

The Canadian Entomologist.

VOL. XLVIII.

LONDON, SEPTEMBER, 1916

No. 9

POPULAR AND PRACTICAL ENTOMOLOGY.

A VISIT TO NIAGARA GLEN.

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After nearly all July sacrificed on the altar of one's profession, three solid weeks of our all too short Canadian summer gone up in smoke and stifling city heat—weeks, too, when every self-respecting entomologist should be clinging perilously at the very top of his bent—it was indeed high time for relaxation. I hurried feverishly down to the Yonge St. wharf and boarded a Niagara boat. I had told no one where I was going, least of all myself. My preparations were stealthy and the contents of my pilgrim's srip of the most meagre. In one pocket (had you picked it) you would have found a tooth-brush, a comb, a cyanide bottle, and two clean handkerchiefs; in another a small plant-press, made of two stout cardboard covers enclosing a dozen sheets of blotting paper, and carefully tied up with a pair of brown laces, borrowed for the nonce from my Sunday boots; in a third an empty tin of Colgate's shaving-stick (serving the double purpose of a drinking cup and a receptacle for larvæ and other specimens that required preserving alive), a compass, a chisel, and a pair of forceps; while in an inner pocket (defying the Artfullest Dodger to touch)—with perhaps an occasional roguish peep abroad—bulged unabashed (or snuggled contentedly, according to your view of it) a negligé shirt, of a pattern much in vogue a decade or two ago, wrapped closely round a collapsible insect net.

It was already growing dusk when I was landed at Queenston village and reported at the quiet, old-fashioned boarding-house where my habits and hobbies being known were no longer subject to comment or disconcerting question. After making arrangements for a night or so's lodging and an early start next morning, I strolled out through the gathering dusk in the direction of the woods at the foot of Brock's monument; after turning a little way down a lane skirted by grapevines, I presently became

aware, on all sides, of tiny rustlings in the foliage, prelude to the drowsy hum and blundering flight of shard-borne beetles; a sound familiar enough, and one that should have surely set me down not more than two or three years or 100 miles away—in the school playground, say, Port Hope, at the height of the June-bug season; but there must have been something peculiar in the keynote of this symphony, for it set vibrating a far more distant chord of memory: a little tilt between the mind's deft fingers, one magic turn of the kaleidoscope we call imagination, and on the instant I found myself a schoolboy in a narrow Kentish lane between chestnut trees and hawthorns, watching at dusk for cockchafers and the occasional prize of a stagbeetle soaring out of the hedgerow. I had no net with me, and though I could tell the beetles were larger than June bugs, capture was out of the question, so I turned in for the night.

Next day I was heading towards the Heights before 6 a.m. For some time I stuck to the main road, for the dew was very heavy; but near the Monument Station I sensed unmistakably the neighborhood of a certain fungus, and following my nose like a questing hound, presently spied, by a clump of red cedar, a small colony of what I was in search of—*Ithyphallus impudicus*—"Stink-horns," to use the vulgar and all too expressive name. Two of the horns, already sinking into putrescence, were tenanted by nearly a score of silphids, dark-winged and with reddish margin on the thorax.

From here, as it was too early for the car-service, I tramped up the belt railway towards the Glen; the sides of the track showed plenty of New Jersey Tea, but it was too soon in the day for insect visitors; on some plants of purple vetch I found great numbers of "the old-fashioned Potato-beetle" (*Macrobasis unicolor*) feeding; and a couple of miles further up, when I was within a few rods of the Glen enclosure, it being after seven o'clock, with the sun hot and strong in its course, came gliding out towards me from the shrubbery that fringed the lip of the gorge, a magnificent yellow-banded snake, larger and stouter than any garter snake I had ever seen before; forward he drove with that wonderful motion that, unaided by limbs, yet rivals in grace and mastery of self-control the most perfect athlete's—rigidity and suppleness

combining to create a new and altogether unique form of energy. I stood between the tracks and watched his advance; strong enough, it looked, to overthrow quite a massive obstacle or thrust it aside, yet gently gliding about a blade of grass without bending it, or flowing like oil round the sides of a stone. Not the slightest notice of me did he take, but lay out along the sand within a foot of the rail and basked in the sun. I stepped over to that side of the track and looked down at him; first his head and neck, and then the markings on his back. There was something strange to my eye in the appearance of this garter snake; the broad zig-zag bands of yellow seemed unfamiliar; the colour itself was not the waspy straw yellow I was expecting, but darker in part, almost red-ocre, like a British hornet; I glanced at the tail: one, two, three, four, five naked joints; it was my first rattlesnake. Just then the rumble of an approaching car forced me to step from the tracks; I had no desire to be marooned for even a moment alone with a rattler on a narrow strip of cliff-edge, so I chose the other side of the right-of-way. As soon as the coast was clear, I returned to my scrutiny; the snake had not moved, though the car had lumbered by within a foot of him, out-rattling a thousand of his kind; but he was startled, probably by the vibration of the ground, and almost immediately slid back into the bushes and so (doubtless) down to the ravine. The keepers at the Glen had not seen one all the season and showed surprise, if not annoyance, that I had not killed this fellow. Snakes are none of them aggressive, but the rattler is, I believe, more than ordinarily sluggish; unless cornered or accidentally stepped upon or jostled, he is perfectly harmless, and in cold weather can be picked up and handled with impunity.

In the rich herbage beside one of the paths that led to the flight of wooden stairs I noticed numbers of little chrysomelians feeding, at least three species, two of them black with four yellow or reddish spots on the elytra (2 basal and 2 apical), one of the beetles proving *Bassareus* and the other *Cryptocephalus*; the third species was of a uniform dark-grey and quadrate in outline, apparently *Pachybrachys*.

I had now reached the Glen itself, and proceeded to hobnob for an hour or two with some old cronies among the ferns. It ap-

pears that when the Glen was Foster's Flats, it harboured a few plants of the Holly Fern (*Polystichum lonchitis*), and I had planned to hunt for this plant, first downstream away from all frequented paths, and then upstream towards the whirlpool. After three hours' unavailing search downstream, I descended towards the river bank for another spell of sunshine and entomology.

Here I came upon a thicket of undergrowth—black raspberries in profusion, a tangle of grapevines, clumps of elder, and a sprinkling of basswood. Halting beside one of these last, before wading into the thicket, I let my eye range over the foliage. Presently I saw a sight that set my heart beating, a pair of tiny longicorns basking on a leaf; it was ten years since I had seen the insect—*Eupogonius subarmatus*—and then, though I had captured the only two I saw, one on a basswood log and the other on a leaf overhead, I knew them for the wariest of their kind. Cautiously as I approached, my quarry dropped off the edge of their leaf before I could get within range. I had now little hope of success, for the insect was extremely small and the ground a miniature jungle of rank grass. I stood, however, and watched the place under the leaf very closely, devouring the ground inch by inch, and presently spied the pair resting on a flat slope of stone, and captured them both with little more ado.

Nothing else was to be seen about the lower ranks of foliage on this tree, but when I got round to the side next the sunken stretch of thicket, more basswoods appeared in the open; the raspberries and the rich drapery of sunlit green beckoned imperiously; I looked at my watch; eleven a.m. The hour was auspicious for sun worship—h-h-h-h-m, bz-z-z-z-z-zm; hullo! I thought, service is just going to begin; here comes the clerk. It was *Pelidnota punctata* settling down on a grapevine, but very lively, and, what was more to the point, quite out of reach; indeed, he only stayed long enough to clear up the mystery of the night before and then make off. Without delay I stepped down into the thicket and, with an eye focussed for small creatures on grass and leaves, proceeded to range about this tangled river-glade.

There is a peculiar charm about moving cautiously through sun-lit spaces or standing at gaze like a pointer on the still hunt for tiny game in the all but breathless glare of July heat. It

takes a trained eye to render visible the sadder-hued and more sluggish forms of all this multitudinous insect life, but it was not long before I began to realize that the wilderness of my choice, so far from being a desert, was a thronging conventicle of fellow sun-worshippers. It was, I recall, while slowly poring over the surface of a tall and stately teasle, from the heart of a neighbouring berry patch, that I spied one of the first members of this congregation. At first I took it for a large yellow-and-brown-banded hymenopter, the velvety sheen of its elytra giving the effect of shimmering wings, but under the lens of my unwavering stare it soon steadied into the form of *Bellamira scalaris*, the first I had ever seen alive; unfortunately it had not come to stay through the service, for hardly had I shaken free from some clinging ropes of thimbleberry vine, than I saw the coveted object hurry to the edge of his perch and soar away into the air, translated from my gaze like some beatific vision into the empyreal vast. Possession is nine points of the law, but of entomology it seemed just then to a beetle-fancier the one and only point worth naming in his whole avocation.

My disappointment was quite keen and lasted for a long time; even now the recollection rouses a fresh pang, as an old wound will throb anew in bad weather. But other sights and better luck (both abundant that day) soon drove all this into the background. Before I left the thicket I had captured one specimen of *Oberea bimaculata* (resting, for a wonder, on the upper side of his raspberry leaf), one specimen of *Plagionotus speciosus*, and seven specimens of *Desmocerus palliatus*, always on the under side of the foliage of elder, usually early elder, whose blossom, long over, had been replaced by clusters of crimson berries. What a magnificent insect the Knotty Cloak is! with his gleaming wing-covers of Prussian blue based with bright yellow; unfortunately, his colours fade; cabinet specimens become actually dingy in the course of years, the yellow in particular losing all its vividness.

At the edge of the thicket, before emerging, I glanced up into a large basswood and noticed a pale yellow object apparently about the size of a cecropia moth depending from an upper leaf; it had not the thin, shrivelled serenity of dead foliage, but, whatever it was, it hardly bent the leaf or its stalk where it hung. Suddenly remembering that I had an insect net with a three-jointed handle

in my pocket, I drew it out and fitting it together scooped the enigma into the silken bag, where it writhed and struggled with moth-like flutterings; it was a tiny bat.

High up on the same tree I now spotted (in its favorite attitude) another specimen of *Eupogonius subarmatus* and conceived the happy idea of utilizing the creature's instinct of escape to secure its capture. It evidently loved to sit up on the spacious platform of a linden leaf and "take the sun"; when approached it would nearly always run (or roll) to the edge of its resting-place and drop over; all I had to do was to hold the net well under its perch and then jar the insect into activity. This went like clockwork, and I spent two or three hours in systematic search about basswood foliage. Blatchley does not mention the linden among the creature's food plants, but I took over a dozen specimens that day of *Eupogonius subarmatus*; they were all found basking on linden leaves, and, with a single exception, on being approached, they all launched themselves obligingly into the captivity of my insect net.

It was nearly three p.m. when I decided to make a trip beyond the paths, upstream, in search of the Holly Fern; I first made my way to the last drinking fountain in the Glen, a lovely cold spring that wells out from the base of a giant block of limestone. Here as I turned away refreshed, I saw dangling in an old spider's web—dead but undamaged, and surely a most unusual victim of those silken meshes—the large and handsome longicorn, *Tylonotus bimaculatus*, the only specimen I have ever taken.

From now on I was a botanist, and though I saw no signs of the Holly Fern, I had the good luck to find a little colony—three or four plants—of Ebony Spleenwort in a grove of hemlock and cedar. Altogether, it was with great reluctance and a fast-declining sun that at last I tore myself away from the Glen and took the car to the monument. Here I spent two hours searching for a wood where report had whispered to me of the Broad-leaved Beech Fern. It was, thus, already dusk when, in spite of the very doubtful clue, I brought my search to a successful close and returned to my lodgings, tired but determined to have one more look in the morning for the apocryphal and probably long extinct Holly Fern of Foster's Flats.

Next day, in order to leave lots of room for my pocket lunch as well as to compel constancy in my fern-search, I most foolishly burned my entomological boats by leaving my cyanide bottle behind. I spent all morning upstream working towards the whirlpool in a vain and tiring (or was it untiring?) search for *Polystichum lonchitis*, and at last about noon gave it up, went again to commune with my little colony of Ebony Spleenwort, and then began my homeward walk along the track.

Here I made a most exciting discovery: the New Jersey Tea blossoms, that early in the morning were quite untenanted and seemed to have lost their fragrance, were crowded with eager guests in the bright sunshine. There is no plant, in my experience, so attractive to beetles as *Ceanothus americana*, and I have a long list of its guests in the shape of captures made on its blossoms; these were mostly of the *Leptura* and *Typocerus* genera of Longicorn, but only a few days before I had added a new find among Scarabs, *Macroductylus subspinosus*, just because the New Jersey Tea was in a new locality; and no matter how old and familiar a blossom is, I always search it carefully in hopes of new finds, if I am in a new district.

But alas! I had no collecting-bottle, nothing but a handkerchief and my Colgate's drinking cup. For some little time I made no discovery beyond a variety (or possibly a new species) of *Trichius*, and soon the four corners of my handkerchief were knotted over specimens of this beetle and the whole handkerchief was redolent of the strangely sweet—if pungent—scent the insect releases on capture—some of the tiger-beetles emit a similar volatile essence with the same sweet but searching odour.

I was about a mile from the Glen when I happened on the first new beetle banqueting in the Tea blossoms—not only a new species, but a new genus; its extremely attenuate outline could belong to nothing but *Strangalia*, and *Strangalia* it proved to be, *Strangalia luteicornis*. It was a happy entomologist, I can tell you, who fitted the stopper of his drinking-cup over that jejune little atomy, and a most unhappy entomologist who had to open the same a score of times and coax a new capture in before any of the inmates found an exit. Handling a basket of snakes, or driving a pig to market would be child's play to that problem. But though

I lost two or three of the entire bag, it was a great catch that I emptied out into my cyanide bottle as soon as I got home: three *Strangalia luteicornis*, four *Leptura subhamata* (all ♂), six *Leptura cordifera*, two *Leptura dehiscens*, and one *Toxotus cylindricollis*, besides not a few specimens of *Trichius*, *Typocerus* and *Leptura* that I had taken occasionally before.

Two days' sun-bath and about 30 hours of revelling among ferns, flowers and insects had made a new man of me, and now, as I lay down the pen with which I have tried to call out of the past the spirit of my trip, dipping deep in the ink-well of memory, it is my most ardent desire to repeat it all in the body next July, and following the lure of *Bellamira*, *Tylonotus*, or *Strangalia*, make one more rare new capture.

ENTOMOLOGICAL SOCIETY OF ONTARIO.

The 53rd Annual Meeting of the Society will be held at its headquarters in the Ontario Agricultural College, Guelph, on Thursday and Friday, November 2nd and 3rd, and will be presided over by Mr. Albert F. Winn, President (Westmount, P. Q.).

A popular lecture will be given on the Thursday evening in Massey Hall by Dr. L. O. Howard, Chief of the U. S. Bureau of Entomology, Washington, D. C.

It is hoped that the members of the Society will endeavour to be present. Subscribers to the "Canadian Entomologist" are cordially invited to attend and to present papers. Members and visitors will be entertained at luncheon in the College Dining Hall at the noon hour each day.

The Secretary will be greatly obliged if members and others will send him the titles of papers they wish to present (stating the length of time required for reading) as soon as they can, in order that the programme may be prepared in due time; it will also be a convenience if members and visitors will notify him a few days before the meeting of their intention to be present.

A. W. BAKER,
Secretary.

Ontario Agricultural College, Guelph.

SOME GENERIC GROUPS IN THE MALLOPHAGA FAMILY MENOPONIDÆ.

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

The chief interest in the study of the Mallophaga lies in the problem of their distribution, which is beyond question fundamentally the problem of the relationships of their hosts. It has already been pointed out very clearly by Kellogg and Harrison

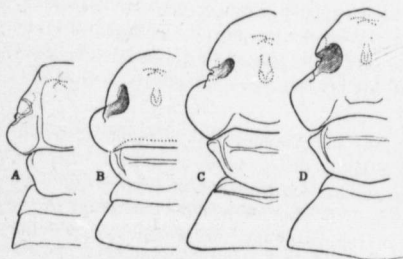


Fig. 10.—Outlines of one side of head of: A, *Dennyus distinctus*, n. s.p.; B, *Myrsidea diffusa* (Kell.); C, *Actornithophilus uniseriatus* (P.); D, *Heleonomus miandrius* (Kell.).

that the solution of the first problem may legitimately be used as an aid in the solution of the second; that the student of these parasites may possibly be able to throw some light upon certain questions of the answers to which the ornithologists are at present in doubt.

However, before this happy end can be achieved, it is necessary that the classification of the Mallophaga themselves be placed upon a sound basis, something that, as it is becoming increasingly apparent, has not yet been accomplished. The generic groups that have in the past been recognized are entirely too broad adequately to express the needs of the situation. The old genera are for the most part really of family value, and many of them have quite recently been elevated to this rank; but the division of these unwieldy and complex groups into small and compact genera has as yet hardly begun, nor have the limits of many of the groups been accurately defined. It is toward this end that this paper is a slight contribution.

The two relatively very large genera, *Colpocephalum* and *Menopon*, with a few smaller genera, constitute the family *Menoponidæ*, a family that includes nearly one-fifth of all the known

Mallophagan species. The family contains a considerable number of unrecognized generic groups, for the separation of which characters must be used that have heretofore been almost entirely neglected. Of these characters those to be found in the chaetotaxy of the posterior femora are perhaps of first importance. The spines on the ventral face of these femora may be arranged in a series of "combs," which are always associated with similar combs upon certain abdominal sternites, or they may be arranged in a distinct patch or brush, usually associated with similar brushes on the abdomen, or they may be irregularly arranged or entirely lacking. The taxonomic value of the combs has already been pointed out by Harrison in the case of *Colpocephalum* (in its restricted sense) and *Tetrophthalmus*, but the brushes have apparently not, as yet, been noted in literature.

Of probably secondary importance are other characters, including the presence of either a slit or notch in front of the eye, the segmentation of the thorax, the presence of heavy spines on the ventral side of the head, the character of the chaetotaxy of the abdomen, the genitalia of the males and the presence of peculiar structures in the gular region.

Having in mind these characters, the group which this paper considers may be defined as follows.

Menoponidae with more or less distinct patches or brushes of spines upon the ventral face of the posterior femora and upon certain abdominal segments. Thorax three-segmented, usually distinctly so, although the mesothorax is sometimes much reduced. Head of a very characteristic shape, the temples very prominent, projecting well beyond the lateral margin.

The following key will serve to distinguish the included genera:

1. Head with a distinct notch (not a slit) in the lateral margin just before the eye.....2.
- Lateral margin of the head continuous to the eye.....3.

2. Femoral and sternal patches composed of spines which are distinctly smaller than those constituting the general chaetotaxy and are very closely crowded together.

Genus *Heleonomus*, n. gen.

Femoral and sternal patches small, composed of spines as large as those constituting the general chaetotaxy, with which the ventral patches sometimes merge.

Genus *Actornithophilus*, n. gen.

3. Oesophageal sclerite and glands apparently lacking, second sternite never with asters of heavy spines.

Genus *Dennyus* Neumann.

Oesophageal sclerite and glands present, although sometimes quite small; second sternite generally with asters of heavy spines.

Genus *Myrsidea* Waterston.

Genus ***Actornithophilus***, n. gen.

Figs. 10c, 11, 13f.

Menoponidae with small, rather indefinite patches of spines upon the ventral face of the posterior femora and upon certain abdominal sternites, and upon certain abdominal sternites, the spines composing the patches as large as those constituting the general chaetotaxy and sometimes merging with it. Thorax distinctly three-segmented, the mesothorax small, but clearly distinguishable. Head of a characteristic shape, the anterior margin rounded, the temples very prominent, their anterior margins nearly at right angles with the longitudinal axis of the body. Lateral margin with a distinct notch before the eye; this notch backed up by a small chitinous area. Oesophageal sclerite and glands present. Male genitalia apparently characteristic, consisting of a very long and slender basal plate, continuous distally with a lamina at the base of which the small paramera and slender endomera (?) are set.

Species occurring, at least for the most part, upon Charadriiformes (*Laridae*, *Alcidae*, *Charadriidae*).

Type of the genus, *Colpocephalum uniseriatum* Piaget.

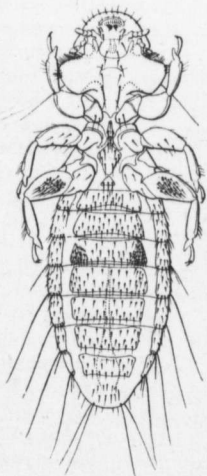


Fig. 11.—*Actornithophilus uniseriatus* (P), ventral side of male.

INCLUDED SPECIES.

From **Laridæ.**

- Colpocephalum abbotti* Kellogg.
Colpocephalum crassipes Piaget.
Colpocephalum epiphanes Kellogg and Chapman.
Colpocephalum funebre Kellogg.
Colpocephalum fuscipes Piaget.
Colpocephalum incisum Piaget.
Colpocephalum latifasciatum Piaget.
Colpocephalum maurum Nitzsch.
Colpocephalum milleri Kellogg and Kuwana.
(—*C. incisum* Piaget. ?)
Colpocephalum sulcatum Piaget.

From **Alcidæ.**

- Colpocephalum perplanum* Kellogg and Chapman.

From **Charadriidæ.**

- Colpocephalum bicolor* Piaget.
Colpocephalum cornutum Giebel.
Colpocephalum fumidum Kellogg.
Colpocephalum gracile Piaget.
Colpocephalum grandiceps Piaget.
Colpocephalum kilauensis Kellogg and Chapman.
Colpocephalum morsitans Kellogg.
Colpocephalum ochraceum Nitzsch.
Colpocephalum ocularis Carriker.
Colpocephalum pædulum Kellogg and Kuwana.
Colpocephalum patellatum Piaget.
Colpocephalum pustulosum Piaget.
Colpocephalum spinulosum Piaget.
Colpocephalum stictum Kellogg and Paine.
Colpocephalum tigrum Kellogg and Paine.
Colpocephalum timidum Kellogg.
Colpocephalum umbrinum Piaget.
Colpocephalum uniforme Piaget.
Colpocephalum uniseriatum Piaget.

From **Passerine Hosts.**

- Colpocephalum grandiculum* Kellogg.

The genus thus formed is a very homogeneous group, and is apparently characteristic of the Charadriiformes (as that order is understood by the more recent authors), especially of the Larolimicolæ. A single species, *A. grandiculus* (Kel.) is recorded from Passerine hosts, but it is possible that these records are unnatural. Only those species of which it is possible to be practically certain have been referred to the genus, and doubtless others will later be included. The list as given probably contains some synonyms, but this cannot at present be definitely determined.

The figures illustrating the genus are of *A. uniseriatus* (P.), the genotype, and *A. timidus* (Kel.).

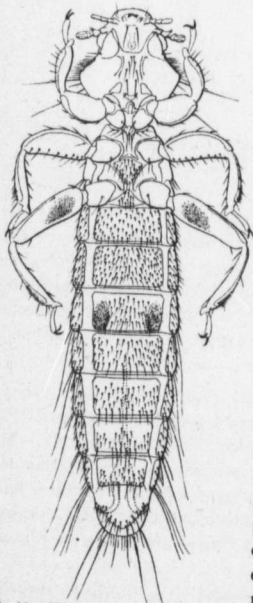


Fig. 12.—*Helonomus miandrius* (Kell.), ventral side of male.

Genus *Helonomus*, n. gen.

Figs. 10d, 12, 13e.

Menoponidæ with very distinct patches of spines upon the ventral face of the posterior femora and upon the 4th abdominal sternite, the spines composing the patches very numerous, closely crowded together and distinctly smaller than those constituting the general chaetotaxy. Thorax 3-segmented, the meso-thorax small. Head of characteristic shape, the lateral margins slightly swollen above the bases of the antennæ, the temples prominent, reclined with the anterior margin set at a very sharp angle to the longitudinal axis of the body. Lateral margin of the head with a deep notch just before the eye, this notch backed up by a large chitinous area. Oesophageal sclerite and glands present. Male genitalia apparently quite characteristic, the basal plate extremely long and slender, the parameres large and stout, with the distal half curved sharply outward. A pair

of conspicuous, tubular chitinous structures present in connection with the preputial sack.

Occurring, at least for the most part, upon Gruiformes.

Type of the genus, *Colpocephalum truncatum* Piaget.

INCLUDED SPECIES.

From **Gruidæ**.

Colpocephalum abdominale Piaget.

Colpocephalum assimile Piaget.

Colpocephalum miandrium Kellogg.

Colpocephalum truncatum Piaget.

Heleonomus confusus n. sp.

This little genus differs rather markedly in general appearance from the preceding, but the tangible characters upon which the two may be separated are few. The shape of the head and the character of the patches of spines, with the character of the male genitalia, are, however, sufficient to afford grounds for their separation. The males of three of the species are before me, and the genitalia of these three are all of the same peculiar type, so it may be assumed that they are the same throughout the genus.

Superficially the genus very closely resembles another group (*Colpocephalum* sens. str.), which occurs upon the same hosts, but which is marked by the presence of combs of spines upon the posterior femora. For this reason it is unsafe to refer species to the new genus without knowledge of this character, which has been entirely overlooked in most descriptions. Only those species of which there can be no doubt (four of them are before me) have been referred to the new genus.

The figures are of *H. miandrium* (Kel.), an entirely typical member of the group.

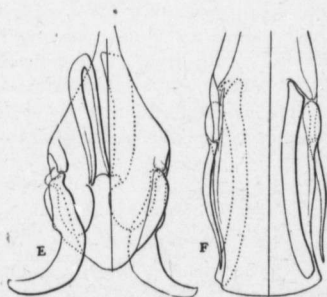


Fig. 13.—Genitalia, except basal plate of: E, *Heleonomus miandrium* (Kel.); F, *Actornithophilus timidus* (Kel.).

Heleonomus confusus, n. sp.

Colpocephalum miandrium (in part) Kellogg, Rept. Kilimandjaro Exped., No. 15, pt. 4, p. 53 (1908).

This species has already been described as the female of *H. miandrius* (Kel.). One of the two specimens at hand is a male in which the genitalia are very weakly developed, this fact, and their presence upon the same host, having led to the confusion of this species and *H. miandrius*.

Host, *Balearica regulorum gibbericeps* (Africa).

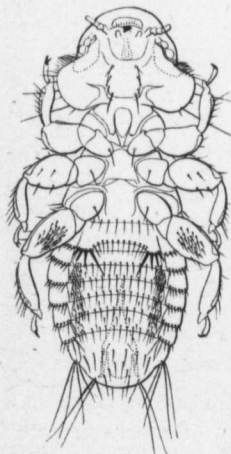


Fig. 14.—*Myrsidea diffusa* (Kell.), ventral side of male.

Genus **Myrsidea** Waterston.

Figs. 10b, 14.

Myrsidea Waterston, Ent. Monthly Mag., Vol. 51, pp. 12-13. (1915).

Menoponidæ with indistinct patches of spines upon the ventral face of the posterior femora and certain abdominal sternites, those upon the sternites merging more or less with the general chaetotaxy. Thorax distinctly 3-segmented, the metathorax frequently curiously modified and produced posteriorly. Head of characteristic shape, the forehead rounded, the temples very prominent and with the anterior margins nearly at right angles to the longitudinal axis of the body. Lateral margin of the head continuous with the eye. Oesophageal sclerite and glands present, although sometimes very small. Abdominal tergites of the female sometimes modified. Second abdominal sternite usually, but not always, with asters of heavy spines. Male genitalia of a type common to this genus and to *Dennyus*, the basal plate moderately long, continuous distally with a broad rounded lamina at the base of which the stout, apically recurved parameres are set.

Occurring for the most part upon Passeriformes, particularly the *Corvidæ*, but also occurring upon certain families of the *Coraciiformes*.

Type of the genus, *Myrsidea victrix* Waterston.

INCLUDED SPECIES.

Order PASSERIFORMES.

Family **Corvidæ**.

- Menopon albiceps* Piaget.
Menopon anathorax Nitzsch.
Menopon brunneum Piaget.
Menopon consimile Piaget.
Menopon euryternum Nitzsch.
Menopon funereum Kellogg and Chapman.
Menopon indivisum Piaget.
Menopon insolitum Kellogg and Paine.
Menopon interruptus Osborn.
Menopon mesoleucum Nitzsch.
Menopon nigrum Kellogg and Paine.
Menopon obovatum Piaget.
Menopon ovatum Piaget.
Menopon robsoni Cummings.
Colpocephalum sjoestedti Kellogg.
Menopon trinoton Piaget.
Menopon trithorax Piaget.

Family **Fringillidæ**.

- Menopon conspicuum* Kellogg and Chapman.
Menopon incertum Kellogg.
Menopon melanorum Kellogg.

Family **Sturnidæ**.

- Menopon cucullaris* Piaget.
Menopon invadens Kellogg and Chapman.

Family **Drepanididæ**.

- Menopon cyrtostigmum* Kellogg and Chapman.

Family **Hirundinidæ**.

- Menopon dissimile* Kellogg.
Trinoton stramineum Giebel.

Family **Icteridæ**.*Colpocephalum mirabile* Carriker.

Order CORACIIFORMES.

Family **Caprimulgidæ**.*Colpocephalum extraneum* Carriker.Family **Rhamphastidæ**.*Myrsidea victrix* Waterston.Family **Alcidinidæ**.*Nitzschia latifrons* Carriker.

The genus was well characterized by Waterston, but, as it appears to be a member of the group under discussion, the description has been repeated, with certain modifications and additions, in order to emphasize the resemblances to and differences from these other genera. No list of included species has heretofore been published.

Many of the included species, especially those upon the *Corvidæ*, are in some respects among the most peculiar of all the Mallophaga, due to the curious modifications of the metathorax of the female. Waterston has suggested that the genus should be still further divided, those species not sexually dimorphic being placed in another genus. However, it hardly seems best to do this, for every degree of dimorphism appears, nor are the modifications of any constant type. Even the asters of heavy spines on the second sternite of the abdomen, which appear in almost all of the species are lacking in *M. sjoestedti*, in other respects one of the most typical members of the group. It would seem that there is throughout the genus an "inherent" tendency to vary, and any further division is liable to result in artificial groupings. The figures are of *M. diffusa* (Kel.), a typical species.

Genus **Dennyus** Neumann.

Figs. 10a, 15.

Nitzschia (not of Baer), Denny, Mon. Anop. Brit., p. 230. (1842).*Dennyus* Neumann, Bull. Soc. Zool. France, Vol. 20, p. 60. (1906)

Menoponidæ with distinct patches of spines upon the ventral face of the posterior femora and upon the 8th and 6th abdominal sternites. Thorax distinctly 3-segmented, the prothorax very

narrow. Head of characteristic shape, the lateral margins continuous with the eye and slightly swollen above the base of the antennæ, the temples prominent. Oesophageal sclerite and glands apparently lacking. Anterior femora much flattened and expanded. Second abdominal sternite never with asters of spines. Genitalia of the male of the same type as in *Myrsidea*.

Occurring, as far as known, only on Micropodidæ (Order Coraciiformes).

Type of the genus *Nitzschia burmeisteri* Denny.

The genus is in many respects very similar to some of the species of *Myrsidea* (*M. dissimile*, for instance), but the combination of characters given is sufficient to distinguish the two. There are less than a dozen species known, and some of these are apparently synonyms. *Dennyus dubius* (Kel.), which was described from immature specimens, is very likely a synonym of either *D. burmeisteri* or *D. tibialis*, but, in the absence of specimens of these two species, little can be done to settle the matter. *D. bruneri* (Car.) is almost certainly a synonym of *D. dubius*, as a cotype of the former which I have before me shows, and some of Carriker's other species appear doubtful. *Nitzschia latifrons* Carriker is almost certainly a *Myrsidea*.

***Dennyus distinctus*, n. sp.**

Description of female—Length 2.2 mm., colour a uniform dark brown.

Head as long as wide, triangular in shape, except for the rather broadly truncate anterior margin, which distinguishes the species from all the others in the genus. Occipital bands distinct, extending forward to above the bases of the mandibles. Principal points of the chætotaxy as follows: A pair of slender hairs directly above the base of each mandible; a longer hair on the lateral

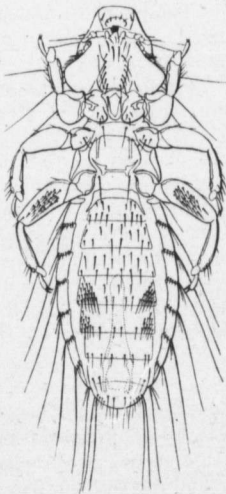


Fig. 15.—*Dennyus distinctus*, n. sp., ventral side of male.

swelling slightly in from the margin; a single long hair and two or three shorter ones at the margin on the lateral swelling; a close fringe of short hairs on the anterior margin of the temples; a transverse row of four long hairs on the occiput between the occipital bands.

Prothorax nearly as long as wide, rather quadrate in shape, rounded posteriorly; two or three short spines and a hair on each "shoulder," and six short hairs along the posterior margin.

Mesothorax and *metathorax* nearly equal in length, separated by a distinct suture. *Metathorax* with a transverse row of long hairs on the posterior margin.

Legs of the type common to the genus, the anterior femora flattened and much expanded.

Abdomen elongated, with nearly parallel sides, widest across the fourth or fifth segment. Each segment with a single transverse row of hairs along the posterior margin, the hairs not as long as the succeeding segment. Second to ninth segments each with a single extremely long hair and one or two shorter hairs at each posterior lateral angle.

Pleurites distinct, separated from the sternites by a narrow clear area, the posterior margin of each pleurite bearing a row of five or six short, thorn-like spines. First sternite short, heavily chitinized, the posterior angles produced back over the second sternite. Remaining sternites less heavily chitinized, but quite distinct. Each sternite with a transverse row of four to eight short, slender hairs along the posterior margin, the second to fifth with a few other scattered hairs. Fifth and sixth each with a distinct patch of closely set spines in each posterior lateral angle.

Description of male—Length 1.9 mm. Very similar to the female, the abdomen somewhat more pointed. Genitalia of the type common to this genus and to *Myrsidea*.

Two males, a female and two immature forms from *Collocalia* sp. (Samarang, Java, E. Jacobson coll.).

A very distinct species, differing in the truncate anterior margin of the head from any other of the genus, but in other respects an entirely typical *Dennyus*. Types in the Stanford University collection.

CANADIAN SPECIES OF THE BEE GENUS
STELIS PANZ.

BY F. W. L. SLADEN, OTTAWA.

(The figures before names refer to species in the Canadian National Collection.)

Females.

1. Skin colour black.....2.
Skin colour bronzy.....6.
2. Pale spot behind eye and pale line on inner margin of eye, last ventral segment of abdomen wide and rounded, and projecting far beyond last dorsal segment, which is angulated; length 5 mm.
subg.....*Stelidium* Robt., 1060, *ontariana*, n. sp.
(?—*trypetinum* Robt.)
Ottawa, 16, VIII.
One specimen, J. I. Beaulne, 1912.
No pale markings on head.....3.
3. Abdominal segments 1 and 2 or 1 to 3 or 4 with a small lateral spot, segments 4 and 5 often with two small inner spots, abdomen so closely punctured as to appear somewhat dull; length 5 mm.
subg.....*Microstelis*, 1061 *lateralis* Cr.
Ottawa, VII.
Segments with pale bands, more or less interrupted; abdomen less closely punctured,
subg.....*Chelynia* Prov. 4.
4. Last dorsal segment with longitudinal ridge on apical portion; last ventral segment tridentate beyond apex of dorsum, the middle tooth long and acuminate.....1062, *rubri* Ckll.
Banff, Alta, 25, VI
Apex of abdomen without these structures.....5.
5. Abdomen elongate, pale bands all about equally interrupted in the middle, last ventral segment projects well beyond last dorsal segment, last dorsal segment with golden pubescence on margin, sting slender and pale.....1063 *submarginata* Cr.
Abdomen rather broad, pale bands usually more widely interrupted on basal segments than on apical segments, last

ventral segment scarcely projects beyond last dorsal, last dorsal without golden pubescence underneath black hairs, sting stout, black.

.....1064 *federalis* Sm. (*nitida* Cr.)
Ont., Ottawa, 8, VI.

6. Segments 1 to 3 with complete yellow bands, segments 4 and 5 with narrow bands, some black hairs on vertex and pleura, length 6 mm.

(subg.....*Chelynia*), Ste. 1065.
Shawnigan, Vancouver Island, 8, VII.

No pale markings, head smaller, narrower than thorax, face much longer than broad, skin dark metallic blue-green, including legs; whole insect, including underside of abdomen, sparingly clothed with short black hair; margin of 6th dorsal segment reflexed.

.....*Pavostelis* (n. subg.) 1066 *montana* Cr.
Banff, Lethbridge, Alta., VI.

Males.

1. A pale spot above each eye and pale markings on inner margins of eye, surface of ventral segment without groove or ridge, four spots on segments 1 and 2, and two on 3 and 4; whole insect strongly punctured all over; length 4½ mm.

subg.....*Stelidium* Robt., 1055, *ontariana* Sla.
(?—*trypetinum* Robt.)

Bethesda, Ont., 15, VIII.

One specimen, Dr. Brodie, 1892.

Head without pale markings.....2.

2. Second recurrent nervure received at or beyond apex of second submarginal cell, 3rd ventral segment depressed in centre, generally a small pale spot on side of segments 1 and 2, often two small spots or a line on side of segments 3 and 4, segment 5 sometimes all black, abdomen so closely punctured as to be rather dull; length 3 to 4 mm.

subg.....*Microstelis* Anct. 3.

Second recurrent nervure usually received before the apex of second submarginal cell, abdomen with pale bands, often interrupted in centre,

subg.....*Chelynia* Prov. 4.

3. Wings normal.....1056 *lateralis* Cr.
Ottawa, 6, VI, on *Potentilla*, etc.
First recurrent nervure fails to reach submarginal nervure in
either wings.....*maculatum* Prov.
4. Ventral segment 3 depressed in centre at apex; length 8 mm.
.....1057 (?*monticola* Cr.)
One specimen, Vernon, B. C. (Venables).
Ventral segment 3 raised in centre at apex, length less.....5.
5. Third ventral segment with low tubercle at apex in centre, the
tubercle slightly produced beyond margin, bands on segments
1 to 5 all about equally interrupted in middle, second sub-
marginal cell longer than first, abdomen much longer than
broad; length 4 to 7 mm.....1058 *subemarginata* Cr.
N. B. to Man., Ottawa, 1, VI.
Third ventral segment broadly raised at apex in centre, not
produced, pale skin bands on segments 1 to 5 more widely
interrupted on basal segments than on apical segments; on
segment 5 they usually meet, abdomen almost as broad as
long.....1059 *federalis* Cr. (—*nitida* Cr.)
Ottawa, 6, VI, Toronto.

(In the compilation of the above tables the author is indebted for
help to Mr. J. C. Crawford of Washington.)

A CURIOUS TRAP FOR DRAGONFLIES.

In a pasture just south of De Grassi Point, Lake Simcoe, Ont., there is an artesian well, consisting of an iron pipe driven perpendicularly into the ground to the required depth and projecting about 2½ feet above the surface. It terminates in a curved joint, from which the water strikes the ground almost vertically, with sufficient force to drill a hole about 10 inches deep into the soil. The water then spreads into a shallow puddle, used as a watering place for cattle and geese. Some of it, however, passes under a nearby fence into a ditch dug along the edge of a cultivated field. This ditch, which is not more than about a foot wide, is the haunt of a number of dragonflies, some of which probably breed nowhere else in the vicinity of De Grassi Point. The water is for the most part covered with duckweed (*Lemna*),

and along the edges of the ditch cat-tail flags and many marsh plants grow.

While visiting this spot on August 9, 1916, I noticed a small dragonfly caught under the jet of water, and on looking closer I found no less than nine of these insects or their remains held down by the force of the cold stream. They were all at or near the surface, most of them more or less entangled in the mat of grass into which the water poured.

The following species were thus found: *Lestes unguiculatus* Hagen, 1♂, 1♀; *Lestes rectangularis* Say, 2♂, 1♀; *Lestes disjunctus* Selys, 1♂; *Libellula pulchella* Drury, 2♂, *Sympetrum* sp., fragments.

The *Lestes* were all alive and though somewhat benumbed were apparently none the worse for the cold shower. One of the *Libellulas* was alive but not very active, the other dead and broken.

On Aug. 12 I visited the spot and found *Lestes forcipatus* Rambur 1♂, 1♀, both alive; *Libellula pulchella*, dead; and some indeterminable fragments of *Lestes*.

No other insects besides dragonflies were found on either occasion. Other dragonflies which were found at this spot on these dates are the following:

Lestes uncatatus Kirby.

Ischnura verticalis (Say).

Ischnura posita (Hagen).

Nehalennia irene (Hagen).

Aeshna umbrosa E. M. Walker.

Aeshna constricta Say.

Libellula quadrimaculata L.

Libellula lydia Drury.

Sympetrum obtrusum (Hagen).

Sympetrum semicinctorum (Say).

The *Libellulas* were seen only about the puddle, where *L. pulchella* and *lydia* were common. The various species of *Lestes* were chiefly found along the ditch, but occurred also about the puddle; the other damselflies and *Sympetrum semicinctorum* were found only along the ditch. *S. obtrusum* was generally distributed. The *Aeshnas* were probably stray visitors.

E. M. WALKER.

NEW NORTH AMERICAN SPECIES OF THE
GENUS *GONOMYIA* Meigen.

(TIPULIDÆ, DIPTERA)

BY CHARLES P. ALEXANDER, ITHACA, N.Y.*

*Contribution from the Entomological Laboratory of Cornell University.

The species herewith described as new belong to the subgenus *Gonomyia*, the members of which have the cell R_2 of the wings present. As has been indicated in earlier papers it is almost impossible to identify isolated females in this genus and in most of the related Eriopterine genera, but the genitalia of the male sex offer remarkably clear-cut characters for the separation of closely related species.

Genus *Gonomyia* Meigen.***Gonomyia (Gonomyia) florens*, sp.n.***Male*—Length 4.4-4.1 mm.; wing 5.4-5.6 mm.*Female*—Length 5.8 mm.; wing 6.8 mm.

Rostrum yellowish brown, the palpi dark brown. Antennæ long and slender, the scapal segments yellow, the first flagellar segment brown, yellowish at the base, remainder of the antennæ dark brown; flagellar segments rather elongated, slightly enlarged just beyond the base. Head yellow with a brown median line.

Mesonotal præscutum light yellow with three dark chestnut-brown stripes which are almost confluent behind; pseudosutural foveæ very large and prominent; lateral margin of the sclerite yellowish becoming more whitish beyond the pseudosutural foveæ; scutum with the lobes rich chestnut brown, the inner edge adjoining the median area yellow, the lateral margin yellowish; scutellum and postnotum light yellowish to a large extent. Pleura pale yellow with a dark brown stripe from the ventral portion of the cervical sclerites running back to the base of the abdomen, enclosing the base of the halteres; mesosternum pale brown; the pale pleural stripe with a sparse whitish bloom. Halteres light brown, the knob pale. Legs with the coxæ pale yellow; trochanters brown; femora light brownish yellow; tibiæ yellowish brown; tarsi brown. Wings with a strong yellowish tinge, the stigma indistinct, the costa yellow, remaining veins brown. Venation: *Sc* moderately long, ending just before or opposite the origin of *Rs*; *Rs* gently

curved; R_2 a little shorter than R_{2+3} ; R_2 half again as long as the cross-vein $r-m$; outer deflection of M_3 obliterated so that cell 1st M_2 is confluent with cell M_3 ; basal deflection of Cu_1 at the fork of M .

Abdominal tergites brown, broadly margined with yellow; sternites yellow, the hypopygium concolorous. Hypopygium with the ninth tergite short, broad, the caudal margin transverse. Ninth pleurite very short and stout, the inner dorsal angle produced caudad into a blunt, fleshy lobe, whose inner margin is fringed with numerous long hairs; a short, blunt, fleshy knob at the base of this lobe, this knob provided with five long hairs on the margin; dorsal pleural appendage slender, originating just below the knob described above, directed proximad, the base enlarged with two or three stout hairs, the tip slightly bifid, the caudal arm with two bristles, the cephalic arm with one bristle; a stout bristle just before the tip on the inner or cephalic side; second pleural appendage a powerful chitinized hook, slightly curved, directed proximad, toward the apex bent strongly cephalad; ventral pleural appendage a slender fleshy rod, beyond the slightly enlarged base bent strongly dorsad so that it lies above the second appendage, at the tip directed caudad and here capped with a short, blunt, chitinized spine. Ninth sternite with a prominent median knob on the caudal margin, this knob with numerous setigerous tubercles.

Habitat—Eastern United States.

Holotype—♂, Indian Castle, Herkimer Co., N.Y., June 9, 1915, (Alexander).

Allotype—♀, topotypic.

Paratypes—3♂ ♀, topotypic.

The types are in the collection of the author.

G. florens may be distinguished from the closely related *G. cognatella* O. S. by its slightly larger size, brighter colouration, and the male genitalia (the powerful curved second appendage, the short, black apex to the ventral appendage, etc.).

***Gonomyia (Gonomyia) flavibasis*, sp. n.**

Male—Length 5.2 mm.; wing 5.3 mm.

Rostrum and palpi dark brown. Antennæ with the two basal segments bright pale yellow; flagellar segments brown with a dense

pale pubescence that is most noticeable on the basal segments. Head yellow with a dark brown median mark.

Pronotum yellow, slightly darkened medially. Mesonotal præscutum yellow with three dark brown stripes, the lateral pair being almost confluent with the broad middle stripe; lateral stripes removed from the margin of the sclerite and beginning just back of the pseudosutural foveæ; the latter is elongate rectangular, chestnut in colour; scutum yellow, the greater portion of each lobe brown; scutellum brown basally, the caudal half yellow; postnotum brown, the sides of the sclerite yellow. Pleura light yellow with two dark brown stripes as follows: dorsal stripe narrow, clear-cut, beginning on the cervical sclerites, running backward just above the base of the fore coxæ and above the base of the halteres; the ventral stripe occupies the mesosternum and is of a much paler brown than the other stripe; the yellow stripe enclosed is very pale, suffused with whitish. Halteres pale, the knobs slightly infuscated. Legs with the coxæ and trochanters light yellowish brown, the fore coxæ whitish yellow on the outer face; femora, tibiæ and tarsi very pale brown, the latter dark brown on the last three segments. Wings nearly hyaline, the stigma indistinct, the veins brown. Venation: *Sc* short, ending far before the origin of *Rs*, this distance about equal to vein *R*₂ alone; basal deflection of *R*₄₊₅ very short or lacking; basal deflection of *Cu*₁ beyond the fork of *M*, this distance a little shorter than the first deflection of *M*₁₊₂; cell 1st *M*₂ open.

Abdominal tergites dark brown, the terminal segments slightly margined with yellowish; sternites light yellow. Hypopygium with the pleurites rather long and slender, the dorsal angle produced caudad as a flattened, fleshy lobe that bears many hairs on the dorsal face; appendages two, the first appendage very long, flattened, the apex bent, the surface of the arm with many long hairs; second appendage complex consisting of a chitinized hook that is slightly bent; underneath the base of this hook is a fleshy lobe with several short bristles on the outer face; above the base of the hook is a slender subchitinized rod that is darkened at the tip.

Habitat—Western United States.

Holotype—♂, Monterey Co., California; July 18, 1896.

Part of the W. M. Wheeler collection in the American Museum of Natural History.

This fly belongs to the *cognatella* group and is closest to *G. delicata* Alexander (Guatemala) but the venation is quite different in the longer subcosta, the different shape of the sector and other venational details.

Gonomyia (Gonomyia) noveboracensis, sp. n.

Male—Length 4 mm.; wing 4.9 mm.

Rostrum light yellowish brown, the palpi dark brown. Antennae black throughout, the basal segments enlarged, the flagellar segments very short, tapering suddenly to the tip of the appendage. Head light gray.

Pronotal scutellum white, dark brown medially. Mesonotal præscutum plain grayish brown, the area behind the pseudosutural foveæ paler, more yellowish; scutum similar; scutellum brownish yellow; postnotum brown with a sparse grayish bloom. Pleura white with two brown stripes, the dorsal one beginning on the cervical sclerites and continuing back to the wing basis; the ventral stripe occupying the mesosternum. Halteres pale. Legs with the coxæ and trochanters brownish yellow; femora, tibiæ and tarsi uniform dark brown. Wings light gray, the stigma not indicated; costal vein yellow, the remaining veins dark brown. Venation: *Sc* short ending far before the origin of *Rs*, this distance sub-equal to the cross-vein *r-m*; *Rs* rather short, rather sharply bent just beyond the base, a little shorter than R_{2+3} ; R_2 oblique, a little longer than the cross-vein *r-m*; basal deflection of *Cu*₁ at or just beyond the fork of *M*.

Abdominal tergites dark brown, broadly margined with silvery; sternites similar, narrowly ringed caudally with silvery; hypopygium reddish yellow. Hypopygium with the ninth tergite having the caudal margin with a broad rounded concavity. Ninth pleurite prominent, elongate, the dorsal inner edge with a prominent tubercle that bears several hairs, the ventral inner edge with a row of large setigerous tubercles; three small pleural appendages, a small, inner, dorsal, cylindrical appendage directed cephalad, slightly enlarged basally, at the apex bearing three or four prominent hairs; a dorsal apical appendage directed proximad, flattened,

enlarged at the apex which bears a row of delicate hairs; a slender subchitinized ventral apical appendage that is directed proximad, slightly toothed at the tip, and on the lower side just before the tip. Gonapophyses and the penis-guard fused into a very large, prominent, cylindrical tube that is armed with chitinized horns and fleshy lobes; the dorsal surface of the tube with two subpendulous, fleshy lobes that are approximated along the median line and densely provided with short, pale hairs; the horns of the cylinder are directed caudad and slightly ventrad; the outermost horns are very broad at the base tapering to the acute apices which are curved proximad; the next inner pair of horns slender, chitinized, bifid at the apex; innermost pair of horns slender, slightly twisted, narrowed to the apex. Ninth sternite with a broad V-shaped median notch, the adjacent angles produced caudo-laterad as fleshy lobes that are provided with numerous setigerous punctures.

Habitat—Eastern United States.

Holotype—♂, Sacandaga Park, Fulton Co., New York; June 11, 1914, (Alexander).

Paratype—♂, topotypic.

The types are in the collection of the author.

***Gonomyia (Gonomyia) filicauda*, sp. n.**

Male—Length 4.8-5.2 mm.; wing 6.3-6.4 mm.

Female—Length 5.4 mm.; wing 6.6 mm.

Rostrum and palpi dark brown, the last palpal segment slender, equal to the preceding two together. Antennæ dark brownish black throughout, the flagellar segments elongate-oval with an abundant pale pubescence and a few stout, black hairs. Head blackish with a dark gray bloom, slightly paler around the occiput.

Pronotum pinkish, the median line broadly dark brown. Mesonotal præscutum dark grayish brown without apparent stripes; sides of the præscutum, median area of the scutum, posterior half of the scutellum and sides of the postnotum light yellow. Pleura light yellow with large dark brown areas representing two interrupted stripes, as follows: on the proepisternum, mesepisternum, mesosternum, a narrow area just in front of the base of the halteres, the anterior face of the fore coxæ and the lateral

face of the posterior coxæ. Halteres very long and slender, pale. Legs with the coxæ yellow marked with brown as described above; trochanters brownish yellow; femora brown, slightly paler at the extreme base; tibiae and tarsi dark brown. Wings with a strong grayish brown tinge; stigma pale brown; veins dark brown; venation: *Sc* rather long, ending slightly beyond the origin of *Rs*; *Rs* very long, longer than R_{2+3} ; basal deflection of R_{4+5} very short or lacking; *r-m* very long, arcuated.

Abdominal tergites dark brown, the extreme lateral margins and the parts of the hypopygium largely yellowish; sternites light brown, the caudal margin very broadly ringed with yellow. Hypopygium with the pleurites moderately long, the dorsal angle produced caudad and slightly dorsad as an elongated fleshy lobe that is sparsely hairy, the hairs on the outer face strong, those on the inner face weak; dorsal pleural appendage a short, fleshy lobe whose caudal margin is produced into a powerful, curved, heavily chitinized hook, directed inward and dorsad; at the tip of the fleshy portion of the lobe are two stout hairs and a group of about eight smaller ones; ventral pleural appendage very long, slender, beyond the base slightly expanded, the apical portion slender, slightly expanded toward the tip, dusky in colour and provided with an abundance of long, delicate hairs. Penis-guard pale in colour, simple, slender from an enlarged base, the apex split by a deep, rounded notch.

Habitat—Rocky Mountain Region.

Holotype—♂, Webster, Colorado, near Platte Canon; August 24-26, 1915; altitude 9,500 feet (E. J. Osler).

Allotype—♀, topotypic.

Paratypes—30 ♂ ♀, topotypic.

The types are in the collection of the author.

Belong to the *subcinerea* group; a long-winged, dark-winged fly with exceedingly elongate halteres. In some specimens the pale colour on the sides of the mesonotal præscutum is obscured by the gray-brown of the dorsum.

Gonomyia (Gonomyia) mexicana, sp.n.

Male—Length 6.1 mm.; wing 6.8 mm.

Female—Length 7 mm.

Similar in colour to *Gonomyia unicolor* Alexander (Guatemala) but larger, the mesonotum more grayish, pseudosutural foveæ and tuberculate pits black, conspicuous, and the venational details slightly different.

Antennæ uniformly dark brown throughout. Pronotal scutellum light yellow. Mesonotal præscutum grayish brown, shiny, without apparent stripes; a rather light yellow area before the pseudosutural foveæ; a dull yellow area between this foveæ and the transverse suture and a small yellow spot on the sides of the scutal lobes above the wing-root. Wing-venation: R_{2+3} twice the length of R_2 and much longer than R_3 ; $r-m$ nearly as long as the basal deflection of Cu_1 , the latter inserted at from one-quarter to one-third the length of cell 1st M_2 . Male hypopygium with the ninth tergite rather short, the caudal margin straight or nearly so; ninth pleurite elongate, rather stout, the dorsal pleural appendage rather short, cylindrical, fleshy, the cephalic or inner angle of the apex with two strong, powerful bristles, the caudal or outer angle with two smaller hairs; second pleural appendage strongly chitinized, the tip acute, curved; ventral pleural appendage a long, pale lobe, subcylindrical, blunt at the apex and bearing sparse elongate hairs; penis-guard very long and pale, the apex bifid by a deep U-shaped notch, each of the lobes thus formed with long hairs; on the ventral face of this arises a slender, rod-like median appendage, sparsely short-hairy at the apex and down the ventral face; the divergent subtending arms are slender, somewhat flattened, the apices produced into a slender cylindrical point, the outer or ventral margin with a few sharp, appressed teeth.

Habitat—Mexico.

Holotype—♂, Cordoba, Mexico; May 8, 1908 (Frederick Knab).

The type is in the United States National Museum.

This species was earlier determined as being *Gonomyia unicolor*, variety, (Proceedings of the United States National Museum, vol. 44, p. 507, 1913); the differences between these closely allied forms will be indicated in connection with the next species, *Gonomyia æqualis*, n.

Gonomyia (Gonomyia) æqualis, sp.n.

Male—Length 6.1 mm.; wing 6.6 mm.

In all general features quite similar to *Gonomyia mexicana*, the main differences lying in the genitalia of the male, these being as follows: Ninth tergite almost straight across or slightly concave; ninth pleurite moderately stout, the dorsal angle produced caudad as a very slender, finger-like lobe, which is provided with numerous setigerous tubercles; at the base of this lobe on the inner side is a tiny, fleshy protuberance directed proximad; dorsal pleural appendage irregular, fleshy, directed proximad, the caudal or outer face near the apex with a strong, curved, chitinized hook, which is directed dorsad and cephalad, the cephalic or inner face with a row of strong bristles which are longer and more approximated at the tip; ventral pleural appendage a pale, fleshy lobe densely covered with short, pale hairs; penis-guard rather long, compressed, the median appendage pale, slightly curved; anal tube broad, prominent, subtended on either side by a concave wing that bears on the caudal outer angle a fimbriate tuft of yellow bristles.

Habitat—Guatemala.

Holotype—♂, Totonicopan, Guatemala; July, 1902; (G. Eisen).

Allotype—♀, totypic.

The types are in the United States National Museum. This species was earlier determined as being a variety of *Gonomyia unicolor* (Proceedings of the United States National Museum, vol. 44, p. 507, 1913), but is readily separated from both *unicolor* and *mexicana* by the structure of the male genitalia. In *G. unicolor* the hypopygium may be described as follows: Ninth tergite almost straight across or slightly concave; ninth pleurite moderately stout, elongated, the dorsal angle not produced; dorsal pleural appendage a subcylindrical, fleshy lobe from an enlarged base, at the apex, with two powerful bristles, the cephalic or inner face with four small hairs that are evenly spaced; ventral pleural appendage a double lobe, dark-coloured, subchitinized, the inner arm stout, cylindrical, with the tip acute, the inner side with two or three hairs, the outer or more ventral arm is slender, curved, and bears

near the tip two stout divergent hairs; penis-guard seen from beneath, a powerful, quadrangular, chitinized base whose caudal angle is a ventrally directed hook, the base on either side subtended by short gonapophyses that end in sharp, chitinized, conical spines; from above and dorsal of the quadrangular base arise two divergent, cylindrical, pointed, chitinized arms.

Gonomyia (Gonomyia) californica, sp.n.

Male—Length 7 mm.; wing 6 mm.

Female—Length 7-9 mm.; wing 6.6 mm.

Rostrum and palpi dark brown. Antennæ with the first segment dull yellow above, the flagellum dark brown. Head bright, pale yellow passing into brown on the sides of the occiput and vertex; a narrow, dark brown median vitta.

Pronotum pale with two divergent brown lines that are connected at the anterior end. Mesonotal præscutum dull yellow with three dark brown stripes that are confluent, only the areas about the pseudosutural foveæ and backward along the margin of the sclerite being of the ground colour; scutum light brown, the lobes dark brown, a dull yellow spot on the lateral margin above the wing-root; scutellum mostly brown, margined caudally with yellow; postnotum dark brown, the basal portions yellowish. Pleura light yellow with two dark brown bands, the dorsal one beginning on the propleura and including a small spot at the base of the fore coxa, continuing backward as a broad band that surrounds the base of the halteres and becomes confluent with the brown of the mesonotal præscutum; the ventral band begins behind the fore coxa, occupies the mesosternum and includes the base of the middle and hind coxæ. Halteres pale, the knob brown. Legs with the coxæ as described above; trochanters pale yellow; femora dull yellow with a dark brown anteapical annulus; remainder of the legs broken. Wings subhyaline, the costal veins yellowish, the remaining veins brown; dark brown spots on the wing-disk as follows: at the humeral cross-vein; at the arculus; at the origin of R_s ; at the tip of Sc_1 ; along the basal deflection of Cu_1 ; at the basal deflection of R_{4+5} ; cross-vein m ; a large stigmal area; at the fork R_{2+3} ; at the tips of cells R_3 and R_5 ,

and a faint seam along the cross-vein *r-m*; venation: *Sc* long, extending beyond mid-length of the long sector; *R*₁ and *R*₂ scarcely contiguous at the wing-margin; basal deflection of *Cu*₁ before the fork of *M*; basal deflection of *M*₃ absent.

Abdominal tergites dark brown, the caudal and lateral margins dull yellow; segment eight largely yellow except the extreme base which is brown; segment nine yellow with a narrow basal ring with a slight median projection caudad; sternites dark brown, deepest sublaterally, the caudal and lateral margins dull yellow. Hypopygium having the ninth tergite with a deep, narrow median notch, the lateral angles rounded. Ninth pleurite stout, the outer angle produced caudad into a slender fleshy lobe that is pointed at the apex and sparsely provided with setigerous tubercles; dorsal pleural appendage a triangular fleshy lobe that is provided with long coarse hairs; ventral pleural appendage, a two-armed chitinized rod whose outer ventral arm is stout basally, narrowed toward the apex which is again expanded into a blunt tip; the inner arm bends dorsad, slender, tapering into an acute blackened apex. Penis-guard prominent, the sides subparallel, the apical half on the dorsal surface with numerous hairs, the apex produced ventro-caudad into a prominent median lobule.

Habitat—Western America.

Holotype—♂, Blue Lake, Humboldt Co., California; June 20-27, 1907 (J. Chester Bradley).

Allotype—♀, topotypic.

Paratypes—1♂, 1♀, topotypic; 1♀, Peachland, British Columbia, May 19, 1912; 1♀, topotypic, June 24, 1903.

The type is in the collection of Cornell University, paratypes in the collection of the author. The two last-named paratypes were earlier determined as *G. blanda* O. S. (Proceed. Acad. Nat. Sci. Phila., October, 1914, p. 286, 287).

This interesting species is nearest to *G. blanda* O. S. differing in the striped pleura, the long subcosta with a dark blotch at its tip, the slight amount of dark colour in the apices of cells *R*₃ and *R*₅, and in conspicuous details of the male hypopygium.

GEOMETRID NOTES.

NEW SPECIES AND VARIETIES.

BY L. W. SWETT, WEST SOMERVILLE, MASS.

Macaria fieldi, n. sp.

Male—Expanse 20-23 mm. Head, antennæ and legs light ashen gray. Thorax and abdomen light ashen gray, with a slight pinkish cast. Fore wings light ashen gray intradiscally, becoming fuscous beyond. They are clear ashen gray to the basal line, which is broad and strongly black at the inner margin, running at a slight angle to the median vein, where it seems to fade out, and there is just a trace of an orange line to the costa. The mesial space is also clear ashen gray, sometimes with a pinkish cast in fresh specimens. Discal spot black, with a paler centre, forming a ringlet of considerable size. The extradiscal line appears as a spot on the costa, just below which it is apparently broken off, running out sharply at a right angle, then connecting with a heavy black line, which runs almost straight to the inner margin, curving in slightly from M_3 to the margin. The black extradiscal line has a faint orange line bordering it inwardly, appearing stronger when the black is faded out. Beyond the extradiscal line there is an irregular blackish or fuscous clouding, apparently bordered by an irregular whitish line. Beyond this clouding the margin of the wing is slightly paler, and there appears to be a minute black dot at the base of the fringe on each vein. Fringe on all the wings fuscous. Hind wings basally light ashen, darker at outer border, more or less strigated. There is a prominent black discal spot; beyond this an extradiscal line, which runs straight across the wing, sometimes fading out before reaching the outer margin. Beyond this is a faint whitish line, appearing like a continuation of that of the fore wing, though not apparent in all specimens. Beneath, very pale ashen, the lines above showing through. The fuscous clouding appears on both fore and hind wings, not quite reaching the outer margins. The discal spots are prominent and black on all the wings.

Female paler than the male, the black extra- and intradiscal lines very faint, with an orange shading, sometimes appearing as pale orange-coloured lines. Fuscous clouding less heavy. Beneath,

the female is more strigated and there is a tendency for the shading to form a more distinct extradiscal band than in the male. On the hind wing, however, the clouding never forms a band to the margin of the wing.

This species bears a slight resemblance to *snoviata* Packard and *puertata* Grossbeck, but differs from both in the straight extradiscal line on both fore and hind wings and in the marginal band beneath.

I take pleasure in naming this species after Mr. George H. Field, who has done so much to advance our knowledge of California Lepidoptera.

Holotype—♂, La Puerta Valley, Calif., July 11; in my collection at the Museum of Comparative Zoology, Cambridge, Mass.; received through the kindness of Mr. Field.

Allotype—♀, La Puerta Valley, Calif., July 11, in Mr. Field's collection at San Diego, Calif.

Paratypes—♂'s and ♀'s, from same locality, in Mr. Field's collection and my own.

***Macaria grossbecki*, n. sp.**

Male—Expanse 22-23 mm. Head, antennæ and legs fawn-coloured. Thorax and abdomen brownish ashen, darker than in *fieldi*, with a suffused appearance, without conspicuous lines or markings as in the other species. Intradiscal line faint, pale orange, shaded with black; mesial space heavily strigated, as in the entire wing; not paler, as in *fieldi*. Discal ringlet clear black, with paler centre. Extradiscal line faint, blackish, with slight clouding. Veins with faint minute dots, fringe fuscous. Hind wings of the same colour as fore wings, with a trace of an irregular extradiscal ochreous line, blackish-shaded. Beneath paler than above, the discal ringlets showing on all the wings. No markings apparent, except the extradiscal brown marginal band, which shades to the outer margin; in this respect differing from *fieldi*.

Female—Similar above to the male; beneath much lighter basally, where it is strigated, a brownish band running extradiscally solidly to the outer margin.

Viewed from beneath, this species has somewhat the appearance of *puertata* Grossbeck; but above, it appears very different

on account of the lack of any heavy markings. It is possibly a suffused variety of *puertata*, but the markings above seem to indicate a distinct and apparently rare species.

I take pleasure in naming this form in memory of Mr. John Grossbeck, whom I considered our best authority on the Geometridæ, and who, shortly before his death, wrote me that he was taking up the mixed *Macaria-Sciagraphia* group. Unfortunately he was never able to finish this work, having only commenced to assemble the material at the time of his decease.

Holotype—♂, La Puerta Valley, Calif., July 11 (G. Field); also in my collection.

Allotype—♀, La Puerta Valley, Calif., July 11 (G. Field); in my collection.

Paratypes—Both sexes, from same locality, all taken by Mr. Field; in his collection and mine.

***Macaria minuta* (Hulst).**

Another species, which I was intending to describe, I came across labelled by Mr. Grossbeck as *Diastictis minuta* Hulst. If this identification is correct, as I believe it to be, the species is not a *Diastictis*, but a *Macaria*.

Above, it has a slight resemblance to *M. grossbecki*: but below, the extradiscal shading forms a bright ochre band, which is not solid, and extends only half way to the outer margin.

I have a very pale female, labelled by Mr. Grossbeck, in error, "*Sciagraphia heliothidata*?" Evidently it puzzled him. I think the strong fuscous marginal shading above and the light ochre below will serve to distinguish this obscure species. Hulst was doubtless puzzled through having only females. There are four brown spots on the costa, from which run pale, irregular, orange, black-shaded lines.

Macaria puertata Grossbeck is one of the most easily recognized species, and should be readily known by the characters of the underside, as should all these closely-related species.

My specimens of *M. minuta* are from La Puerta Valley, Calif., July 11, and Prescott, Ariz., Aug. 13, collected by Messrs. Geo. H. Field and E. J. Osler