

The Canadian Entomologist.

VOL. XLIX.

LONDON, JULY, 1917

No. 7

POPULAR AND PRACTICAL ENTOMOLOGY.

THE DEATH-FEIGNING INSTINCT.

BY E. MELVILLE DUPORTE, MACDONALD COLLEGE, QUE.

Many widely different animals possess the instinct of feigning death. The sand-hopper, a terrestrial amphipod, and the pill-bug (*Armadillidium*) are well-known examples among the Crustacea. That many Myriapods will coil up and remain perfectly still on being touched is well known to all acquainted with the habits of the common millipedes. Among the spiders, the Epeiridæ or orb-weavers are perhaps the ones which most commonly feign death on being disturbed.

Though rare the instinct occurs among the vertebrate animals. Certain fishes and amphibians are known to feign death. Two noteworthy examples of death-feigning birds are the partridge of the pampas of the Rio de la Plata and the tern of Pekinese Island.

Among mammals one of the best known examples is that which has enriched the "American language" with the expressive term "playing 'possum." Other well known examples are the fox and the armadillo.

It is among insects, however, that the death-feigning instinct is most widely distributed, especially among the Coleoptera and Hemiptera. The active flyers such as the Diptera, Hymenoptera and Lepidoptera seldom feign death.

The term "feigning death"—an unfortunate one as it connotes a consciousness which does not exist—is used to designate the assumption by an animal, when disturbed, of a rigid state which may be of momentary duration or may last upwards of an hour. The attitude of the feigning animal varies, but is very seldom the same as the attitude of the dead insect. The motionless condition and the rigidity due to the contraction of the muscles are the chief characteristics of the death feint, and for this reason I have included under the term all rigid motionless attitudes which are the result of a reaction to a shock stimulus. Given so broad

an interpretation the death feint among insects falls into one or other of the three divisions which follow:

1. *The insect on receiving a shock becomes rigid without releasing its hold.*

Certain caterpillars will hold on to a twig by one or more pairs of prolegs, and elevate their bodies, assuming more or less grotesque rigid attitudes in which they will remain for a considerable time. Perhaps the best known examples are the caterpillars of the Sphinx Moths and of certain geometers. In these cases the insect seems to come to rest naturally in the immobile attitude, without the stimulus of a shock, the contraction of the muscles being probably due to an internal stimulus resulting from the active metabolism which takes place after the insect has eaten. If such is the case these reactions cannot properly be described as death feints. In other insects, however, a similar attitude can be definitely brought about by a shock. Thus if the yellow-necked apple-tree caterpillar (*Datana ministra*) be disturbed it will raise both ends of its body with a jerk, retaining hold of the twig by means of the four pairs of anterior prolegs.

2. *The insect when disturbed rolls itself into a motionless ball.*

This habit seems to be common among terrestrial forms rather than among arboreal ones. The ruby wasps or cuckoo-flies (*Chrysididae*) lay their eggs in the nests of wasps and bees. If attacked by their hosts the ruby wasps bend their abdomen beneath the thorax, and in this attitude resemble a small, metallic ball.

Sometimes the head and abdomen are bent back above the thorax. Thus Kirby and Spencer say of *Silpha thoracica* "when alarmed it turns its head and tail inwards until they are parallel with the trunk and abdomen and give its thorax a vertical direction, when it resembles a rough stone."

Certain of the rove beetles (*Staphylinidae*) combine both attitudes, bending the head beneath the thorax and the abdomen above the elytra.

Many cutworms and other caterpillars also roll themselves into a motionless ball when disturbed.

3. *The insect releases its hold, contracts its legs and antennæ and falls to the ground, where it usually remains motionless and apparently dead.*

This is the condition to which the term "death feint" is usually applied, but it is difficult to draw a sharp line of demarcation between this and the reaction of the ruby wasps, between the attitude of ruby wasps and that of the carrion and rove beetles, or between the attitude of these beetles and the rigid attitude of the yellow-necked apple-tree caterpillar.

The death feint varies greatly in degree. On the one hand we have certain insects which when disturbed remain momentarily quiet, becoming active again almost immediately. On the other hand we have De Geer's classical example, *Anobium pertinax*. Kirby and Spence referring to this insect and in part quoting De Geer say: "All that has been related of the heroic constancy of American savages when taken and tortured by their enemies scarcely comes up to that which these little creatures exhibit. You may maim them, pull them limb from limb, roast them alive over a slow fire, but you will not gain your end; not a joint will they move nor show by the least symptoms that they suffer pain,"* and they naively continue: "do not think, however, that I ever tried these experiments upon them myself, or that I recommend you to do the same." In spite, however, of the admonition of the learned authors of the *Introduction of Entomology* several workers have repeated these experiments and found that the case of *Anobium* is an extreme one and that the majority of feigning insects gradate between this extreme and the other in which the loss of activity is but momentary. In *Tychius picirostris*, for example, the writer finds that while the legs and antennae of the feigning insect may be cut off without eliciting any symptoms of activity, more drastic disturbances such as decapitation or severing the trunk always cause the insect to resume its activity. In the same insect it was found impossible to elicit the feigning response on a hot surface, and an insect in the death feint placed on a hot surface immediately became active and tried to escape. Cold, on the other hand, very greatly increased the duration of the feint.

*Compare Holmes on the feint of the Pekinese tern. "You may pull them about, stretch out their legs, neck or wings and place them in the most awkward positions, and they will remain as limp and motionless as if really dead. They will even suffer their wing and tail feathers to be plucked out one by one without a wince."

The duration of the feint may be momentary or it may exceed an hour. There is little uniformity either in individuals of the same species or in the same individual during successive feints. I have never found any gradational relation between the duration of successive feints, but Fabre found that in the beetle *Scarites gigas* the duration increased with each successive feint. With *Tychius picirostris* the longest feint may occur at any place in a succession of feints, but the average duration of the earlier feints is greater than that of those occurring later in the series. Turner had the same results with the ant-lion, and Gee and Lathrop the the Severins, and other workers have also failed to observe any definite relation in the duration of successive feints.

Most insects will feign again and again if stimulated. The number of successive feints is, however, limited. An insect after responding to a larger or smaller number of shocks will finally refuse to respond further. If allowed to rest, however, it will again respond.

In some cases—a well known example is the golden-rod chrysomelid *Trirhabda canadensis*—the insect may feign death on the near approach of the collector; in others the feint is not normally elicited until the insect is touched. Within the same species, however, the intensity of the shock seems to have no effect on the intensity or duration of the feint.

Both the collector and the economic entomologist have taken advantage of the death feint. One of the best known cases in which the economic entomologist enlists the aid of this instinct is the destruction of the plum curculio by jarring the trees. Scott and Fiske in an account of their work on the control of this pest in a Georgia peach and plum orchard give a list of other insects collected by jarring the trees for the curculio. This list includes two hundred and sixty-nine species of Coleoptera representing thirty-one families; seventy-one species of Hemiptera-Heteroptera representing eleven families; and eight species of Homoptera representing three families. Other orders were represented, but the numbers were so few that these insects were not listed.

The advantage of the death feigning instinct to its possessor is doubtful. When an animal resembles its surroundings in colour or form, the ability to remain perfectly still makes it practically

indistinguishable. Every collector or hunter knows the value of immobility in concealment. Certainly every collector has felt the impulse to give voice to some strongly emphatic expletive on losing a coveted specimen which on being approached drew its legs close to its body and dropped to the ground where it remained effectively hidden from his disappointed eyes. We should be careful, however, not to lay too much emphasis on the advantages of this action because it is hardly probable that the natural enemies of these insects are quite as readily outwitted as we are. Indeed the instinct may in some animals be not only useless but positively injurious. • This is true of certain birds which, when pursued, instead of seeking safety in flight or shelter, feign death in the open where they may be easily captured.

There have been several explanations given of the nature of the death feint. Certainly there is no consciousness involved, and the instinct is merely a physico-chemical reaction to external stimulus. The most probable theory is that in the death feint we have an example of negative thigmotaxis, that shrinking from contact characteristic of so large a proportion of all classes of animals.

A NEW NORTH AMERICAN SPECIES OF THE GENUS TETRAMERINX (DIPTERA, ANTHOMYIIDÆ).

BY J. R. MALLOCH, URBANA, ILL.

The genus *Tetramerinx* belongs to the subfamily *Cœnosiina* of the *Anthomyiidae*, and may be distinguished from its allies by the presence of 4 post-sutural dorso-central bristles on the mesonotum. The females are readily distinguished from any allied genus except *Phyllogaster* by the peculiar clawlike processes on the apical abdominal segment.

Stein described the genus under the name *Tetrachæta*, but this name was preoccupied and subsequently was replaced by *Tetramerinx* by Berg.

KEY TO SPECIES.

1. Third antennal joint not over twice as long as second (Ill.).....*brevicornis*, sp. n.

- Third antennal joint at least four times as long as second..... 2.
2. Hind femora of male with a comblike fasciculus of short, stiff bristles at base of ventral surface; abdomen in both sexes with a pair of large subtriangular black spots on dorsum of segments 2 to 4; veins 3 and 4 of wings convergent apically; antero-dorsal surface of hind tibia with 1 bristle in female (Cal.)..... *femorata* Malloch
- Hind femora of male without a fasciculus at base; abdomen in both sexes with a faint central line; veins 3 and 4 of wings subparallel; antero-dorsal surface of hind tibia with 3-4 bristles (Mass., Tex.)..... *unica* Stein

***Tetramerinx brevicornis*, sp. n.**

Female.—Length 4 mm. Black, densely covered with yellowish gray pruinescence. Frons yellowish gray with the exception of an opaque, black, wedge-shaped mark on each side at apex of frontal triangle; antennæ and palpi black. Thorax unmarked. Abdomen with very faint indications of a pair of spots on dorsum of segments 2 and 3. Legs black. Calypteræ white, yellowish on margins. Halteres yellow. Wings clear, veins yellowish.

Frontal triangle very broad, obscuring central stripe on posterior half; each orbit as broad as central stripe, the bristles nearer inner than outer margin, a series of short setulæ laterad of the bristles; frons and face distinctly protuberant; third antennal joint about twice as long as second; arista swollen on basal fourth, very shortly pubescent; marginal bristles on cheek sparse; cheek one-fifth as high as eye, the latter nearly twice as high as long. Thorax very sparsely haired; acrostichals irregularly 2-rowed. Abdomen without strong bristles except at apex. Fore tibia with or without a weak bristle; mid tibia with 2 weak posterior bristles; hind tibia with 4-5 antero-dorsal and 2 antero-ventral weak bristles. Inner cross-vein distinctly beyond middle of discal cell; outer cross-vein almost straight; veins 3 and 4 subparallel apically.

Type locality, Waukegan, Ill., August 23, 1906. Taken on shore of Lake Michigan. Two specimens.

Type in collection of Illinois State Laboratory of Natural History.

THE ANTHOMYIID GENUS *PHYLLOGASTER* (DIPTERA).

BY J. R. MALLOCH, URBANA, ILL.

In the collection of the Illinois State Laboratory of Natural History I find two species of the genus *Phyllogaster*, one being the genotype and the other an undescribed species.

Nothing is known of the immature stages of the genus. The specimens before me were taken on or near the seashore or the banks of rivers. The genotype was described from specimens from Florida and Massachusetts.

The females of this genus may be separated from those of any other in Cœnosiinæ except *Tetramerinx* by the presence of four strong, clawlike thorns at apex of last abdominal segment. The former has but 3 pairs of post-sutural, dorso-central bristles while the latter has 4. Both sexes of *Phyllogaster* have the frons protruded beyond the anterior margin of eyes, the antennæ much elongated, and the arista bare and much swollen on the basal third.

DIAGNOSIS OF SPECIES.

Abdomen with an interrupted longitudinal median brown stripe and a pair of faint spots of same colour on segments 3 and 4; hind femora with 1 or 2 strong and several weak bristles on apical half of antero-ventral surface; hind tibiæ with 1 antero-ventral bristle; third vein of wing bare proximad of the inner cross-vein. *cordyluroides*.

Abdomen usually with the central stripe faintly visible, the spots indistinguishable; hind femora with from 3 to 5 strong bristles on apical half of antero-ventral surface; hind tibiæ with 2 antero-ventral bristles; third vein usually with a few weak bristles proximad of the inner cross-vein. *littoralis*.

***Phyllogaster cordyluroides* Stein.**

Berl. Ent. Zeitschr., 1897, p. 256.

I have before me two males which I consider belong to Stein's species. One specimen, from Florida, is very pale in colour, being July, 1917

densely covered with whitish gray pruinescence. The abdominal markings are distinct though not so well defined as in the other example, from Padre Island, Texas, which is considerably darker and has the markings very conspicuous. The Florida specimen is not in very good condition, but the Texas one has the lateral plates of the apical, furcate ventral segment armed with numerous hairs amongst which there are several long bristles. The arista in both specimens is subequal in length to the third antennal joint. Length 3-4 mm.

***Phyllogaster littoralis*, sp. nov.**

Male and female.—Black, densely covered with whitish-gray pruinescence, which is slightly yellowish on dorsum of head and thorax. Antennæ and palpi black. Abdomen with very faintly indicated central dark stripe. Legs black, apices of femora and all of tibiæ reddish yellow. Wings clear, veins pale. Halteres yellow.

Orbital bristles moderately strong, 4-7 in number; arista pubescent, basal third much swollen, entire length about $1\frac{1}{2}$ that of third antennal joint; cheek from one-fourth to one-third the height of eye. Thorax with few setulæ; acrostichals irregularly 2-rowed. Abdomen with setulose hairs, third and fourth segments with a transverse series of bristles on middle which is stronger than the one at apex. Fore tibiæ without median bristle; mid tibiæ with 2 on posterior surface; hind tibiæ with 2-3 antero-dorsal, 2 antero-ventral, and 1 postero-dorsal. Third vein usually with a few weak, widely-placed bristles on under surface proximad of the inner cross-vein.

Length 3.5-5 mm.

Type locality, Grand Tower, Ill., July 12, 1909, on willow on bank of Mississippi River. Paratypes, Waukegan, Ill., August 23, 1906, on shore of Lake Michigan; Algonquin, Ill., July 10, 1895; South Haven, Michigan; July 14, 1914, on shore of Lake Michigan.

A NEW SPECIES OF SOMATOCHLORA (ODONATA) WITH
NOTES ON THE CINGULATA GROUP.

BY CLARENCE HAMILTON KENNEDY,
CORNELL UNIVERSITY, ITHACA, N. Y.

While gathering material during the past year for a list of western dragonflies, the writer has had the privilege of examining these insects in nearly all the large collections of the United States. Particular attention was paid to the genus *Somatochlora* because of the meagre data heretofore published on these rare insects. Much difficulty was experienced in finding enough material in any one collection to make adequate comparisons of related species.

The writer wishes to thank Dr. Holland and Mr. Hugo Kahl, of the Carnegie Museum, for the privilege of using the specimen in the Carnegie Museum collection as a type.

Dr. Walker has promised to monograph this genus. It certainly needs thorough overhauling by someone who can assemble all the material for careful comparison. The identity of many of the females is a matter of conjecture.

***Somatochlora walkeri* n. sp.**

Holotype.—Male, collected on the Kuskokwin River, Alaska, by A. Stecker, and now in the Carnegie Museum of Pittsburgh, Pa.

Allotype.—Female, a broken specimen in the collection of the Museum of Comparative Zoology. It is a part of the Hagen collection and is labeled "Epith. septentrionalis ♀ Hag. Saskat. Scudder, F. C. Gray's Fund." Segments 4 and 5 are missing, which give it the small size of *septentrionalis*.

Near *hudsonica*, but colour very dark and appendages different. More remotely related to *septentrionalis*, *albicincta* and *cingulata*.

Length of abdomen, male (exclusive of appendages) 32 mm., length of appendages 3 m.; female with abdominal segments 4 and 5 missing, but the abdomen without appendages is probably about 34 mm. Length of hind wing, male, 33; female 29 mm.

Male.—Colour: labium yellow, labrum black, anteclypeus creamy, postclypeus black. Frons black with metallic greenish

reflections, a brownish creamy spot on each side. Vertex and occiput almost black, rear of head black. See Pl. XIII, fig. 9.

Prothorax hidden by the heavy, white pile on the rear of the head and on the mesothorax.

Mesothorax and metathorax metallic green with coppery reflections on the lower end of the mesepisternum and the infraepisterna. Coxæ and all legs black. A suggestion of creamy along the alar edge of the mesepisternum. An obscure, narrowly elliptical, yellow spot on the posterior edge of the mesepimeron above the metathoracic spiracle. Entire thorax covered with long, creamy pile. Wings hyaline. Pterostigmata pale brown.

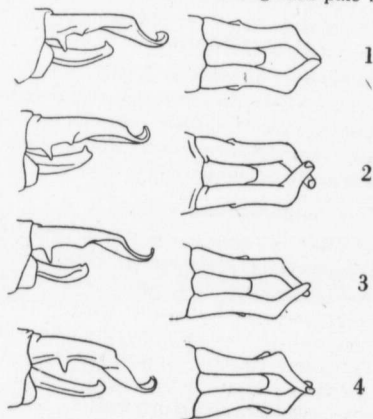


Fig. 10.—*Somatochlora septentrionalis*.

1. Appendages of male, Somer (Coll.), Labrador, M. C. Z.
2. Appendages of male, Grand Lake, Nfd., Williamson.
3. Appendages of male, Winthern (Coll.), Labrador, M.C.Z.
4. Appendages of male, Hudson's Bay, Carnegie Mus.

Abdomen with segments 1-3 and 10 black with metallic green reflections, segments 4-9 pure black except the intersegmental membranes 2-3 and 9-10, and the triangular yellow spot on the lower anterior edge of segment 3.

Structure.—This is a short, heavy species. Occiput large, reaching half way to the vertex. Lateral keel on segments 4-8.

Genital lobes small. Appendages 2-2½ times as long as segment 10. See Pl. XIII, figs. 10, 11. Viewed from above, cylindrical, arching slightly entad, the flat tips, which are half the length of the cylindrical bases, bent sharply entad at almost 90 degrees, then curving caudad with their apices bent dorsad and cephalad. Viewed laterally the externo-inferior surface of the appendage is a longitudinal groove whose external edge has a blunt tooth at its extreme base and the inferior or ental edge has a similar basal tooth, but this just caudad of the tooth on the external edge of the groove. Viewed laterally the apical third or the flat tip bends abruptly ventrad, then curves caudad, dorsad and finally cephalad. Inferior appendage about half the length of the superiors. Viewed ventrally it is triangular with its base more than half as wide as the appendage is long.

Female.—Colour as in the male but the prothorax with the posterior lobe yellow. Anterior coxa yellow on the outer or posterior side. Femora of anterior and middle legs brown on their basal two-thirds. Front wings with a tinge of dusky in the subcostal space to the first cross-vein. Hind wings tinged along the costal edge to beyond the arculus, also the first three basal cells posterior to the median dusky. Pterostigmata brown.

Abdomen with a pale area on the side of segment 1 and three pale areas on the side of segment 2, the dorsal one of the three being circular and twice the diameter of either lower spot. A large, circular, basal spot on the side of segment 3. (Segments 4 and 5 missing). Obscure, minute, lateral spots on segments 6 and 7. Articulatory membrane between segments 2 and 3 white, between segments 7-8, 8-9 and 9-10 pale.

Vulvar lamina scoop-shaped, reaching to the middle of segment 10. It is more heavily chitinized than in the type female of *hudsonica*. The sternum of segment 9 reaches barely to the middle of segment 10. Appendages lacking.

This species has been confused with *hudsonica*. Figs. 5-8 are from the types of *hudsonica* in the Mus. of Comp. Zool. Dr. Walker has this true *hudsonica*, collected by Mr. Whitehouse at Red Deer, Alberta.*

*F. C. Whitehouse, Odonata of the Red Deer District. Can. Ent., XLIX, p. 100, Mar., 1917.

De Selys' description (Bull. Acad. Belg. (2) XXI, p. 301) agrees with the M. C. Z. types of *hudsonica*. Martin's figure 28 (Cordulines, Coll. Selys page, 27) is not the true *hudsonica* but this species *walkeri*, which is probably figured from a specimen in the Selys' collection mislabeled *hudsonica*. *Walkeri* differs from *hudsonica* in the superior appendages being closer together; in lateral view, in that the tip is directed ventrad, while in *hudsonica* it is directed caudad. In *walkeri* the two basal teeth almost overlap in lateral view. In *hudsonica*, they are apart the width of either tooth.

In coloration *walkeri* is very dark, but in a large series of *semicircularis* (Kennedy, Proc. U. S. N. M., 46, p. 111,) and in a large series of *albicincta* in the Carnegie Museum there is much variation in colour.

This species has *hudsonica* as its nearest relative. For this reason I have associated with this male the female found in the M. C. Z. collection which is most like the type female of *hudsonica* but seems to be specifically distinct. The female differs from the *hudsonica* female in darker coloration (as does the male) and in the shorter sternum of segment 9. The only other females with which these might be confused are those of the *forcipata* group, but in none of these does the vulvar lamina exceed segment 9 in length.

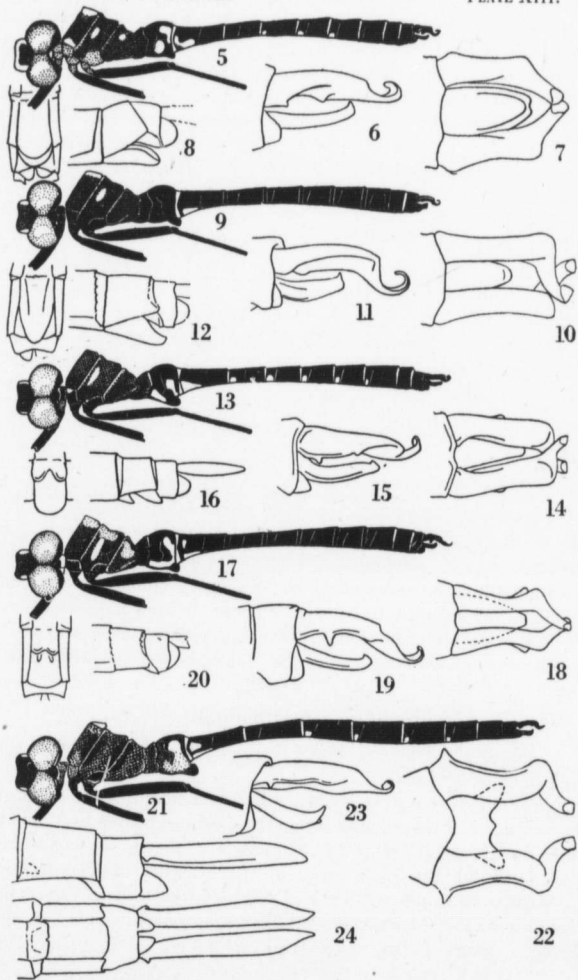
I take pleasure in naming this species for Dr. E. M. Walker, who has done so much work on our northern Odonate fauna.

***Somatochlora hudsonica* (Hagen).**

This species resembles *albicincta*, but is readily distinguished by the greater width between the bases of the superior appendages of the male. Until Mr. Whitehouse took this species at Red Deer, Alberta, last summer, the only specimens in this country were the types in the Museum of Comparative Zoology. The types are 2 ♂'s and ♀, from Ft. Resolution, Hudson Bay Ter., Kennicott, 1861. See figs. 5-8.

***Somatochlora albicincta* (Burmeister)**

Excepting possibly *semicircularis* this is the most common species in collections. The finest series is that in the Carnegie Museum from Mt. Ranier, Washington, collected by Jennings.



SOMATOCHLORA WALKERI, N.SP., AND ALLIES.

The less robust form which Scudder described as *eremita* appears in collections. The types of *eremita* are 3♂'s and ♀, Hermit Lake, New Hampshire, now in the collection of the Boston Society of Natural History. A ♂ and ♀ *eremita* are in Dr. Calvert's collection from the type locality. The writer has a male of this form collected by Dr. Walker at Banff. *Albicincta* and *eremita*

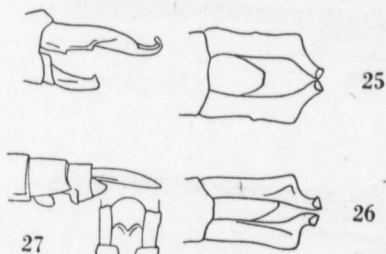


Fig. 11.—*Somatochlora albicincta*.

25. Appendages of male, type of "*eremita*" in Bost. Soc. of Nat. Hist., Hermit Lake, New Hampshire.
 26. Appendages of male in Dr. Calvert's Coll., Hermit Lake, New Hampshire.
 27. Segments 9 and 10 of female in Dr. Calvert's Coll., Hermit Lake, New Hampshire.

undoubtedly intergrade. Figs. 25-27 show specimens from Hermit Lake, fig. 25 being from the type. The male from Banff resembles fig. 26. See also figs. 13-16. The types themselves are nearer to the typical *albicincta* than the Banff or Dr. Calvert's specimens.

Somatochlora septentrionalis (Hagen).

This is the smallest species in the genus, the abdomen being but 31 mm. in length.

A male of this from Hudson's Bay was found in the Carnegie Museum. It was so different from the specimen figured by Williamson (Ent. News, XVII, p. 138, as *hudsonica*) that it was considered new until the two male types in the Museum of Comparative Zoology were examined, when it was found that these type males were intermediate between the Williamson male and this Carnegie Museum male.

Text fig. 10, 1-8 show the variation in the appendages of the four known males of this rare species.

This is evidently a very northern species as the known specimens are from Newfoundland, Labrador and Hudson's Bay. The vulvar lamina of the type female in the M. C. Z. is similar to that of the *albicincta* female but not as deeply notched, being less than a third the length of the lamina. The female can be distinguished by her very small size, for the abdomen of this type is but 30 mm. in length.

The following specimens are in American collections. ♂, Grand Lake, Newfoundland; ♀, Bay of Islands, Newfoundland, in collection of Williamson; ♂, Stag Island, Rupert Bay, Hudson's Bay, in Carnegie Museum; ♂, type, Labrador; ♂, Labrador; ♀, type, Labrador, in the Museum of Comparative Zoology. See also figs. 17-20.

***Somatochlora cingulata* (Selys).**

This is the largest and finest of all the American *Somatochlores*. It is interesting in that in her great robustness the female develops tubercles at the base of her appendages similar in position to those on the male. What is probably a similar assumption of male characters by robust females occurs in another species of *Somatochlora* not in this *cingulata* group. In a letter to Dr. Walker I suggested it might be due to a great abundance of food, while Dr. Walker had data that would indicate it to be due to climatic differences.

Besides a male, and I think a female, in the M. C. Z. collection, whose labels I neglected to copy, the following specimens occur in the collections I have had the privilege of studying. ♂, Bay of Islands, Newfoundland, and ♀, Grand Lake, Newfoundland, in Mr. Williamson's collection. ♂ and ♀, St. Ignace Isl., Lake Superior, and a ♀, from Orient Bay, Lake Nipigon, Ontario, in the Carnegie Museum. See figs. 21-24.

EXPLANATION OF PLATE XIII.

Figs. 5-8. *Somatochlora hudsonica*, male and female types, M. C. Z. Ft. Resolution, Mackenzie, Kennicott, 1861.

Figs. 9-12. *Somatochlora walkeri*, male type, Carnegie Mus., Kuskokwin Riv., Alaska; female type, Saskat., in M. C. Z.

Figs. 13-16. *Somatochlora albicincta*, male and female, coll. Williamson; male, Bay of Islands, Nfd.; female, Kadiak Isl., Alaska.

Figs. 17-20. *Somatochlora septentrionalis*, male, Carnegie Mus., Stag Isl., Rupert Bay (Hudson's Bay); female type, Winthem (Coll.), Labrador, in M. C. Z.

Figs. 21-24. *Somatochlora cingulata*, male and female, Carnegie Mus., St. Ignace Isl., Lake Superior. In copula.

ON SOME NEW OR NOTEWORTHY COLEOPTERA FROM THE WEST COAST OF FLORIDA.—II.

BY W. S. BLATCHLEY, INDIANAPOLIS, INDIANA.

During the winter and early spring months of 1916-'17 a number of interesting species of Coleoptera were taken in the vicinity of Dunedin, Florida, some of them on Hog Island, others about the lakes and hammocks north and east of the town. Some of these species are evidently undescribed; others are worthy of note on account of their having been hitherto taken at only one or two localities in Florida. Among the undescribed forms taken during the winter is a Staphylinid secured while on a visit to Gainesville. While not found near the coast it is included among the others noted in this second paper bearing the above title.

Biocrypta magnolia, sp. nov.

Elongate, subfusiform, feebly convex. Dark reddish or chestnut-brown, the antennæ and legs paler. Head subquadrate, as wide as elytra, strongly narrowed in front of eyes, vertex coarsely and sparsely punctate; basal joint of antennæ as long as the next four united, third slightly longer than second, which is equal to fourth. Thorax one-third longer than wide, apex as wide as base, sides almost parallel, angles rounded; disc highly polished and with an irregular row of rather coarse punctures each side of middle, and numerous scattered ones between these and the margins. Elytra as long as and slightly wider than thorax, about one-fourth longer than wide, sides parallel, disc coarsely, closely, shallowly and somewhat rugosely punctate. Abdomen but slightly

narrower than elytra, minutely and sparsely punctate, its surface as well as that of head and elytra sparsely clothed with very fine, prostrate hairs; under surface finely and sparsely punctate, the punctures bearing coarse, semi-erect hairs. Male with sixth or last ventral deeply and acutely notched, the third more or less prolonged backward in a lobe. Female with sixth ventral unmodified, the third with an obtuse perforated tubercle near its front margin. Length 7-7.5 mm.

Described from six males and one female taken February 7 beneath the loose bark of a large magnolia log on the grounds of the State University at Gainesville, Fla. Three of the males have the lobe of third ventral but feebly developed, while in the others it is prolonged backward beyond the middle of fifth segment. The genus *Biocrypta*, founded by Casey* upon LeConte's *Cryptobium prospiciens*, differs from its nearest allies in the absence of a pleural fold near the side margin of elytra, in the head being distinctly narrowed in front and by the males having the sixth ventral notched at apex, the third at the same time being lobed as described above. *B. prospiciens* Lec., which occurs in Texas and Arizona, is the only other known North American species of the genus. From it *B. magnolia* differs in colour and in its wider head and smaller eyes, as well as in the different form and coarser sculpture of its thorax.

Medonella minuta Casey.

Three specimens of this pretty little Pæderid were taken December 22 from beneath logs and chunks partly buried in the sand, just above the reach of high tide along the beach of the bay at Dunedin. It was described from Biscayne Bay, and is not recorded elsewhere.

Zagloba bicolor Casey

A dozen specimens of this bristly little Coccinellid were swept January 29, from the low sea-blite, *Batis maritima* L., which grows in partially overflowed tracts on Hog Island, opposite Dunedin. The beetle was described from Palm Beach, Fla., in 1899,** and has not since been recorded.

*Trans. Acad. Sci. St. Louis, XV, 1905, 25.

**Journ. N. Y. Entom. Soc., VII, 114.

***Ischyryus tripunctatus*, sp. nov.**

Form and size of the well-known *I. 4-punctatus* Oliv., from which it differs in sculpture and colour as follows: Head much more coarsely punctate and with a reddish-yellow spot each side between the eyes; thorax less coarsely punctate than head, but more so than in *4-punctatus* and with three instead of four round, black spots, the median one twice the size of the lateral ones, the latter more distant from the margin than in *4-punctatus*. Elytra more distinctly alutaceous and with fine, scattered punctures along the intervals; the common scutellar black spot larger and more evenly quadrate, separated by a narrow, yellow cross-bar from a black space which extends three-fourths to apex and which is partially broken by a yellow line extending backward to apical third along the fifth interval; apex yellow, the oblong, black, sub-apical spots of *4-punctatus* lacking. Length 7 mm.

Described from a single specimen taken near Dunedin, February 8, from between the leaves of a large air plant, *Tillandsia utriculata* L.

***Soronia brunnescens*, sp. nov.**

Elongate-oval, feebly convex. Uniform pale reddish-brown, the legs but slightly paler. Head finely and sparsely punctate, broadly impressed between the eyes, which are prominent and coarsely granulated; antennal grooves almost straight. Thorax two-thirds wider than long, apex broadly and shallowly emarginate; sides broadly and regularly curved, the hind angles obtuse; disc very finely, sparsely and evenly punctate, the margins moderately explanate and feebly recurved. Elytra slightly wider at base than thorax at middle, their margins more widely explanate, sides broadly curved from base to the rounded apex; disc glabrous, without trace of costæ, punctate like the thorax. Abdomen minutely pubescent, finely and densely punctate. Length 3.5 mm.

Described from three specimens taken at porch light at Dunedin, June 10. From the other members of the genus, which are easily known by the presence of a frontal lobe which projects over the basal joints of the antennæ, *brunnescens* is distinguished by its uniform pale colour, smaller size and lack of elytral costæ.

Arhipis lanieri Guer.

A single dead specimen of this rare Elaterid was taken in a fungus beneath the bark of a dead water-oak on December 1st. Its first and probably the only other record from the United States was by Schwarz*, who found a large colony of the adults in the branch of an undetermined tree at Cocconut Grove, Florida. He has also beaten it from branches at Cayamas, Cuba.

Chrysobothris chrysoela Ill.

This very handsome little Buprestid is mentioned by Schwarz as being "very rare" at Haulover, Enterprise and Lake Ashby, Fla. A half dozen or more specimens have been taken near Dunedin by beating the wax myrtle, *Myrica cerifera* L., in November and March. It has also been taken by me at Ft. Myers, Sanibel Island and Lake Istokpoga, and is probably more widely distributed than the records would indicate.

Melanophila notata Lap. & Gor.

Single examples of this rather rare species were taken at Dunedin and Ormond on June 5 and April 6, on the former date at light. It is recorded from Georgia and Florida, and a specimen was taken in an Indianapolis street car on June 22—perhaps an involuntary import by some passenger.

Hypotrachia spissipes Lec.

A single example at porch light on June 5. This species was described from Florida by LeConte in 1862,** but I can find no further mention of it in any Florida list, Schwarz giving only the name as recorded from Florida, but the species not collected by him.

Polyphylla gracilis Horn.

Three specimens have been beaten from young pine trees near Dunedin, between March 27 and April 10. It was described from "near Jacksonville, Fla."

Chlorophorus annularis Fab.

A single example of this East Indian species, known hitherto from India, Java, Borneo and Sumatra, was taken at porch light at my residence in Dunedin by my son on June 10, 1915. It was determined for me by A. J. Mutchler of the American Museum of Natural History, and was shown by him at the meeting of the New York Entomological Society on November 21, 1916.

*Proc. Ent. Soc. Wash., Vol. 2, p. 39.

**Smithsonian Misc. Coll., III, 137.

***Neoclytus simplarius*, sp. nov.**

Elongate, slender, subcylindrical. Pale reddish brown, the apical third or more of elytra fuscous-brown; elytra each with a narrow, oblique bar of white pubescence at basal fourth, and a similar but wider bar of longer white hairs at apical third, both of these bars extending over to the sides of the under surface. Head coarsely, densely, rugosely punctate. Thorax subcylindrical, nearly twice as long as wide, its sides just visibly curved from apex to basal third, then suddenly strongly narrowed into the neck-like base; disc rather finely, very densely rugosely punctate, the median line with five very small, transverse tubercles. Elytra at base slightly wider than middle of thorax, then feebly narrowed and subparallel almost to apex, the tips separately obtusely angulate; disc minutely, evenly and very densely granulate-punctate, the granules covered with a very fine, velvety pubescence. Middle and hind femora armed at apex with two minute flat spurs. Length 4-8 mm.

Described from two specimens, beaten from *Ampelopsis arborea* L. at Dunedin, March 29-April 3, and two cotypes in the collection of Chas. W. Leng, taken at Enterprise, Florida, on November 10, from *Quercus nigra*. The transverse ridges or tubercles of the median line of thorax in the Dunedin types are so small as to be easily overlooked, and the species, therefore, taken for a *Clytanthus*, but in one of the Enterprise specimens they are larger and there are two additional tubercles on each side. The species resembles *Clytanthus albofasciatus* Lap. closely in form, size and general colour, but differs widely in the shape and sculpture of thorax and in the arrangement of the pubescent pale bars of elytra.

(To be continued.)

THE INSECT COLLECTIONS OF CANADA.

COLLECTION OF MACRO-LEPIDOPTERA, OWNED BY
F. H. WOLLEY DOD, MIDNAPORE, ALTA.

BY F. H. WOLLEY DOD.

The collection consists of about twenty-five to thirty thousand specimens. Of these, about three or four thousand are British, with a few other European and some Asiatic examples. These, with

very few exceptions, are kept together in one cabinet. The bulk of the British collection was formed during the owner's schoolboy days, over twenty years ago. Special attention has always been given to the Lepidoptera of Alberta, and allied species have been acquired from time to time from other parts of the continent in order to get a better understanding of local forms. But a chief specialty has now long been made of the Noctuidæ of North America, which comprise by far the greater portion of the collection. Very many of these have been obtained by purchase or exchange.

The room in which the collection is kept is comparatively large and very well lighted. The presence of a good light is most desirable for making critical studies, the absence of it giving rise to false conceptions. The collection itself is contained partly in cabinets, and partly in wooden store boxes. The drawers of the largest cabinets measure about eighteen inches wide, and about twenty-four from front to back. Such a large size has many advantages, especially for long series, but has been found rather unwieldy and awkward in practice. About seventeen or eighteen inches square seems more generally serviceable. About half the boxes are twelve inches by twenty, and double-sided; that is, each box contains usable space of twenty-three by nearly nineteen inches. These have considerable advantages over large cabinet drawers by reason of their lightness, though flat drawers, if not too heavy are actually safer. The smallest boxes are ten inches square and single-sided.

The paper, or occasionally the bare cork, as well as the sides of the cases, are first covered with a paint consisting of oxide of zinc and gelatine, applied hot. This, besides being an excellent way of renovating a stained or dirty box, increases the whiteness of even the best new paper, and greatly improves the light.

The greater part of the Noctuidæ were recently re-arranged, Sir George Hampson's generic names being used, with occasional slight alterations in the sequence for greater convenience and economy of box room. But the order of species in many of the genera is more in accordance with the owner's own conception of relationship. Hampson's specific names have also been used, with certain changes deemed necessary. The specimens are in double rows, males being placed on the left of a column, and females on

the right, whenever the sexes are fairly well divided or where economy of space is not important. But when one sex largely predominates, especially in long series, or where space is scarce, supers of the long sex are pinned to the inside of the centre of the wrong row. For instance, in a series of twenty-five males and six females, about five of the males might be pinned just sufficiently to the left of the centre of the female row to attract attention to the fact that they were not females. This still leaves room for the subsequent insertion of a few of either sex without lengthening the column. It has been usual to arrange a species in groups by localities, the sex arrangement being adhered to. In the case of a long series from one locality, some scheme of more or less continuous variation is often followed, say from light to dark, those of opposite sexes which most closely resemble one another being kept side by side. It may be observed that such an arrangement leaves frequent blanks in one or other of the rows, giving a very asymmetrical appearance, and in fact is not a paragon of neatness. But the collection is intended essentially for study, and though neatness is aimed at in most departures, utility and instructiveness are primarily considered. Some of the smallest species are arranged three or four rows in a column instead of two. In some of the cabinets the columns are divided by narrow strips of red paper pinned on, but others, and all the boxes, are merely ruled in ordinary lead pencil. Throughout the Noctuidæ spaces have been left for all known species, and every space has a name label. The size of the spaces varies according to the probability of acquisition in the near future, and also, unfortunately, in some genera especially, to the space available, and the length of the series already possessed. The size of spaces left for extension of series is regulated for the most part by the degree of variation. Though some cases have far more blanks than specimens, as a matter of fact the collection as a whole is much more crowded than was at first intended, and there is occasionally little or no room for extension. The columns also are too close together. All cases are, of course, kept well supplied with naphthaline.

As very close attention is paid to variation, long series of the more variable species are kept, there being in one or two instances as many as two hundred and fifty, and that number is considered far

from adequate. The species name is placed at the bottom of each column as well as at the end of the series or of the space left for extension. Each label has the name in brackets except the last of these. Reference has sometimes to be given to a continuation of a series in some extra box not in the sequence. Series consist of specimens picked to show the variation as much as possible. It has always been the custom, at the end of a season's collecting, to carefully examine all the new material in each species taken, and to pick out examples showing modifications not yet in the series, and relax, set and install them. Owing to lack of time in the summer very few things are set fresh. Unfortunately there are as yet very few early stages represented. Each drawer or box has an outside label on the front, on which they are numbered consecutively, with the names of all the genera contained therein, and when a genus is not all in one case, with some indication of the included species or group. Extreme accuracy of data is attempted.

The locality of personally or locally collected specimens is, as a rule, indicated by means of two labels on the transfixing pin. The uppermost of these gives the general locality and province, exact date when possible, and collector's name, though it has been a general custom to put the owner's name to all material collected by one or two constant assistants in the immediate district. This practice was to save extra trouble, but is not strictly in accordance with principles. A smaller label beneath this gives the more exact locality. Method of capture is occasionally indicated. Bred specimens are so marked, with "ex larva" or other stage, and food plant. Pairs taken *in copula* bear identifying labels. Specimens acquired from outside sources were formerly marked with collector's name and from whom received, and date of receipt. Latterly all such material has been given a small label bearing the year of acquisition, and a number, corresponding to similar numbers in an "Acquisition" book, in which full details of the receipt are noted. For instance, "13-16" on a small, separate label beneath the locality label refers to a note in the book under the year 1913, and Acquisition No. 16. This note gives details of the transaction, whether purchased, exchanged, donated, etc., date of receipt, number and class of specimens,

from whom received, general condition, and other details worth recording. The first lot received in the following year bear reference label "14-1." This system is in use in many museums, notably at Washington and in British Museum, and has many advantages to commend it.

The collection contains very few actual types, probably not more than a dozen, and fewer than a hundred co-types. But the next in value to types, and frequently, be it said, of far greater value than co-types, are specimens personally compared with types, co-types, with other important specimens, and with figures and descriptions. These specimens all bear extra explanatory labels, such as "Xd male type* at Rutgers College," with brief indication as to its concise points of difference, or "=beta female type at Brooklyn, exactly," or "*Alpha delta*, agrees with fig. of type," etc., etc. Specimens submitted to experts are similarly labeled, (in red ink) with reference to filed correspondence in corroboration. Specimens of which figures have been published are also marked. Some specimens have been compared with two or more types, and synonymic references thereby made or confirmed.

In addition to the above "authenticity" pin-labels, small card labels are placed at the side of these specimens so that they may be found quickly. These are more brief, and the most important ones are on tinted card, to catch the eye. For instance, a small, red-tinted label beside a specimen in the series of *Euxoa catenula* Grt., "Xd type, and *contagionis* Smith Xd type," would indicate the one by comparison of which with both types the reference of *contagionis* to *catenula* had been made. Varieties are not often separated or indicated as such, but merely by a similar side label bearing the name under which the form was described, whether actually compared or not; e. g., under *Monima hibisci* (*Tæniocampa alia* of our lists) would be a large species name-label, "*hibisci* Gn.," at the foot of each column, and each one bracketed except the last. At the side of one specimen might be a small label "*quinquefasciata* Sm.," which is considered a variation. In this particular case an "Xd type" or "Xd description" specimen is probably referred to, though a specimen thus indicated

*The author uses a private symbol ♂, enclosed in a circle, to indicate male type, and ♀, enclosed in a circle, for female type.

does not always bear an authenticity label. Against another might be "*latirena* Dod" indicating one of a geographical race, and another "*malora* Smith." The status of such names, and of others, as decided upon by the owner, is explained in note-books and a card index. A brief note is sometimes placed at the bottom of a series, perhaps referring for comparison to some other species and box. Points for future investigation are thus kept in mind.

By no means the least valuable accessory to the collection is a series of MSS books containing critical notes. All those concerning North American species are indexed in a Smith's 1903 Check List, species described since its publication being entered at intervals. That was the system primarily adopted, and still adhered to, though the notes are now also indexed on a card index referred to below. They consist largely of records of impressions gained from inspection and studies of sundry other collections, and include notes on all types seen, as well as details concerning comparisons made with them, and any other facts about collections or specimens examined deemed worthy of note. There are a large number of entries concerning careful comparisons of Hampson's published figures with the types or other specimens from which they were taken, detailing any discrepancies in reproduction. A considerable quantity of discovered synonymy, and corrections of errors in identification by other authors are therein noted, which have not yet been published. Nearly all except the earliest notes bear dates of origin, and the same applies to those on the pin-labels. Needless to say, of several notes taken of the same type on different occasions, where inconsistencies appear, those of the later dates carry most weight, being the result of a closer acquaintance and better knowledge. These MSS books are primarily for the author's own guidance and instruction, and, it must be confessed, are scarcely a model of calligraphy.

Another very useful accessory is a Card Index, containing between four and five thousand cards, dealing almost exclusively with Noctuidæ. A card is allowed for each specific or varietal name ever published of North American species included in Hampson's catalogue from vols. IV to XIII. On the cards are entered:

The name and its author, at the top.

Reference to original description and date.

Reference to the more important publications such as Hampson's and Smith's catalogues, monographs, and to figures, stating in each case the genus to which the name has been variously referred, and dates of the publications.

Important synonymic references.

At the bottom of the card, if the name stands as the prior one for a species, all the later names are given, with authors and dates, numbered in order of priority, those that stand for recognizable variations being so indicated. Or, if a synonym or variety, the first name only of the species is referred to, e. g., "*=alpha* Sm., 1891" or "*=var. of alpha* Sm., 1891," the authority for such references being elsewhere given on the card. Since, as before mentioned, each synonym or variety has a card to itself, a few species have twenty or more cards. A certain European Tortrix would require nearly seventy, allowing only one for each name. When space fails, another card has to be added, and the fact indicated at the top of each. At the top corners of the card are given:

Reference to the page in note-books where the form is dealt with.

Reference to the number of the slide on which genitalia have been mounted.

Reference, when thought desirable, to the drawer or box containing the species in the collection.

On the reverse side of the card is given the sex, locality and present location of each known type and co-type, together with the number, sexes, and localities mentioned in the original description.

A great deal of time has been spent in preparing this index, which has obviated more congenial work, but it has proved to be of the highest value and utility, as entire knowledge of literature and personal study of any name can be discovered in a moment, with little trusted to memory alone.

There is also a full MSS list of the N. American Noctuidæ, in Hampson's order and names, but revised to correspond with the arrangement in the collection. The recent synonymy only is given, original or otherwise, and all names which are considered to refer to recognizable varieties are entered as such. This list is

marked off according to box numbers, so that immediate reference can easily be made directly to any series.

A beginning has been made of the study of genitalia, and about six or eight hundred most excellent mounts have so far been prepared by Mr. W. H. T. Tams. Where material and time have permitted, several mounts of a species have usually been prepared from one locality, and where variation has been noticed or suspected, more have been made from different localities. As many as four are sometimes put upon one slide, and each mount is numbered to correspond with one on the specimen from which it was taken. These bear the usual data, and are carefully preserved, being in many cases installed in the general collection, and their position indicated by a special symbol at the side. The slides are numbered consecutively, and a catalogue is kept of them, in which brief, critical notes are entered. This study entails the sacrifice of the abdomens of the specimens. Poor, if recognizable, specimens have been used by preference, but when such details of comparison were thought to be of extreme value, good specimens have often been used, even of rare species. It is confidently believed that the partial spoiling of a certain number of specimens is a means fully justified by the end in view, which is the ultimate better understanding of a department of entomological study about which, whilst much has been written and suggested, a very great deal yet remains to be discovered. So far as the author has at present investigated, much valuable evidence, sometimes quite unexpected, has been acquired. And though it is by no means proposed to accept all previously published notes and figures made by others on the subject as unimpeachable evidence in favour of claims made therefor, certain facts brought to light speak for themselves in such a way as to remove all doubt which may have existed as to the extreme value of the study, if carefully and intelligently followed, as an aid to the elucidation of various obscure problems of relationship.

Perhaps the most regrettable want in connection with the collection is a good library. This contains very few publications of an earlier date than 1890, and scarcely any European literature, none of the earlier authors.

The author takes great pleasure in naming North American Noctuidæ and preparing critical notes for other students, and exchanging views. The work is found to be self-instructive, as well as useful to others. All material received is studied very closely, and anything doubtful compared with series and notes. The Card Index is resorted to in this connection. Everything is always returned unless special leave is given for retention. There are a large number of duplicates for distribution, consisting for the most part of Noctuidæ, principally unset. All Macro-Lepidoptera from Alberta or vicinity are desirable, and Noctuidæ (only) of N. America or Europe, and some Asiatic. When at home the owner derives great pleasure from showing the collection to any entomological visitors who are genuinely interested.

RECORDS OF EUROPEAN MIRIDÆ OCCURRING IN
NORTH AMERICA. (HEMIPTERA, MIRIDÆ).

BY HARRY H. KNIGHT, ITHACA, NEW YORK.*

The writer desires to submit some definite data on the occurrence of certain species of Miridæ common to Europe and now known from North America. There are here recorded three species new to our fauna, and definite records are given of three others which are of particular interest. In conclusion the writer gives his findings on certain species supposed to occur and that apparently do not.

Subfamily PHYLINÆ. Tribe PHYLINI.

Microsynamma bohemani Fallen.

16 ♂ ♀, June 27, 1916, Honeoye Falls, N. Y. (H. H. Knight). ♀, June 22, 1914, Rochester Junction, N. Y.; ♂ 2 ♀'s, June 26, 1915, Honeoye Falls, N. Y. (M. D. Leonard). ♀, July 27, 1913, Callicoon, N. Y. (Wm. T. Davis). ♂, Aug. 9, Spruce Brook, Newfoundland, (Chas. Schaeffer). 7 ♂ ♀, Fort Collins, Colorado, (U. S. National Museum).

This species is apparently well distributed in the Eastern United States, having been reported before, but rather indefinitely. Mr. Van Duzee has failed to recognize it in his recent check-list of the Hemiptera, and previously in his tables to the genera of Miridæ. The writer has compared our specimens of this species

*Contribution from the Department of Entomology of Cornell University, July, 1917

with European forms of *bohemani* determined by Reuter, and finds them to be identical. At Honeoye Falls, N. Y., the species was found breeding on ornamental willows, growing in a commercial nursery. Doubtless the insect was in this case imported from Europe in the egg stage on the nursery stock. One specimen from Colorado has the hemelytra entirely pale, but the form of the insect is distinctive.

Subfamily ORTHOTYLINÆ. Tribe HALTICINI.

Orthocephalus mutabilis Fallen.

Specimens of this species were taken by Mr. C. W. Woods, July 2, 1913, Orono, Maine. Mr. Woods reports finding the species on wild daisies and only in one field. The writer has compared two male specimens with European representatives of *O. mutabilis* determined by Reuter, and finds them identical in structure of the genital claspers as well as colour. *O. mutabilis* Fallen is easily distinguished from *O. saltator* Hahn by the pale or yellowish inner half of the clavus and the black tibiae. The writer has not seen a specimen of *saltator* collected from North America. Provancher (1886) records *O. saltator* from Canada, and his description fits that species very well. Mr. Van Duzee (Can. Ent., 44: 322), in reviewing the Provancher collection of Hemiptera, states: "136. *Orthocephalus saltator* Hahn. A Capsid new to me but certainly not the European *saltator* Hahn." If *O. saltator* Hahn has been taken in North America the writer would appreciate having the matter brought to his attention. Mr. Van Duzee in his recent tables to the genera of Miridæ left out the genus *Orthocephalus* for want of material from this continent.

Halticus apterus Linnaeus.

The writer has seen only one specimen of this species taken in North America, and that was received from Mr. H. M. Parshley who will shortly publish the record from the New England States. This specimen was compared with European material at the U. S. National Museum and found to be identical.

Halticus citri Ashmead, which is our most common species, has in the past frequently been labeled *apterus*. It appears under

three names in the Uhler collection and in the U. S. National Museum collection. *Halticus apterus* is easily recognized by the large, robust, convex form, the black and very shining dorsum without the golden scale-like pubescence.

Subfamily ORTHOTYLINÆ. Tribe ORTHOTYLINI.

Cyrtorrhinus caricis Fallen.

12 ♂ ♀, Sept. 10-17, Rockaway Beach, Long Island, N.Y. (H. Ruckes). ♂ 2 ♀'s, Sept. 5-10, Sea Cliff, N. Y. (Nathan Banks). ♀, Sept. 30, Lakehurst, New Jersey, (H. G. Barber).

This species adds another to our fauna of those well known in Europe. In the past Uhler had placed his *Orthotylus marginatus* as a *Cyrtorrhinus*, but to date no species from this country has been allowed to remain in that genus. The writer has worked over all the literature on *Cyrtorrhinus caricis* Fallen and finds the material here recorded agrees with that species in every respect. The small size, rounded black head with two pale spots on the vertex, black thorax and scutellum, pale legs, clavus and inner half of the corium fuscous with the embolium and outer half of corium pale greenish, will serve to distinguish the species at once.

Saunders (British Heteroptera, p. 283) records the species from "amongst rushes," and judging from the Long Island locality records the species will probably be found breeding on *Carex* or other plants in the Cyperaceæ.

Heterotoma merioptera Scopoli.

♀, Aug. 5, 1915, Honeoye Falls, New York, (M. D. Leonard). This interesting addition to our fauna was taken by Mr. Leonard on the land of one of the large importing nursery firms situated at Honeoye Falls, N. Y. It has doubtless been introduced in the nursery stock shipments or in the packing that comes around the stock. In this way we have got and will probably continue to import insects that deposit their eggs in the stems of various plants.

Saunders (British Heteroptera, p. 295) gives a good account of the species which is easily recognized by the rugose character of the membrane and the inflated second antennal segment. The writer has compared the above specimen with forms from Spain and England and finds it to be identical.

Subfamily MIRINÆ. Tribe MYRMECORINI.

Pithanus maerkelii Herrick-Schaeffer.

This interesting Mirid was first reported from the United States by Mr. C. E. Olsen (Bull. Brooklyn Ent. Soc., 10 : 34) who took specimens on Long Island, N. Y. A specimen was taken next at White Plains, N. Y., by Mr. Torre Bueno, and during the past year the writer received a specimen from Mr. H. M. Parshley, collected at Eastport, Maine, by Mr. C. W. Johnson.

The writer took ♂, 11 ♀'s, June 27, 1916, at Honeoye Falls, N. Y., and other specimens were taken at the same time by Mr. Wm. T. Davis who was present on the trip. The species was swept from grasses growing along the edge of land set to nursery stock, and thus may have been imported locally at that place. The writer took one female specimen which had fully developed wings, and this form is, according to Saunders (British Heteroptera, p. 219), "very rare."

Species of Doubtful occurrence in North America.

The writer has recently completed a revision of the genus *Lygus*, and during the course of researches on the material from North America came to the conclusion that the records of *Lygus contaminatus* Fallen, *Lygus lucorum* Meyer, and *Lygus viridis* Fallen, have been cited in error. In the case of *Lygus viridis* Reuter (1909), the writer was able to study one of the specimens and finds it to be different from the European *viridis* Fallen: having structural points of difference which will be shown in the forthcoming paper on *Lygus*. The writer has studied European specimens of the above species which were determined by Reuter, and are now to be found in the collection of the U. S. National Museum. The records of *contaminatus* and *lucorum* have doubtless been based on certain colour forms of *Lygus apicalis* which species has a wide distribution in North America.

Neobothynotus modestus Wirtner (Ent. News, 28 : 33, 34).

The writer is unable after a careful study of the literature to find generic points of difference between *Neobothynotus* Wirtner and *Bothynotus* Fieber. Furthermore, the description of *N. modestus* Wirtner does not appear to differ from the description of *Bothynotus pilosus* Boheman, which species is well described by

Reuter (Hemip. Gym. Eur., V, p. 7) and Saunders (British Heteroptera, p. 263). The writer strongly suspects, though regretfully, that the above represents an importation of *Bothynotus pilosus* Boheman on some of the shrubbery in Col. Huff's park.

SOME NEOTROPICAL MEGACHILID BEES.

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

The specimens recorded below are in the U. S. National Museum.

Anthidium chubuti Cockerell.

Both sexes from Chubut, Patagonia (from W. F. H. Rosenberg). There is great variation in size, and the femora may show much or little black. The male, not previously known, differs by having the clypeus and space between clypeus and eyes, and mandibles except apex (which is bidentate) and extreme base pale yellow; vertex with either a complete band or a pair of spots; face with pure white hair; greater part of pleura with pure white hair, but posteriorly it is black; vertex, mesothorax and scutellum (except posteriorly) with fulvous hair; occiput and metathorax with black hair, front with sooty; marks on abdomen variable, the posterior three pairs may be reduced to spots. The large male has a small third tooth on the mandibles. *A. patagonicum* Schrottky, published about a month and a half later, is evidently the same species.

Anthidium rubripes Friese.

Male.—Mendoza, Argentina (*C. S. Reed*). The hair on head and thorax is white, not "yellowish brown," as Friese describes; but the insect otherwise agrees, and there is no other species from Mendoza like it. The species is closely allied to *A. chubuti*, but narrower and quite distinct. The male mandibles are bidentate at end, and have on inner side a large, black, triangular plate.

Hypanthidium taboganum, sp. n.

♂, (Type). Length 7-8 mm.; black and bright chrome yellow, only the tegulae, knees, scape behind (in front yellow) and base of flagellum red; head and thorax extremely densely punctured, with scanty hair, that on head and thorax above fox-red; yellow markings as follows: mandibles except apex, clypeus,

July, 1917.

dog-ear marks, band like lateral face-marks (ending in point at level of middle ocellus), entire occipital band going half-way down cheeks, small spot on tubercles, lateral and anterior margins of mesothorax (except a wide interval on anterior middle), axillæ, broad hind margin of scutellum, anterior and middle tibiæ and basitarsi; in front, elongate basal and transverse apical mark on hind tibiæ, hind basitarsi in front and spot on second tarsal joint, oblique mark at extreme sides of second abdominal segment, and all of the other segments except extreme base and translucent reddish apical margin; mesopleura with large, distinctly separated punctures; wings dilute fuliginous, apicostal region darker; first three abdominal segments finely punctured, the others with large punctures; no lateral spines; seventh segment very broadly rounded, with a median pit. The anterior femora may be red above except at base.

♀.—Similar, but clypeus black, mandibles with only a small, yellow spot, no dog-ear marks, more red hair on scutellum, yellow of legs reduced and more or less reddened, hind tibiæ black except a small basal spot, all the basitarsi black, anterior femora with a yellowish-red band on apical half; yellow bands of abdomen narrower, the fourth notched behind. Ventral scopa shining white.

Hab.—Taboga Island, Panama, June 9 and 11, 1911, (*A. Busck*); also one Feb. 19, 1912, (*A. Busck*). Related to *H. aureocinctum* and *H. panamense*, but easily separated by the yellow and black legs and absence of discal stripes on mesothorax. From the descriptions, it seems also to be somewhat allied to the *Anthidium mexicanum* and *A. agnatum* of Cresson; these species have been supposed to belong to *Dianthidium*, but the types should be examined to see if they are possibly *Hypanthidium*.

Hypanthidium melanopterum, sp. n.

♀.—Length about 8 mm.; black and chrome yellow; yellow markings as follows: lateral face-marks (consisting of a large patch on each side of antennæ, sending a narrow stripe upward along orbits), entire occipital band going a little way down cheeks, narrow anterolateral margins of mesothorax, rather narrow band bordering scutellum and axillæ, slightly broken band on first abdominal segment, small mark on each side of second, entire bands on third

to sixth, on sixth covering segment except margin; tegulae bright ferruginous; wings fuliginous; legs black, the anterior femora (except basally) and tibiae red in front; a small, red tubercle below each eye; scape yellow in front, otherwise red with a dusky shade; base of flagellum (and under side more or less) red; ventral scopa glittering white. Mesothorax densely and strongly punctured.

Hab.—Mexico (Baker collection 2154). Easily known from *H. taboganum* by the band on first abdominal segment. It is allied to *H. ecuadorium* (Friese), but easily separated by the shape of lateral face-marks, less projecting and much more narrowly margined scutellum, very coarse punctures of thorax above (especially large on scutellum), entirely black tubercles, etc.

***Stelis veraecrucis*, sp. n.**

♀.—Length about 7 mm.; black, with yellow markings as follows: clypeus except a very large semicircular area above (the yellow area thus like two mountains with a valley between), narrow lateral face-marks extending a little above level of antennae, a small, elongate spot at inner upper side of each antennal socket, a very narrow, occipital band, scutellum and axillae except anterior border, (no other yellow on thorax), and entire bands on abdominal segments 3 to 6; legs very dark reddish-brown, without markings; tegulae black; wings fuliginous, the costal region darkest, second recurrent nervure going far beyond end of second submarginal cell; abdomen partly obscure reddish beneath at base; venter with short, white hair. Antennae black, with red spot at apex of scape, and third joint red beneath; head and thorax above with excessively large, crowded punctures, on mesothorax so large that a line from anterior to posterior end traverses only about a dozen; scutellum prominent; base of metathorax with a transverse band of large pits.

Hab.—Medellin, Vera Cruz, Mexico (*H. H. Hyde*; Baker coll. 1785). For the interpretation of this Baker number see Ann. Mag. Nat. Hist., Feb. 1905, p. 201. Nearest to *S. laticincta* Cress., but very distinct by the large punctures of thorax, first two abdominal segments all black, etc. The insect has a close superficial resemblance to the two species of *Hypanthidium* described above.

BOOK NOTICE.

A Year of Costa Rican Natural History, by Amelia Smith Calvert, Sometime Fellow in Biology, Bryn Mawr College, and Phillip Powell Calvert, Professor of Zoölogy, University of Pennsylvania. The Macmillan Co., New York; The Macmillan Co. of Canada, Toronto Feb, 1917. xix+577 pp., with maps and numerous illustrations from photographs, including coloured frontispiece. Price \$3.00.

The single year (May 1, 1909 to May 10, 1910) spent by Professor and Mrs. Calvert in Costa Rica was a full one indeed, to judge by this interesting chronicle of their experiences in that remarkable land. To have gathered, in a single year, the vast quantity of information contained within its pages must have demanded great concentration of effort, both mental and physical. This information concerns not only the animals and plants of the country, in which the authors were chiefly interested, but also the climate and topography, the life and customs of the people, conditions and methods of travel, and many other matters of interest to the visitor.

As the main object of the trip was the study of the dragonflies of the country, the references to these insects are proportionately numerous, and among the more interesting discoveries in this field were the finding and rearing of the larvæ of *Mecistogaster modestus*, which breeds in the water between the leaves of epiphytic bromeliads (plants belonging to the Bromeliaceæ or Pine-apple family), the larva of Coña, which possesses lateral abdominal gills, recalling those of the mayflies and Sialids; and the habits of certain waterfall dwellers belonging to the genera *Thaumatoneura* and *Argia*. These have already been described at length by Dr. Calvert in a series of papers published in the Entomological News.

A great many other matters of interest to entomologists were brought to light, not only concerning dragonflies but numerous other groups of insects, e. g., observations on the swarming and migratory flights of butterflies and day-flying moths, the habits of leaf-cutting ants and the curious relationship between the ants found upon the Bull's Horn Thorn and their host tree, interesting cases of apparent mimicry and protective coloration, curious and striking insects of various kinds, such as the huge horn-bearing Scarabæidæ, (*Dynastes*, *Megaceros*, etc.), strange lepidopterous

larvæ, particularly the weird caterpillars of some of the Megalopygid moths; and hosts of other observations of interest to students in all branches of entomology.

Much is also told of the birds, reptiles, mammals and other animals observed, while the descriptive notes on the plants, illustrated by numerous photographs, will not only be of interest to botanists, but will be of much value in giving to the general reader a mental picture of the types of vegetation, characteristic of tropical America.

Among the most interesting chapters is the one describing the ascent of the volcano Irazu, which gives a detailed account of the volcano itself with its various craters and many notes on the plants and animals observed there; and the final chapter, dealing with the destruction of Cartago by earthquakes in the spring of 1910, just at the close of the authors' year in Costa Rica. Cartago was chosen as their headquarters, from which excursions to various parts of the country were made, the materials collected being always brought here and kept in a room in the hotel, which served as a laboratory. One of the early chapters (chap. 4) is devoted to a description of the town and its life, as it existed before the earthquake, while the last chapter, "Carthago deleta est," gives a vivid and detailed picture of this terrible event, in which the entire town was wrecked and nearly 300 people were killed, the authors themselves suffering a very narrow escape. Fortunately, although the living larvæ, which represented the rearings of many months, were nearly all killed, the preserved specimens, notes, journals and photographs were uninjured.

The book is remarkable for the extreme care and accuracy which characterize both matter and typography. The authors have not been content merely to state their own experiences, but have acquainted themselves with a large body of literature treating of the various subjects upon which they have written. One of the most useful features of the book is the copious bibliography contained in Appendices III and IV, the former giving a list of "papers based in whole or in part on the collections made by the authors in Costa Rica," the latter "a list of selected literature relating chiefly to the Natural History of Costa Rica, exclusive of that cited in Appendix III."

Mailed July 2nd, 1917.