus samoset*, an exceedingly rare insect in this vicinity.

Wollaston, Mass

FRANK H. SPRAGUE.

Mr. James Walker reports the capture of *Thecla acadica* at Orillia, in the middle of July.

Mr. J. Alston Moffat states that *Argynnis Atlantis* has for the first time been taken at London at the end of June and during July; it has also been abundant at Sarnia and Windsor.

### CORRESPONDENCE.

#### MELSHEIMER'S SACK BEARER.

Mr. C. G. Anderson has contributed of his own capture, a fine specimen, and the first in the Society's collection, of that interesting, and, with me, rare moth *Perophora Melsheimerii*, Harris. I have never met with it in my collecting. I have often found its cases and living larva within when beating bushes, but never succeeded in rearing them. As they pass the winter in the larval state, I could not keep them in a dormant condition until their food plant, the oak, came out in spring. It is a handsome insect, with finely-curved costal edges and hooked tips to its front wings; bearing a strong resemblance, as Harris remarks, to *Bombyx mori*; but more attractive in colour and ornamentation.

J. ALSTON MOFFAT.

#### ASSOCIATION OF ECONOMIC ENTOMOLOGISTS.

The Seventh Annual Meeting of the Association of Economic Entomologists will be held at Springfield, Mass., on the two days immediately preceding the general sessions of the American Association for the Advancement of Science, *i. e.*, Tuesday and Wednesday, August 27 and 28, 1895. Room 4, second floor of the High School, has been assigned for this purpose, where the meetings will be called to order at 10 A. M. and 2 P. M. on the days mentioned.

Information as to hotel and railroad rates, together with the preliminary announcement of the A. A. A. S., may be obtained by addressing W. A. Webster, local Secretary, Springfield, Mass.

PROF. J. B. SMITH,  
*President.*

C. L. MARLATT  
(Washington, D. C.),  
*Secretary.*

*Sir*,—I desire, on behalf of the Entomological Society of Ontario, to acknowledge the receipt—through Mr. H. H. Lyman, of Montreal—of the specimens of *Nemeophila petrosa* and *plantaginis* from which the plate was made for illustrating Mr. Bean's paper in the April number of CAN. ENT.,—in excellent condition.

J. ALSTON MOFFAT, Curator.

#### DEGHUEE ALUMNI.

A dinner was given to Prof. Jos. Deghuée, of the old State Street School, Brooklyn, N. Y., on April 9th, by seventy graduates. Among these were Senator Luxow; F. W. Hinoides, Registrar; Rufus Zogbaum, Artist; Cashier William Halls; DeWitt Webb; John H. Walsh, and other prominent officials and merchants. The School is of interest as having turned out three students of American Entomology: Ed. L. Graef, who presided on this occasion; Fred Tepper, and A. Radcliffe Grote, whose names are known to readers of the CAN. ENT. Prof. Deghuée is a graduate of the University of Bonn, and for fifty years has been active as a teacher in Brooklyn. The following lines, by A. Radcliffe Grote, were sent by the author from Bremen, and were read during the evening by Mr. Albert Steiner:—

A moment pause! The air is stirred  
 From far across the main;  
 A scholar's waiting for the word,  
 Wants to be heard again.

Look round the board! Of all you taught,  
 If few attend to-day—  
 If any of us came to naught,  
 If others made their way.

All loved you. More can not be said,  
 O, teacher, wise and true!  
 The light that you upon us shed,  
 In love returns to you.

Fill for the absent ones a cup,  
 Whose hearts are yours alway;  
 And fill the goblet brimming up—  
 A thousand healths—*Deghuée!*

Mailed August 2nd, 1895.