

Morris



# The Canadian Entomologist

VOLUME LIII.

No. 9

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EDITOR:

DR. J. McDUNNOUGH

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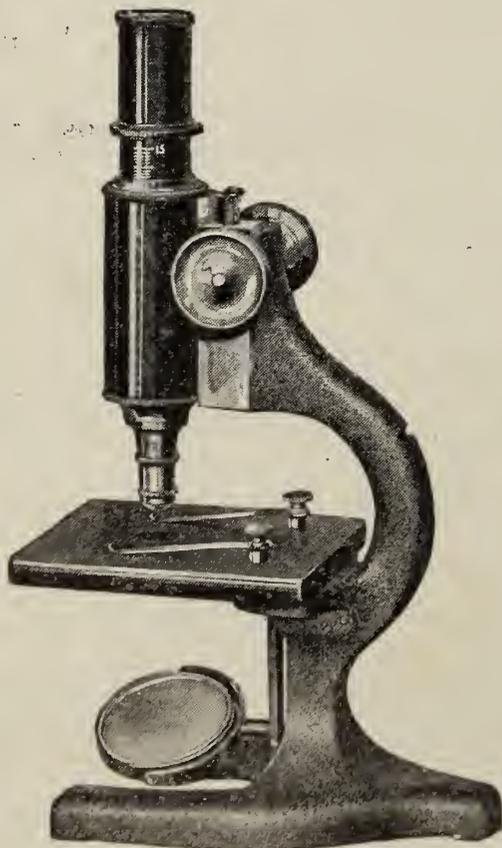
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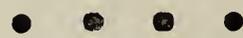
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# The Canadian Entomologist

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No. 9

## POPULAR AND PRACTICAL ENTOMOLOGY.

### THE LIFE HISTORY OF A HOBBY HORSE.

BY FRANCIS J. A. MORRIS,  
Peterborough, Ont.

#### PART III.—SECOND CHILDHOOD—THE TREE'S INCLINE.

I suppose one reason why people do not transplant well in middle life is that they never cease to miss the common sights and sounds of their native land ; snatched away from daily contact with the environment in which they have grown and spread until they come to fill every nook and cranny of it, they suddenly find themselves wrenched from a thousand rootlets that ministered unseen to their life needs ; starved of their sap from root to stem, they lose their lusty vigour, languish along their branches, and pine away in leaf and flower and fruit. It is impossible to feel at home anywhere until you have become thoroughly familiar with your surroundings ; this power of adaptation, shared by us with all things living, is strictly limited, and if the change is too violent or the organism too far set in maturity, acclimatization becomes impossible.

Not the faintest idea had I when I came to Canada at twenty-five years of age that my comfort and happiness depended mainly on familiarity with a whole little world of natural objects, to which I had grown so used as to be quite unconscious of their presence. The web that at infinite pains and with prolonged effort I had woven for myself, at whose centre I swung cradled in content was suddenly swept away by the rough hand of circumstance ; I was flung bodily to an infinite distance, to find myself sprawling hopelessly on the ground ; instinctively I set all my spinnerets frantically to work rebuilding the orb without which life itself was impossible, and groping feverishly for fresh points of attachment.

All the years I had lived in Great Britain, I had never approached Nature by way of Science ; though roughly familiar with the broader distinctions of *family*, I knew next to nothing of *genus* and *species*, and had never studied the classification of either Flowers, Insects, or Birds ; my knowledge was purely empirical, and for the most part I was quite unconscious of the points of distinction in form and structure that must surely underlie our recognition of individual forms. I was therefore powerless to identify what I saw, unless by good luck it happened to have a next of kin among my acquaintance in Great Britain ; with every stranger I met along the roadside, I must turn (so like your stiff Englishman!) to my companions for an introduction, and then hunt him up in Burke's Peerage or some other book of celebrities ; and I found to my sorrow on enquiry that such popular guides and illustrations of the Ontario *flora* and *fauna* were unprocurable. In little old England, which you could set afloat in Lake Superior, for a century or better, authorities more numerous almost than the entire population of Canada had been publishing descriptions as accurate as those of Scotland Yard, portraits as lifelike as Madame Tussaud's, that must infallibly lead to the apprehension of every flower, fern, insect and bird in the

British Isles, no matter how securely hidden it might fancy itself from the long arm of the Naturalist.

I was as helpless as a child, and as full of curiosity, for I had just entered a new world full of novelties ; hundreds of flowers and insects that I had never seen before, flaunted their beauty in front of me at every turn ; scores of birds with strange plumage and unfamiliar cries met my gaze on every walk in the country ; and like a child, too, I wanted at first to know just their names, to have a simple label that I could attach to them, some definite word that I could hunt up in a book, and so round out my field observations.

It is not given to all to enter second childhood thus wide-eyed and mentally alert, and for the sake of others who may be similarly placed or may want in adult life to enter on the study of Natural History, I wish here to record some of my early experiences as a stranger in a strange environment to which the senses of his neighbours had grown dulled from boyhood. And let me tell you, I found it far harder to learn the secret of the sights and sounds that met me than if I had been a child. The world of childhood and boyhood was forever shut to me, and often I found myself envying the youngsters who were penetrating such mysteries day by day, without conscious effort, by companionship with their fellows and the traditions of their kind. I was herded with the grown-ups and found most of them sadly ignorant and careless of the Natural life about them.

It was when summer was already sinking into the lap of autumn, and within a fortnight of my setting foot in Canada, that I took up my quarters in Toronto preparatory to a 3-term session at the School of Pedagogy. Almost the first things that had struck me were the wonderful clarity of the air, and the lavish way of the sun in spilling whole weeks of blue unclouded summer days over the land. As we steamed up the St. Lawrence, I had noted with astonishment the sharp outlines and bright colours of the houses along the distant shore, so different from the hazy indistinctness of an English landscape. On landing at the docks I had been taken through Montreal on a sight-seeing tour ; I can't remember now what "Notre Dame" looked like either inside or out, but I know that the streets and sidewalks of the city were literally covered with grasshoppers, almost in the heart of the business section. About Toronto when you walked in the fields, every step you took squirted showers of these insects, as well as crickets and locusts, up at your face. It was as hard to steer a conversation safely through such elements as for a swimmer to breathe in a choppy sea,—you never knew when you were going to get a mouthful ; and often it was impossible to be quite sure whether your last ejaculation had been a word or an insect. After a little experience one learned to wade along in silence, glasses jammed close up to one's eyes and mouth tight shut, like a ship running through heavy seas with port holes closed and hatches battened down. Ontario had been in the grip of a drought for five or six weeks, a very exceptional thing, I was told ; but most of the twenty-five years passed in Ontario since 1894 have only gone to prove the rule of this exception.

My walks that Fall were mostly in the direction of Rosedale, and all of them alive with wonders ; chipmunks and groundhogs, severally after their kind, came chattering and frisking forward with eager curiosity to meet the tender-

foot, went scurrying in shortlegged rippling bulk across the fields or stood stock still and bolt upright, "frozen" at the mouth of their burrow, the living counterpart of a neighbouring stump; acres of goldenrod and asters rioted beside the path; goldenrod of the most beautiful curving plumes in place of the stiff homely spikes of the British species; asters of every size and shade, from white and pale lilac to the rich violet and blue of the Michaelmas Daisy; butterflies that fairly made one's mouth water, Swallow Tails and Fritillaries (Silver Spots), Camberwell Beauties (Mourning Cloaks), Tortoiseshells and Painted Ladies, fluttered and sailed and flew, a bevy of beauty; and mingling with them strangers of unmistakably royal blood (to judge from their robes), Emperors and Viceroys worthy of a front page in Burke's Peerage; and then the birds! In place of a single Green Woodpecker—rare and local—I saw four or five kinds, all painted as gay as the Tropics, the Flicker, the Red Head, the Downy, the Hairy, and these, mind you, for all their gorgeous plumage, as common as sparrows, or poppies in a cornfield. To cap it all, my ears were filled from every side in the woods with myriads of strange sounds, tapping, creaking, chirping voices, call-notes and songs, as mysterious as Echo, and all clamoring for me to join their game of "I spy" and track them to their secret lair; the very heavens were full of sound, showers of soft twittering notes and sweet music fell about me in the open; Puck in the woods and Ariel in the sky, what a royal hide-and-seek they had with me that Fall!

As we were returning from Rosedale on one of these early trips, I called my companion's attention to the barking of a foxterrier in the distance; after locating the sound, he stared at me incredulously for a moment and then remarked scathingly: "A nice one you are in the country, and not know a crow when you hear it!" And a crow it proved to be, but how different, with its short, sharp, staccato challenge, of "cá, cá," from the English rook and its lazy drawl of "cää, cää!"

Two other birds I met that Fall for the first time in my life, the lovely Bluebird (a close kinsman of the English Redbreast) and the American Robin. This last I had looked eagerly forward to seeing for over a year; ever since the day when I had joined in the laugh that went round my uncle's dinner-table one Christmas at the expense of a cousin newly home from British Columbia. He had been regaling us with travellers' tales of the strange land beyond the seas, and we had all been devouring them with relish and perhaps a pinch of salt; till he came to this outrageous whopper, no more to be swallowed than Gulliver's reported linnets from Brobdingnag as big as swans: "In Canada," remarked my cousin with some pride, "our robins are as large as blackbirds." "Yes," countered my uncle drily, "and how large are your turkeys, my boy?" It was only when I became a resident of Ontario that I discovered the robins were a red-breasted thrush; and in the Spring it soon grew to be an exquisite pleasure to note the bird's song, so characteristic of the thrushes, with its tell-tale bars "sung twice over," as Aristophanes observed more than twenty-three centuries ago and Robert Browning somewhat later;—and if you had no ears to hear, behold! the dumpy fledglings, with the speckled breasts they bore, and the way they had with the garden worms, the quick little run over the lawn and the head cocked on one side to listen, thrushes every inch

of them, from the tip of the bill to the toes.

During the winter I had made the acquaintance of Dr. Brodie and he had promised to take me out with him in the Spring ; unfortunately I was too busy between April and June to steal much time for Natural History. I was able, however, to make three or four trips in the doctor's company and learn something about the environs of Toronto. About the time of the Spring flights of warblers, we had a day at Victoria Park ; and later he took me over the Don flats to a wooded hill-side beyond the C.P.R. The trip I recall most vividly was my first visit to High Park. It was in June and our way led past the Grenadier Pond, and then west and north. I was greatly struck with the beauty of the scenery, the rolling downs, with their deep ravines, the groves of oak and pine, the underbrush and the richness of the vegetation, interspersed with barren tracts of drifting sand. High Park became a favorite resort of mine and I came in later days to wander all over the district from Parkdale to Humberside and Lambton.

We had taken insect nets with us, and in a heathy space dotted here and there with oaks I captured several butterflies ; they were nearly all quite strange, and it was then, I think, that there first came home to me the hopelessness of identifying species without good illustrated popular books of entomology ; it was all plain sailing as long as the doctor was with me, but I fully realised how helpless I should be alone. On our way back in the late afternoon, we heard a bird singing in a near-by oak, and stopped to listen. I had rarely heard more delicious music, though obviously of less range and richness than a nightingale's ; it was certainly finer than the English thrush, I thought, and wilder like the Missel thrush's, the bars often repeated in true throistle fashion, and with many interludes of those wonderful soft undertones when you knew the bird's throat feathers would be gently ruffling above the breast ; the doctor thought it was a Hermit thrush ; it was certainly of the thrush family, for I caught a glimpse of it, large, brown, and with speckled breast ; I have since identified the bird from my recollection of the song, as the Brown Thrasher, and its choice of perch confirms this, almost at the top of a large oak, proclaiming itself to the world.

Without either musical ear or knowledge of musical terms, I wish to put it on record that except from the English nightingale I have rarely heard more delightful music than this bird's. It is quite a mistake to suppose that because poets have sung more wonderfully about the English skylark, the thrush and the nightingale, these bird-songs themselves must be far grander than those of Ontario ; the Brown Thrasher and the Rose-breasted Grosbeak are a match any day for their British cousins, and the Hermit Thrush is declared by such masters as John Burroughs and Schuyler Matthews to be more than the peer of the Nightingale ; it isn't the Bird that is wanting, it is the Wordsworth, the Shelley and the Keats ; given the human soul whose chords respond to the birds' ineffable sweetness, their tender melancholy, their world-old pathos and ecstasy of passion, and they too will be among the immortals.

Another fallacy the faithful observer must expose, in spite of poets' protest, is what Ruskin calls "the pathetic fallacy,"—to which we are all peculiarly prone in listening to the songs of birds ; we know, if we reason it out, that

There can be none of the rich content of human thought and the depth of human emotion behind those warblings ; yet as we listen the heart aches with infinite yearning, we are under the spell of enchantment and it sways our whole being. It is recorded somewhere how Shelley was rudely awakened from a dream of love once by the sight of his *inamorata's* healthy zest over a mutton chop ; he would have had the same revulsion of feeling in a Cambridge lane with me while listening to the Nightingale on a sunny day of June ; in the very midst of one of its divinest passages, its throat feathers stirring to the liquid melody, the bird stopped short and darted down to gobble a big grub, like the greediest fowl on wings—a *prima donna* and a glutton !

Soon after this trip to High Park, I went to spend the summer on Centre Island with some city friends, and at the close of the year was appointed to the staff of the Smith's Falls High School, on the Rideau River, some fifty miles south of Ottawa.

This was my first year in a country district and I hugely enjoyed meeting the natural conditions of an Ontario winter. Many a time as children in Scotland we had battled our way to school through blizzards of snow, had eagerly consulted the glass to see if "the black frost" was going to make the ponds bear, and one winter had twice seen with bulging eyes the mercury fall below zero. Sledges and skates had long vanished away, but again and again I found the experiences of this first real winter in Canada send my thoughts harking back over fifteen years and more to the Perthshire home.

It may have been this that made me more than usually homesick on the approach of Spring. I hungered for the sight of English hedgerows with sweet violets, primroses, hyacinths and half a hundred other familiar sights. I had forgotten for the moment all the novelties that had come in their stead, and this nostalgia lasted on all through the dreary days of March and early April, when nothing seems to be alive, and all the highways and byways stick up their effective "No Trespass" sign, daubed in inches of mud and slush. Another torture of Tantalus that aggravated my hunger later on was to be sent on some wild goose chase of eager anticipation, as when I was told of a bed of cowslips and found marsh marigolds, honeysuckle that proved to be columbine, Yellowhammers that were Flickers ; I had even a childish disappointment over the "Daddy-long-legs" when it turned out a spider instead of a crane-fly.

Our school had only three assistants, and it was practically Hobson's choice for companionship ; the only man on the staff besides myself was the teacher of Science, and we had already fallen into the daily habit of walks together long before the winter ended.

The course of work for Science then in the Junior School was almost entirely Botany, and I watched with considerable interest his preparations for identifying flowers, an art till then wholly unintelligible to me. Half in a spirit of fun I rigged myself out with a little linen-tester for a magnifying-glass, a pair of small needles sunk over head and ears (if they had them) in the pith core of a lilac twig, and a copy of Spotton's High School Botany ; in three days I had outstripped even the most eager of his pupils ; in a week the jest was deadly earnest, and in a month the zealot became a hopeless monomaniac. I still hated to pick the flowers to pieces, and the tedium of working out some of the

less attractive genera and families, like the Crucifers and the Composites, came near to damping my ardour. Still I persevered, even resisting as a rule the terrible temptation to guess at the plant's identity *a priori*, instead of working it out honestly by the key. I think my progress surprised even my foster parent the Science master, for I took to Botany as a duck takes to the water; he hadn't allowed enough for some of the main factors in the problem; I had spent years in the English lanes and knew the household names of most of the familiar flowers; Greek and Latin had become almost a mother tongue to me and a second nature, so that the botanical terms were full of meaning; and, more than all, I burned with desire to gain "the freedom of the realm"; ahead of me I could see summers full of glorious discovery in Ontario; and when I had discovered America (botanically), I was determined to go over and discover Great Britain; and never did Highlander with the gift of second sight see the vision of his own future more truly than I did that first Spring in Smith's Falls. It was a case of Archimedes and his lever over again; given Spotton (or Gray), I could move the universe—or at least stick labels all over it; if an Afrite had dropped me into the heart of some equatorial forest, I'd have welcomed the chance and, bar cannibals, crocodiles and the tsetse fly, been as happy as a clam.

That plants like animals had sex was a piece of common knowledge, but the analysis of a flower and the names and relations of its different parts were quite new to me. My first lessons were in this, and by taking a few leading types and separating their parts, identifying each of these and studying their mutual relations, I soon got the hang of the system.

The very heart and centre of every perfect flower was an elongate hollow body (the pistil) of complex nature, comprising below a vessel (the ovary) in which the unripe seeds (ovules) developed; at the upper end of the ovary was a vertical extension in the form of a slender tube or hollow stalk (style) whose widened apex (stigma) served as a receptacle for the pollen-grains, which then passed down the style-tube into the ovary; round this procreant cradle of the flower were grouped, like a body guard round their queen, a set of tiny stalks (stamens), each surmounted by a pair of little boat-shaped vessels (anthers) of pollen to quicken the ovules; in turn about these two essential parts,—the queen and her consorts (pistil and stamens), were grouped usually two sets of leaf-like protective lobes known as the floral envelope; the inner ring (corolla) of brightly colored lobes (the petals), and the outer ring (calyx) of green lobes (the sepals); if only one of these two rings occurred, whether green or brightly colored, it was called the calyx of sepals.

According to the form of the pistil and the number and arrangement of stamens, petals and sepals, all flowering plants were arranged into two great divisions: I. those whose seeds in germinating sprouted into a single leaf (Monocotyledons), and II. those whose seeds sprouted into a pair of leaves (Dicotyledons.) The first class had nearly always straight or parallel veins in the leaves, and their flower parts in 3's; it included (a) Arrowheads, (b) Grasses, (c) Sedges, (d) Arums, (e) Rushes, (f) Lilies, (g) Irids, (h) Orchids. The second class had net-veined leaves and the parts of the flowers in 5's and 4's, occasionally 2's. Of this class a small sub-division bore the seeds naked (i.e.

not enclosed in a capsule), like the pines ; but the vast bulk of them possessed ovaries or seed cases. These were arranged in three divisions (1) those with one or both of the outer rings (corolla and calyx) wanting (Apetalous) ; (2) those whose petals were not united to one another (Polypetalous) ; (3) those whose petals were united, whether altogether or only at the base (Gamopetalous).

In the first few weeks of Spring it was easy to keep pace with the procession of flowers and assimilate the principles of the new science at the same time ; but in June and July the different kinds of habitat became so numerous and so crowded that one could not visit them all often enough to exhaust their denizens. However, in the course of two years, I knew nearly all in the neighbourhood, and it was only by going to a distance that I could add to my acquaintance ; but by a happy provision of Nature, when novelties ran out, the pleasure of renewing old acquaintance out-begged the joys of fresh discovery.

(To be continued.)

## A REVISION OF THE NEARCTIC SPECIES OF THE TACHINID GENUS *ERNESTIA* R. D. (DIPTERA).

BY JOHN D. TOTHILL.

In Charge of Natural Control Investigations, Entomological Branch, Ottawa.

While in Washington, D.C., in March, 1921, Dr. Aldrich suggested that a revision of the nearctic species of the genus *Ernestia* would be a profitable undertaking. The rich collection in the U. S. National Museum was placed at my disposal, and I had with me some material belonging to the Entomological Branch of the Dominion Department of Agriculture and some California material belonging to Mr. E. P. VanDuzee. It was soon found that the male genitalia afforded an excellent series of characters for separating out the species, and the revision was consequently based largely upon a study of males. When the males had been sorted out into sixteen species, it was found that the females could be sorted out into fourteen species. It was not possible in all cases to assign a male and female to each species, and as the male characters are more readily seen than the female ones, it seemed better to base the descriptions of new species upon males. Descriptions of twelve new species have been drawn up and also of such of the existing species that seemed to require a more ample description than has been published. Well known and easily recognizable species have not been redescribed.

It is a great pleasure to acknowledge the cordial assistance given me by Dr. J. M. Aldrich, and also to express my sense of appreciation to Mr. Arthur Gibson, the Dominion Entomologist ; Dr. L. O. Howard, the Chief of the U. S. Bureau of Entomology ; and to Mr. A. F. Burgess of the U. S. Bureau of Entomology, for making the study in Washington possible. Mr. Charles T. Greene has been kind enough to make the drawings for this paper.

THE GENUS *ERNESTIA* R.D.

*Erigone* R.D. Myod. 65, 1830.

*Mericia* R.D. Myod. 64, 1830.

*Platychira* Rond. Dipt. Ital. Prod. 1859.

*Varichaeta* Speiser, Berl. ent. Zeit. 1903.

*Panzeria* R.D. Myod., 69, 1830.

*Okanaganian* Tn. Can. Ent. 289, 1915.

*Melinocera* Tn. Proc. Biol. Soc. Wash. XXVIII., 22, 1915.

The genus *Ernestia* was proposed in 1830 by Robineau Desvoidy for the reception of a single species that he called *microcera*. According to Bezzi (Kat. Pal. Dipt. 1907) the species *microcera* R.D. is a synonym of *rudis* Fall. described in 1810 as a *Tachina*. As the species *rudis* Fall. does not properly belong in the genus *Tachina*, it therefore becomes the type species of the genus *Ernestia*.

The genus *Fausta* was proposed in 1830 by Robineau Desvoidy for the reception of five species. In 1863 the same author designated *nemorum* Meig. as the type species of the genus. For reasons that will appear later, it seems that in spite of the wide parafacials, this species is closely related to the generalized *Ernestias*, such as *rudis* Fall. and *radicum* Fab. In order to preserve the sense of relationship with *Ernestia* and yet to bring out the difference between the two series, it seems advisable to treat *Fausta* as a subgenus of the genus *Ernestia*.

The species described by Coquillett as *Meriania chalybea* is undoubtedly congeneric with *puparum* Fab. of Europe, a male and female of which—determined by Bezzi—I have seen. The genus was proposed for species having the sides of the face hairy and otherwise resembling *Ernestia* s. str. Hairiness of the facialia in this group is, however, of questionable generic value because *Ernestia flavicornis* Br. exhibits a marked tendency in this direction, especially in some specimens. Furthermore, the male genitalia in *chalybea* Coq. and in *puparum* Fab. also exhibit the same generalized features as do those of *E. flavicornis*. The best way to express this clear relationship seems to be to treat *Meriania* as a subgenus of the genus *Ernestia* for the inclusion of *puparum* Fab., *chalybea* Coq., *flavicornis* Br., and *nigrocornea* sp. n.

These two subgenera, *Fausta* and *Meriania*, are evidently closely related, as shown by the generalized genitalia. In the known species they can be separated by the presence of discal bristles on the second abdominal segment in *Fausta* and by their absence in *Meriania*; and by the presence of hairs on the parafacials in *Meriania* and by their absence in *Fausta*. An undetermined female *Ernestia* from Armstrong, B.C., in the National Collection at Ottawa has both hairy parafacials and discal abdominal bristles; if, when the male becomes known, this proves to belong to the *Fausta-Meriania* group, it would show that these two subgenera could be treated more naturally as a single subgenus.

The genus *Metaphyto* was proposed by Coquillett in 1897 for the reception of a single species, *genalis* Coq. This species has wide parafacials as in *Fausta* and genitalia that relate it to *Ernestia arcuata* et al. (See the discussion of this point later). The relationships will be fairly well expressed by treating *Metaphyto* as a subgenus of the genus *Ernestia*.

An examination of the type of *Okanaganian hirta* Tn. shows the fly to be *E. (Metaphyto) genalis* Coq.

*Xanthophyto labis* Tn. may prove to be an *Ernestia* when more is known about its habits. The yellow third segment of the antenna, the cloud over the radio medial cross vein, and the generalized condition of the male genitalia all

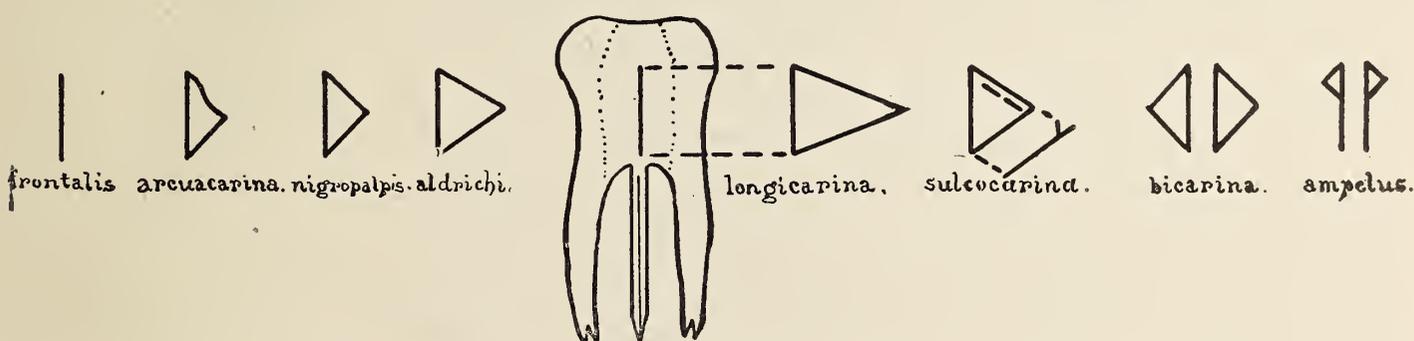
suggest a close affinity with *E. flavicornis* Br. Until the male is known, however, and until the reproduction habit is established, there is not sufficient justification for linking the genus with that of *Ernestia*. In *X. labis* the chaetotaxy of the scutellum differs from that of all the known species of *Ernestia*.

*Pyraustomyia penitalis* Coq. exhibits the same peculiar scutellum chaetotaxy found in *X. labis*, and is probably not congeneric with *Ernestia*.

In so far as is known, all the members of the genus *Ernestia* have the habit of depositing living maggots in the path of their host.

#### INTERRELATIONS OF THE NEARCTIC SPECIES

The nearctic species of the genus *Ernestia* differ from one another chiefly in the structure of the male genitalia—most of the species are in fact inseparable without reference to these organs. Arranging them in a series according to the degree of specialization of the genitalia, one can therefore gain some idea as to their immediate ancestry. The most generalized condition of the genitalia is found in *E. flavicornis* Br., *E. nigrocornea* sp. n., *E. chalybea* Coq., and *E. frontalis* sp. n., where the base of the inner forceps has developed no median keel-like projection. In *arcuata* sp. n., *johnsoni* sp. n., *nigropalpis* sp. n., and *incisa* sp. n. there is a well-developed keel-like projection. More highly specialized again are *E. aldrichi* Tn. and *E. longicarina* sp. n. in which the keel-like projection has become longer than in any other known nearctic species. In *E. platycarina* sp. n. one margin of the carina has become flattened. In *sulcocarina* sp. n. the same margin has become grooved. In *bicarina* sp. n. the groove in the carina has developed to such an extent that a splitting has oc-



cured so that there are two keel-like projections instead of one. Finally, in *E. ampelus* Walk., and in *E. fissicarina* sp. n., the two keel-like projections have become reduced into a pair of knob-like structures. From these facts the group would appear to be monophyletic. With the evolution of the keel-like projection in mind, it is possible to test the validity of the genus *Fausta* proposed for the reception of forms having the sides of the face abnormally wide. In the type species *E. nemorum* Meig., the keel-like structure is in the generalized condition found in *E. flavicornis* Br., *E. frontalis* sp. n., *E. nigrocornea* sp. n., *E. rudis* Fall. and *E. radicum* Fab. In the nearctic species *genalis* Coq., on the other hand, there is a well-developed unsplit median keel-like projection as in *E. arcuata*. It would seem, therefore, that *Fausta* is not a natural genus, as the species are less closely related to one another than to species in the genus *Ernestia*. An explanation that suggests itself is that in the evolution of the *Ernestia* group a widening of the sides of the face has taken place twice; first when the genitalia were still generalized, and secondly when a keel-like process had been developed. Such a relationship can be expressed by retaining

*Fausta* as a subgenus for the inclusion of the generalized *nemorum* Meig. and by retaining *Metaphyto* Coq. as a subgenus for the inclusion of *genalis* Coq.

RELATIONSHIPS OF THE NEARCTIC AND PALAEARCTIC SPECIES OF THE GENUS  
ERNESTIA S. STR.

From an examination of five palaeartic species it would appear that while some of the nearctic species are very closely related to palaeartic species, yet there are perhaps no two species common to the two land masses. A more extensive study of the European material may, of course, serve to modify this statement. It may be of interest to point out the difference between the European species I have examined and their nearctic relatives.

A male specimen of *E. rudis* Fall., so determined by Bezzi, has no keel-like projection on the basal part of the inner forceps, and in this respect resembles *E. flavicornis* of Brauer and my *E. frontalis*. It differs from the former in not having a bright yellow third antennal segment and from the latter in having the width of the front at the narrowest place equal to less than the length of the second antennal segment.

A male specimen of *E. radicum*, so named by Brunetti, has a keel-like projection on the basal part of the inner forceps in such a rudimentary condition that it can only be seen by careful scrutiny. It differs from *E. flavicornis* Br. in the color of the third antennal segment; from *E. frontalis* in the notably shorter inner forceps of the male genitalia and from *E. nigrocornea* in the narrower facialia.

A male specimen of *E. connivens* Zett., so named by Bezzi, is evidently very closely related to my *nigropalpis* and *arcuata*. In *nigropalpis*, however, the tips of the outer forceps are laterally compressed so as to be bayonet-like in shape; and in *arcuata* the fifth tergum is much longer and more clearly defined.

A male specimen, named *E. consobrina* Meig. by Bezzi, has a median keel-like projection on the base of the inner forceps that is split longitudinally into two halves, very much as in the case of my *bicarina*. In the latter species, however, the splitting process has been carried considerably further; and also each prong of the fifth sternite terminates in a short spine, which is not the case in *consobrina*.

There is a male specimen from Shirmer, labelled "Berlin, Germany," that has not been identified. It runs in my key to section 10 but it can be readily separated from all the nearctic species on account of the extraordinary length of the median keel-like projection on the base of the inner forceps:

DISTRIBUTION OF THE GENUS ERNESTIA.

Our knowledge of the distribution of the genus *Ernestia* in the Southern Hemisphere is too meagre to warrant any conclusion concerning the origin and development of the group for the whole world. For the Northern Hemisphere, however, our knowledge of the distribution of the group is at least fairly complete. In his catalog of palaeartic Diptera, Kertész lists twenty-three species, while for North America we now have sixteen species; consequently, palaeartic rather than a nearctic origin is indicated, although, of course, by no means proven.

Further light is thrown upon this question by reference to the degree of specialization of the species in the respective regions. We have already

seen that the condition of a split keel-like process on the base of the inner foreceps represents almost the highest achievement in the specialization of these flies. This condition is reached by *E. consobrina* Meig. in Europe and by *E. bicarina* sp. n. in America. It therefore seems certain that the split keel was achieved when a land bridge connected the two great land masses. It also follows that the group achieved its greatest development during the period of the last land bridge. Indeed, the only development of any importance that appears to have taken place since the land bridge days is the reduction of the split keel found in the two American species, *ampelus* Walk., and *fissicarina* sp. n.; and further studies of the palaeartic species may show even this slight specialization to have been an ancient rather than a modern achievement.

As there are reasons for supposing that very few, and perhaps none, of the now extant species are common to the two land masses, it seems to follow that although the nearctic and the palaeartic species have had a common origin during the land bridge period, yet a slight further development has been achieved in each of the now separated land masses during the recent period of isolation.

#### SYNOPSIS OF THE NEARCTIC SPECIES IN THE GENUS ERNESTIA R. D.

##### Subgenus *Meriania*.

*chalybea* Coq.

*flavicornis* Br.

*nigrocornea* sp. n.

##### Subgenus *Fausta*.

No nearctic species known.

##### Subgenus *Ernestia*.

*frontalis* sp. n.

*johnsoni* sp. n.

*nigropalpis* sp. n.

*arcuata* sp. n.

*incisa* sp. n.

*aldrichi* Town.

*longicarina* sp. n.

*platycarina* sp. n.

*sulcocarina* sp. n.

*bicarina* sp. n.

*ampelus* Walk.

*fissicarina* sp. n.

##### Subgenus *Metaphyto*.

*genalis* Coq.

#### KEY TO THE SUBGENERA OF THE GENUS ERNESTIA.

1. No discal macrochaetae on the second abdominal segment; parafacials hairy, at least in the females, especially on the upper part.....  
 ..... Subg. *Meriania*
- Discal macrochaetae present on the second abdominal segment; third antennal segment black; parafacials never hairy, even on the upper part  
 ..... 2
2. Width of the parafacials not nearly equal to the length of the third anten-

- nal segment.....*Ernestia* s. str.
- Width of the parafacials equal to the length of the third antennal segment, i.e., parafacials unusually wide.....3
- 3. A median keel-like projection at the base of the inner forceps of the male genitalia, i.e.; genitalia specialized.....Subg. *Metaphyto*
- No such projection, i.e., genitalia generalized.....Subg. *Fausta*

KEY TO THE NEARCTIC SPECIES IN THE SUBGENUS MERIANIA.

- 1. Third antennal segment black.....*E. nigrocornea* sp. n.
- Third antennal segment yellow or reddish.....2
- 2. Width of front in male equal to less than the length of the second antennal segment; parafacials very hairy in the male.....*E. chalybea* Coq.
- Width of front in male equal to the length of the second antennal segment; parafacials in the male hairy on only the upper part and the hairs very thin.....*E. (Meriania) flavicornis* Br.

KEY TO THE MALES OF THE NEARCTIC SPECIES OF THE GENUS ERNESTIA S. STR.

- 1. Genitalia yellow or rufous.....2
- Genitalia dark or black.....3
- 2. Width of the front at narrowest place less than the length of the second antennal segment; inner forceps with a short keel flattened on one edge.....*platycarina* sp. n.
- Width of the front at narrowest point equal to or greater than the length of the second antennal segment; inner forceps without a keel and with two conspicuous projections placed side by side.....*ampelus* Walk.
- 3. Width of front at narrowest point fully twice as long as the second antennal segment.....4
- Width of front at narrowest point less than twice the length of the second antennal segment.....6
- 4. Inner forceps with a conspicuous keel.....*aldrichi* Tn.
- Inner forceps without a keel.....5
- 5. Base of inner forceps with two conspicuous projections placed side by side.....*fissicarina* sp. n.
- Base of inner forceps without such projections.....*frontalis* sp. n.
- 6. The fifth sternite with a deep incision on the lateral margin of each of the two prongs.....*incisa* sp. n.
- The fifth sternite normal.....7
- 7. The inner forceps with a pair of short keels placed side by side.....*bicarina* sp. n.
- The inner forceps with a single keel.....8
- 8. The width of front as great or greater than the length of the second antennal segment.....*johnsoni* sp. n.
- The width of front less than the length of the second antennal segment.....9
- 9. Palpi black; the fifth tergum scarcely distinguishable from the first genital segment with which it is united.....*nigropalpis* sp. n.
- Palpi reddish, at least at tip; the fifth tergum clearly marked off, at least laterally by a suture from the sixth.....10
- 10. Keel-like portion of the base of the inner forceps of unusual length, its dor-

sal edge not concave; the apical portions of the outer forceps laterally compressed and each terminating in a pair of hooks. . . . . *longicarina* sp. n.  
Keel-like portion not of remarkable length, its dorsal edge strongly concave; the apical portions of the outer forceps cylindrical and each terminated by a single hook. . . . . *arcuata* sp. n.

## KEY TO THE FEMALES OF THE NEARCTIC SPECIES IN THE GENUS ERNESTIA.

1. Third antennal segment yellow. . . . . Subg. *Meriania*  
Third antennal segment black. . . . . Subg. *Ernestia* 2
2. Fourth abdominal segment rufous. . . . . 3  
Fourth abdominal segment black. . . . . 4
3. Second antennal segment rufous. . . . . *ampelus* Walk.  
Second antennal segment black: . . . . . *platycarina* sp. n.
4. Second antennal segment yellow. . . . . 5  
Second antennal segment black. . . . . 8
5. Fifth sternite without a longitudinal groove or depression; tarsal segments of front legs cylindrical; bend of fourth vein with a well-marked appendage. . . . . sp. *a*  
Fifth sternite with a longitudinal groove or depression; tarsal segments of front pairs of legs flattened dorsoventrally; bend of fourth vein with a very indefinite or with no appendage. . . . . 6
6. Fifth sternite with a deep longitudinal depression. . . . . 7  
Fifth sternite with a very shallow longitudinal depression. . . . . sp. *c*.
7. The depression in the fifth sternite extending through the posterior margin, i.e.; the posterior margin concave; a short but distinct carina running the full length of the depression. . . . . sp. *b*.  
The depression in the fifth sternite not extending through the posterior margin, i.e.; the posterior margin straight; no carina in the depression. . . . . sp. *d*.
8. Front at the vertex as wide as either eye; the second, third and fourth but not the fifth abdominal sternites each with a group of strong, blunt, downwardly directed macrochaetae seen best in profile. . . . . 9
9. Palpi coal black, . . . . . *nigropalpis* sp. n.  
Palpi yellow, at least at tip. . . . . 10
10. The fifth abdominal sternite with two parallel longitudinal grooves separated by a shallow carina. . . . . *bicarina* sp. n.  
The fifth abdominal sternite with only a single longitudinal groove or depression. . . . . 11
11. The fifth sternite longer than the fourth. . . . . *sulcocarina* sp. n.  
The fifth sternite shorter than the fourth. . . . . probably *johnsoni* sp. n.

(To be continued)

NEW SPECIES OF CRANE-FLIES FROM NORTH QUEENSLAND  
(TIPULIDAE, DIPTERA).

BY CHARLES P. ALEXANDER,

Urbana, Ill.

The undescribed species of crane-flies that are characterized herewith were kindly sent to me by Dr. James F. Illingworth. Most of the material was

collected along the Babinda Creek, North Queensland. The difficulties in the way of collecting these insects in Queensland are well shown by the following paragraph from one of Dr. Illingworth's letters:

"Sweeping along streams is almost out of the question here in the tropics, where every bush is provided with recurved hooks to hold one up. I have torn a number of nets full of holes trying to do it and seldom make a catch. Most of the specimens I found either singly on the vegetation, in the scrub, or in caverns under the large rocks along the streams."

A few additional specimens were secured by Mr. Alan P. Dodd. I would express my indebtedness to Dr. Illingworth and Mr. Dodd for this interesting material. The types of the new species will be preserved in the writer's collection.

**Genus *Dicranomyia*, Stephens.**

**Subgenus *Thrypticomya*, Skuse.**

The type of the subgenus is *D. (T.) aureipennis* (Skuse) (Australia). Other species belonging to this group are *D. arcuata* (Alexander) (Japan), *longivena* (Edwards) (India), *seychellensis* (Edwards) (Seychelles Islands) and probably *saltens* (Doleschall) (Oriental Region). Two additional undescribed species were included in the present material.

***Dicranomyia (Thrypticomya) doddi*, sp. n.**

General coloration dark brown; thoracic pleura obscure brownish yellow; tarsi largely white; wings with a distinct brown suffusion that is uniformly distributed over the wing surface; stigma large; supernumerary crossvein in cell  $Sc_1$  only a short distance before  $r$ .

*Male*.—Length 6 mm.; wing 5.8 mm.

*Female*.—Length 5.5 mm.; wing 6 mm.

Rostrum obscure yellow; palpi dark brown. Antennae dark brown. Head greyish brown.

Mesonotum dark brown. Pleura obscure brownish yellow. Halteres long and slender, dark brown. Legs with the coxae and trochanters dark brown; femora dark brown, slightly paler basally; tibiae and about the basal one-half or slightly more of the metatarsi dark brown; remainder of the tarsi white or faintly reddish white. Wings with a uniform brownish suffusion; stigma large, elongate-oval, dark brown; veins dark brown. Venation:  $Sc$  ending opposite the origin of  $R_s$ ;  $Sc_2$  pale, removed from the tip of  $Sc_1$ , the latter being about equal to the deflection of  $R_{4+5}$ ; supernumerary crossvein in cell  $Sc$  a little more than the length of  $r$  before this latter crossvein; extreme tip of  $R_1$  atrophied; inner end of cell 1st  $M_2$  slightly arcuated; cell 1st  $M_2$  about equal to vein  $M_3$  beyond it; basal deflection of  $Cu_1$  near midlength of cell 1st  $M_2$ .

Abdomen dark brown.

*Habitat*.—North Queensland.

*Holotype*, ♂, Gordonvale, June, 1920 (A. P. Dodd).

*Allotopotype*, ♀.

*Paratopotype*, ♂.

This crane-fly is dedicated to its collector, Mr. Alan P. Dodd. Its closest relative is apparently *D. seychellensis* (Edwards) which differs mainly in the coloration of the wings.

**Dicranomyia (Thrypticomyyia) fumidapicalis, sp. n.**

General coloration dark brown; thoracic pleura yellow; legs dark brown, the tarsi largely white; wings hyaline basally, with about the apical fifth strongly infuscated.

*Male*.—Length 6—6.5 mm.; wing 6.7 mm.

*Female*.—Length about 5.5 mm.

Described from alcoholic specimens.

Rostrum and base of palpus obscure brownish yellow; terminal palpal segments dark brown. Antennae dark brown, the flagellar segments with a short basal pedicel and with long, unilaterally arranged verticils as in the males of this group. Head dark.

Mesonotum dark brown, the median area of the scutum and the postnotum paler. Pleura obscure yellow, the mesosternum infuscated. Halteres elongate, brown. Legs with the coxae and trochanters yellowish; only the fore legs remain attached to the body; femora, tibiae and about the basal third of metatarsi dark brown; remainder of the tarsi except the terminal segment white; fore metatarsi with a small tubercle near the base. Wings hyaline with about the apical fifth strongly infuscated, this including almost all the wing beyond the level of the cord; stigma oval, still darker brown; veins dark brown. Venation:  $Sc_1$  before the origin of  $R_s$ ,  $Ss_2$  ending just beyond the origin of  $R_s$ ,  $Sc_1$  alone being a little longer than the basal deflection of  $Cu_1$ ;  $R_s$  long, arcuated at origin;  $r$  near tip of  $R_1$ ; cell 1st  $M_2$  long and narrow, longer than vein  $M_3$  beyond it; basal deflection of  $Cu_1$  beyond midlength of cell 1st  $M_2$ .

Abdomen of male long and slender, dark brown; sternites a little paler.

*Habitat*.—North Queensland.

*Holotype*, ♂, Babinda, August 7, 1920 (J. F. Illingworth).

*Allotopotype*, ♀.

*Paratopotypes*, 2 ♂'s.

The apically darkened wings are very conspicuous.

**Subgenus Idioglochina, subgen. n.**

Flagellar segments with the inner face strongly produced into flattened disks, giving a subserrate appearance to the antennae, the periphery of each disk with a series of about six spinous bristles. Wings with costa and radius greatly incrassated;  $r$  long, arcuated; cell  $R_1$  very large, due to the strong bending of  $R_{2+3}$  toward  $R_{4+5}$  near its origin.

Type of the subgenus.—*Rhipidia tusitala* Alexander (Samoa).

*Dicranomyia de beauforti* de Meijere (Papuan subregion) is also a member of this subgenus.

**Subgenus Euglochina, subgen. n.**

Wings very long and narrow, cuneiform, entirely without an anal angle;  $R_s$  very short, about equal to the basal deflection of  $R_{4+}$ , originating far out toward the wing-tip, the cord lying beyond five-sixths of the wing-length; cells beyond the cord unusually short and crowded; vein 2nd A running parallel to  $Cu_1$  at the margin separate or fused with the tip of  $Cu_2$ .

Type of the subgenus.—*Dicranomyia cuneiformis* de Meijere. (India to Java).

*Dicranomyia connectans* Alexander (Tropical Africa) is also a

member of this subgenus. Edwards (Ann. Mag. Nat. Hist., ser. 8, vol. 8, pp. 58, 59; 1911) has determined the *Limnobia saltens* of Doleschall as falling in this group of species. Almost coincidentally, De Meijere (Tijdsch. v. Ent., vol. 54, p. 22; 1911) determined *saltens* as being a typical member of *Thrypticomyia* Skuse. The habitus of the species of *Euglochina* is very distinct from that of *Thrypticomyia*.

**Genus *Libnotes*, Westwood.**

**Subgenus *Pseudoglochina*, subgen. n.**

Tarsal claws simple, the basal enlargements provided with two acute bristles. Wings long and narrow, cuneiform, entirely without an anal angle; Rs short, straight; no supernumerary crossvein in cell  $Sc_1$ ; cell 1st  $M_2$  open by the atrophy of  $M_3$ .

Type of the subgenus.—*Libnotes pulchripes* Alexander.

*Dicranomyia kobusi* de Meijere and *D. bicinctipes* Brunetti of the Oriental region are likewise members of this group. In the opinion of the writer, the group is closer to *Libnotes* than to *Dicranomyia* but this whole series of genera and subgenera are very closely allied.

**Genus *Geranomyia*, Haliday.**

***Geranomyia (Geranomyia) sagittifer*, sp. n.**

Rostrum and antennae black; vertex silvery grey; general coloration of the thorax shining orange, the mesonotal praescutum with a median arrow-shaped black mark; legs pale yellowish brown; wings pale grey with five rather small brown costal markings, vein  $Sc$  long.

*Female*.—Length (excluding rostrum) 6.5 mm.; wing 6 mm.; rostrum alone 2.9 mm.

Rostrum and palpi dark brownish black. Antennae black. Head above silvery grey.

Mesonotum shiny orange, the praescutum with a single arrow-shaped median black mark, the broad end behind, a short distance before the suture, the narrow end terminating slightly anterior to the level of the pseudosutural foveae. Thoracic pleura dull ochreous. Halteres orange, the knobs a little infuscated. Legs with the coxae and trochanters orange; femora brownish yellow; tibiae and tarsi light brown. Wings pale grey, the costal and subcostal cells a little more yellowish; five comparatively small brown markings in the costal region, arranged as follows: at the supernumerary crossvein in cell  $Sc$ ; at origin of Rs; at tip of  $Sc_1$ ; at tip of  $R_1$  and  $r$ , and at the end of the vein  $R_{2+3}$ ; cord and outer end of cell 1st  $M_2$  very narrowly and indistinctly seamed with grey; veins brown. Venation:  $Sc$  long,  $Sc_1$  extending to just beyond the end of Rs,  $Sc_2$  at the tip of  $Sc_1$ ; Rs long, angulated at origin, thence straight; cell 1st  $M_1$  pentagonally rectangular, widened distally, about as long as vein  $M_{1+2}$  beyond it; basal deflection of  $Cu_1$  just beyond the fork of  $M$ .

Abdomen dull orange-yellow.

*Habitat*.—North Queensland.

*Holotype*, ♀, Gordonvale, June, 1920 (A. P. Dodd).

*Paratypes*, 3 ♂'s, Babinda, October, 1920 (J. F. Illingsworth).

***Geranomyia (Geranomyia) nigronitida*, sp. n.**

Head dark; mesonotum shiny black, the pleura yellowish; wings nearly

hyaline; stigma small, brown; Sc long, basal deflection of  $Cu_1$  before midlength of cell 1st  $M_2$ ; abdominal tergites dark brown, sternites light yellow.

*Male*.—Length (excluding rostrum) 6—6.4 mm.; wing 5.8—6 mm.; rostrum alone about 3 mm.

*Female*.—Length (excluding rostrum) 7.5—7.8 mm.; wing 6.5 mm.; rostrum alone about 3.5 mm.

Described from alcoholic specimens.

Rostrum elongate, dark brown; palpi dark brown. Antennae dark brownish black. Head dark, grayish pruinose.

Pronotum dark brown. Mesonotum shiny black, the humeral regions of the praescutum paler; in dried specimens the lateral margins of the praescutum may be slightly pruinose. Pleura obscure yellow. Halteres pale yellowish white. Legs with the coxae and trochanters yellow; remainder of the legs broken. Wings nearly hyaline; stigma small, brown; veins dark brown. Venation: a supernumerary crossvein in cell Sc; Sc long,  $Sc_1$  extending to just before the end of Rs,  $Sc_2$  a short distance from the tip of  $Sc_1$ , the latter about equal to m; Rs comparatively short, straight, about twice the deflection of  $R_{4+5}$ ; inner end of cell 1st  $M_2$  slightly arcuated; outer deflection of  $M_3$  a little longer than m; basal deflection of  $Cu_1$  before midlength of cell 1st  $M_2$ , much longer than  $Cu_2$  alone.

Abdominal tergites dark brown, especially in the female; sternites light yellow.

*Habitat*.—North Queensland.

*Holotype*, ♂, Babinda, August 7, 1920 (J. F. Illingworth).

*Allotopotype*, ♀.

*Paratopotypes*, 4 ♂ ♀.

### Genus *Molophilus*, Curtis.

#### *Molophilus unispinosus*, sp. n.

General coloration sulphur-yellow; vertex with a brown spot; mesonotum light chestnut; male hypopygium with three pleural appendages on either side, the longest a cylindrical curved arm with the apex enlarged and provided with a powerful blackened spine, surrounded by numerous yellow hairs.

*Male*.—Length about 3.5 mm.; wing about 3.7 mm.

Described from an alcoholic specimen.

Rostrum and palpi brown. Antennal scape light sulphur-yellow, the flagellum broken. Head sulphur-yellow above with a conspicuous circular dark brown spot on the vertex; genae slightly infuscated.

Mesonotum with the praescutum light chestnut, the lateral margins dark brown; scutal lobes similar, the posterior lateral angles slightly produced laterad, light yellow; scutellum chestnut yellow; postnotum obscure yellow. Pleura brownish yellow, the dorso-pleural region light sulphur-yellow. Halteres pale, the knobs light sulphur-yellow. Legs with the coxae and trochanters pale brownish yellow; remainder of the legs broken. Wings greyish yellow, the veins yellowish.

Abdomen brownish yellow, the lateral margins of the tergites paler. Male hypopygium with three pleural appendages on either side, the longest a cylindrical curved arm that is expanded into a collar at the end, armed with a single

powerful chitinized spine, surrounded by numerous golden-yellow hairs.

*Habitat*.—North Queensland.

*Holotype*, ♂, Babinda, August 7, 1920 (J. F. Illingworth).

**Molophilus longioricornis**, sp. n.

General coloration dark brown; antennae of the male elongated; pleural appendages of the male hypopygium a chitinized horn with a long, slender spine on the proximal face beyond midlength.

*Male*.—Length about 3.2 mm.; wing, about 3.6 mm.

Described from an alcoholic specimen.

Rostrum and palpi pale brown. Antennae dark brown; the flagellar segments are broken beyond the base but the antennae are very long, probably only a little shorter than the body. Head dark.

Thorax dark brown, only the pleural membranes paler. Halteres pale, the knobs a little darker. Legs with the coxae pale brownish yellow; trochanters yellow; remainder of the legs broken. Wings with a strong grayish suffusion; veins dark brown.

Abdomen dark brown. Male hypopygium with each pleural appendage appearing as a cylindrical chitinized horn, the bent apex suddenly narrowed into a chitinized spine that is directed proximad; beyond midlength of the appendage on the proximal face is a long, slender, slightly bent spine; the outer face of the appendage is provided with several small appressed spines.

*Habitat*.—North Queensland.

*Holotype*, ♂, Babinda, August 7, 1920 (J. F. Illingworth).

Genus **Limnophila**, Macquart.

**Limnophila illingworthi**, sp. n.

Antennae dark brown, the first flagellar segment light yellow; mesonotal praescutum and pleura brownish yellow, narrowly striped longitudinally with brown; legs dark brown, femora with a narrow yellowish subterminal ring; tibiae with a narrow yellowish ring just beyond the base; wing light gray, the costal margin strongly yellowish; a series of dark brown costal spots; all cells of the wing dotted with gray; costal fringe conspicuous.

*Male*.—Length about 8 mm.; wing about 8.5 m.

Described from an alcoholic specimen.

Rostrum brown; palpi dark brown. Antennae dark brown, the first flagellar segment conspicuously light yellow; antennae short, the first scapal segment elongate. Head brown, paler between the eyes.

Mesonotal praescutum brownish yellow, indistinctly striped longitudinally with brown, there being a more conspicuous median stripe that becomes obliterated before the suture and two sub-lateral stripes on either side; lateral margins of the praescutum darker brown; scutum obscure brownish yellow, each lobe encircled by brown, this circle darker anteriorly and laterally; scutellum pale brownish yellow with a narrow brown median line; postnotum pale brownish yellow with the median line darker brown and with two transverse bars, one near midlength, the other at the posterior margin. Pleura yellow, striped longitudinally with pale brown, there being two or three more or less complete brown stripes that are a little narrower than the pale stripes between. Halteres yellow, the knobs slightly darker. Legs with the coxae yellow, traversed by narrow brown lines, there being two such lines on the fore and middle coxae;

trochanters yellow ; femora dark brown, with a narrow light yellow ring before the broad (2 mm.) tips ; tibiae dark brown with a narrow light ring immediately beyond the base, this a little broader than the pale femoral ring ; tarsi pale brown. Wings light gray, the costal margin strongly yellow ; wings heavily spotted with dark brown and gray ; a series of dark brown spots along the costa, there being about ten before the larger one at the tip of Sc ; three additional large spots situated at the ends of veins  $R_1$ ,  $R_2$ , and  $R_3$  ; a large pale brown area at the origin of Rs and as seams along the cord and outer end of cell 1st  $M_2$  ; all cells of the wings with rather abundant gray dots, a little larger and heavier at the ends of the longitudinal veins ; veins brown, costa, subcosta and radius more yellowish. Venation: Sc long,  $Sc_1$  extending some distance beyond the fork of  $R_{2+3}$ ,  $Sc_2$  nearly three times as long as  $Sc_1$  alone ; indistinct supernumerary crossveins in the last three brown spots in the costal cell ; Rs long, almost square at origin ;  $R_{2+3}$  short, shorter than the basal deflection of  $Cu_1$  ; r at the tip of  $R_1$  and beyond midlength of  $R_2$  ; inner ends of cells  $R_3$ ,  $R_5$  and 1st  $M_2$  in oblique alignment ; cell 1st  $M_2$  long and narrow, the outer end widened ; petiole of cell M short, about equal to the basal deflection of  $Cu_1$ , the latter inserted just before midlength of cell 1st  $M_2$  ; costal fringe conspicuous.

Abdominal tergites brown, darker brown laterally ; sternites a little paler, especially on the caudal half of the segment.

*Habitat*.—North Queensland.

*Holotype*, ♂, Babinda, August 7, 1920 (J. F. Illingworth).

*Paratopotype*, ♂, October, 1920, (J. F. Illingworth).

This handsome crane-fly is dedicated to its collector, my friend, Dr. James F. Illingworth. It is possible that it is more correctly referable to *Epiphragma* but the supernumerary crossveins in the costal cell are very faint and three in number.

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## ANNOTATED CHECK LIST OF THE MACROLEPIDOPTERA OF ALBERTA—ADDITIONS, 1920

BY KENNETH BOWMAN,  
Edmonton, Alberta.

I record below the additions to my "Check List of the Macrolepidoptera of Alberta, published by the Alberta Natural History Society (Red Deer, 1919), which were made during the season of 1920.

The numbers before the names are those of Messrs. Barnes and McDunnough's "Check List of the Lepidoptera of Boreal America, 1917." The numbers after the names indicate the month in which the insects were taken. The capital letters are abbreviations of localities, as follows: B, Banff ; Bm, Blairmore ; C, Calgary ; Cd, Cadomin ; E, Edmonton ; L, Laggan ; N, Nordegg ; P, Pocohontas.

The insects were identified by Messrs. Barnes & Lindsay, Mr. L. W. Swett and Dr. J. McDunnough, as shown by the initials in brackets following each insect. I wish to express my great indebtedness to them for their kindness in identifying these insects.

57	<i>Eurymus hecla pallida</i> Skin. & Men. . . . .	6 N.	(B & L)
205	<i>Euphydryas colon</i> Edw. . . . .	6 Bm.	(B & L)
957	<i>Isia isabella</i> A. & S. . . . .	6 C.	(B & L)
987	<i>Apantesis blakei superba</i> Stretch. . . . .	7 C.	(B & L)
1310	<i>Euxoa atropulveria</i> Sm. . . . .	9 Bm.	(B & L)
1567	<i>Rhynchagrotis morrisonistigma</i> Grt. . . . .	7 N.	(B & L)
2362	<i>Eremobia alticola</i> Sm. . . . .	8 Cd.	(B & L)
3576	<i>Lomanaltes eductalis</i> Wlk. . . . .	7 E.	(B & L)
3945	<i>Carsia paludata</i> Thun. . . . .	8 E.	(B & L)
N.S.	<i>Lobophora simsata</i> Swett . . . . .	6 E. Wabaska River	(L.W.S.)
3977	<i>Lygris diversilineata</i> Hbn. . . . .	8 C.	(B & L)
3978	<i>Lygris propulsata</i> Wlk. . . . .	7.8 E. C. Cd.	(J.McD.)
N.S.	<i>Hydriomena mcdunnoughi</i> Swett . . . . .	5 N. Cd.	(L.W.S.)
N.S.	<i>Xanthorhoe dodata</i> Swett. . . . .	6.8 L. P.	(L.W.S.)
N.S.	<i>Xanthorhoe reclusata</i> Swett . . . . .	7 L.	(L.W.S.)
N.S.	<i>Xanthorhoe incurvata lagganata</i> Swett . . . . .	7 L. N.	(L.W.S.)
4156	<i>Eupithecia palpata</i> Pack. . . . .	6 E.	(L.W.S.)
4374	<i>Phasiane hebetata</i> Hlst. ( <i>demaculata</i> B&McD) 6.7 E.N.P.C.Bm.		(L.W.S.)
4401	<i>Itame occiduaria</i> Pack. . . . .	7 C.	(B & L)
4424	<i>Itame decorata</i> Hlst. . . . .	7.8 C.	(B & L)
4644	<i>Sicya macularia agyllaria</i> Wlk. . . . .	8 N. Cd. B.	(J.McD.)
4726	<i>Metanema quercivoraria</i> Gn. . . . .	7 N.	(B & L)
4748	<i>Pero occidentalis</i> Hlst. . . . .	6 P N.	(B & L)
5097	<i>Phlyctaenia indistinctalis</i> Warr. . . . .	7 N.	(B & L)
5102	<i>Phlyctaenia tertialis</i> Gn. . . . .	7E. N.	(B & L)
5253	<i>Pyralis farinalis</i> Linn. . . . .	8 E.	
6751	<i>Paranthrene polistiformis</i> Harris. . . . .	8 C.	(J.McD.)

## A NEW SPECIES OF OAK GALL AND ITS MAKER.

BY B. W. WELLS AND Z. P. METCALF,

North Carolina State College and Experiment Station.

The gall described below was discovered on *Quercus marylandica* Muench., near Raleigh, North Carolina, by the senior author who was impressed by its unique characters. The specimens were brought into the laboratory and the adults reared. These adults may not belong to the genus *Andricus* but awaiting a thorough revision of the Cynipid genera they may be placed there provisionally.

The gall is very different from any other North American cynipid cecidium in the possession of the curious peltate bract-like appendages, which are borne on and constitute a part of the gall proper; in the usual situation with bracted galls the bracts are borne beneath the larval cell or cells, representing aborted leaves. The adult insects emerged about June 1st.

### *Andricus peltatus*, n. sp.

Female.—Black, with legs and antennae testaceous yellow. Head: black, mouth parts testaceous yellow, surface uniformly but finely punctate and sparsely covered with rather long whitish pubescence; cheeks rather narrow, but more than one-fourth of the length of the long diameter of the eye. Antennae four-

teen-segmented; first and second segments enlarged, third segment one-half again as long as the fourth; segments five to thirteen nearly equal in size, segment fourteen conically attenuated, all the segments with rather heavy yellowish pubescence; segments one and two yellow testaceous, the others blackish. Thorax: black; pronotum rather coarsely punctulate with rather uniform yellowish white pubescence; mesonotum smooth, polished, parapsidal grooves deep, rather close together at the scutellum widely divergent anteriorly; scutellum coarsely and irregular rugulose, very sparsely pubescent. Legs: yellowish testaceous rather uniformly covered with paler pubescence; basal tarsal segment shorter than 2 to 5; wings transparent, veins brownish, areolet small. Abdomen: highly polished, second segment about as long as the rest of the abdominal segments united, second segment with a few sparse hairs laterally. Length average 2.4 mm.

*Holotype*. Female, bred from galls on *Quercus marylandica* Muench., Raleigh, North Carolina deposited in the United States National Museum.

*Paratypes*. Three females and one gall in the collection of the United States National Museum, bred from similar galls.

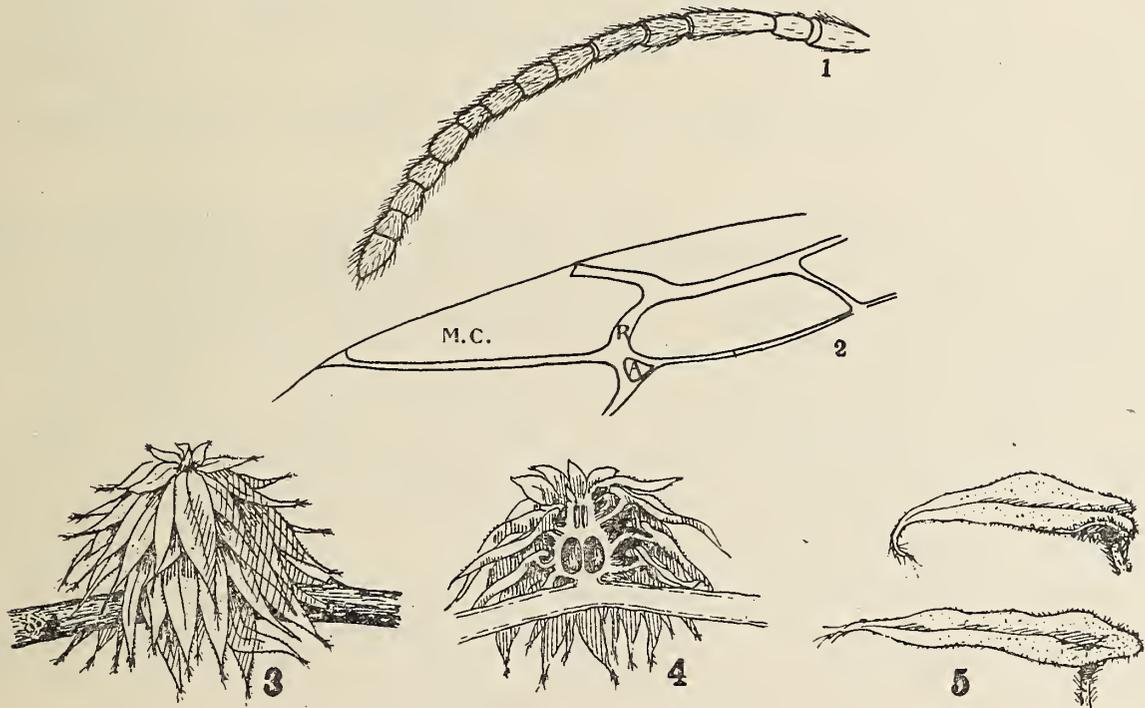


Fig. 2. 1. *Andricus peltatus*, Antenna. 2. *Andricus peltatus*, portion of wing showing radial vein (R) marginal cell (M. C.) and areolet (A). 3. Dithalamous gall ( $\times 1$ ). 4. Median vertical section of preceding ( $\times 1$ ). 5. Two bract-like appendages from gall showing peltate character ( $\times 2$ ).

***Andricus peltatus* Wells and Metcalf, Cecidium nov.**

On *Quercus marylandica* Muench., sessile on stem at nodes (originates from apical meristem of lateral bud) on branch portions from 1-5 years old; prosoplasma, concentric type with up-walled superstructure; flask-shaped, the neck bearing numerous, sparsely hairy bract-like appendages which are reflexed and overlap shingle fashion. Appendages greenish with red-tinged hairy tips, peltate, lanceolate, stalk short. When young very thickly covered with acicular trichomes some of which are of the compound stellate type; 8-14 mm. high, 14-22 mm. wide at base including appendages; 1 or sometimes 2 larval cells in proximal half (Fig. 4), distal false chambers corresponding, walls thick, thin sclerotic layer differentiated around nutritive layer lining the chamber; rare, Raleigh, North Carolina. Types in collection of B. W. Wells. The above description is based on six mature and four immature specimens.

THE NORTH AMERICAN SPECIES OF THE ANTHOMYIID GENUS  
HEBECNEMA SCHNABL (DIPTERA).

BY J. R. MALLOCH,  
Urbana, Ill.

This genus differs from *Helina* R.-D., to which it is most closely allied, in having the prealar bristle absent, arista invariably plumose, fifth abdominal sternite in male with a deep U-shaped posterior excision, and the female genitalia without a pair of long slender apical processes.

KEY TO SPECIES.

1. Species entirely fulvous yellow.....*fulva* Bigot  
Species with thorax and abdomen entirely black . . . . . 2
2. All femora and tibiae reddish yellow.....*pallipes* Malloch  
Mid and hind femora and all tibiae reddish yellow . . . . . *nigricolor* Fallen  
All femora and usually tibiae also black . . . . . 3
3. Abdomen without a dorsal central black vitta, sometimes with one or two  
pairs of very indistinct blackish spots . . . . . *fumosa* Meigen  
Abdomen with a very distinct dorsocentral black vitta . . . . . 4
4. Halteres with black knobs; abdomen in female entirely glossy black with-  
out pruinescence . . . . . *vespertina* Fallen  
Halteres with yellow knobs; abdomen in female with distinct gray  
pruinescence . . . . . 5
5. Male abdomen broadly ovate, with pearlaceous gray pruinescence, and an  
almost linear black dorsocentral vitta; mid femur with a few long fine  
bristles at base on posteroventral surface; head hardly flattened above;  
eyes hairy . . . . . *umbratica* Meigen  
Male abdomen narrowly ovate, with brownish gray pruinescence, and a  
broad black dorsocentral vitta which tapers posteriorly; mid femur  
without distinct bristles basally on posteroventral surface; head of male  
distinctly flattened above; eyes bare . . . . . *affinis*, sp. n.

I have included *fumosa* and *nigricolor* though so far they have not been recorded from this country. It is, however, not improbable that they will ultimately be found to occur either in New England or the northwest.

***Hebecnema affinis*, sp. n.**

Male.—Black, almost glossy. Thorax and abdomen with brownish gray pruinescence, the former very indistinctly vittate, the latter with a broad, black, dorsocentral vitta which tapers posteriorly. Legs black, the tibiae paler. Wings infuscated, more conspicuously so basally and anteriorly. Calyptrae whitish yellow. Halteres yellow.

Head rather conspicuously flattened above; eyes bare, separated at narrowest part of frons by a distance equal to width across anterior ocellus; each orbit with three or four bristles and some weak hairs anteriorly; parafacials almost invisible from the side; third antennal segment over twice as long as second; longest hairs on arista longer than width of third antennal segment. Thorax normal. Abdomen narrowly ovate; basal sternite in type with a few hairs, in other specimens bare; fifth sternite normal. Legs as in *vespertina*, except that the mid femora lack distinct bristles basally, and there are two anteroventral bristles on hind tibia.

Female.—Very similar to the female of *umbratica*, but the eyes are bare

and the abdomen more distinctly speckled.

Length, 5 mm.

*Type*, male, Rutland, Vt., August 1-15, 1916.

*Allotype*, Auburndale, Mass., June 22.

*Paratypes*, one male, Mt. Greylock, Mass., June 15, 1906; one female, Bar Harbor, Me., July 30, 1919.

Type in collection of Boston Society of Natural History.

I have no doubt whatever that this species occurs in Europe, where it is confused with *vespertina*, as Stein in one of his recent papers on European Anthomyiidae states that *vespertina* varies in the colour of the halteres, having them sometimes black and sometimes yellow, and in the number of bristles on the anteroventral surface of the hind tibia. I have found only one male of *vespertina* which had two anteroventral hind tibial bristles and that was on one tibia only. The colour of the halteres in both sexes of *vespertina* is black while in the new species they are yellow in both sexes.

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#### BOOK REVIEW.

CONTRIBUTIONS TO THE NATURAL HISTORY OF THE LEPIDOPTERA OF NORTH AMERICA, VOL. IV., No. 4.

—The Pterophoridae of North America—by Wm. Barnes, M.D., and A. W. Lindsay, Ph.D.

The final number of Volume IV. of the well-known "Contributions" contains a noteworthy monographic revision of the North American 'plume-moths'. This interesting family has been much neglected by American entomologists during the past twenty years; in fact since the publication of the Fernald monograph in 1898 only a few sporadic descriptions of new species have appeared and with each year the difficulties connected with the correct determination of material in this group have become greater and greater. The present paper should obviate all this for besides 170 pages of text there are included 7 plates containing most excellent enlarged photographic reproductions of the primaries (and in some cases of the secondaries) of all the North American species, and in addition 7 plates dealing with structural details (wing venation and male genitalia).

Great care has been taken to establish the correct synonymy of each species. A large proportion of the existing type material has been personally examined and in cases where this was not possible, careful comparisons have been made by well-known specialists with material sent from the Barnes Collection. A number of changes in specific synonymy—some of them quite startling—have resulted, but these appear to be thoroughly well authenticated and must be accepted.

The greatest changes, however, are to be found in the generic nomenclature. Following what we believe to be the only course, if stability of nomenclature is ever to be attained, the authors have adhered strictly to the International Rules of Nomenclature and the opinions rendered by the International Commission on Nomenclature. According to these rules a genotype is not fixed until one of the originally included species in the genus in question has been definitely cited—either at the time the genus was created or at a later date—as

the type, all so-called 'restrictions' previous to such a time being invalid (vide Opinion 46). This latter clause has been the subject of much adverse criticism and is even now not observed by numerous Lepidopterists; for a very able discussion of this point we would refer the reader to a recent paper by Dr. J. C. Bradley in the Transactions of the Entomological Society of London for 1919, page 51.

As a result of a strict application of the above rules for the first time to the *Pterophoridae* we find *Oxyptilus* Zell. superceded by *Pterophorus* Geoff. (type, *didactyla* Linn.) and in place of *Pterophorus*, as generally used, following Walsingham, Fernald and Meyrick, we have the term *Oidaematophorus* Wllgn. *Platyptilia* Hbn. is used in its old established sense but *Alucita* Linn. is correctly referred to *hexadactyla* Linn., supplanting *Orneodes* Latr. The four species included under it in the Barnes and McDunnough Check List are distributed in the genera *Aciptilia* Hbn., *Pselnophorus* Wlshm. and *Adaina* Tutt., to which latter genus are also referred several species formerly included in *Pterophorus*.

The only adverse criticism of the above changes that could possibly be made is that Lamarck's *Systeme des Animaux sans Vertebres* (1801) has not been accepted by the authors as fixing genotypes. The point is still a mooted one and has been touched upon by Dr. Bradley in the above mentioned paper. It is a great pity that the Secretary of the International Committee, Dr. C. W. Stiles of Washington, cannot be prevailed upon to secure an early vote on this subject, as until this matter and the one concerning the validity of Hubner's 'Tentamen' are definitely settled, no stability in the generic conceptions of the Lepidoptera is possible. In the present instance, if Lamarck had been recognized as fixing genotypes, it would have been permissible to employ both *Oxyptilus* Zell. and *Pterophorus* Linn. in the generally accepted way.

The monograph deals with 117 species of which 31 are new to science, the greater proportion of these new species being from the southwestern states and referable to the genus *Oidaematophorus*. Keys to the genera and to the species are included and a full bibliography is given. The authors are to be highly complimented on the thoroughness of the work and it is to be hoped that through its means a fresh impetus will be given to the study of these interesting forms, the biology of which in so many cases is still completely unknown.—J. McD.

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#### CORRECTIONS.

Page 152.—Table of Species, couplet I, second section, change to read "Disc of Thoracal squamae not pilose."

Page 153.—Couplet 9, second section, change to read, "Face without median black stripes."

Page 152.—*Syrphus ribesii*, sixth line, change "of" to "or" and read "tip, or apical sixth."

C. H. CURRAN.

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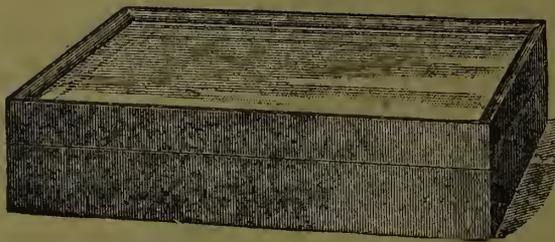
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