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EDITED BY

DR. E. M. WALKER,

Biological Department,
UNIVERSITY OF TORONTO, TORONTO;

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No. 1

POPULAR AND PRACTICAL ENTOMOLOGY.

A WEEK'S COLLECTING ON COLISEUM MOUNTAIN, NORDEGG, ALTA.

BY F. C. WHITEHOUSE, RED DEER, ALTA.

A number of years ago Mr. F. H. Wolley Dod gave his experience of a day's collecting on a mountain top near Laggan (Ent. News, March, 1908). In the hope that it may prove of passing interest to collectors, I tell a somewhat similar story.

On the 16th July last year Mr. K. Bowman, of Edmonton, made a trip to the top of the Coliseum Mountain, Nordegg. He took a pair of *Brenthis astarte*; one or two *Papilio zolicaon* and *P. nitra*; took a *Neoarctia yarrowi*, and otherwise satisfied himself that it was a "happy hunting ground." On the 10th August, 1916, I made the same trip. The day was sunny but bitterly cold; however, I took a fine pair of *Neoarctia beani* and several other good things, and I was equally pleased with the promise of the Mount. Since then Mr. Bowman and myself have discussed a camping-collecting trip on Coliseum Mountain every time we met, and in the end we went.

We left Red Deer, 9th July, Alberta Central, 1.30 p.m. for Rocky Mountain House, arrived 7 p.m., spent the night at the Mountain View Hotel, and resumed our journey, C.N.R., 7 o'clock a.m., arriving at Nordegg shortly after noon. Mr. Stuart Kidd of the Bighorn Trading Co. had everything ready for an early start next morning, viz., two pack ponies and a packman, tent, sleeping-roll, blankets, a grub-stake, cook pots and an axe.

Mr. W. Stevenson, of Nordegg, a new recruit to the entomological fraternity, promised to join our party for two or three days; and the plan for the morrow was as follows: We to leave at 7 a.m. hot-foot for the mountain top to scout for water, and particularly a spring that I had found in August the previous year. It was estimated that we could perform our mission and be back at the cliff face in time to meet the packman and his ponies after

their laborious ascent. If water were found we could pack the stuff to the top, and if not, readjust our plans.

Well, we started at 8 o'clock and came upon *Brenthis tricularis*, beautifully fresh, just below the village. On the trail to Mire Creek, *Eneis jutta*, *O. chryxus*, *Colias interior*, *Pieris napi*, etc., were on the wing, and the muskeg teemed with *Phyciodes pratensis* in its infinite variety. Now I have no wish "to split on a friend," but Mr. Bowman, enthusiastic and capable collector as he is, is physically incapable of "carrying on" with anything required to perfect his series flying within a few feet of his net; while as to Mr. Stevenson, absolutely everything was to him pure gold! There were butterflies in the ointment, and the best laid plans came all to grief!

We reached the cliff face two hours late, with "Dutch" and his ponies scrambling up almost on our heels. Assuming that he would wait for our return, we hurried off to look for the spring. We did not find water, but *Eneis brucei*, *Colias nastes*, *Lycæna aquilo* et al., delighted our vision. While returning to the cliff face through a clump of spruce, Mr. Bowman took a sweep at a dragon-fly, and passed me his net containing a male of *Somatochlora minor*, and we shortly after took two females of *Somatochlora franklini* (to collect species of which genus was the particular object of the trip so far as I was concerned—though, of course, all desirable butterflies and moths were "good fishing"). From the spruce to where we were to find "Dutch" was not far, and we found him, scurrying home through the muskeg, 2,500 feet below, riding one pony and leading the other.

It was 1.30 p.m. We held a council of war.

Clearly "Dutch," tired of waiting for us, and probably quite as thirsty as we were, had dumped the pack and left us to our fate. Water we must have, unless we abandoned our camping scheme altogether—which we were naturally quite determined not to do—but first to find the pack. I suggested that the others go down to where "Dutch" was last seen, search there and scan the cliff face from below, for it was clearly unnecessary for us all to go down if it was to be only a matter of coming up again! They saw the pack right against the cliff about 200 feet east of me around a bend, and I made my way to it while they re climbed the 500 feet.

Pending their arrival I rescued from a spider and appropriated to my own use a fine specimen of *Anarta cordigera*. Reassembled, we started the descent.

It was at this juncture that Mr. Stevenson discovered (by dropping the blanket pack) that cornerless objects will roll down hill. To confirm this, the tent, dunnage-bag and bedding-roll were despatched on a like course, after which the articles mentioned travelled by the "rolling method" exclusively—with occasional encouragement from the toe of a boot. Arriving at a plateau, it was decided that one of us should explore the bottom of the ravine for water. The others suggested that it was my turn, and I went. The descent was steep and a tangle of deadfall, but I reached the bottom at last. The rocks were dry! I struck off down stream, and within a few hundred feet came upon water—a spring, pure and cold, bubbling over the rocks for a hundred feet or so, and then again losing itself among the rocks. My friends joined me shortly after, and having drunk we decided that we would camp right there at about 5,000 feet. First, however, the outfit must be packed to the spot—terrible thought!

I will skip all that we endured from thirst and weariness for the balance of that semi-tropical afternoon. Let it suffice that we and our belongings were back at the camping ground again by 5 o'clock, and that in less than an hour we had the tent pitched and supper cooked. Here endeth the first day.

July 12th.—By 8.30 a.m. we had breakfasted and commenced the ascent, not on the slope taken the previous day, but that upon which the camp was situated. This proved to be the easier climb in every way—a matter of about an hour or so to the top.

It might be well here to describe briefly the Coliseum Mountain. It is a long mount of 6,500 feet altitude, running east and west, and consisting of three different formations. That to the east, is a long, smooth ridge, flat on top, and having two or three good clumps of spruce on the south side. The western formation is a round peak with perpendicular cliffs and a flat top. Joining the eastern ridge and the western peak, is a huge semicircular amphitheatre of loose shale, facing the south, from which the mountain takes its name. This is slightly lower, narrow on top, and treed with spruce. The highest point of the eastern

ridge is on the north side, nearly at the western end, and this is undoubtedly the best collecting area. The mountain side here is loose shale with a short cliff of four to six feet at the top.

Returning to the insects, on this, the second day, we found *Colias nastes* on the wing, *Æneis brucei* very common, *Argynnis meadi*, *lais* and *eurynome*; *Brenthis tricularis*, *chariclea* and *freijsa*; *Erebia epipsodea* and *disa* (the latter rare); *Lycæna aquilo* and *scudleri*, *Euchlœ creusa*, *Papilio zolicaon* (2 or 3 only and *passé*); *Pamphila mandan* and *Hesperia centaureæ*.

Of dragonflies I took *Cænagrion angulatum*, *Æshna eremita* and *sitchensis*; *Sympetrum rubicundulum decisum*, *Leucorrhinia hudsonica* and, of the genus *Somatochlora*, males and females of *minor*, one female of an undetermined species, but no males to the odd females of *franklini* taken the previous day. We returned to camp well pleased with our catch.

July 13th.—On the top, mostly in the favoured area mentioned above, Mr. Bowman captured 6 of the handsome tiger moth, *Neoarctia yarrowi*. Our party explored to the western peak, and while the trip yielded nothing special, it was a glorious walk, giving a magnificent view of the Bighorn and more distant mountain ranges. On this date I took a male of *Somatochlora albicincta* on the top, and a female of the same on returning to the camp in the evening. This was the fourth variety of the genus in three days. Just before starting the descent in the late afternoon a new butterfly put in its appearance, viz., *Melitæa anicia*.

July 14th.—A glorious hot day, and by 2 o'clock Mr. Bowman had captured three *Brenthis astarte*. We also took four *P. zolicaon*, five *N. yarrowi*, eight *M. anicia*, two *Androloma maccullochi*, and other diurnals previously mentioned.

This was also a good day for dragonflies, as the males of *S. franklini* (quite fresh) put in their appearance. I took four; also males and females of *minor* and a male of *albicincta*.

In the early afternoon Mr. Stevenson, who had to return to Nordegg, bade us good-bye and left on his long tramp home.

July 15th.—Mr. Bowman accompanied me to the top and

caught a few good things, then at noon he also made tracks for Nordegg. Before leaving he explained the method that he had found most efficacious for taking that most difficult of butterflies—*Brenthis astarte*, viz., to wait patiently until the insect settled on one of several pink-flowered plants of *Dianthus acaulis* and then spring! In due course a bright male appeared, and for half an hour I tried Mr. Bowman's method—and every other—in vain. *Astarte* is a peculiar insect—deceptive as to colour, pugnacious as to disposition, and fleet passing understanding. On the wing it looks red, due to the rapidly beating wings exposing the undersides. Why it should rush at every inoffensive butterfly that comes near it I cannot say, but rush at them it does. *Astarte* makes its appearance from the shaly slopes and, flying up over the edge of the cliff, rushes round on top for a few minutes attacking every butterfly in its course. Then it tumbles headlong over the cliff, flies along the loose shale, comes up again—and repeats. I watched my first *astarte* do all this many times and inspiration came to me. It flew slower when it was over the cliff! Why? Ah, I had the secret, and over the cliff I went myself (almost headlong in my eagerness). There I sat, where the foot of the cliff rose from the shale, net ready, and my eye glued to the edge of the cliff to my right where he would come over. Here he is! Flew right into my net! I give my discovery for the benefit of future collectors of *astarte*. Down under the cliff, both "hunter and hunted" are in the shadow.

At 3 o'clock as nothing much desirable excepting *Colias nastes* seemed to be on the wing, I was inclined to return to camp, but decided that I would first try the second clump of spruce. Well was I rewarded, for there I took a fine, fresh *Erebia disa*—my first of this species—and a pair of *Melitea anicia* and, returning through the other clump, I captured a dragonfly prize indeed, a beautiful female of *Somatochlora cingulata*—the fifth species of the genus to date! I also took a number of two other varieties, *franklini* and *minor*, and one female of *walshii*.

I returned to camp at 5.30, and amplified tent accommodation was the only compensation that I had for the loss of my two friends.

July 16th.—This day I took a good mixed bag, increasing my *Somatochlora* series of *minor*, *albicincta* and *franklini*. Two *astarte* were on the wing, a female that I took at rest on a rock, and a male by the easy system practiced the previous day. I also caught one *N. yarrowi*, a fine pair of *Vanessa milberti*, a *S. galii*, two *C. nastes*, two *Eneis chryxus* and saw a *Neoarctia beani*, that I much wanted for Mr. Bowman, flying low over the shale. I walked to the eastern end of the ridge, but a strong south wind was blowing and nothing much resulted.

Mentioning wind, reminds me that a breeze on a mountain top—even on glorious, hot, cloudless days, is the rule rather than the exception. This has evidently created in mountain-top butterflies the protective and pretty habit of lying over on their sides when at rest. *C. nastes* and *O. brucei* are much given to this attitude, but I think all the other species taken adopted it more or less. Even when temporarily there was no wind, or the spot was a sheltered one, it made no difference. Instinct told them to "lie low," and lie low they did.

On returning to camp I saw a largish *Somatochlora* flying by a jack pine, and netted it successfully when it settled. It proved to be a male, not of the odd female of the 14th (*cingulata*) but a seventh species, viz., *semicircularis*.

July 17th.—This was to be my last day on the mountain, some time during the morning, i. e., after I had left for the top. "Dutch" was to come up to pack the outfit back to Nordegg. I rose at 6.30 and reached the top at 10 o'clock. Soon after I saw, but failed to capture, a butterfly that I greatly desired, viz., *Papilio nitra*. It flew straight past me just out of reach. I did get, however, a male *Somatochlora* to pair with the large, white-ringed female of the 15th, *cingulata*; a lot of females of *S. franklini*, and a mixed lot of butterflies that have already been mentioned. At 2.45 I started down for Nordegg, took several fresh *Colias christina* and a *Pieris occidentalis* en route, and arrived at 4.30.

While my story of the mountain is finished, I might record a few captures made during the next two days in the valley. On

the 18th I took a male of the very rare dragonfly *Somatochlora septentrionalis*, and on 19th three males of *Somatochlora hudsonica*—making nine species of the genus in nine days. This is believed to be the world's record. On the 19th, with Mr. Bowman's assistance, I also took 60 *Cænagrion interrogatum*, of which dragonfly but eight specimens had previously been taken, a long series of *Somatochlora albicincta* and a fine *Euchlœa ausonides*.

Mr. Bowman, on the nights of 15th and 16th worked "light" for months, and he and I collected at night together 17th, 18th and 19th. Of the mass of material taken I will mention a few. Six *Neoarctia beani*. This was somewhat of a surprise as we believed the insect a mountain-top species. Of the genus *Autographa*, the following: 1 *mappa*, 1 *putnami*, 1 *excelsa*, 2 *flagellum*, 4 *orophila*, 13 *Euxoa mollis*, 10 *Phasiane ponderosa*, 2 *Hydriomena perfracta*, etc. At Nordegg also in May last Mr. Bowman took a fine series of *Spodolepis substriataria*.

But few varieties of birds were noted on the mountain, viz.: eagles (both the golden and bald-headed occur there); a finch, I think *Spinus pinus*, and the large grouse *Dendragapus obscurus*. In the valley on 19th July Mr. Bowman and myself had a good opportunity to observe an Arctic three-toed woodpecker, *Picoides arcticus*.

Mammals were very little in evidence on the mountain. I saw what looked like a rather large chipmunk on the loose shale where *astarte* dwells, one squirrel at the camp, and some deer tracks near the top. I also heard a mountain marmot—the whistle of which is unmistakable. Of course, bears, both grizzly and black; bighorn sheep and goats all occur near Nordegg, but Coliseum would hardly be high enough for sheep or goats, and I certainly saw no signs of bear.

Nordegg, as an entomological collecting ground, is rich and virgin soil, and systematic work there for several years should produce fine results. While the town is really a coal mining camp, any collector would be made welcome, and Mr. Stuart Kidd, of the Bighorn Trading Company, would, I am sure, arrange camping facilities to meet any collector's requirements.

NOTES ON BARNES AND McDUNNOUGH'S "CHECK LIST OF LEPIDOPTERA OF BOREAL AMERICA."

BY F. H. WOLLEY DOD. (ON ACTIVE SERVICE.)

The authors of the new Check List have followed Sir George Hampson's arrangement of families and genera, making certain changes which for various reasons seemed advisable. They have discarded certain of Hampson's generic names, considering that compliance with Banks and Caudell's "Entomological Code" was more likely to meet with general acceptance than the law of strict priority, which has been most rigidly adhered to by Hampson. With that exception, the changes made in generic reference and in specific synonymy are based on careful study of structural characters and positive identification of species. For many years the authors have been making a most careful and systematic study of types, and of figures and descriptions as well. With the enormous amount of material at their disposal they have been able to compare and match types exactly, and have accurate figures made of others, and by studying long series from various parts of the continent, have been able to trace associations which Hampson, with fewer specimens available, had no opportunity of doing. Whereas in Hampson's work the arrangement of the species in each genus is in tabular form, based (1) on secondary sexual characters, and (2) on certain details of colour or maculation, in the new list the species are, to a great extent, grouped together according to their degree of apparent relationship to one another, though a more scientific method from the writer's point of view, owing to one presenting considerable difficulty in accomplishment, owing to the diversity of relationship of many species to others in different groups. Thus the position of a species in a large genus in the new list, whilst in general denoting affinity to those placed near it, does not necessarily signify nearer relationship to them than to others placed apart from it.

The careful and painstaking methods of Messrs. Barnes and McDunnough have been well known to the writer for years, and, as regards the Noctuinæ, he has most carefully followed their published notes, and not infrequently exchanged correspondence and ideas with them, which has resulted, it is to be hoped, in mutual

benefit. The writer has made a special study of specific characters in the Noctuinæ, but must admit the undoubted advantage which the authors have over him in the amount of material examined. By far the greater number of changes in synonymy in this family made by them are much in accordance with his own views, but it is perhaps inevitable that he is unable to concur fully with their opinion on all points of relationship or identification, though in some instances he must submit to their superior knowledge. Some of the divergences of view are doubtless the result of differences of conception as to the term "race." On the whole, the authors have, perhaps, erred on the side of conservatism, and usually have been inclined to give a doubtful form or race the full benefit of the doubt in placing it as a species. It may be that the writer has grown unconsciously to err in the other direction.

Notwithstanding a complete index, collectors who have not studied Hampson's works may, at first, experience some difficulty in finding their way about the list. But too full a synonymy in a mere check-list, which is all that it purports to be, is apt to be confusing rather than otherwise. The majority of the points in which the list differs from Hampson have been referred to in various publications, but principally by the authors in their "Contributions." A few changes, however, appear for the first time.

The following notes and criticisms include those that are confirmatory, controversial, and contradictory. Some of the points referred to have previously been published by the writer in sundry papers, and no excuse is offered for repetition. Those of a contradictory nature are in no wise intended to be derogatory to the value of the list, or to the knowledge of its authors, but rather, it is hoped, to enhance its value, and offer suggestions for future investigation.

Arctia obliterata Stretch. stands as an aberration of *ornata* Pack. (978). If that is correct, the identification, as Stretch's species, by Dr. Dyar, of a Calgary specimen in my collection, which is almost certainly a form of *turbans*, must be wrong.

Euxoa collocata Sm. stands as a synonym of *atrigrigata* Smith. This reference is new to me, though I had tentatively as-

sociated them from a figure of the latter which was described in 1890 from a single poor and badly-rubbed specimen from "N. W. B. C." I did not recognize it when I saw the type, which must be a very pale specimen. I had not previously heard of *collocata* from Canada.

E. rubefactalis Grt. is made a synonym of *infracta* Morr., which is also new. The latter is known to me only by the description, which is meagre, but does not misfit.

E. relaxa Sm. It is a surprise to see this referred to *septentrionalis* Walk. I knew the latter well by sight when I saw the type of *relaxa* in 1910, and pointed out several specimens of what I believed to be Smith's species to Dr. Barnes about a week later, amongst a lot of unstudied material which he handed me to look through. I never for one moment associated it with Walker's species, and am under the impression that it is still absent from my own collection. I am not willing to accept the reference at present.

E. declarata Walk., with *decolor* Morr. as a synonym, is kept distinct from *campestris* Grt. Walker's type is a rather large male from Vancouver Island. Grote's is a rather smaller and narrower-winged female from New York. Both are even, dull fuscous brown. It would be hard to find two specimens more alike in colour, and all the details of maculation are exactly similar also, and, as I have before stated, I consider them identical. Morrison's type I never saw. Smith stated that it was a form with contrasting light and dark shades. The original description is not very lucid, but seems to indicate something of the kind, especially as it begins, "allied to *geniculata*."

E. tessellata Harris. The synonyms and varieties placed under this name are, as a whole, much as I had them in my own notes, though it is not clear why five of Smith's names stand as synonyms of var. *tesselloides*. Judging from a number of figures by the authors as *orbicularis* Smith, I should include that without question. But this name stands as a species separated from the present one in the list by over sixty others,

and associated closely with *marens* and *sotnia*, which have little in common with *tessellata*.

- E. olivia* Morr., hitherto unrecognized in our lists under *Feltia*, the authors have apparently examined, and consider it to be prior to *lacunosa*. Morrison's species is still unknown to me, and I have several times changed my opinion about the type of *lacunosa* in the British Museum. But the other six names here referred to as synonyms or varieties, are in my opinion all one species, and the same as the *lacunosa* of the Henry Edwards collection.
- E. criddlei* Sm., is made a variety of *exculpta* Sm. That is new to me. I knew them to be close allies, and do not dispute the reference, but I must refer *criddlei* to *perpolita* Morr., though I little suspected it on first acquaintance with *criddlei*, and before I saw the black form.
- E. sessile*, *termessa* and *nævula* are treated as one, as I had suggested in correspondence that they should be, but their reference to *alko* Strk. is new to me.
- E. friabilis* Grt. stands as an aberration of *messoria*, which I believe to be correct. Dr. McDunnough and I studied the type together, and arrived at the same conclusion. It came from Ontario.
- E. vallus* Sm. I had not previously associated this closely with *hostoniensis*, but am interested to note the suggested near relationship.
- E. vulpina* Sm. I think this should certainly be nearer *quinquelinea*.
- E. nesilens* Sm., is correctly referred as a form of *tristicula*, but I have referred the former name as a synonym of *remota* Sm. Two female types of *remota* in the Henry Edwards' collection were exactly like Calgary *nesilens*, and a type in the Washington collection, while differing in certain details, agreed with a Calgary *nesilens* in Dr. Barnes' collection. The author places *remota* next *tessellata*, separated from *nesilens* by nearly forty species.

Chorizagrotis auxiliaris, *soror*, *agrestis* and *inconcinna* stand as four species, with *intraferens* as a form of the first named. The latter is correct, but *agrestis* and *auxiliaris* are also the same species as I have proved by breeding from a known parent. Nor am I able to recognize *soror* Smith as distinct. The species appeared in millions in Southern Alberta in the spring of 1915, the larvæ doing widespread damage to field crops. I have little faith in the distinctness of *inconcinna*, but must let that stand for the present.

Rhizagrotis insertans Sm. Another of those species, described in 1890 from B. C., of which I had seen the type, but failed to recognize it. The authors place it between *albalis* and *cloanthoides*.

Agrotis acarnea Sm. The species, besides having spined tibia, has slightly hairy eyes, which fact I pointed out to Smith in 1910, though he failed to see it. A few other specimens have since come to hand, and one is in the British Museum. Hampson has described a new genus, *Trichosilia*, to receive it. It is related closely to *Episilia*.

A. inopinatus, *sierræ* and *unimacula* stand, in this order, as three species. The latter name is used by Hampson as prior to the long familiar *haruspica*. I have quite failed to separate *inopinatus* from *unimacula*. *Sierræ* is doubtful, but is scarcely well placed between the other two names.

A. atricincta Sm., is referred to *tepperi* Sm. This is quite new to me. I have not seen the type of the latter, but assume the reference to be correct.

Apectoides fales Sm. I cannot consider this distinct from *pressus* Grt. as listed. It is not unlikely that more of Smith's names in this genus will have ultimately to be referred to Grote's species.

Ufeus Grt. I have referred *hulstii* Sm. described from Utah, to *plicatus* Grt. In the new list they stand as distinct. I have carefully compared Grote's description with the Grote specimen (not the type) in the British Museum. This leaves me

in doubt as to whether my previous identification of *plicatus*—made on unsound evidence—was correct, and for the present I provisionally accept *hulstii* as distinct. It occurs in Canada, and stands in most collections as *plicatus*.

Anytus Grt. The species previously referred to *Fishea* Grt., as well as to *Anytus*, are included under this generic name. *Hanhami* Smith, described from Vancouver Island, stands as a var. of *evelina* French. *Discors* Grote, identified by Smith as a *Luperina* near *burgessi*, is now referred to this genus, with *vinela* Smith as a synonym.

Next comes *cupola*, a species described by Hampson from specimens sent him by the writer from Utah. Then follow, in this order, *yosemitæ* Grt., *entheæ* Grt., *instruta* Sm., (syn. *derelicta* Hamp.), *exhilarata* Sm. and *betsia* Sm. *Exhilarata* I have referred elsewhere to *yosemitæ*, and Smith (in litt.) concurred. It is not clear why they are here separated by the other names. *Derelicta*, from Aweme, seems correctly referred to *instruta* from De Claire, both Manitoba localities. This species is *yosemitæ* of previous lists, though this reference is not given. It is unquestionably very close to *entheæ*, and may prove to be a pale form of it. *Betsia*, which I have from the type locality in Utah, is very likely a pale form of either *yosemitæ* or *instruta*, which are very close allies.

Matuta Grt. (*Adelphagrotis* Sm.) *Apposita* should not stand between *stellaris* and *quarta*, which are more nearly related to one another than *apposita* is to either.

Rhynchagrotis Sm. Not much revision of the list of these species has been attempted by the authors. The genus is, if possible, a more difficult one than *Euxoa*, and until many of them have been bred, it is perhaps as well to leave the names about as they stand.

Scotogramma Sm. *Trifolii* is referred here, as per Hampson. *Mutata*, described by me under *Mamestra* as an ally of *trifolii*, also stands under this genus. Hampson has placed it in the collection under *Cardepiæ* as an ally of *nova* Smith. I accept his generic reference, though superficially the resemblance is

nearer *trifolii*. *Oregonica* stands as a species, with *morana* Smith as a variety, and I believe that to be correct. *Inconcinna* Sm. stands next, and is most certainly well placed.

Polia Ochs. Following Hampson, this generic name is used for *Mamestra* of previous lists. Hampson, however, has found *Miselia* Ochs. to be a prior name. *Distincta* Hbn. is a difficult species to place in a list, as it seems to have no very close ally, but it surely has no justifiable position between *determinata* and *columbia*. Also the relationship suggested by seeing *leucogramma* between *columbia* and *meditata* is new to me. I believe *columbia* to be a local form of *meditata*, and have expected that *determinata* may prove to be the same species.

P. ingravis is very likely the same as *quadrata*, though they are here separated by twenty-two species.

P. lubens is referred to *crisifera* by Hampson, but now they are correctly separated. *Invalida*, which stands as distinct, I believe to be *crisifera*. The two Vancouver Island specimens of *glaucopis* Hamp., on which the description was based, looked at first rather sharply distinct from the poor series of *lubens* in the British Museum, but after seeing more material, I agree with the authors in considering it only a variety.

P. mystica Smith (1699) should most certainly come next to *nimbosa* (1696).

P. dodi (1716). The correct place for this seems between *tacoma* (1709) and *lilacina* (1717); and *liquida* (1707), of which I consider *meodana* (1708) merely a variation, belongs to the same group. I should prefer to see *atlantica* (1710) between *subjuncta* (1686) and *nevada* (1687), and indeed in Western Canada it may sometimes be confused with the latter. A Calgary male in the British Museum bearing Barnes' and McDunnough's label "*nevada*" is a dark, richly coloured *atlantica*.

P. detracta (1659) would closely associate with *goodelli* (1718), and *acutermis* (1719) is very doubtfully distinct from the latter.

- P. pulverulenta* Smith. If my identification of this is correct, it is unquestionably distinct from *assimilis*, though it still stands as a variety, as described by Smith, and subsequently listed by him and all other authors. Both occur in Alberta, and not only are they separable superficially, but the male genitalia differ obviously. This happens to be at variance with Prof. Smith's own statement, and it is not unreasonable to suspect some inaccuracy on his part. I must admit I have not seen the type, but my identification fits the description exactly, except as to genitalia.
- P. larissa* (1739). I cannot consider this to be distinct from *anguina* (1732). The type of the latter is in the British Museum, and a comparison with seven Calgary *larissa* there shows them, to my mind, to be identical. *Imbuna*, *vicina*, *acutipennis* and *pensilis* stands as four species. They comprise a rather puzzling aggregate which requires thorough investigating with the aid of breeding and genitalic study. There seems little to separate *imbuna* from *vicina* except size, and that difference is well within the reach of variation. *Acutipennis* seemed satisfactorily referred to *vicina* also, where Hampson left it. I still try to keep *pensilis* separate in my collection, though I have much difficulty in placing material from some localities.
- P. negussa* (1682), whilst correctly in close association with *plicatus* (1681), stands widely separated from *gussata* (1742) in the new list. In so far as it is possible to be sure without having bred them, I am convinced that the first and last named are forms of one species. Mr. Tams worked specially for them in the spring of 1915, and procured a fine series, whilst Mr. Sanson took a number at Banff in the same year. The variation is continuous between the two extremes. I refer both names to *segregata* (1741).
- P. beani* (1743). The nearest ally of this is surely *legitima* (1741).
- P. tenisca* Sm. stands as a variety of *stricta*, and, contrary to my original belief, I consider this correct.

- P. olivacea* Morr. The ten names standing as varieties of *olivacea* are scarcely all of varietal value, but one of them, *comis*, may possibly prove distinct, in which case *petita* is probably a variety of it. Breeding from Vancouver Island females may throw some light on the problem.
- P. hanhami* B. & McD., and *alfkeni* Grt. are both now referred by Hampson in the collection to *Eriopyga*, where they seem to fit better. His error in placing Grote's species with the Acronyctinæ in the catalogue has been elsewhere referred to.
- Eriopyza* Gn. I have referred *smithi* Dyar (1861) to *incincta* Morr. (1819), but am open to conviction to the contrary if good evidence is forthcoming. *Uniformis* stands as distinct from *furfurata* with very doubtful correctness.
- Nephelodes* Gn. I cannot agree to the separation of *tertialis* from *emmedonia*. The latter name Hampson has found to be prior to *minians*.
- Xylomiges* Gn. I am glad to see *indurata*, *nicalis*, *tantiva* and *argus* all referred to *curialis*, as that is fully in accord with my own views formed after seeing the types; but that the names are all of varietal value is hard to believe.
- Orthosia* Ochs. This is used by the authors instead of *Monima* Hbn. of Hampson, and includes the large species under *Graphiphora* in Dyar's list. The treatment of a very large number of Smith's names throughout the Noctuidæ, would probably have caused him deep concern had he been spared to see it, but the retention of so many as referring to varieties might have given him some solace. Under the latter category, with doubtful justice in every case, come his seven names under *hibisci*. If they can really all be retained, I feel that my *latirena* referred to too large an aggregate, and is not sufficiently definite to be retained as well.

(To be continued.)

GEOMETRID NOTES.

ON THE GENUS XANTHORHÖE.

BY L. W. SWETT, LEXINGTON, MASS.

Xanthorhœ pontiaria and *forsaria* Taylor have been so often misidentified in collections, that I have tried to straighten them out in this paper. About three years ago Mr. E. H. Blackmore, of Victoria, B. C., collected a long series of all the forms and sent them to me to work up. Through the kindness of Drs. Barnes and McDunnough I was supplied with types and paratypes of both species, so that I did not have to rely on descriptions.

Xanthorhœ pontiaria was described by the Rev. G. W. Taylor in the Canadian Entomologist, vol. XXXVIII, p. 400, Dec. 1906, from four specimens, the type being a female from Wellington, B.C., May 23, 1905. There were two other females agreeing with the type, and from the same locality, but the male from Salem, Oregon, June 2, 1904, on a closer examination, proved to be distinct and a good species. The typical *pontiaria* Taylor is whitish fuscous in colour and resembles slightly the European *fluctuata*, but is much larger. The central band of the primaries is usually brownish, with a whitish centre, in the type form. The anal tuft of hairs of *pontiaria* is bushy and reddish-shaded, and seems broader than in any of the other species. The head is reddish-tinged in front, and the antennæ appear to have longer pectinations than the other species. There is a form of *pontiaria* in which the central band is solid reddish brown, but this is not so common as the white-centred variation. The male type of *pontiaria*, as I have said before, is not conspecific with the female; and as the female was designated as the type, I propose to describe the male as follows:

***Xanthorhœ macdunnoughi*, sp. nov.**

Antennæ rather narrowly pectinate, palpi short; front of head gray, as is thorax and abdomen. The primaries are dark ashen gray, with a broad, irregular fuscous band centrally. Basally there are several indeterminate hair-lines, rounded outwardly below the costa. Just before the intradiscal line there is pale band crossed by a geminate, brown hair-line, following the same course as the intradiscal line. The intradiscal line is geminate, bent

sharply outwardly below costa, then running in scollops on the veins to inner margin. Beyond the intradiscal line is a brown hair-line scolloped outwardly on the veins and bordering the pale, central portion of the median band. Just before the extradiscal, is another hair-line, following the same course and scolloped on the veins. The central part of the band is lighter with a small, black discal spot. The two central hair-lines have a tendency to form confluent circles in the median band of the primaries. The extradiscal line is geminate, composed of two hair-lines bent outwardly below the costa, forming a projection, then making an inward and outward curve to form a second projection. From the second projection it curves slightly backward, then runs straight to inner margin. The pale space beyond the extradiscal line is crossed through the centre by a scolloped hair-line. A submarginal brown scolloped line, the scollops running inwardly on the veins. The margin is fuscous traversed by a white, subterminal scolloped line. The fringe is short, fuscous, with small, geminate, black dots at the base. Secondaries pale gray with six or seven indeterminate, brown, wavy, hair-lines crossing them. The basal line runs just outside of the discal spot, curving upwards slightly as it leaves inner margin. The next two lines follow the same course as the extradiscal, and beyond this is a pale band, with a hair-line running through the middle. Margin of wing fuscous with a white, scolloped, subterminal line. Beneath the primaries are smoky ashen, with the lines above showing faintly through. Secondaries marked the same as above, only the lines are, in most cases, accentuated as dots on the veins.

This is a rather rare species, and not so ashen in colour as *pontiaria*, being more of a gray fuscous colour. I take pleasure in naming this species after Dr. McDunnough, who has given us many valuable papers in the "Contributions," despite several adverse criticisms which have recently appeared.

Expanse 25-30 mm.

Holotype.—♂, May 30, 1915, Victoria, B.C., from E.H. Blackmore, in my collection.

Allotype.—♀, May 14, 1913, Victoria, B.C., from E. H. Blackmore, in his collection.

Paratypes.—3 ♂s and 2 ♀s from Victoria and Duncans, B. C., in my collection; 4 ♂s, 7 ♀s, June 7 to July 3, from Victoria and Goldstream, B.C., in the collection of Mr. Blackmore. One ♂ Salem, Oregon, June 2, 1904, with other ♂s and ♀s from British Columbia in the Barnes' collection.

Xanthorhøe macdunnoughi can be easily separated from *pontiaria* Taylor by the general gray colour of the primaries, the gray head (that of the latter being reddish) and the narrower pectinated antennæ.

Xanthorhøe forsaria Taylor (Can. Ent., l. c., p. 401) has been a puzzle for a long time. It is evidently a species of high altitudes, as I have never seen any except from mountainous regions. The specimen from Laggan, Alberta, July 20, 1904, may not be the same as *forsaria*, as I have a ♀ from the same district which seems distinct. The type specimen taken in August is a yellowish ashen with a faint, reddish brown median band, the whole insect having a rubbed appearance. I have seen two other specimens taken on Mt. Cheam, B.C., by Mr. Bush through Mr. E. H. Blackmore, and they agree with Drs. Barnes' and McDunnough's specimens. The central band is narrow at the inner margin, and has the projections of the extradiscal line well rounded off. I have a form approaching *forsaria* Taylor very closely from Atlin, B.C., which I propose to describe as follows:

***Xanthorhøe atlinensis*, sp. nov.**

Head, thorax and abdomen fuscous; antennæ rather narrow as in *macdunnoughi*. Primaries smoky fuscous, rather diaphanous, crossed by seven or eight scolloped fuscous lines, with a faint, reddish brown median band. There is a basal brown patch, the outer edge of which runs out from costa toward median vein, then bends backward and goes to inner margin. There are three brown scolloped hair-lines between basal and intradiscal lines. The intradiscal line curves slightly outward till just below costa, then runs straight to inner margin, with a slight curve, being accentuated on the veins. There is a second hair-line running exactly like the intradiscal and almost touching it. The centre of the median band is lighter than the sides, and has a small, black spot. There is a hair-line just before the extradiscal which makes

quite a sharp projection below costa, then curves back and runs straight to inner margin. The extradiscal line goes straight across costa, the forms the usual sinus, the projections of which are rather more rounded than usual. Below the second projection the extradiscal line runs back, then goes straight to the inner margin, being rather narrow there. The median band has a reddish brown, somewhat washed-out appearance, as in *forsaria*, and is narrow at the inner margin. Beyond the extradiscal line is the usual pale band, with two scolloped hair-lines; and a fuscous outer margin, with subterminal, scolloped, white line. The fringe is short and fuscous, with the small, marginal dots rather contiguous. Secondaries pale smoky fuscous with six or seven indeterminate scolloped hair-lines, accentuated as dots on the veins. The extradiscal line runs straight out from costa, making a rounded angle below the small, black, discal joint. There is a pale band which is crossed by a scolloped line, then a heavy scolloped submarginal line, followed by a fuscous marginal border with the usual subterminal, scolloped, white hair-line.

Beneath the primaries are as above with the lines faintly showing through, but the basal portion is darker than the outer portion. Secondaries as above, but are darker basally.

This species is closer to *forsaria* Taylor than any other, but differs in the smoky diaphanous colour where the former has a yellow or ochreous tinge. It also differs in the time of appearance. These species all have the lines and bands running about the same, and it is very difficult to draw any one character as constant.

Expanse 30 mm.

Holotype.—♂, June 26, 1914, Atlin, B.C., from Mr. E. H. Blackmore, in my collection.

Paratypes.—One ♂, June 28, 1914, from Mr. Blackmore, in my collection, and 6 ♂'s, June 28, 1914, in coll. Blackmore and the Provincial Museum, Victoria, B.C. There is still another species occurring in the vicinity of Victoria, B.C., which emerges early in the season and resembles superficially *pontiaria* but is more fuscous, and the central band is solid blackish with a tendency to fade below median vein, as in *forsaria* and *atlinensis*. This species was taken along with the others by Mr. Blackmore, and

as it is through his efforts that I have been able to prepare this paper I propose to describe it as follows:

Xanthörhoe blackmorei, sp. nov.

Antennæ broad as in *pontiaria*, front of head with reddish tinge, thorax and abdomen fuscous ashen. The primaries are fuscous ashen, a basal brown band starts at an angle from the costa, turns back and goes straight to inner margin. There is a pale space crossed by three scolloped hair-lines beyond the brown basal patch. The intradiscal line starts at an angle below costa, then curves outwardly to inner margin. In the holotype, the intradiscal line curves outward from costa to inner margin and lacks the sharp bend downward on costa which occurs in some specimens. The median band is usually solid blackish with a wine-coloured tinge, and has a tendency to disappear below median vein. In some examples the centre of the median band is pale and there are the geminate intra- and extradiscal lines, as in the other species. The extradiscal line runs downward from costa about 3 mm. and then forms a small sinus, the second projection of which is about on a line with median vein. Below the median vein the extradiscal line makes two scollops inwards, then runs straight to inner margin, scolloped on the veins. There is the usual pale, extradiscal band and scolloped hair-lines with the marginal band beyond and subterminal, white scolloped line. The fringe is short with small, black dots on either side. The secondaries are fuscous ashen, with the usual lines, except that in some specimens the extradiscal line is strongly angled below the discal dot. Beneath the primaries and secondaries are marked as above but paler, except in the basal portions, where they are smoky.

Expanse 28-30 mm.

The early date of appearance, together with tendency of the extradiscal line to be angulate, and the blackish median band of primaries, help to separate this species from the others.

Holotype.—♂, May 2, 1915, Victoria, B.C., from E. H. Blackmore, in coll. Swett.

Allotype.—♀, May 19, 1915, Victoria, B.C., from E. H. Blackmore, in coll. Swett.

Paratypes.—♂s and ♀s, from Victoria and Goldstream, B.C., in colls. Blackmore, Barnes and Swett.

These closely allied species are best separated by the genitalia, as the markings run very close and they are rather variable.

Xanthorhœ pontiaria differs from the others in the shape of the costa of the valvæ, near the tip, which is somewhat sickle shaped and has heavy, tooth-like spines resembling a lobster claw. The sacculus is long and jointed, the saccus does not taper but is broad and rounded at base. The penis is stout with a spined, bulbous head, the spines being long and heavy. The calcar is not heavily haired.

Xanthorhœ macdunnoughi has a very short, chunky costa, with deep sinus near the tip, which is heavily armed with fine spines, extending around tip almost to the indentation on the sacculus. The sacculus is not elongated as in *pontiaria* and has the indentation opposite projection of costa above, and is very broad and somewhat angulate near the base. Penis stout with bulbous spined head; calcar with fine, short hairs. The saccus is not blunt but rather long and tapering. The shape of the saccus alone would separate these two species.

In *Xanthorhœ blackmorei* and the two species following, the costa of the valvæ is of a very different shape. About half way between the tip and base there arises a jointed projection like the horn of a rhinoceros, with the point directed just above base of uncus. On the outer side it slopes down forming a sinus, the extreme tip of costa being club shaped and with a few fine spines. The sacculus is elongated, rounded at tip, and has very slight indentation opposite base of projection. Near the base it forms quite a sharp angle. The calcar is longer haired than the former species and rather coarse. The saccus is broad and blunt like *pontiaria* at tip.

Xanthorhœ atlinensis shows a close relationship to *blackmorei* in the shape of the costa of the valvæ but differs as follows: The projecting horn is a little nearer base and just before it there arises a second little horn. The horn is more erect than in *blackmorei* and on the outer side slopes down, forming a gentle elongated sinus, the tip of it being just rounded, not swollen or club shaped. The sacculus is elongated and pointed at tip, and opposite the

horn has an oblong indentation, and the base lacks angulation. The saccus is broad but has a suddenly narrowed tip; the calcar has rather long hairs, but they are rather sparse. The penis is stout and bulbous with spines, and the cornuti of the vesica are three in number, long, moderate and short.

In *Xanthorhœ forsaria* the costa of the valvæ is shaped as in *atlinensis*, but the first horn is much longer, as is also the large one. On the outer side of the large horn is a slight point or rudimentary spine. The large horn is nearer tip of costa than in *atlinensis*, also it makes a very slight sinus, and the tip is quite narrow with many fine spines. The sacculus is elongate and pointed but broader than usual, and the base is very wide and rounded. The calcar has numerous fine, short hairs, and the saccus is broad with a stubby, rounded tip, not narrow as *atlinensis*. The penis does not seem quite so bulbous or so stout as usual, though it is decorated with the usual heavy spines. Probably all the species have the three cornuti on the vesica. My mount of *Xanthorhœ forsaria* was made from a ♂ paratype, which Dr. McDunnough kindly gave me. The shape of the costa of the valvæ and the sacculus, and the type of the saccus, seem to give better characters for separation than the penis in this group, though with more material the results might prove different. The above description is based entirely upon the male genitalia, as I had too few females to spare for slides. Possibly *atlinensis* may prove a northern race of *forsaria*, but I cannot tell without more material, and the sexual characters would seem to keep them apart.

PHENACOCOCCUS STACHYOS Ehr. (= *P. pettiti* Hollinger).

In the Canadian Entomologist for August, 1917, the writer described, as new, a mealy bug from Missouri. A short time after the description was published, G. F. Ferris called my attention to the apparent similarities that he thought existed between *Phenacoccus pettiti* Hollinger and a certain Californian species previously described by Ehrhorn as *P. stachyos*. A slide mount of the California species was submitted to the writer for comparison with his series of individuals of the Missouri species. Ferris states that the specimen he submitted to the writer is a toptype

of Ehrhorn's species, and so it is with this information that the writer has arrived at a definite conclusion relative to the synonymy. The main characteristic of this species, as mentioned by the writer in the August number of this journal, is the presence of projecting glands in the anal lobes as well as at various points throughout the body of the insect. Ehrhorn overlooked this prominent character in his description, and in so much as that description is lacking in certain details, the few points of similarity mentioned did not lead the writer to suspect that the Missouri species was the same as *P. stachyos* Ehr.

A. H. HOLLINGER,
Missouri Agricultural Experiment Station, Columbia, Mo.

SOME HETEROPTERA FROM THE PARRY SOUND DISTRICT, ONT.

BY J. R. DE LA TORRE BUENO, WHITE PLAINS, N.Y.

In 1915 Mr. H. S. Parish collected Heteroptera in the Parry Sound District, Ont. His collection was not very extensive, owing to the time of the year he was there. It was typical of the temperate part of Eastern North America. The results are presented here as a fragment towards our knowledge of the fauna of Canada.

The species are arranged according to Van Duzee's Check List, for the sake of conformity, but it should be understood that I do not at all subscribe to that arrangement, as I deem it phylogenetically unsound, for all that it is based (with changes) on the late Prof. Reuter's last work. This, I am sure, he would have modified, had he lived, as he would have come to recognize, e. g., that the Nepidæ bear no close relationship to the Belostomatidæ. Branched antennæ, in subaquatic forms, are no indication of relationship else the aquatic bugs and beetles are akin; they only indicate convergence through function.

Homæmus æneifrons Say, July 10, 26; Aug. 5.

Mormidea lugens Fabr., June 14, 1 sp.

Euschistus euschistoides Voll., June 10, 14; July 1; 4 sp.

Euschistus tristigmus Say, June 8; 1 sp.

Cænus delius Say, June 28; 1 sp.

- Neotiglossa undata* Say, June 10, 3 sp.
Cosmopepla bimaculata Thomas, June 14, 1 sp.
Banasa calva Say, June 14, 24, 2 sp.
Perillus exaptus Say, July 10, 1 sp.
Podisus maculiventris Say, June 22, 1 sp.
Alydus conspersus Mont., July 26, 28, 2 sp.
Corizus crassicornis Linn., June 18, 24; July 10, 28; 8 sp.
Corizus bohemani Sign., June 24, 1 sp.
Neides muticus Say, Aug. 8, 2 sp.
Nysius californicus Stal., Aug. 28, 1 sp.
Nysius ericæ Schill., June 23; July 6, 10, 28; 13 sp.
Ischnorhynchus resedæ Panz., June 7, 9, 22, 23; 13 sp.
Cymus angustatus Stal., June 16, 18, 23, 24, 26; July 6, 7, 10, 23, 26; 13 sp.
Cymus discors How., July 23, 16 sp.
Blissus leucopterus Say, June 18, 1 sp.
Geocoris bullatus Say, June 20, July 8, 2 sp.
Ligyrocoris diffusus Uhl., July 26; Aug. 5, 8; 4 sp.
Sphærobium quadristriatus Barb.? July 23, 25, 26; 6 sp.
Corythucha marmorata Uhl., July 23, 26, 2 sp.
Corythucha sp., June 8, 20; Aug. 6; 10 sp.
Sinea diadema Fabr., Aug. 5, 3 sp.
Pagasa fusca Stein., July 27, 1 sp.
Reduviolus subcoleopratus Kirby, July 10; Aug. 5; 5 sp.
Reduviolus ferus Linn., June 18; July 10, 26, 27, 28.
Reduviolus kalmii Reut., June 14, 15; July 9, 14, 18, 22; 1 sp.
Anthocorus musculus Say, July 26, 28, 4 sp.
Triphleps insidiosus Say, July 10, 28, 3 sp.
Dicyphus fameliculus Uhl., June 8, 23, 2 sp.
Monalocoris filicis Linn., June 7.
Labops hesperius Uhl., June 7, 14, 23, 24; July 18. Long and short-winged forms. 10 sp.
Acanthia coriacea Uhl., June 22, 1 sp.
Gerris rufoscutellatus Latr., June 11; Aug. 3; 11 sp.
Gerris marginatus Say, June 11, 5 sp.
Gerris buenoi Kish., Aug. 3, 10 sp.
Metrobates hesperius Uhl., Aug. 3, 5 sp.

THE BEE-GENUS BRACHYNOMADA.

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

In 1807 Jurine described a curious parasitic bee from Europe, naming it *Pasites maculatus*. A ferruginous variety (var. *brunneus* Friese) occurs in Northern Africa; a specimen before me is from Biskra, Algeria, (*F. D. Morice*). A second species, *P. minutus* Mocs., occurs in Hungary; while *P. friesei* Ckll. comes from Mt. Kilimandjaro in Africa. *P. villosus* Friese, from the Transvaal, is to be called *Margania villosa*. *Pasites* has two submarginal cells in the anterior wings, 12-jointed antennæ in both sexes, and the spine at the end of the female abdomen is entire, not bifid as in *Ammobates*. According to our knowledge of bee-structure, this cannot be a primitive form; it must be derived from an ancestor with three submarginal cells, antennæ 12-jointed in the female, 13-jointed in the male, and possibly the caudal spine of the female divided. Such a type, agreeing in all general features with *Pasites*, is found where we might least expect it, in South America, particularly in Argentina. I believe the relationship between the European and South American genera is a fact, and that we have in America a remnant of a once widely distributed type, which gave rise to the now exclusively old world *Pasites*. The supposed *Pasites* described by Cresson from Cuba is now referred to *Hypochrotania*. The South American genus referred to was named by Holmberg in 1886 *Brachynomada*. He had two species from the Argentina, which he called *B. argentina* and *B. chacoënsis*. In 1907 Ducke gave the name *Nomada tomentifera* to a form of *B. argentina*. Friese, in 1908, gave a synopsis of the species known to him, but unfortunately referred them to Holmberg's *Dæringiella*, which is an Epeoline genus. Friese showed that the genus extended into Brazil. The list of species, as it stands to-day, is as follows:

B. argentina Holmbg.
 " *tomentifera* (Dke.)
B. chacoënsis Holmbg.
B. franki (Friese).
 " *obscuripes* (Fr.).

B. bigibbosa (Friese).
B. thoracica (Friese).

In 1916 (Ann. Mag. Nat. Hist., June, p. 432) I described a new genus *Austrodioxys*, with the species *A. thomasi* from the Argentine. It has in general the characters of *Brachynomada*, but there are only two submarginal cells. Ducke intimates that two submarginal cells may occur as an abnormality in *Brachynomada*; but there is no reason for doubting that the specimen of *A. thomasi* is normal.

I have before me, from the U. S. National Museum, a small bee collected by Prof. L. Bruner at Carcarana, Argentina. Ashmead examined it and referred it to the North African genus *Schmiedeknechtia* Friese. It is, however, of the *Brachynomada* type, and since it has only two submarginal cells, it ought to go in *Austrodioxys*. Unfortunately, however, the second submarginal cells receive both recurrent nervures, whereas in *Austrodioxys* the first submarginal receives the first recurrent. In *Austrodioxys* it must be the first transverse cubital which has dropped out, but in the Bruner specimen rather the second. Under these circumstances it will probably be best to consider *Austrodioxys* a subgenus only, its type becoming *Brachynomada thomasi* (Ckll.). The Carcarana insect may be described as follows:

***Brachynomada subminiata*, n. sp.**

♀.—Length about 7 mm., anterior wing 5; head and thorax black, strongly punctured; the face, upper border of prothorax, and sides of thorax to a considerable extent, with silvery white hair; mandibles simple with a broad, red median band; lower margin of clypeus polished and exposed; face broad; flagellum ferruginous beneath; cheeks broad, with fine, white hair; mesothorax shining, with coarse punctures; scutellum strongly punctured, broadly truncate, subemarginate in middle; tegulae rufotestaceous; wings dusky hyaline, nervures and the large stigma dark ferruginous; first s.m. not twice as long as second; second s.m. receiving first r.n. near base, the second a short distance beyond middle; legs rather obscure ferruginous, with white hair, the anterior femora blackened; claws as in *B. thomasi*; abdomen broadly, densely punctured; first segment red; second black, red apically; third red, more or less stained with black basally; 4 to 6 dark; segments 1 to 4 with clear-cut, narrow white hair-bands,

fifth with a more diffuse band; apex with a pair of entirely separate parallel red spines, curved downward; venter red, black apically. (*Bruner*, 17).

The basal nervure meets the transversomedian; the marginal cell is obliquely truncate and appendiculate, exactly as in *Pasites*. The hind legs are much more slender than in *Pasites maculatus*, and the outer apical angle of hind tibia is much more salient. The face, though broad, is not so broad as in the *Pasites*.

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

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

(Continued from vol. XLIX, page 433.)

Limneria compacta. Type.—Female, Ent. Branch, Dept. Agr., Ottawa.

Limneria crassicornis. Type.—Male, yellow label 1222. 2nd Coll. Pub. Mus., Quebec. Left antenna beyond middle, right anterior leg at trochanter, left median tarsus and hind tarsi broken off.

Limneria dentata. Type.—Female, yellow label 451. 2nd Coll. Pub. Mus., Quebec. Right antenna gone at scape.

Limneria distincta. Type.—Female, yellow label 1060. 2nd Coll. Pub. Mus., Quebec. Right antenna at scape, left at 6th joint, gone.

Limneria excavata. Type.—Not in Pub. Mus., Quebec, unless under *Limneria valida* Cress.

Limneria flavipes. Type.—Male, yellow label 358. 1st Coll. Pub. Mus., Quebec. Right antenna beyond middle, right wings, left hind wing, gone.

Limneria fusiformis. Type.—Female, yellow label 302. 2nd Coll. Pub. Mus., Quebec. Left antenna at scape, right at apex, gone; median tarsi broken; right hind tarsus and left hind leg at femora, gone.

Limneria guignardi. Type.—Harrington Coll.

Limneria hyalina. Type.—Female, yellow label 299. 2nd Coll. Pub. Mus., Quebec.
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- Limneria infumata.** Type.—Female, yellow label 300. 2nd Coll. Pub. Mus., Quebec. Antennæ and one middle leg broken.
- Limneria marginata.** Type.—Female, yellow label 703. 2nd Coll. Pub. Mus., Quebec. Antennæ broken, the left before the right beyond the middle.
- Limneria nigricoxa.** Type.—Female, yellow label 675. 2nd Coll. Pub. Mus., Quebec.
- Limneria pallipes.** Type.—Female, yellow label 304. 2nd Coll. Pub. Mus., Quebec. Antennæ broken beyond middle, left hind leg beyond coxa missing.
- Limneria parva.** Type.—Female, yellow label 298. 2nd Coll. Pub. Mus., Quebec. One antenna broken at apex; hind legs gone.
- Limneria pilosula.** Allotype.—Yellow label 1100. 2nd Coll. Pub. Mus., Quebec. Abdomen glued on label, apex of right antenna gone. Type.—Female not located.
- Limneria plena.** Type.—Female, yellow label 296. 2nd Coll. Pub. Mus., Quebec. Antennæ and right hind tarsus gone.
- Limneria ruficornis.** Type.—Not in Pub. Mus., Quebec, unless under *Limneria dentata* Prov.
- Limneria ruficoxa.** Type.—Female, yellow label 303. 2nd Coll. Pub. Mus., Quebec. Antennæ beyond middle, left hind leg at trochanter, right hind tarsus and ovipositor sheaths, gone.
- Limneria rufipes.** Type.—Female, yellow label 521 and name label *Limneria mellipes* Prov. Proved by Provancher catalogue. 2nd Coll. Pub. Mus., Quebec. Antennæ broken near middle.
- Limneria sericea.** Type.—Not located.
- Limneria sessilis.** Type.—Female, yellow label 348. 2nd Coll. Pub. Mus., Quebec. Antennæ broken before middle.
- Linoceras cloutieri.** Type.—Female, yellow label 264. 2nd Coll. Pub. Mus., Quebec. Allotype.—Male, yellow label 303. 1st Coll. Pub. Mus., Quebec.
- Liris magnifica.** Type.—Male, yellow label 1721. 2nd Coll. Pub. Mus., Quebec.
- Liris rugosa.** Type.—Male, yellow label 1222. 2nd Coll. Pub. Mus., Quebec.
- Lonchidia hirta.** Type.—Not located.

- Lyda burquei.** Type.—Female, yellow label 126. 1st Coll. Pub. Mus., Quebec. Lacks left flagellum.
- Lyda harringtoni.** Type.—Female, Harrington Coll.
- Lyda quebecensis.** Type.—Female, yellow label 504. 2nd Coll. Pub. Mus., Quebec. Lacks antennæ; only one anterior wing left, and that on pin.
- Lyroda subita.** Type.—Not located.
- Macrocentrus aciculatus.** Type.—Female, yellow label 1484. 2nd Coll. Pub. Mus., Quebec.
- Macrocentrus longicornis.** Type.—Male, yellow label 911. 2nd Coll. Pub. Mus., Quebec. Lacks right antenna.
- Macrocentrus mellipes.** Type.—Female, yellow label 571. 2nd Coll. Pub. Mus., Quebec. Lacks antennæ; abdomen loose and dirty.
- Macrocentrus pacificus.** Type.—Ent. Branch, Dept. Agr., Ottawa. Head gone.
- Macrocentrus pectoralis.** Type.—Male, yellow label 728. 2nd Coll. Pub. Mus., Quebec. Lacks abdomen and some legs; antennæ incomplete.
- Macrophya albipes.** Type.—Female, white label 157; yellow label 1676. 2nd Coll. Pub. Mus., Quebec.
- Macrophya contaminata.** Type.—Yellow label 36. 2nd Coll. Pub. Mus., Quebec. Also 2 specimens without labels.
- Macrophya crassicornis.** Type.—Yellow label 1547. 2nd Coll. Pub. Mus., Quebec.
- Megaspilus lucens.** Type.—Not in Pub. Mus., Quebec, unless under *Proctotrupes flavipes* Prov.
- Megastylus politus.** Type.—Not in Pub. Mus., Quebec, unless under *Stilpnus americanus* Cress.
- Meniscus ashmeadii.** Type.—Not located.
- Meniscus crevieri.** Type.—Not in Pub. Mus., Quebec, unless under *Meniscus scutellaris* Cress.
- Meniscus marginatus.** Type.—Female, yellow label 1037. 2nd Coll. Pub. Mus., Quebec.
- Meniscus superbus.** Type.—Female, yellow label 418. 2nd Coll. Pub. Mus., Quebec.
- Mesochorus areolatus.** Type.—Female, yellow label 680.

- 2nd Coll. Pub. Mus., Quebec. Left antenna gone at scape; abdomen glued on yellow label.
- Mesochorus flaviceps.** Type.—Female, yellow label 358.
2nd Coll. Pub. Mus., Quebec.
- Mesochorus humeralis.** Type.—Female, yellow label 698.
2nd Coll. Pub. Mus., Quebec.
- Mesochorus jucundus.** Type.—Female, yellow label 679.
2nd Coll. Pub. Mus., Quebec.
- Mesochorus pleuralis.** Type.—Female, yellow label 367.
1st Coll. Pub. Mus., Quebec.
- Mesochorus politus.** Type.—Female, yellow label 681.
2nd Coll. Pub. Mus., Quebec.
- Mesochorus rufulus.** Type.—Female, yellow label 577.
2nd Coll. Pub. Mus., Quebec. Antennæ broken near base; hind legs except left coxa, and abdomen, missing.
- Mesochorus saint-cyri.** Not in Pub. Mus., Quebec, unless under *Echthrus abdominalis*.
- Mesochorus truncatus.** Type.—Female, white label 464, yellow label 1559. 2nd Coll. Pub. Mus., Quebec. On a short pin.
- Mesoleius annulatus.** Type.—Female, blue label 259(s); yellow label 1242. 2nd Coll. Pub. Mus., Quebec.
- Mesoleius antennatus.** Type.—Female, yellow label 338.
2nd Coll. Pub. Mus., Quebec.
- Mesoleius canadensis.** Type.—Female, yellow label 336.
2nd Coll. Pub. Mus., Quebec.
- Mesoleius chicoutimiensis.** Type.—Female, yellow label 1584. 2nd Coll. Pub. Mus., Quebec. Most of antennæ and legs gone; right hind leg present.
- Mesoleius fissus.** Type.—Male, yellow label 339. 2nd Coll. Pub. Mus., Quebec. Lacks apices of antennæ.
- Mesoleius inflatifrons.** Type.—Female, blue label 445.
2nd Coll. Pub. Mus., Quebec.
- Mesoleius junctus.** Type.—Male, yellow label 936. 2nd Coll. Pub. Mus., Quebec.
- Mesoleius mellipes.** Type.—Male, yellow label 413. 1st Coll. Pub. Mus., Quebec.

- Mesoleius niger.** Type.—Female, yellow label 933. 2nd Coll. Pub. Mus., Quebec.
- Mesoleius tardus.** Type.—Female, yellow label 337. 2nd Coll. Pub. Mus., Quebec. Abdomen glued on.
- Mesoleius telarius.** Type.—Female, yellow label 1241, old rose label 74. 2nd Coll. Pub. Mus., Quebec. Right flagellum gone.
- Mesoleptus albopleuralis.** Type.—Male, yellow label 462. 2nd Coll. Pub. Mus., Quebec.
- Mesoleptus angustus.** Type.—Male, Harrington Coll. Labelled "Type. Rohw. Gahan."
- Mesoleptus annulatifipes.** Type.—Male, yellow label 1239, name label "*Mesoleptus cinclipes* Prov." Proved by Provancher's catalogue. 2nd Coll. Pub. Mus., Quebec.
- Mesoleptus annulatus.** Type.—Female, Harrington Coll. Pink label "p. 471" Paratype, yellow label 683. 2nd Coll. Pub. Mus., Quebec.
- Mesoleptus barbatus.** Type.—Male, yellow label 1230. 2nd Coll. Pub. Mus., Quebec. Provancher mistook sex.
- Mesoleptus canaliculatus.** Type.—Male, yellow label 322. 2nd Coll. Pub. Mus., Quebec.
- Mesoleptus depressus.** Type.—Male, yellow label 400. 2nd Coll. Pub. Mus., Quebec. Lacks hind tarsi.
- Mesoleptus erectus.** Type.—Female, yellow label 399. 1st Coll. Pub. Mus., Quebec.
- Mesoleptus fasciatus.** Type.—Not located.
- Mesoleptus filiformis.** Type.—Male, yellow label 1240. 2nd Coll. Pub. Mus., Quebec. Provancher mistook sex.
- Mesoleptus flavicornis.** Type.—Female, yellow label 464. 2nd Coll. Pub. Mus., Quebec. Lacks flagellum beyond first.
- Mesoleptus incompletus.** Type.—Not in Pub. Mus., Quebec, unless under *Cremastus fusiformis* Prov.
- Mesoleptus interruptus.** Type.—Female, yellow label 390. 1st Coll. Pub. Mus., Quebec. Part of antennæ gone.
- Mesoleptus lætus.** Type.—Yellow label 319. 2nd Coll. Pub. Mus., Quebec. Antennæ and abdomen gone.
- Mesoleptus largus.** Type.—Female, yellow label 1231. 2nd Coll. Pub. Mus., Quebec.

- Mesoleptus laurentianus.** Type.—Male, yellow label 394. 1st Coll. Pub. Mus., Quebec. Most of left flagellum, left hind leg, apical joints of right hind tarsi gone.
- Mesoleptus longipes.** Type.—Not in Pub. Mus., Quebec, unless under *M. moveni* Prov.
- Mesoleptus lucens.** Type.—Male, yellow label 318. 2nd Coll. Pub. Mus., Quebec.
- Mesoleptus maculatus.** Type.—Not in Pub. Mus., Quebec, unless under *Exyston clavatus* Prov.
- Mesoleptus moyeni.** Type.—Female, yellow label 315. 2nd Coll. Pub. Mus., Quebec.
- Mesoleptus nigricornis.** Type.—Female, Harrington Coll.
- Mesoleptus perditus.** Type.—Male, blue label 165(s); yellow label 1257. 2nd Coll. Pub. Mus., Quebec. Lacks apex of left antenna.
- Mesoleptus rhopalocerus.** Type.—Male, yellow label 1561. 2nd Coll. Pub. Mus., Quebec.
- Mesoleptus rufipes.** Type.—Female, yellow label 406. 1st Coll. Pub. Mus., Quebec.
- Mesoleptus rufomixtus.** Allotype.—Male, Harrington Coll. Type.—Female not located.
- Mesoleptus rufulus.** Type.—Female, yellow label 455. 2nd Coll. Pub. Mus., Quebec. Lacks apices of tarsi except one; abdomen glued on yellow label.
- Mesoleptus sancti-hyacinthi.** Type.—Not in Pub. Mus., Quebec, unless under *Mesoleptus inceptus* Cress.
- Mesoleptus seminiger.** Type.—Female, yellow label 467. 2nd Coll. Pub. Mus., Quebec. Lacks flagella. Allotype.—Male, yellow label 401. 1st Coll. Pub. Mus., Quebec.
- Mesoleptus sericeus.** Type.—Female, yellow label 483. 2nd Coll. Pub. Mus., Quebec. Apices of flagella wanting; abdomen loose.
- Mesoleptus uniformis.** Type.—Female, yellow label 402. 1st Coll. Pub. Mus., Quebec. Cocoon on pin. Labeled *Campoplex unicolor*. Proved by Provancher's Catalogue, Provancher mistook sex.

(To be continued.)

OBITUARY.

SAMUEL T. WOOD.

We regret to record the death of Mr. Samuel T. Wood, of the Editorial Staff of the Toronto "Globe," which took place, after a lingering illness, on Nov. 6, 1917, at his residence in Toronto.

By his death Canada has lost a writer of great charm, and this loss will be felt by a wide circle of readers, particularly among nature lovers, for it was by his writings on natural history that Mr. Wood was best known.

Mr. Wood, who was of Scotch-Irish parentage, was born on a backwood farm in Hastings County, Ont., in 1860, and was educated at the Belleville public and high schools and the Belleville Business College. Having been from his youth an earnest advocate of single tax he was naturally attracted to journalism as a vocation, and after a year on an Ottawa newspaper he entered the service of the Toronto Globe, first as a reporter and later as an editorial writer.

For some twenty years past he contributed a series of Saturday editorials on various phases of natural history, and these articles reveal an accuracy of observation, together with a deep sense of the poetical in nature, which never degenerated into sentimentality. A selection of these articles was recently published under the title "Ramblings of a Canadian Naturalist," and met with a ready sale among the thousands of readers, who were already familiar with his work in "The Globe."

Although more particularly interested in birds, Mr. Wood possessed a love of nature too broad to restrict him to any one branch of natural history, and though he would have been the last person to claim for himself the title of "entomologist," his observations frequently led him to discourse on insects and their ways in his usual delightful manner. He was a member of the Toronto Branch of the Entomological Society of Ontario, and although not an active contributor to its proceedings his presence at the meetings was always welcome, for he was a most intelligent listener, and usually had some pertinent question or observation to make on the subject in hand.

Besides his interest in Natural History he was a keen student of economics, and published many articles on economic subjects, among which may be mentioned a series of short "Lessons in Economics," which for a time were a daily feature in the *Globe*; and a very excellent "Primer in Political Economy," which he published in 1901.

Mr. Wood had a very quiet and unassuming manner, and a most kindly and attractive personality, which won him a great many friends and admirers. He is survived by his father (Mr. Samuel Wood), his second wife and two sons, to whom we extend our deepest sympathy.

ANNUAL MEETING OF THE ENTOMOLOGICAL SOCIETY OF ONTARIO.

The fifty-fourth annual meeting of the Entomological Society of Ontario was held at Macdonald College on November 8th and 9th. Among the visitors from a distance were Dr. T. J. Headlee, New Brunswick, N.J.; Dr. W. C. O'Kane, Durham, N.H.; J. H. Emerton, Boston; A. F. Burgess, Melrose Highlands, Mass.; Professor Brittain, Truro, N.S. The more prominent Quebec delegates included Dr. Chapais, St. Denis-en-bas; Father Leopold and Professor Letourneau, La Trappe; G. Maheux, Provincial Entomologist, Quebec; Dr. Corcoran and Professor Higgins, of Loyola College, Montreal; Dr. Willey, McGill University, and Messrs. Winn, Moore and Cummings, Montreal. The Ontario delegates were Dr. Hewitt, Messrs. Gibson, Swaine and Petch, Ottawa; Professor Caesar and Mr. A. W. Baker, Ontario Agricultural College, Guelph; Mr. W. A. Ross, Vineland Station; Mr. F. J. A. Morris, Peterborough; Mr. J. D. Evans, Trenton.

Following is the programme:—

Reports of Council, Treasurer, Librarian, Curator, Branch Societies, Delegate to the Royal Society of Canada, and Directors of Divisions.

"Further Notes on the Imported Onion Maggot," by Mr. Arthur Gibson; "The Entomological Service of Quebec," by Mr. George Maheux; "Some Important Insect Pests of the Season," by Prof. L. Caesar; "Insects of the Season in Quebec," by E. M.

DuPorte; "The European Hemerophila Pariana," by Dr. E. P. Felt; "Black Flies in the Dixville Notch," by Dr. W. C. O'Kane; "Some Notodontian L arv e," by Dr. J. A. C orcoran; Address of Welcome, by Principal Harrison, Macdonald College; President's Address, by Mr. A. F. Winn, Montreal; "The Problem of Mosquito Control," by Dr. T. J. Headlee; "The Black Cherry Aphis," by Mr. W. A. R ess; "A Comedy of Errors," by Mr. F. J. A. Morris; "Trans-Canadian Spiders," by Mr. J. H. Emerton; "A Further Report on the Value of Dusting vs. Liquid Spraying," by Prof. L. Caesar; "A Few Notes on the Ecology of Insects," by Prof. W. Lochhead, Macdonald College; "The Nervous System of Caterpillars and Its Relation to Classification," by Mr. J. M. Swaine; Motion Picture Film, "Field and Parasite Work Against the Gipsy and Brown Tail Moths," by courtesy of U. S. Bureau of Entomology, Washington, through Dr. A. F. Burgess and Dr. C. Gordon Hewitt; Motion Picture Film, "Orchard Spraying in Nova Scotia," by Professor W. H. Brittain; "The Effect of Stable and Horn Fly Attacks on Milk Production," by Mr. A. W. Baker; "Habits, Behaviours and Tropisms of Insects," by Dr. Arthur Willey.

At the close of the evening session a most valuable symposium took place on the question of how Canadian entomologists can help to increase food production, introduced by Dr. C. Gordon Hewitt, in which many of the members joined.

The following officers were elected for the ensuing year:—

President, Professor L. Caesar, Ontario Agricultural College, Guelph.

Vice-President, Mr. Arthur Gibson, Ottawa.

Secretary-Treasurer, Mr. A. W. Baker, O.A.C., Guelph.

Curator, Mr. Eric Hearle, O. A. C., Guelph.

Librarian, Rev. Prof. C. J. S. Bethune, O.A.C., Guelph.

Directors: J. M. Swaine, Ottawa; C. E. Grant, Orillia; Dr. A. Cosens, Toronto; F. J. A. Morris, Peterborough; J. W. Noble, Essex, Ont.; W. A. Ross, Vineland Station, Ont.

Delegate to the Royal Society of Canada, The President.

W. L.