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POPULAR AND PRACTICAL ENTOMOLOGY. A RED-LETTER DAY.

BY FRANCIS J. A. MORRIS, PETERBOROUGH, ONT.

Part I.

On July 2nd, 1917, I formed one of a party of friends who motored up to Chemong Lake. We were celebrating the holiday, but in a peculiar way; half an acre of ground had been rented by the more enterprising members of the party, and on it quite a respectable market garden was in process of culture; how respectable, you will perhaps best understand when I tell you that it yielded during the season several barrels of potato bugs. When Tom Sawyer wanted his fence whitewashed, he simply cracked up the job till his friends insisted on doing the work for him; much in the same way for more than a week—especially in the leisure hours of evening—my neighbour had been carefully preparing the ground for me to dig in with the hoe. But the strategic advantages of his position were more than neutralized by my thorough acquaintance with Tom Sawyer and the famous whitewashing episode. I was well aware that the picnic wasn't going to be all cakes and ale and that I should be expected to do my bit; but just as my neighbour took rod and reel, I took insect net and cyanide bottle, to provide for lucid intervals.

It was about half-past ten when our chauffeur drew up in a spacious cedar thicket almost at the water's edge. We found the occupants of the other car had stopped at the kitchen-garden instead of coming on the last half mile to headquarters. Feeling confident that there were not hoes enough to go round I invited the only other man in our party to come exploring the wood with me; he had spent 60 years diligently ignoring woods, so I knew he was pretty safe to refuse; and indeed I hardly waited to see what "starting-hole" of excuse he would wriggle down, before plunging into the shadowy cedar aisles in a direction calculated to bring me out near a big hill that I had noticed during the drive. This height commanded a view of the lake and was wooded in front all

down the steep slope to the shore; the trees were mixed, but with cedar predominating. On the top of the slope were 3 or 4 magnificent basswoods, a landmark for miles around.

Moving south-westward I soon shook myself clear of the cedar thicket, and crossing a somewhat spongy meadow began to ascend the slope. Half-way up I came upon a small clearing, partly filled in with raspberry bushes and surrounded on all sides by cedars. Hardly had I stepped into this, than a sharp, querulous bark, almost like a fox-terrier's, warned me that I had been discovered by a sentinel crow on its outlook post overhead. Almost immediately bedlam broke loose and the air was thick with these black, jabbering lunatics. For a moment I was puzzled to know why a general alarm had been rung in, but it was soon apparent, nearly every cedar round the edge of this hidden glade had 3 or 4 young crows roosting on its branches, and though at first they tried the dodge of "freezing" on their perch, they soon began hopping and fluttering clumsily into cover, while the old birds guarded their retreat.

Finding nothing of interest about the raspberry thicket or the elder shrubs in its midst, I resumed my climb and presently won out to the top. Here I paused and took my bearings; just beyond me, on the far side of a low bank of field-stone, topped by a rickety old rail fence, lay an open meadow, while over my head stretched the noble canopy of a giant basswood. If my tribe had a totem pole, it should be of either basswood or white pine, for most of my lucky finds have been about these two trees, and I seldom pass either without giving it a good look-over. If my faith had ever wavered, that tree effectually nailed my colors to the mast forever and a day: on the very first leafy branch and almost the first bit of foliage that caught my eye, there sat an unmistakable specimen of *Hoplosia nubila*. Now this beetle is far from common; during all the years of collecting in Port Hope, I had never seen it, and in three seasons at Peterborough I had taken but four, all on freshly fallen timber, three on basswood and one on beech.

There was a breathless moment of suspense while I captured the insect and registered a mental vow not to leave the spot till I had hunted high and low for further trace of its kind. For some minutes my eye ranged over the foliage for insects as searchingly

as an up-to-date spraying machine, but without result. I then drew close to the trunk of the tree, and on the jutting spike of a dead branch appeared another *Hoplosia nubila*. I had seldom found anything of much account on dry wood, but I recalled the book statement that this insect bred in dead limbs of basswood. Half the tree spread out on the meadow side of the low stone rampart, so I made to enter the field; on the upper end of a picket and again on the top rail of the fence I met—apparently, like me, getting over the wall—three more specimens of *Hoplosia nubila*.

Where had they come from? Had they dropped from the green foliage above, or emerged from a dry branch under the tree? I noticed now for the first time a large, dead limb lying along the bank of field stone—a windfall of several years ago—rotting, but fortunately not sodden from contact with the earth; the end away from the butt had one or two boughs still armed with broken branches, and one of these rose at an angle and was partly supported on the second rail of the fence right at the picket. Only an enthusiastic collector knows how my mouth watered and my heart danced when I looked closely at the picket and the branch here on the sunny side of the fence: resting on their surface, within easy reach, I counted 7 specimens of *Hoplosia nubila*. By the time I turned reluctantly away to join the hoeing-bee at lunch, I had captured 17.

As soon as lunch was over some of the men scattered to look for bait, hoping to catch a bass or two before revisiting the kitchen-garden. I, too, set out to look for bait, but as soon as I rounded the corner I dived into the friendly shelter of the cedars and made a bee-line for the basswood. The sun had almost given my recruiting ground the slip, but I succeeded in capturing 8 more specimens about the dead limb and the picket fence; and on visiting some trees further along the ridge I captured 2 more.

To test out the insect's habits and season I made it a point during the next few days to visit all the basswoods newly felled or dead that I could think of in the neighbourhood; on July 3rd I examined some newly felled basswood at Nassau and succeeded in capturing 3 specimens of *Hoplosia*, apparently attracted to the dying trees either to breed or to oviposit on the branches; and a few days later I took 5 on some windfalls and one on a lopped

branch in the same neighbourhood; also on July 4th, revisiting this dead limb of my first captures west of Chemong, I took 4 more specimens, including a mating pair and a single specimen in the very act of emerging, its head and antennæ alone being visible. Examination of the insect's burrow and of others in which I found larvæ, went to prove that it is fondest of dead wood and that it does not bore deep, the tunnels being all either in or just below the under bark. For nearly a fortnight I came across occasional specimens of the beetle, and had the unique experience of making one capture on a dead *maple*; altogether my catch for the season of this rare longicorn was well over 40 specimens. It never rains but it pours.

Part II.

On this holiday of July 2nd, it was still early afternoon when I returned to the picnic ground; learning there that the men, after landing a small sunfish, had been converted from angling-rods to hoes, I hurried off to encumber them with help. When I reached the fence and hailed the toilers, I found that the stony land in a fit of wanton mischief had smashed one of their hoes and—in short they scorned my proffered help and (in much the tone that the Athenians of old consigned a man "to the crows") they bade me be off to my beloved bugs.

"There's many a true word spoken in jest," though that was not the comment I muttered as I turned away in the direction of a fallen poplar by the roadside. It was a balsam or small balm-of-Gilead, and on it I found 2 specimens of *Hyperplatys aspersa*, my first that season. Working east, I then skirted the fence between the road and the market-garden. Almost at the corner of the half-acre lot I noticed, doing duty for a top rail in the old snake-fence, a dead brush-head of hemlock; branches, twigs, and actually a few cones still in place; quite dry, even to the patches of resin upon it. I examined this closely in hopes of longicorns or buprestids, as the sun poured its burning rays over the surface, and presently on the south side I noticed a curious looking weevil that was strange to me; it was black and rough on the back, with a conspicuous, broad patch of dull, white across the elytra near the base; it reminded me a little, in pattern at least, of a somewhat uncommon beetle called *Eurymycter* which I have occasionally

captured; only the patch on this last is snow-white and situated at the outer end of the elytra.

Before dropping my prisoner into the *oubliette*, I took off my glasses and examined it closely; it was entirely new to me; on the centre of the thorax was a perfect little *fleur-de-lys* or trefoil of fawn-coloured pubescence, while on the scutellum was a tiny spot of white. On getting a front view of the head, I found it had the long, broad, flat "horse-face" of the *Anthribidæ*, and this feature was rendered all the more conspicuous from being white with dense pubescence. I had never ventured very far into even generic distinctions of the great Clan *Curculio*, and made no attempt when I got home to examine my find under a lens. But meantime I searched carefully over the bark of the hemlock for more, and at last, just when I was giving up the search, I spotted a second specimen (rather larger, but with decidedly shorter antennæ) right on the upper surface of the hemlock. Seeing two or three more hemlocks in the same condition of decay, I spent an hour of unremitting toil scouring their surface, above, below and on the sides, ferreting into every nook and cranny with searching looks; but all in vain.

When I came to pin my captures, I found that the tiny white scutellum had immediately behind it (i. e., further from its base) a spot of jet black pubescence that looked like a cavity, and also that the roughness on the elytra was strongest a little behind the base, where it rose into two bold tubercles (one on each elytron), for all the world like a pair of projecting shoulder blades; and these tubercles were partly within, partly without the white patch mentioned before. After dating the insects and putting them into one of the collecting cases in which I keep the season's catch from spring till fall, I soon forgot all about them in the more fast and furious fun of hunting Long-horns.

During July and August I was corresponding with a well-known New York coleopterist in the matter of *Microclytus gazellula* Hald. and its puzzling little doppelgänger *Microclytus gibbulus* LeC. This correspondence culminated in the arrival of a precious little box at our tent on Cache Lake. It contained a beautiful specimen of *M. gazellula*; in writing to thank for this most acceptable present, I promised the donor a verified pair

(♂ and ♀) of *M. gibbulus* as soon as I returned from camp. A few days after, I received a letter of acknowledgement, with a P. S. which declared that the writer had for years greatly desired to possess in his cabinet a specimen of a small beetle found, but rarely, on fungus-covered logs in our northern forests; it was called *Gonotropis gibbosus*. I had never heard this name before, nor did I know to what family the beetle belonged; so, naturally, my first thought was that I could never have come across the insect or I should have known the name, and further, that among the 10,000 or 11,000 beetles known in North America, it was most improbable I should ever stumble upon the particular one my correspondent desired.

When, moreover, I returned from the backwoods and drew out my Henshaw to find *Gonotropis* a weevil, I felt still more certain it was a case of looking for a needle in a haystack; nor was it much better to learn that it belonged to the small family of *Anthribids*, for of these I had only 2 or 3 representatives at most. However, I turned up the two works I possess on the weevils, LeConte and Horn's monograph and the recent book of Blatchley and Leng; here, avoiding the small print of detailed description, I looked to see the range and record of captures; from the older work I found that the insect was *sui generis* and (worse and worse!) that both generic and specific descriptions were founded on a single specimen from Colorado; the recent work did indeed record it over a very wide range on both sides of the border, but it was evidently extremely rare, for the senior author, Leng, was the very man who had written to me about it.

Having gone so far, however, I glanced over the detailed specific description: "convex, black; white face, proboscis and scutellum; broad, saddle-shaped patch of white near the base of the elytra; two humps on the 3rd interval;" and suddenly there rose out of the page before me the picture of a stony market-garden, two mocking men with hoes, a snake-fence, a dead hemlock rail, and that queer little pair of weevils squatting on the bark, like hobgoblins in a fairy tale. I jumped for the shelf on which my July captures lay cabined, and from the middle of a box most ludicrously labeled "Bachelors," drew out the tiny pair of

oddities (husband and wife, as sure as antennal measurements could make them) captured at Chemong on July 2nd.

I then subjected them to a careful scrutiny with the specific description before me. Point for point, they coincided throughout. The only thing debatable was the "deep fovea" behind the scutellum; if "behind" meant further from the base, there was no cavity there; I focused the insect under a two-inch objective in the microscope, and after some trouble succeeded in touching the centre of this so-called pit with the point of a fine needle mounted on a pen-holder; as soon as the needle point came into focus the insect was jarred into a blur, and when the vibration ceased there was the needle-tip still in focus and resting on the centre of the black spot; it was no fovea, but a tiny patch of jet-black pubescence on a level with the snow-white scutellum.

To the best of my belief, then, on July 2nd, 1917, besides capturing over a score of *Hoplosia nubila*, I had taken two specimens of this great rarity *Gonotropis gibbosus*, specimens, moreover, that by a unique stroke of luck formed a natural pair, male and female. If it never rains but it pours, assuredly on this date, in the quaint parlance of Geoffrey Chaucer, it fairly "snewèd" of good things.

A TIPULID FLY FROM BALTIC AMBER.

BY T. D. A. COCKERELL AND GRACE E. CLARK, BOULDER, COL.

In *Canad. Entom.*, 1915, p. 159, it was remarked that some of the Mycetophilidæ had remained without evolutionary progress in about a million years, exhibiting merely minor changes or the shuffling of characters, producing closely related species. The Baltic amber is probably twice as old as the Florissant shales, and yet, in spite of the great age of the specimens, dating back to Oligocene times, we find that many of the species differ little from those of to-day. Such, for instance, is the Tipulid fly now described. It presents an assemblage of characters which permit its recognition as a species; but we cannot say that it is more primitive or archaic in appearance than its descendants or representatives living in the same region at the present time.

Limnophila electrina, n. sp.

Male.—Body and legs dark reddish brown, thorax decidedly

reddened above; head black; tibiae with minute spurs; antennae as shown in Fig. 1.

Wings nearly 6 mm. long, without markings; subcosta branched at end, with lower branch a trifle longer than upper, its termination level with basal end of discal cell; radius straight except for a very slight upward bend at the end; radial sector sharply bent near its origin, with an appendicular nervure directed basad from the angle; R_2 and R_3 both show a gentle and practically even



Fig. 1.—*Limnophila electrina*, n.sp.: antenna.

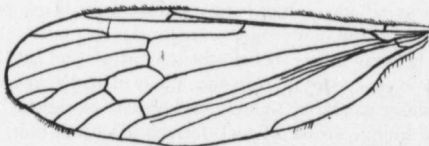


Fig. 2.—*Limnophila electrina*, n.sp.: wing.

curve; upper branch of media forked a considerable distance beyond end of discal cell, the stem a little longer than the fork; radial cross-vein joining radial sector at base of fork of its upper division (as in *L. nacrea* and *lentoides* figured by Alexander, and *L. rogersii* figured by Scudder); posterior cross-vein joining discal cell a little beyond middle; Cu_2 sharply deflected downward at its end.

The following measurements are in microns: end of Sc_2 to radial cross-vein, 784; upper apical corner of first basal cell to separation of R_2 from R_3 , 496; radial sector from basal angle to end of first basal cell, 1089; discal cell on second basal, 352; discal cell a fifth posterior, 240; first posterior on third, 640; first posterior on second, 592.

In Baltic Amber; received from Mr. F. H. Ward.

This appears to be distinct from all the species described by Meunier from amber. The antennae have bristles resembling those of *L. vulcana*, but the basal joint is far more robust. The wings appear to be quite distinctive.

THE INSECT COLLECTIONS OF THE
MARITIME PROVINCES.

BY W. H. BRITAIN, PROVINCIAL ENTOMOLOGIST FOR NOVA SCOTIA.

The following notes on the insect collections of the Maritime Provinces have been compiled from information sent me by the owners or curators of the collections referred to in the article. It has not been possible for the writer personally to examine all the collections, and accordingly he has to acknowledge his indebtedness to the following: Mr. Harry Piers, Curator, Provincial Museum, Halifax, N.S.; Mr. Jos. Perrin, McNab's Island, N.S.; Mr. Wm. Mackintosh, Provincial Entomologist, St. John, N.B.; Mr. L.S. McLaine, Fredericton, N.B., and Mr. A. G. Dustan, Annapolis Royal, N.S. In some cases the exact words of the foregoing have been used in describing the collections.

INSECT COLLECTION OF THE PROVINCIAL MUSEUM, HALIFAX, N.S.

The insect collection of the Provincial Museum of Nova Scotia consists of about 2,000 Nova Scotia specimens, most of which have been collected since 1900. It consists almost entirely of Lepidoptera, with a few Coleoptera, some Orthoptera and other miscellaneous insects. The principal components are:

1. The Russell Collection of Lepidoptera, consisting of about 259 specimens of butterflies and about 788 specimens of moths, total about 1,047 specimens, each with full data attached, and collected by John Russell in the vicinity of Digby, Nova Scotia. It was purchased from him in 1906 and 1909. This is part of the material upon which Messrs. Joseph Perrin and John Russell prepared their "Catalogue of Butterflies and Moths, mostly collected in the neighbourhood of Halifax and Digby, N.S.," which was published in the Proc. and Trans. N. S. Institute of Science, Vol. 12, pp. 258-290 (read 1909, published 1912).

2. The Eaton collection of Lepidoptera, with a few other insects, consisting of about 450 specimens, with data collected during a number of years by Miss Lucy C. Eaton, in the vicinity of Truro, Col. Co., N.S. Of these 379 were purchased from her in 1905 and the remainder under her donations. The Lepidoptera in this collection formed the basis of her paper on "The Butterflies of Truro, N.S.," which was published in the Proc. and Trans. N. S. Institute of Science, Vol. 9, pp. 17-18 (1895).

3. Miscellaneous specimens of Nova Scotia Coleoptera collected by A. H. C. Prichard, specimens of Orthoptera and other Nova Scotia insects from various sources.

Owing to the lack of proper insect cabinets for the preservation and display of all these specimens, they are at present stored in boxes and somewhat liable to attack by pests, but it is the intention of the institution to obtain proper cabinets for them as soon as possible.

INSECT COLLECTION OF THE NOVA SCOTIA AGRICULTURAL COLLEGE.

The great bulk of the material composing the collection of the Nova Scotia Agricultural College consists of specimens taken in the province by members of the entomological staff from the summer of 1913 up to the present time, together with a few insects captured in other provinces. There is also a small collection of Coleoptera taken in Kansas a good many years ago, as well as a certain amount of material received in exchange from various American entomologists.

All doubtful specimens have been submitted to specialists for determination. The Coleoptera have been determined by Professor Wickham and Dr. Van Dyke; the Lepidoptera, by Mr. Arthur Gibson; the Hemiptera by Messrs. E. P. Van Duzee, H. H. Knight and H. S. Parshley and the bees by Mr. Sladen. Dr. L. O. Howard and the members of his staff have from time to time reported upon a large number of insects of different groups.

The following account does not take into consideration a large number of insects that have been determined but not put away in the collection. There is also some accumulation of material that has not yet been put up ready for determination, and still more that we have not been able to get determined at all. The latter particularly applies to Diptera and to parasitic Hymenoptera.

In the Coleoptera we have about 1,000 specimens distributed over 38 families and 203 genera; in the Lepidoptera about 1,000 specimens, 25 families and 300 genera; Hemiptera about 800 specimens, 23 families and 115 genera; Hymenoptera 340 specimens, 10 families and 19 genera; Orthoptera, 164 specimens, 3 families and 13 genera. There are about 110 named species of Diptera, but the greater part of the material in this order is still

undetermined. The material in groups other than those mentioned is insignificant.

A complete card index is kept of all insects in the collection, with full details regarding each species. In this way it is intended to build up an authentic list of Nova Scotian insects as rapidly as this can be accomplished. The Lepidoptera are put up in Comstock cases with the bottoms lined with patent cord instead of wooden blocks. All other orders are placed in Schmitt boxes. After a representative number are placed in the regular collection, the remainder are placed in duplicate boxes to be used in exchange.

OTHER INSECT COLLECTIONS IN NOVA SCOTIA.

Mr. Jos. Perrin, McNab's Island, Halifax, N. S., has a private collection of Lepidoptera, mostly taken on McNab's Island. He also has twelve cases of American and foreign Lepidoptera. The collection is housed in an oak cabinet with thirty drawers and containing material collected for the Russell-Perrin List published February, 1912, and for the supplementary list published October, 1915. The number of specimens contained in the collection is 1,470, representing 286 genera and 122 species and varieties.

Mr. Perrin also has in his care at present eight Riker specimen mounts, containing 387 specimens of Lepidoptera taken at Stellarton, N. S., by Mr. C. B. Hills, of Wabana, Newfoundland. Many of these are of interest and are not yet identified.

Mr. Chesley Allen, Normal College, Truro, N.S., has collected in all orders but, with the exception of the Lepidoptera, most of the material has not yet been arranged, though work on this is now proceeding. Mr. Allen is especially interested in the Microlepidoptera and has a complete collection of Nova Scotian Crambinae, including a number not recorded in the list. He is now preparing an article on this group.

Mr. Harry Piers, Curator, Provincial Museum, Halifax, N.S., has a private collection of insects, consisting mostly of Orthoptera, on which is based a paper dealing with this group, which he will shortly publish.

The collection of the Dominion Entomological Laboratory at Annapolis Royal consists of nearly 3,000 specimens, most of these belonging to the Lepidoptera and Hymenoptera, but the other main orders are represented to some extent. Much of the material is still undetermined.

COLLECTION OF INSECTS IN THE NATURAL HISTORY MUSEUM AT
ST. JOHN, N. B.

The Natural History Society of New Brunswick was organized in 1862. The majority of the members at that time were geologists and ornithologists, and it was not until about 1884 that the first collection of the insects of St. John County was presented by Mr. H. E. Goold. Mr. Goold may be considered the pioneer entomologist of the Natural History Society of New Brunswick. A few years later Mrs. C. E. Heustis made a collection of insects in the vicinity of St. John and presented it to the Museum. For a number of years Mrs. Heustis was a contributor to the *Canadian Entomologist*. These collections were exposed to light and insects were almost entirely destroyed.

About 1895 Wm. McIntosh began making a general collection of the insects of New Brunswick. This collection has steadily grown, and at the present time numbers about nineteen thousand four hundred and sixty-seven specimens. Mr. A. G. Leavitt collected Hymenoptera for several years and recently presented his collection, numbering about two thousand specimens, to the Museum. Smaller collections have been presented from time to time.

At the time of writing the insect collections in the Museum number over 24,000 specimens, including several thousand specimens, which have not yet been incorporated in the general collection and a large number of unnamed "unique" specimens. As is the case in so many collections, the Lepidoptera outnumber the other orders. The general collection shows some five thousand one hundred and seventy specimens representing less than eight hundred species.

The New Brunswick material was determined mostly by Dr. Fletcher and Herman Strecker. The Noctuidæ were named by Dr. John B. Smith and Dr. Ottolengui: Geometers by Rev. G. W. Taylor, of British Columbia, and others by Dr. H. C. Dyar and Wm. Beutenmuller. The Hymenoptera, numbering some four thousand eight hundred and thirteen are not well worked up. Mr. Sladen determined a number of the bees, and Mr. H. H. Harrington many of the saw-flies, etc. S. A. Rohwer, of the United States National Museum, determined a number of the saw-flies, finding

twelve new species among them. Some hundreds of species remain undetermined. The Coleoptera were examined first by Mr. Harrington and later by Dr. Wickham. They include about six hundred named species and a considerable number undetermined, about four thousand one hundred and eighty-seven in all. The Diptera number about four hundred species, three thousand three hundred and sixty-five specimens, many unnamed not being enumerated. The other orders are not very well represented in the collection—Hemiptera about four hundred and forty-two specimens; Dragonflies, two hundred and thirty-one; Orthoptera, one hundred and twenty-nine. Stone-flies and their allies two hundred and seventy-six; other orders about four hundred and fifty-four.

It has always been the policy of the Natural History Society of New Brunswick to make its collections useful to the public, and with this end in view nearly two hundred large Denton tablets have been prepared showing the various insect orders, with life-histories of the important economic pests, useful insects, etc. These tablets have been around the province twice on "Better Farming Special" trains, and have been exhibited at a number of Agricultural Exhibitions. They are used in the Agricultural and Natural Study Short Courses for teachers in winter and summer, and are loaned to schools when available. Indeed, so much material has been given to schools and farmers and used for educational exhibits as to seriously deplete the general collection.

OTHER NEW BRUNSWICK COLLECTIONS.

A good many years ago the Provincial University at Fredericton purchased the Preston collection. These were collected by Dr. Preston, a homeopathic physician at St. John, and consisting of a cabinet of eight or ten trays. Four of these were Coleoptera, native and exotic forms herein represented. They are partially named. There are also two cases of Lepidoptera, native and exotic, partially named, and one case of Odonata. The collection is in poor condition at the present time, and evidently has not been touched for years. The University also has six trays of native insects, mostly Lepidoptera. A few of these have been named by Dr. L. W. Bailey and William McIntosh. They are not in very good condition.

The Dominion Entomological Laboratory at Fredericton has a collection of Diptera in which the New Brunswick forms are well represented, especially the following families: Tachinidæ, Tipulidæ, Tabanidæ, Syrphidæ, Dolichopodidæ, Muscidæ, Asilidæ and Anthomyiidæ. There is a small collection of parasitic Hymenoptera and one of Formicidæ fairly representative of the province. There are also a few Lepidoptera.

The foregoing are a few of the chief insect collections found in the Maritime Provinces. We have heard of others, but have been unable to secure accurate information concerning them. Doubtless still others are in existence, and it is hoped that this article may have the effect of bringing them to light. Up to the present time we have been unable to get word of a single systematic collection of insects in the Province of Prince Edward Island.

A NEW SPECIES OF SARCOPHAGA FROM BRITISH COLUMBIA.*

BY R. R. PARKER, BOZEMAN, MONT.

Sarcophaga vancouverensis, n. sp.

Holotype.—Male, collection of R. R. Parker.

Allotype.—Female, collection of R. R. Parker.

Paratype.—Male, United States National Museum.

Length 8 to 10 mm.

Male.—Head. Viewed from side parafrontals and genæ with dark reflections; from front transverse impression unusually dark. Breadth of front at narrowest part about one-third eye width; cheek height approximately one-third that of eye. Front prominent; frontal vitta at its narrowest part about three times width of each parafrontal. Second and third antennal segments very dark; third, one and one-half times length of second; arista short plumose to slightly beyond middle. Back of head with the black cilia behind eyes extending half-way to foramen, otherwise clothed with whitish hair. Genæ with several irregularly placed hairs between transverse impression and lower eye orbit.

Chaetotaxy.—Lateral verticals absent; vibrissæ inserted slightly above oral margin; frontal rows of bristles extending but slightly

*Contribution from the Entomological Laboratory of the Montana State College, Bozeman, Mont.
April, 1918

below base of vitta, the lower few pairs somewhat divergent from its edges.

Thorax.—Metanotum clothed with sparse, slender, reclinate bristles. Spiracular hairs very dark, except those of spiracular cover which are light coloured at tips. Epaulets dark.

Wings.—Distinctly smoky under binocular; bend of fourth vein normally a right angle, anterior cross-vein scarcely more basal than end of first longitudinal (almost beneath it); third vein bristly; costal spine vestigial; section III of costa slightly greater than section V; calypters whitish, fringed with white hair.

Legs.—Dark. Posterior femur sub-cylindrical, a little arched; distal half of posterior ventral surface with a thin beard of long hair; anterior face with three rows of bristles, those of intermediate row few and not present distally, those of lower row scattered; tibia with anterior and posterior beards of long, coarse hairs, the former much the stronger. Middle femur clothed beneath with short hair; anterior and posterior ventral rows of bristles present, latter not complete proximally; distinct "comb" absent; tibia with a slight beard-like fringe of hair posteriorly; submesotibial bristle present.

Chaetotaxy.—Anterior dorsocentrals long, as long as the two anterior pairs of postsuturals; acrostichals absent; inner presuturals scarcely or not at all differentiated; three pairs of well developed postsutural dorsocentrals; praescutellar acrostichals present; scutellar apicals present: two or three sternopleurals, if three the middle one is very slender; lower sternopleurals slender, with hairs anterior to them.

Abdomen.—Clothed above with short, reclinate bristles, beneath with longer, mostly erect hairs. Ventral plates almost square (posterior angles not rounded), vestiture erect except that of third which is short and decumbent.

Chaetotaxy.—Second segment without marginal bristles; third with two marginals and four or five laterals (marginals and laterals may not be separated by increased spacing, so that there may appear to be a complete marginal row of bristles).

Genital Segments.—First, shining black or deep brown, in profile slightly convex, for most part the hairy vestiture shorter than that of second, marginal bristles absent; second (g. s. 2).—

shining orange, anal area small, hairy vestiture long. Forceps (f.),—darkened, especially the distal portion, in profile the hairy vestiture extends well toward tip of prongs, later attenuate, curved forward and slightly spreading.

Genitalia.—See figure. Anterior claspers (a. c.), posterior claspers (p. c.), accessory plate (a. p.).



Fig. 3.—*Sarcophaga vancoverensis*, n. sp.: genitalia of male.

Female.—The single female examined differs from the male in the following important characters: breadth of front at narrowest part nearly equal to eye width; frontal vitta at its narrowest part about one and one-half times the width of each parafrenal, and just below ocellar triangle with several hairs at each side. Arista more plumose. Posterior femur spindle-shaped, its posterior ventral surface with a proximal row of bristles. Anterior and posterior rows of ventral bristles of middle femur complete. Costal spine short. Three sternopleural bristles. Vestiture of abdomen of short reclinate bristles throughout. Genital segments dull orange: first not divided into two lateral lips, but carinated on mid-dorsal line (appears like two lips), spiracles central and visible. Ventral plates overlapped and concealed by lateral edges of first genital segment.

Described from 7 male and 1 female specimens.

Range.—British Columbia, Vancouver, May 12 and 19, 1916, June 11, 1916; Savary Island, July 3, 1916. One specimen is labeled "Bd. Bay, May 22, 1915." Collector, R. S. Sherman.

Both holotype and allotype were collected on Savary Island on July 3, 1916.

We regret that the statement in our March issue concerning Professor W. A. Riley's change of position was inaccurate. A corrected statement is given below.

Professor Wm. A. Riley, who has been connected with the Entomological Department of Cornell University for the past eighteen years, has been appointed Professor of Entomology and Chief of the Division of Entomology and Economic Zoology at the University of Minnesota. He will continue his teaching work in Insect Morphology and in Medical Entomology.

AN APPARENTLY NEW SPECIES OF LEPTINILLUS.
(COLEOPTERA, LEPTINIDÆ.)

BY G. F. FERRIS, STANFORD UNIVERSITY, CALIFORNIA.

The coleopterous family Leptinidæ includes but two genera and two species, but it is of especial interest because of the fact that these two species are exactly half of the number of species of Coleoptera that are known to be, or suspected of being, ectoparasites upon birds and mammals. Of the other two species one, *Platypsyllus castoris* Ritsema (the only representative of the family Platypsyllidæ) is a permanent, obligate parasite upon beavers in both its larval and adult condition. The other, a Silphid, *Lyrosoma opaca* Mann, is a resident of the nests of certain maritime birds but is suspected of utilizing the birds for purposes of transportation. Of the two Leptinids one, *Leptinus testaceus* Müll. is an oft-recorded resident of the nests of bumble bees and small mammals, but it has once been recorded as occurring on mice¹ and once from shrews². The other, *Leptinillus validus* (Horn), is apparently a much less common form and of its habits nothing is known, except that it has once been taken from the skins of Alaskan beavers¹. The discovery of a second species of *Leptinillus* with some definite information in regard to its habits is, therefore, of considerable interest.

Leptinillus aplodontiæ, n. sp.

Female.—Length 3 mm., depressed and broadly oval in shape, of a reddish brown colour, feebly shiny, the entire dorsum closely and uniformly beset with fine, setiferous punctations, the setæ short and slightly lighter in colour than the body. *Head* hexagonal in shape behind the frontal suture, the labrum convex anteriorly, the posterior angles of the head nearly right angles, the occiput much constricted and produced into the prothorax. Beneath the lateral margin at each posterior angle is a shallow, longitudinal groove which extends forward to the base of the antennæ and into which the first antennal segment may be received. *Antennæ* 11-segmented, slender, reaching but little beyond the posterior margin of the pronotum. *Mentum* with the posterior angles produced into a stout process about as long as

1. Riley, C. V. *Insect Life*, 1 : 306. (1889).2. Kellogg, V. L. *Science*, N. S., XXXIX : 360-61. (1914).

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the mentum itself. *Pronotum* anteriorly of the same width as the head, posteriorly about twice as wide, the greatest width about one and one-half times the length, the lateral margins arcuate.



Fig. 4.—*Leptinillus apodontis* n. sp.; labium.



Fig. 5.—*Leptinillus apodontis* n. sp.; genitalia of male.

Prosternum extending over, but not separating, the anterior coxæ, without a brush of hairs at the tip. *Elytra* at the base very slightly narrower than the pronotum, then widening slightly, sharply

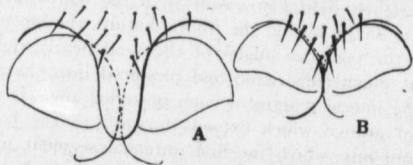


Fig. 6.—A: Prosternum of *Leptinillus apodontis* n. sp.
B: Prosternum of *Leptinus testaceus* Mull. from a specimen from Forrester Id., Alaska, det. Van. Dyke.

rounded posteriorly, entirely concealing the abdomen. *Wings* lacking. *Legs* clothed with fine pubescence. *Abdomen* ventrally with fine, setiferous punctures.

Male.—Length 3.5 mm., elytra not concealing the tip of the abdomen. Otherwise resembling the female. Genitalia very closely resembling the genitalia of *Leptinus testaceus* Müll., as figured by Sharp and Muir³.

Habitat.—From *Aplodontia* sp. (a genus of rodents peculiar to the Pacific Coast), Fallen Leaf Lake, Plumas Co., Calif., Aug., 1917. W. K. Fisher col.

Types.—Holotype, a female, and allotype, and thirteen paratypes, one dissected, mounted on slides and used as the basis of the accompanying figures, deposited in the collection of the Department of Entomology of Stanford University.

Remarks.—While this species is obviously very similar to *L. validus* (Horn) there are certain differences that are apparent upon a comparison with his original description⁴ and later notes⁵. *L. validus* is described and figured as possessing a distinct brush of stiff hairs at the tip of the prosternum, a feature that is not present in the new species, and it is also indicated that the prolongations of the posterior angles of the mentum are very long and slender, while in my specimens they are short and stout as in *Leptinus testaceus* Müll. Nor do my specimens possess any trace of the eye spot described by Horn. Certain apparent differences in shape might easily disappear upon a direct comparison of specimens but there is a real difference in size, the new species measuring but 3 mm. in length for the female and 3.5 for the male as compared with 5 mm. for *validus*. Certainly as far as the literature is concerned there is sufficient ground for recognizing the specimens from *Aplodontia* as distinct.

It should be noted that although the prosternum extends back over the anterior coxæ it does not actually separate them, and they are in fact fully as contiguous as they are in *Leptinus testaceus* Müll.

Mr. Fisher informs me that the specimens were found upon two individuals of the host, and that they leave the host, after it

3. Sharp, D. and Muir, F. Trans. Ent. Soc. London, p. 506; pl. LI, f. 55-55a. (1912).

4. Horn, G. H. Trans. Amer. Ent. Soc., 4 : 145-6; figs. (1872).

5. Horn, G. H. Trans. Amer. Ent. Soc., 10 : 113-4; pl. 5, f. 1-6. (1882).

is killed, as soon as the body begins to cool. I have myself previously examined numerous specimens of the same genus of mammals in a search for ectoparasites but without result, but as all my specimens were examined some time after death it is possible that the beetles had already departed and that they may occur much more frequently than the lack of collecting records would indicate.

STUDIES OF CANADIAN SPIDERS IN SUMMER OF 1917.

BY J. H. EMERTON, BOSTON, MASS.

In the past summer I have continued the collection of Canadian spiders north and west of the region covered in 1915 and 1916, in the great bog country south and west of Hudson Bay, which has now been made accessible by the Grand Trunk Transcontinental line and the Hudson Bay railways. Starting in the latter part of June it seemed best to visit the most northern points first, and so in company with Mr. J. B. Wallis, of Winnipeg, I arrived at The Pas, June 30, and took the next train down the Hudson Bay Railway on July 4. The country all the way is nearly flat, descending from about 800 feet at The Pas to 350 feet at Kettle Rapids, 330 miles distant, and the present end of the road. It is covered with a thick layer of sphagnum moss in which grows a forest of small spruce with undergrowth of Labrador Tea and Mountain Cranberry. The drainage is naturally slow, and large and small lakes cover much of the country, connected by streams through which the summer travel of the country is carried on. After a few days at The Pas our next stop was at the railroad camp at mile 214, where we spent nearly a week, then at mile 256 where there is a large area of gravel rising to twenty feet above the general level and then to Kettle Rapids, where we collected for a week in the neighbouring bog and on the river banks. The spiders are for the most part, those which have been long known in the bogs of Maine and Labrador, the tops of the White Mountains or the Rocky Mountains. The most conspicuous species are the three cobweb spiders of the spruce trees, *Theridion zelotypum*, *Linyphia limitanea* and *Linyphia nearctica*. *T. zelotypum* covers the whole area from Kettle Rapids on the north to Minoki and Cochrane

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on the south. *Linyphia limitanea* is also found through the whole area except the most southern stations. It is most abundant on trees growing near lakes and rivers. *Linyphia nearctica* appeared only at Kettle Rapids, the most northern station. It had previously been found at Nipigon, Montfort and Lake St. John and on the coast of Maine and Labrador. For its eastern distribution see the Canadian Entomologist for January, 1917. With these species occurred usually *Lophocarenum decemoculatum*, *Grammonota pictilis* and occasionally *Dipena nigra* and *Tilla montana*, and in the southern part of the range *Theridion nontanum*. Among the spiders without webs the most common was *Dendryphantes flavipedes* and in the southern part *Dendryphantes militaris* and *D. aestivalis*. The rarer *D. montanus* of the White Mountains occurred at Kettle Rapids, and with it *Sittacus rainieri* of the Rocky Mountains. Half-way along the railroad were found the rare *Habrocestum (Euophrys) cruciata* of the White Mountains, and also rare *Epeira aculeata* of Laggan and Jasper. The Lycosidæ were of species already known to extend across the continent. As usual where the ground is covered with sphagnum but few spiders were found in it, but in the southern part of the region where the land is higher and drainage better other mosses and leaf mold accumulate and the usual transcontinental spiders occur, *Pedanostethus fuscus*, *Tmeticus montanus*, *Hahnia agilis*, *Bathypantes subalpina* and *Amaurobius borealis*. At Minaki a new *Lophocarenum* was found, closely resembling *L. sculptum* of the west coast and *L. excavatum* of the east coast. In the bog at Minaki was the black and white variety of *Epeira labyrinthea* with nests hung in the stiff grass near the ground as in bogs of Maine and New York.

Outside of the spruce forest area a little collecting was done at Dauphin and Winnipeg, and around the home of Mr. Criddle at Aweme. At the latter place two species of burrowing spiders, *Lycosa missouriensis* and *Lycosa wrightii* were found in great numbers in the sandy fields, as they are around Chicago and along the Great Lakes. At Dauphin and around the ponds at Cochrane occurred *Singa campestris* a species living in tall grass and before found at Kenora and Edmonton.

A PARTIAL KEY TO SPECIES OF THE GENUS AGROMYZA (DIPTERA.)

SECOND PAPER.

BY J. R. MALLOCH, URBANA, ILL.

The species included in the present key are distinguished from their congeners by having the costa discontinued at or slightly beyond the apex of the third vein, and the halteres yellowish or whitish.

The larval habits of very few of the species are known and their known distribution indicates, not their actual range of occurrence but, rather, the fact that very little attention has been paid to the group by collectors. The same fact is in evidence throughout the genus.

This group contains species placed by other authors in *Napomyza* Haliday, and *Domomyza rondani*. Melander records the European species *anomala* Strobl. from Idaho and Washington. I have not seen this species.

1. Frons lemon-yellow; cross-veins very close together..... 2
 Frons red or black..... 4
2. Lateral margins of mesonotum broadly pale yellow; anterior
 2 pairs of dorso-centrals much weaker than the posterior
 2 pairs, the front pair much cephalad of suture. Food-
 plant unknown. Montana;
 Idaho.....(*brevicostalis* Malloch) *plagiata* Melander.
 Lateral margins of mesonotum not yellow, coloured as disc... 3
3. Antennæ black; length of costa from humeral vein to apex of
 first two-fifths as long as next section; third vein ending
 little more than length of preceding section of costa be-
 fore apex of wing. Larvæ mining in *Ranunculus abor-*
 tivus. Ind.; Ill..... *davisi* Walton.
 Antennæ black; length of costa from humeral vein to apex of
 first over three-fourths as long as next section; third vein
 ending over twice as far as length of preceding section of
 costa from apex of wing. Larvæ mining in *Verbena*,
 Centaurea, etc., Col.; Ariz.; Alaska;
 Europe..... *lateralis* Fallen

- Antennæ yellow. Food-plant unknown.
 Ill.....*aristata* Malloch.
4. Frons black.....5
 Frons reddish.....10
5. Last section of fifth vein much longer than preceding section.....6
 Last section of fifth vein shorter than or subequal to preceding section.....7
6. Last section of fifth vein about $2\frac{1}{2}$ times as long as preceding section. Food-plant unknown. Ill.....*indecora*, n. sp.
 Last section of fifth vein less than twice as long as preceding section. Larvæ mining cambium of *Prunus domestica*. N. Y.....*pruni* Grossenbacher.
7. Squamæ gray, fringes brown; last section of fifth vein nearly as long as preceding section. Food-plant unknown. N. H.; Europe.....*subnigripes* Malloch.
 Squamæ whitish, fringes pale; last section of fifth vein slightly more than half as long as preceding section.....8
8. Pubescence on arista indistinct; occiput projecting on upper half; mesonotum with 4 pairs of dorso-centrals; cross-veins separated by about the length of outer cross-vein. Food-plant unknown. Ill.....*aprilina* Malloch.
 Species without the above combination of characters; cross-veins separated by about twice the length of outer cross-vein.....9
9. Pubescence on arista indistinct; occiput not projecting; mesonotum with 3 pairs of dorso-centrals. Food-plant unknown. N. M.....*abbreviata* Malloch.
 Pubescence on arista distinct; occiput projecting on upper half; mesonotum with 4 pairs of dorso-centrals. Food-plant unknown. Alaska.....*kincaidi* Malloch.
10. Mesonotum with 2 pairs of dorso-centrals; humeri yellow; general colour glossy black; small, robust species, 1.5-2 mm. in length. Food-plant unknown. Md.; Ill.....*nitida* Malloch.
 Mesonotum with 4 pairs of dorso-centrals.....11

11. Large, robust species, 4 mm. in length; general colour shining black. Larvæ mining cambium of *Prunus domestica*. N. Y.....*pruni* Grossenbacher.
 Smaller, slender species, 2 mm. in length; general colour black, slightly shining. Food-plants unknown.
 Alaska.....*parvicella* coquillett.

***Agromyza indecora*, sp. n.**

Male and Female.—Black, shining. Frons opaque, orbits and ocellar triangle shining. Legs black. Wings clear, veins black. Halteres brown, knobs whitish yellow. Squamæ grayish, fringes blackish.

Orbital bristles strong, usually 6 in number; antennæ of moderate size, third joint rounded apically; arista swollen at base, microscopically pubescent; cheek narrow, its height about half as great as width of third antennal joint. Mesonotum with numerous short discal setulæ and 4 strong dorso-centrals; the pair of bristles between posterior dorso-centrals well developed. Abdomen stout. Legs stout, the pair of posterior bristles on mid-tibia very unequal in size. Costa ending just beyond apex of third vein; third and fourth veins very noticeably divergent apically; inner cross-vein usually at middle of discal cell or slightly beyond that point; outer cross-vein below apex of first vein; last section of fifth vein 2 to 2½ times as long as preceding section.

Length 2.5–3.5 mm.

Type locality, White Heath, Ill., June 24, 1916; June 29, 1917; (J. R. Malloch). Food-plant unknown.

This species is closely related to *pruni* Grossenbacher, but may be separated from it by the venation. This character is usually a rather unstable one, but my series of *pruni* contains no example with the last section of the fifth vein approximating to twice the length of the preceding section, while in the large series of *indecora* there is no specimen which has the last section of that vein less than twice as long as the preceding section. The inner cross-vein in *indecora* is usually but little beyond the middle of the discal cell, whereas in *pruni* it is generally one-third from apex of the cell. The third and fourth veins in *pruni* are but little divergent apically; in *indecora* they are strongly divergent.

LECTOTYPES OF THE SPECIES OF HYMENOPTERA
(EXCEPT APOIDEA) DESCRIBED BY ABBÉ
PROVANCHER.

BY A. B. GAHAN AND S. A. ROHWER, WASHINGTON, D. C.

(Continued from page 106.)

- Pezomachus quebecensis.** Type.—Not in Pub. Mus., Quebec, unless under *Pezomachus canadensis* Cress.
- Pezomachus sulcatus.** Type.—Not located. Probably in Harrington collection.
- Phæncarpa rubriceps.** Type.—Male, yellow label 1052.
2nd Coll. Pub. Mus., Quebec.
- Phæogenes annulatipes.** Type.—Harrington Coll.
- Phæogenes aterrimus.** Type.—Female, yellow label 435.
2nd Coll. Pub. Mus., Quebec. Left antenna at apex and left hind tarsus broken.
- Phæogenes crassitelus.** Type.—Female, yellow label 1196.
2nd Coll. Pub. Mus., Quebec. Ovipositor and sheath broken off at apex of abdomen.
- Phæogenes falardeau.** Type.—Female, yellow label 666.
2nd Coll. Pub. Mus., Quebec. Allotype without labels.
- Phæogenes gaspesianus.** Type.—Female, yellow label 664.
2nd Coll. Pub. Mus., Quebec. Right antenna broken at 5th joint.
- Phæogenes huarti.** Type.—Female, yellow label 328. 2nd Coll. Pub. Mus., Quebec. Lacks abdomen.
- Phæogenes indistinctus.** Type.—Male, Harrington Coll. Pink label "P. 409." Lacks apex of left antenna. Labeled by Davis = "Phygadeuon."
- Phæogenes mellinus.** Type.—Female, yellow label 719.
2nd Coll. Pub. Mus., Quebec. Some verdigris.
- Phæogenes nigricornis.** Type.—Male, yellow label 988.
2nd Coll. Pub. Mus., Quebec.
- Phæogenes orbis.** Type.—Male, yellow label 514. 2nd Coll. Pub. Mus., Quebec. Antennæ broken at tip.
- Phæogenes pinguis.** Type.—Female, Harrington Coll. Head missing.
- Phæogenes recticaudus.** Type.—Female, yellow label 1197. 2nd Coll. Pub. Mus., Quebec. Abdomen broken off and glued on label.

Phæogenes recticornis. Type.—Female, yellow label 1200, blue label 15. 2nd Coll. Pub. Mus., Quebec. Right antenna at apex, right fore wing, hind wings, legs on left side, missing; abdomen broken off and glued on label.

Phæogenes sectus. Type.—Male, white label 439; yellow label 1552. 2nd Coll. Pub. Mus., Quebec. Lacks left antenna and left hind leg. On short pin.

Phæogenes tuberculifer. Type.—Male (?), yellow label 979. 2nd Coll. Pub. Mus., Quebec.

Phanerotoma fasciata. Type.—Yellow label 599. 2nd Coll. Pub. Mus., Quebec. Abdomen and antennæ beyond third joint missing.

Phasgonophora elegans. Type.—Harrington collection. Paratype.—Blue label 73(s); yellow label 1341. 2nd Coll. Pub. Mus., Quebec.

Philanthus harringtoni. Type.—Not located. Probably returned to collector.

Photopsis canadensis. Type.—Blue label 690; yellow label 1400. 2nd Coll. Pub. Mus., Quebec.

Phygadeuon abdominalis. Type.—Female, yellow label 218. 2nd Coll. Pub. Mus., Quebec. Some verdigris. Allotype.—Yellow label 271. 1st Coll. Pub. Mus., Quebec.

Phygadeuon acaudus. Type.—Female, yellow label 1017. 2nd Coll. Pub. Mus., Quebec. Complete but pin obliterates some of the characters.

Phygadeuon aciculatus. Type.—Male, yellow label 665. 2nd Coll. Pub. Mus., Quebec.

Phygadeuon albicoxus. Type.—Male, yellow label 269. 2nd Coll. Pub. Mus., Quebec.

Phygadeuon alternans. Type.—Yellow label 669. 2nd Coll. Pub. Mus., Quebec. Only thorax and coxæ present.

Phygadeuon annulatus. (Name preoccupied.) See *Phygadeuon fusiformis*.

Phygadeuon apicatus. Type.—Not in Pub. Mus., Quebec, unless under *Ichneumon velox* Cress.

Phygadeuon ater. Type.—Not in Pub. Mus., Quebec, unless under *Ichneumon helvipes* Cress.

- Phygadeuon attenuatus.** Type.—Female, yellow label 1048. 2nd Coll. Pub. Mus., Quebec.
- Phygadeuon autumnalis.** Type.—Yellow label 640. 2nd Coll. Pub. Mus., Quebec. Thorax and part of legs on pin, rest missing.
- Phygadeuon brevicaudus.** Type.—Female, yellow label 1181. 2nd Coll. Pub. Mus., Quebec.
- Phygadeuon capitalis.** Type.—Male, Harrington Coll. Pink label "P. 413."
- Phygadeuon caudatus.** Type.—Female, yellow label 265. 1st Coll. Pub. Mus., Quebec.
- Phygadeuon cephalicus.** Type.—Male, yellow label 663. 2nd Coll. Pub. Mus., Quebec.
- Phygadeuon constrictus.** Type.—Yellow label 718. 2nd Coll. Pub. Mus., Quebec. Lacks abdomen and tarsi.
- Phygadeuon cornutus.** Type.—Female, yellow label 938. 2nd Coll. Pub. Mus., Quebec.
- Phygadeuon crassipes.** Type.—Female, yellow label 276. 1st Coll. Pub. Mus., Quebec.
- Phygadeuon cressoni.** Type.—Not in Pub. Mus., Quebec. unless under *Ichneumon velox* Cress.
- Phygadeuon curticus.** Type.—Female, yellow label 1558. 2nd Coll. Pub. Mus., Quebec.
- Phygadeuon dorsalis.** Type.—Not in Pub. Mus., Quebec, unless under *Ichneumon humilis* Prov.
- Phygadeuon dubius.** Type.—Not in Pub. Mus., Quebec, unless under *Phygadeuon pubescens* Prov.
- Phygadeuon electus.** Type.—Male, white label 1; yellow label 1117. 2nd Coll. Pub. Mus., Quebec. Lacks apices of antennæ. Provancher mistook sex.
- Phygadeuon excavatus.** Type.—Not located.
- Phygadeuon fasciatus.** Type.—In Pub. Mus., Quebec, with name label. Other data not obtained.
- Phygadeuon fraterculus.** Type.—Female, Harrington Coll. Pink label "P. 404." Lacks left hind leg below coxa and right hind tibia and tarsi.
- Phygadeuon fusiformis.** Type.—Female, Harrington Coll. Pink label "P. 391." Lacks left flagellum.

- Phygadeuon goddessii.** Type.—Not located. Probably returned to collector.
- Phygadeuon gracilicornis.** Type.—Female, Harrington Coll. Left antenna broken.
- Phygadeuon guignardi.** Type.—Female, yellow label 1178. 2nd Coll. Pub. Mus., Quebec.
- Phygadeuon hilaris.** Type.—Not in Pub. Mus., Quebec, unless under *Phaogenes helvus*. Cress.
- Phygadeuon impressus.** (Nat. Can. Vol. 7, p. 212) Type.—Male, yellow label 213. 2nd Coll. Pub. Mus., Quebec.
- Phygadeuon impressus.** (Nat. Can. Vol. 6, p. 281) Type.—Not in Coll, unless under name *Platylabus thoracicus* Cress.
- Phygadeuon inflatus.** Type.—Not located. Female, yellow label 221 bearing this name label in 2nd Coll. Pub. Mus., Quebec, cannot be type.
- Phygadeuon inhabilis.** Type.—Female, yellow label 205. 2nd Coll. Pub. Mus., Quebec.
- Phygadeuon insignis.** Type.—Not in Pub. Mus., Quebec, unless under *Phaogenes herbus* Cress.
- Phygadeuon jocosus.** Type.—Female, old rose label 90, yellow label 1180. 2nd Coll. Pub. Mus., Quebec.
- Phygadeuon lavoiei.** Type.—Female, yellow label 660. 2nd Coll. Pub. Mus., Quebec.
- Phygadeuon lechevallieri.** Type.—Yellow label 692. 2nd Coll. Pub. Mus., Quebec. Lacks antennæ, legs, left wings and abdomen.
- Phygadeuon longicornis.** Type.—Female, Harrington Coll. Pink label "P. 388." Lacks apex of right antenna.
- Phygadeuon lucens.** Type.—Female, yellow label 270. 1st Coll. Pub. Mus., Quebec. Lacks antennæ.
- Phygadeuon maculatus.** Type.—Female, yellow label 206. 2nd Coll. Pub. Mus., Quebec. Lacks antennæ.
- Phygadeuon marginatus.** Type.—Male, Harrington Coll. One antenna and apical half of other missing.
- Phygadeuon maturus.** Type.—Female, yellow label 453. 2nd Coll. Pub. Mus., Quebec. Apices of antennæ and left fore wing gone.

Phygadeuon mignaulti. Type.—Female, yellow label 661. 2nd Coll. Pub. Mus., Quebec. Lacks right antenna.

Phygadeuon mucronatus. Type.—Female, yellow label 611. 1st Coll. Pub. Mus., Quebec.

Phygadeuon niger. Type.—Not in Pub. Mus., Quebec, unless under *Ichneumon extrematatis* Cress.

Phygadeuon nigriceps. Type.—Female, old rose label 40, yellow label 1179. 2nd Coll. Pub. Mus., Quebec.

Phygadeuon nitidulus. Type.—Male, yellow label 262. 1st Coll. Pub. Mus., Quebec.

Phygadeuon occidentalis. Type.—Female, yellow label 263. 1st Coll. Pub. Mus., Quebec.

Phygadeuon orbitalis. Type.—Male, yellow label 513. 2nd Coll. Pub. Mus., Quebec.

(To be continued)

SOME SOUTH AMERICAN BEES.

BY T. D. A. COCKERELL, BOULDER, COLORADO.

Colletes chubutensis, sp. n.

♂.—Length about 10 mm., anterior wing 7.5 mm.; head, thorax and legs black, abdomen obscure steel-blue; head, seen from in front, forming roughly an equilateral triangle, the vertex being very broad; malar space extremely long, fully twice width of mandibles at base; mandibles red at apex; labrum rather weakly plicate basally; clypeus shining, very sparsely punctured, with a broad, band-like median depression; antennæ black, long, reaching metathorax; third joint 320 microns long, fourth 480, fifth 450; mesothorax and scutellum dullish, not polished; area of metathorax smooth and shining, with a sub-basal, transverse ridge, above which, in the middle, is a small pit; hair of head and thorax very long and abundant, white on face, cheeks and under side of thorax; sides of face with black hairs; hair of upper part of head and thorax with blackish intermixed, the whole appearing grey; tegulae piceous; wings hyaline, faintly dusky, nervures and stigma dark fuscous; second s.m. extremely broad, receiving first r.n. in middle; legs with white hair, extremely long on anterior femora posteriorly; abdomen shining, hardly punctured; hind margins of segments narrowly brownish, without hair-bands; dorsal surface

of abdomen with very long, erect hair, white basally, but mainly black on apical half.

Chubut, Patagonia (from W. F. H. Rosenberg), U. S. Nat. Museum. In Friese's table of Chilean and Argentine *Colletes* this falls nearest to *C. biciliatus* Friese (*ciliatus* Friese, preocc.), from Chile, but it appears to be certainly distinct. Unfortunately Friese gives no detailed account of the male of *biciliatus*. In the North American fauna it falls nearest to *C. productus*, except for the colour of the abdomen.

***Colletes rufosignatus*, sp. n.**

♂.—Length about 8 mm., anterior wing 5.5 mm.; black, the hind margins of abdominal segments obscurely brown, and apical tarsal joints dull ferruginous; malar space long, but less than twice as long as wide; mandibles red at apex; labrum smooth and shining, without distinct plicæ or pits; clypeus shining, sparsely punctured; antennæ black, only moderately long, but middle joints longer than broad; third joint 270 microns long, fourth 320, fifth 305; hair of head and thorax long, mainly dull white with a faint creamy tint, but some long, black hairs at sides of face, and more or less fuscous on vertex, while the hair on the scutellum is light orange-ferruginous; mesothorax shining, finely but not densely punctured; area of metathorax at base with plicæ bounding a series of pits, below this rugose, but with the lower end of the triangle smooth, the smooth area bounded above by a tuft of erect hair; tegulæ black; wings hyaline; nervures and stigma piceous; legs with white hair; on middle and hind tarsi the tufts of hair at ends of joints are reddish; abdomen shining, with minute, weak punctures, and long, thin, erect hair, white basally, largely black apically, but no hair-bands.

Chubut, Patagonia (from W. F. H. Rosenberg), U. S. National Museum. Allied to *C. patagonicus* Schrottky and *C. rhodaspis* Ckll., but apparently not the male of either. The colour of the scutellar hair suggests *patagonicus*, but that insect, at least in the female, has the other hair much darker.

***Coelioxys bruneri*, sp. n.**

♂.—Length 8.2 mm.; black, with the first abdominal tergite entirely, the middle third of second and a smaller area on third, bright ferruginous; legs red, black basally (including part of

femora), the hind tibiae also dark on basal half externally, and the hind tarsi black; mandibles red subapically; antennae black; tegulae clear ferruginous; wings rather strongly infuscated, especially apically; hair of eyes rather short (80 microns long); face densely covered with white hair; posterior orbits, especially below, with a fringe of short, white hair; mesothorax and scutellum densely, rugosely punctured, but the posterior disc of mesothorax and a small area in middle of scutellum, smooth and shining; mesothorax very thinly hairy, but anteriorly with two oval, oblique, bright, fulvous hair-patches; scutellum with a small median tubercle, directed upward; axillar spines slender, curved inward; mesopleura thinly hairy; stigma ferruginous; nervures fuscous; anterior coxae spined; spurs ferruginous; abdomen dorsally shining, with large, scattered punctures; hind margins of segments fringed with white hair, weak on first, and interrupted on second; venter with broad, apical margin of first segment and base of second red; no ventral keel; fourth ventral segment produced and truncate in middle of margin; fifth with an apical pit; apical teeth of abdomen six, not counting very small ones or penultimate segment; lateral teeth long and slender; lower apical longer than upper; no median denticle.

Carcarana, Argentina (*Bruner*, 65), U. S. National Museum. Very near to *C. jujuyensis* Holmbg. (♀), but apparently not its male, on account of the rugose scutellum. Also close to *C. cordillerana* Holmbg., but that has the male abdomen 7-dentate. Also allied to *C. bruchi* Schrott., but quite distinct. The apical segment of abdomen is much less produced than in *C. rufibasis* Ckll., which closely resembles it in superficial appearance, though not in structure.

***Pseudagapostemon pampeanus* (Holmberg).**

A male and female from Carcarana (*Bruner*, 77, 19) are provisionally referred here, but may represent a distinct species, and it is not certain that the sexes are correctly associated. The female is very close to *P. joergenseni* (Friese), but much broader. The genus contains a number of closely related forms, the relationships of which are not clearly understood.

***Halictus (Chloralictus) bruneriellus*, sp. n.**

♀.—Length about 6.5 mm., anterior wing 5 mm.; head and

thorax bluish green, legs piceous, abdomen black, the hind margins of the segments faintly reddish; hair of head and thorax scanty, white; labrum with yellowish hair; mandibles obscurely reddish in middle; apical half of flagellum ferruginous beneath; clypeus short, black, with sparse coarse punctures; supraclypeal area shining green, with a few punctures; front densely punctured; mesothorax shining, the disc with sparse, large punctures; scutellum shining; area of metathorax rugose; posterior truncation distinct; tegulae dark reddish brown; wings hyaline, very faintly dusky, stigma and nervures reddish brown; hind spur with three teeth; abdomen shining, with only minute, indistinct punctures; no hair-bands, but the usual thin, pale hair.

Carcarana, Argentina (*Bruner* 39), U. S. National Museum. Related to *H. spinolæ* Reed (*paramario* Friese) and *H. danicorum* Ckll., but considerably larger. In the North American fauna it resembles *H. subconnexus* Ellis, but differs by the narrower face, more copiously punctured mesothorax, more dusky stigma, and rugose base of metathorax.

Augochlora argentina Friese.

Carcarana (*Bruner* 80). Agrees with a specimen received from Friese.

Augochlora (Odontochlora) phoenomöe (Schrottky).

Carcarana (*Bruner* 86).

Augochlora (Pseudaugochloropsis) callisto Smith.

Carcarana and Bahia Blanca (*Bruner* 8, 75).

A NEW HOPLIA FROM FLORIDA.*

BY W. S. FISHER, WASHINGTON, D. C.

Among a collection of Coleoptera submitted by Mr. H. L. Dozier for determination, the following interesting new species of *Hoplia* was found.

Hoplia floridana, n. sp.

Male.—Elongate, black, shining. Upper surface sparsely clothed with short, semi-erect lanceolate, hair-like cinereous scales. Head strongly rugose, sparsely clothed with short, erect hairs. Clypeus one-half wider than long, feebly reflexed in front, when viewed laterally, not in the same plane as rest of head, but

*Contribution from the Branch of Forest Insects, Bureau of Entomology.

obliquely truncate; sides nearly parallel, truncate in front with the angles rounded; surface flat with large, round punctures, clothed with inconspicuous, erect hairs. Clypeal suture prominent and strongly elevated. Prothorax one-half wider than long; sides oblique to just in front of middle, then strongly angulate and slightly concave to the posterior angles, which are rounded; front angles acute; apex broadly emarginate; base nearly truncate; disc strongly convex with the surface finely rugose and sparsely clothed with rather short, lanceolate, hair-like cinereous scales, with longer, erect hairs along the lateral margins. Elytra one-half longer than wide, slightly narrowed posteriorly, surface rather strongly rugose with only traces of costæ and clothed similar to the prothorax. Pygidium strongly narrowed posteriorly, surface densely, finely rugose and clothed with hair-like scales similar to those on the elytra. Beneath, sparsely clothed with hair-like scales as above. Posterior femora short and very much swollen. Anterior tibiæ with two large, well developed teeth. Posterior tibiæ greatly enlarged posteriorly, surface with large, round, confluent punctures. Claws of front and middle tarsi chelate and unequal, the outer one being larger and bifid at the tip. Hind tarsi with a single claw which is not cleft.

Length 10 mm.; width 4.5 mm.

Female.—Similar to male except as follows: Colour reddish brown, shining. Surface rather densely clothed with yellow, nearly round scales, with a few semi-erect, short, lanceolate, hair-like scales of the same colour, the scales not being abundant enough to obscure the colour of the elytra.

Length 9 mm.; width 4mm.

Habitat.—Lake Wales, Florida.

Holotype (male), allotype and paratype (female) in the U. S. National Museum Collection; also two paratypes (male and female) in the collection of the Florida Agricultural Experiment Station at Gainesville, Florida.

Described from five specimens, two males and three females, received from Mr. H. L. Dozier and labeled "Agric. Exp. Station, Lake Wales, Florida, Ec. No. 219 & 220, J. R. W." In a letter from Mr. Dozier he states that "These specimens were collected April 7, 1917, with a report that they were feeding on citrus foliage."

This interesting species is easily distinguished from any other North American species by its peculiar clypeus, which is obliquely truncate in front of the clypeal suture, the latter being strongly elevated, and also by the greatly swollen posterior femora and enlarged tibiae.

BOOK NOTICE.

THE BIOLOGY OF DRAGONFLIES (ODONATA OR PARANEUROPTERA).—By R. J. Tillyard, M.A., (Cantab.) B.Sc. (Sydney), F.L.S., F.E.S. Cambridge, The University Press, 1917. \$4.50.

Since the publication in 1893 of Dr. Calvert's excellent "Catalogue of the Odonata of Philadelphia, with an Introduction to the Study of this Group of Insects," no general treatise on the biology of the dragonflies has appeared, and as Dr. Calvert's work is now long out of print and necessarily somewhat out of date, such a treatise has been much needed. Mr. Tillyard's book fills this need admirably. He has aimed "to present as full and complete an account of the biology of the Odonata as it is possible to offer in the present state of our knowledge of these insects," and he has spared no pains in carrying out this object. Every chapter bears the imprint of a thorough assimilation and careful sifting of the available data and a great deal of new matter has been added from the author's own extensive researches in many branches of the subject. With this wealth of material is combined a clearness and directness of diction, which, with the abundance of good illustrations and full glossary of technical terms should enable any biologist to follow the text without difficulty. A charm of novelty is added by the author's familiarity with the Australian fauna, from which he draws a large number of examples, in illustration of the various phenomena described.

Of the nineteen chapters ten are devoted chiefly to anatomical matters, including those on the external features, the wings, the larva or nymph, and the various organic systems. These are followed by chapters on a variety of subjects; embryology, coloration, classification, zoogeographical distribution, the geological record and bionomics; the last-named including a miscellaneous collection of facts, relating to habits, food, enemies, economic value, etc.

To these are added a chapter on British species and a final one on "Collecting, Rearing and Biological Methods."

The book teems with suggestive ideas, particularly regarding the phylogeny of various characteristic structures, such as the anal appendages, the pterostigma, the nodus and other venational features, the rectal gills of the Anisoptera, the caudal gills of the Zygoptera and the types of colour pattern. The wings of the Zygoptera are regarded as having been originally anisopterous, as were those of the fossil order Protodonata, their general reduction, especially in the anal area of the hind wings having been correlated with their use as mere "sculling organs" with no power of soaring or "planing."

In the scheme of classification adopted, the chief deviation from the systems usually followed is the separation of the family Lestidæ, with three subfamilies Epiophlebiinæ, Lestinæ and Synlestinæ. This change is based upon both imaginal (venational) and larval characters and appears to be well founded. Diagnostic characters are given for all the groups as far as the tribes.

The subject of Zoogeographical Distribution is considered from a somewhat novel viewpoint. The fauna of each geographical region is divided into three main groups, palæogenic, entogenic and ectogenic. The palæogenic fauna consists of isolated remnants of a past age, formerly more widely distributed than at present; the entogenic fauna of those groups which are most characteristic of the region in question, where they may form definite "zoocentres;" while the ectogenic fauna consists of such groups as have invaded the region from some neighbouring region in which they are entogenic. The same genus may be entogenic in more than one region. Separate tables are given of both ectogenic and entogenic genera, and their distribution in the various regions.

The fossil record, described in the next chapter, also contains many interesting suggestions, such as the probability that the larvæ of the Protodonata dwelt in damp earth rather than water, no larval forms having been preserved among the abundance of imaginal remains in the Commeny deposits, and the larval tracheal system of recent forms being a modification of an originally

terrestrial type. The remarkable forms constituting the suborder Anisozygoptera of Handlirsch are considered to be true Zygoptera of an early unreduced type, and are placed as subfamilies of Calopterygidae and Lestidae.

Some errors and minor defects are, of course, present in this, as in all books treating of so wide and varied a field, but as most of these have already been pointed out by other reviewers, we shall merely call attention to the following:

In the historical sketch in the introduction there is no mention of any American author. Some reference, at least, should have been made to the pioneer work of Hagen and the monumental labours of Dr. Calvert, than whom no one has done more to place our knowledge of the order on a sound and substantial basis. No mention of Bartenev's work on the Palæarctic fauna occurs in any part of the book.

On page 19 the cervical sclerites and gula are stated definitely to represent the skeleton of the last head-segment. This is by no means an established fact, as they have also been interpreted as belonging to the intersegmental membrane between the head and prothorax, being serially homologous with sclerites which are sometimes found in the two succeeding intersegmental areas.

The length of embryonic life is much more variable than is indicated (p. 242). Dr. Calvert has pointed out that in Pennsylvania the eggs of *Sympetrum vicinum*, deposited in the autumn, do not hatch until the following spring. This is also true in Ontario of *Boyeria vinosa* and almost certainly also in the case of the various species of *Æshne*.

In compiling the census of the Odonata of the world (p. 299) the Selysian monographs by Martin should not have been used for the nearctic region in preference to Muttkowski's catalogue, as they are incomplete and deficient in their treatment of the North American fauna.

We do not wish, however, to detract from the impression we have tried to give of the truly admirable qualities of Mr. Tillyard's book, for lack of space necessitates the omission of much that might be added in its praise. It is a book that is indispensable to every biological and entomological library.

Mailed April 13th, 1918.