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# The Canadian Entomologist.

VOL. XXXI.

LONDON, AUGUST, 1899.

No. 8.

## A LIST OF MANITOBA MOTHS.—Part III.

BY A. W. HANHAM, WINNIPEG, MAN.

The Noctuids of this Province, as already known, make a very fair list, and include a number of rare moths, as well as a good percentage of new species. I have seen all Mr. E. F. Heath's things, and his additions to my list are quite numerous; these appear as taken at Cartwright. The Rounthwaite records are Mr. L. E. Marmont's (I have seen his collection), and he has added some rare species. The Brandon records are in some cases my own, as I have visited there the last three summers; others are Mr. H. W. O. Boger's, of that place. I have seen paintings of a number of moths collected at the Douglas swamp by Mr. Criddle, of St. Alban's, Aweme, and these have given me a few extra names.

My best collecting here has been done at light, at Brandon off bloom on the prairies, and I have also had very fair success, both here and at Brandon, from sugaring late in the season (from the middle of August until early in October).

A very large proportion of the species listed have been referred to Prof. John B. Smith, who has been untiring in his efforts to help me, and without whose kind assistance this list would have been impossible, or very incomplete. A few things, still doubtful, remain in his hands for future determination. Others, that would have increased my list, came to grief in the mails. These species, it is hoped, will be taken again during the coming season.

*Thyatira scripta*, Gosse. Cartwright.

*Euthyatira pudens*, Gn. Rounthwaite; one at black currant bloom early in May.

*Pseudothyatira cymatophoroides*, Gn. Common at light, end of June and early in July (1897); also netted at dusk flying along the edge of the woods close to my house.

*Pseudothyatira expultrix*, Grt. One only, at light, beginning of July.

*Leptina latebricola*, Grt. Cartwright.

*Panthea acronyctoides*, Walk. July 12th; one at light.

- Raphia frater*, Grt. June 17th to July 13th; very common at light, both in 1897 and 1898. In 1895 (June 30th), I got a pair by beating. One of my specimens is very richly suffused with black on primaries.
- Charadra deridens*, Gn. June 27th (1897); one at light.
- Diphthera fallax*, H.-S. June 17th, 24th, etc.; rather rare at light.
- Arsilonche albovenosa*, Goetze (Henrici, Grt.). Cartwright.
- Acronycta Americana*, Harr. Have taken the pupæ of this species plentifully in the spring and fall, attached to the under side of boards and logs in woods, but I have never taken more than one at light (July 8th).
- Acronycta hesperida*, Smith. One at light, about the middle of July (1897).
- Acronycta dactylina*, Grote. Several at light, early in July.
- “ *lepusculina*, Gn. Brandon and Rounthwaite.
- “ *innotata*, Gn. July 13th (1898); one at light.
- “ *morula*, G. & R. June 21st (1894); one at rest on fence.
- “ *furcifera*, Gn. June 3rd (1896); one at rest on tree in Elm Park.
- “ *hasta*, Gn. Cartwright.
- “ *Manitoba*, Smith. One specimen only.
- “ *quadrata*, Grote. Cartwright and Douglas.
- “ *revellata*, Smith. At light, June 19th, and several early in July.
- “ *grisea*, Walk. Cartwright.
- “ *falcula*, Grote. June 24th, one at light; also from Cartwright.
- “ *parallela*, Grote. June 21st (1896), one at rest in the city.
- “ *ovata*, Grote. Cartwright, and one here at light.
- Acronycta hamamelis*, Gn. Not uncommon at light; June 18 until middle of July.
- Acronycta luteicoma*, G. & R. June 10th (1894), one at rest on tree in woods near St. Boniface.
- Acronycta sperata*, Grote. Cartwright.
- “ *noctivaga*, Grote. Brandon.
- “ *emaculata*, Smith. At light, May 13th, etc.
- Acronycta impressa*, Walk. At light, May 13th to 22nd (Winnipeg), and again middle to end of July (Brandon). These two species were confused until recently, and I cannot speak with certainty as to number taken.
- Acronycta oblongata*, S. & A. Rare at light, June 22nd, etc.
- “ *lanceolaria*, Grote. Rounthwaite. A rare and early species.

- Microcoelia fragilis*, Gn. Rare at light, end of June.
- “ *diphtheroides*, Gn. Rare at light, end of June and July 1st.
- Bryophila lepidula*, Grote. June 13th and 20th (1896), two at rest on fences.
- Bryophila teratophora*, H.-S. A pair at light early in July (1897).
- Chytonix palliatricula*, Gn. At light, end of June. A number have been secured from pupæ, both here and at Quebec; they are attached to the under side of boards, or in a similar manner to those of *A. Americana*, and I have found both species on the same board.
- Rhynchagrotis chardinyi*, Bdv. Occasional, at thistle bloom, July 15th, August 3rd, etc., and hiding at the roots of weeds; also fairly plentiful at light, middle to end of July.
- Rhynchagrotis rufispectus*, Morr. Nice, fresh specimens at light, August 5th to middle of month. At Brandon, at sugar, August 21st to September 1st.
- Rhynchagrotis cupida*, Grt. Brandon, July 31st (1896), one at bloom; also one here at light in 1897.
- Rhynchagrotis placida*, Grt. End of July, frequently at light. Brandon, at bloom July and August, and at sugar till nearly end of August.
- Rhynchagrotis alternata*, Grt. Common at sugar in Elm Park, middle to end of August (1896); also at Brandon in 1898. A few at light, end of July.
- Adelphagrotis prasina*, Fabr. Rare at light in July.
- Platagrotis pressa*, Grt. At light and at bloom in July.
- Pachnobia littoralis*, Pack. (Smith's list, 1643.) June 20th (1896), one under a log on railway bank; also from Cartwright.
- Pachnobia Fishii*, Grt. (Smith's list, 1638.) May 24th, one at light.
- “ *salicarum*, Walk. Cartwright.
- Agrotis perattenta*, Grt. (Smith's list, 1613.) Several at light during July.
- Agrotis ypsilon*, Rott. August and September, common at sugar; also at bloom and at light.
- Peridroma occulta*, Linn. One or two at light, July 23rd, etc.; also at Brandon and Cartwright.
- Peridroma stricta*, Morr. August 8th, two at light; also at Rounthwaite.
- “ *saucia*, Hbn., and var. *margaritosa*, Haw.
- A very variable insect. Common at light and at sugar during August and September, and taken as late as October 2nd.

- Noctua Smithii*, Snellen (baja †, Auct.). Another very variable species. Common at Winnipeg, and particularly so at Brandon; at bloom from the middle of July until towards the end of August.
- Noctua Normaniana*, Grt. Not nearly so common as the foregoing, but fairly plentiful at Brandon at bloom, in 1896, from middle to end of July, and taken here at light in 1897, about the same date.
- Noctua bicarnea*, Gn. Occasional, at light, towards end of July.
- Noctua Treatii*, Grt. Three specimens at light, July 2nd and later (1897); not taken last season. Prof. Smith states that it is not uncommon at Calgary.
- Noctua c-nigrum*, Linn. At light, middle to end of July, but not common.
- “ *rubifera*, Grt. Rare at light, beginning of July.
- “ *rosaria*, Grt. Included by authority of Prof. Smith.
- Noctua cynica*, Smith. A few at sugar at Brandon, August 30th and September 1st.
- Noctua fennica*, Tausch. Have taken this species in the house as early as June 20th. It has proved quite a nuisance, both on the Brandon prairies at bloom and here at light, during July. My latest record is August 31st (at light).
- Noctua plecta*, Linn. Three specimens at light on July 25th (1897), and more abundantly last season, also at light.
- Noctua collaris*, G. & R. Several at light at the end of July. Here and at Brandon, by sweeping *Solidago*, during August. (This species appears to have a decided preference for *S. rigidus*.)
- Noctua haruspica*, Grt. Both seasons this moth has been abundant at light during July, and some evenings by no means a welcome visitor for this reason. The usual form here is paler than the Eastern one.
- Noctua clandestina*, Harr. This species is generally very abundant under loose bark. I noticed it especially so on July 1st (1895) on fence posts. Has been taken as late as August 25th. Not a common insect at light.
- Noctua atricineta*, Smith. Brandon; at bloom, middle of July (1896), a pair only.
- Noctua patefacta*, Smith. Brandon; one at bloom towards end of July (1896).
- Rhizagrotis introferens*, Grt. (Smith's list, 1698.) One in July (1894), bred from the pupa; also at Cartwright.

- Feltia subgothica*, Steph. Very common at bloom, middle of July to end of August. Taken as late as September 23rd.
- Feltia herilis*, Grt. Nearly as plentiful at bloom as *subgothica*, and out with it. Both these species came frequently to light.
- Feltia jaculifera*, Gn. (*tricolor*, Lint.). Until a short time ago this species and *herilis* were both *jaculifera* in my collection, and the moth called *herilis* proves to be *Carneades ochrogaster* (1834). At the present time I only appear to have one specimen of *jaculifera* with a Brandon label, and owing to the confusion of names referred to above, I cannot speak with certainty as to its abundance here.
- Feltia venerabilis*, Walk. Several at light, August 31st to September 4th; also at Brandon at bloom.
- Feltia robustior*, Smith. Three specimens of this new species were taken altogether; the first on August 27th, off golden-rod, another on August 30th, at sugar (in a small swamp), and the third September 1st, also off golden-rod. All three in the vicinity of the Experimental Farm at Brandon.
- Feltia volubilis*, Grt. June 24th, one at light; also from Cartwright and Rounthwaite.
- Porosagrotis murænula*, G. & R. Brandon; rare at sugar, end of August.
- “ *catenula*, Grt. Brandon and Cartwright.
- Porosagrotis mimallonis*, Grt. Brandon; a beautiful, fresh specimen, off golden-rod, on August 27th; also from Cartwright.
- Carneades quadridentata*, G. & R. Brandon; at bloom, August 28th.
- “ *niveilinea*, Grt. A pair at Brandon at light, August 20th.
- “ *Ridingsiana*, Grt. Cartwright.
- Carneades flavicollis*, Smith. This was the most abundant species taken at Brandon, at bloom on the prairies, in 1896 (from middle to end of July), and worn examples were taken there in 1897 until the middle of August. Taken here at light, both in 1897 and 1898, but not in any numbers.
- Carneades velleripennis*, Grt. I took a pair here at light on September 1st, 1897; one at sugar at Brandon on August 27th, 1898, and several off heads of *Solidago* at Carberry on September 14th.
- Carneades scandens*, Riley. Rather plentiful at light for about a week (July 12th, etc., 1898).
- Carneades pleuritica*, Grt. Several at bloom on the prairies at Brandon towards end of July (1896).

- Carneades ptychrous*, Grt. At Brandon, August 14th, 1897, off golden-rod, and quite common off the same flower at Carberry on September 14th, 1898 (during the afternoon).
- Carneades messoria*, Harr. Brandon, at bloom, and Winnipeg, at light, towards the end of July.
- Carneades incallida*, Smith. Brandon and Cartwright.
- Carneades dissona*, Moeschl. Brandon; one on September 1st, I think, at sugar. (Prof. Smith says it was described from Labrador.)
- Carneades tessellata*, Harr. Common both at light and at bloom, during the latter part of July.
- Carneades insulsa*, Smith. Taken at light towards the end of July, and the most abundant species at Brandon, during August, at bloom on the prairies. Has been taken at sugar also. This species is extremely variable, some being almost black, while the rarest and most striking form is almost equally light coloured.
- Carneades detersa*, Smith. Cartwright.
- “ *segregata*, Smith. Cartwright.
- Carneades basalis*, Grt. One specimen only at Brandon, at bloom, in 1896, near the end of July; also seen from Beulah, Man.
- Carneades ochrogaster*, Gn. Very common under logs some seasons, from end of July to end of August. Fairly common here at light, and at Brandon at bloom. Sometimes on the wing during the afternoon. Some of the forms of this variable species rank among our handsomest Noctuids.
- Carneades infusa*, Smith. Prof. Smith, in naming my specimens, says that this new species is allied to *obeliscoides*. It was taken at Brandon on August 31st and September 1st, at sugar and at bloom; also seen from Cartwright.
- Carneades divergens*, Walk. Very common at light, during the early part of July, especially in 1897.
- Carneades redimicula*, Morr. A few at bloom at Brandon in July, 1896, and August, 1898.
- Carneades tesselloides*, Grt. One at light in June.
- Carneades silens*, Grt. Some beauties at light, from 1st July to middle of the month. At Brandon, off bloom, middle of July, 1896. An occasional specimen has none of the dark markings.
- Carneades quinque-linea*, Smith. “It is likely, from the material sent me by Mr. Heath, that this is merely a very sharply marked *incallida*. It should be so referred.”—(J. B. S.) Cartwright.

- Anytus sculptus*, Grt. Not uncommon at sugar here and at Brandon, August 27th to September 5th; also a few at light early in September.
- Mamestra Rogenhoferi*, Moeschl. One specimen each season at light, middle of July. (According to Prof. Smith, this is a species only hitherto recorded from Labrador.)
- Mamestra mystica*, Smith. Occasional, at light, about the middle of July; also from Cartwright.
- Mamestra purpurissata*, Grt. Rather plentiful at bloom at Brandon, middle to end of July, and here at light, towards end of same month. (A rather fine species.)
- Mamestra meditata*, Grt. Rather common at light in July; also sometimes at bloom.
- Mamestra cervina*, Smith. Common at light, end of June to middle of July.
- Mamestra neoterica*, Smith. At light, with *cervina*, but not so numerous. Both these new species, together with *mystica*, were described by Prof. Smith in *Entomological News* (December No. of Vol. IX.).
- Mamestra distincta*, Hbn. Cartwright.
- Mamestra Farnhami*, Grt. A handsome species. Cartwright and Rounthwaite.
- Mamestra atlantica*, Grt. Plentiful at light, from the middle of June until nearly the end of July.
- Mamestra desperata*, Smith (= 1953 = *radix*, Wek.). A few at light, middle to end of June.
- Mamestra subjuncta*, G. & R. Rare at light, end of June.
- “ *grandis*, Bdv. Rare at light, end of June.
- “ *trifolii*, Rott. Rounthwaite.
- Mamestra rosea*, Harv. One at light, end of June. Another from Brandon (pupa found April 24th, moth evolved May 15th).
- Mamestra picta*, Harr. A beauty, at light, July 12th (1898).
- “ *lubens*, Grt. A few at light, end of June and early in July.
- “ *assimilis*, Morr. Several at light, first part of July.
- Mamestra adjuncta*, Bdv. A beautiful species when in good condition; taken in July, and appears to be rare here.
- Mamestra legitima*, Grt. From Cartwright and Rounthwaite. Rather an early *Mamestra*, and quite richly coloured when fresh.



- Mamestra lilacina*, Harv., and  
form *illabefacta*, Morr. This species does not seem to be on the wing until July, but during that month, especially in 1897, it was exceedingly common at light.
- Mamestra obscura*, Smith. Cartwright.
- Mamestra renigera*, Steph. Common at light, middle to end of July, and at bloom on the prairies.
- Mamestra olivacea*, Morr. This species appears to be out from the middle of July to the middle of August, and is common both at light and at bloom. It shows quite a range of variation.
- Mamestra incurva*, Smith. Cartwright.
- Mamestra lorea*, Gn. A nuisance at light, especially about the beginning of July.
- Mamestra quadrannulata*, Morr. Rounthwaite. (This, I understand, is a good catch.)
- Mamestra anguina*, Grt. (var. *larissa*, Smith.) Brandon.  
" *vicina*, Grt. Brandon; one at bloom in July.
- Mamestra gussata*, Smith. Brandon. (Described from Calgary. Quite a pretty species.)
- Hadena niveivenosa*, Grt. Common at light, at the end of July, and taken on the wing during the day.
- Hadena stipata*, Morr. August 15th; three specimens at bloom at Brandon.
- Hadena passer*, Gn. Several at light in 1897, about the middle of July.  
" *remissa*, Hbn. One at light at the beginning of July.  
" *suffusca*, Morr. (= *illata*, Walk.) Several at light early in July.  
" *finitima*, Gn. End of June, one at dusk.
- Hadena lateritia*, Hbn. Taken under logs on July 13th, etc., at bloom, and common at light early in July.
- Hadena dubitans*, Walk. (= *sputatrix*, Grt.) As common as the preceding species, and out at the same time.
- Hadena plutonia*, Grt. Cartwright.  
" *impulsa*, Gn. Two or three at light, July 15th, etc.
- Hadena devastatrix*, Brace. Common under logs, and at light during July, and towards the end of September have taken fresh specimens at sugar and at light.
- Hadena arctica*, Bdv. At bloom in garden, and came freely to light in July.

- Hadena relecina*, Morr. Cartwright and Rounthwaite. I think Mr. Marmont took his late, at sugar.
- Hadena lignicolor*, Gn. One of the abundant species during July at light.
- Hadena transfrens*, Neum. Occasional, at Brandon, off golden-rod, both during the day and by sweeping after dark.
- Hadena indirecta*, Grt. Cartwright.
- “ *didonea*, Smith. Cartwright.
- “ *modica*, Gn. One or two only, at light, towards the end of July.
- Hadena mactata*, Grt. (This name is on my authority. I have looked over the specimens received from Mr. Hanham, and believe now that I have two good species, neither of them *mactata*, though both nearly allied to it.—J. B. Smith.) Very common at sugar, from August 24th to nearly the end of September; also taken at light.
- Hadena miseloides*, Gn. July 19th; one at light.
- Hadena fractilinea*, Grt. (No. 2060.) Brandon; a few at bloom, and generally off golden-rod.
- Xylophasia semilunata*, Grt. (No. 2023.) Cartwright.
- Trachea delicata*, Grt. June 18th to July 19th; at light, but only a few taken.
- Hillia crasis*, H. S.;  
also form *senescens*, Grt. Rare at light, and at sugar in September.
- Hillia algens*, Grt. Rather plentiful at sugar, end of August and beginning of September; also some at light.
- Oligia festivoidea*, Gn. Rare at light, in July.
- “ *versicolor*, Grt. Rare at light in July.
- Platyperigea praeacuta*, Smith, (?). Rounthwaite; one at sugar in September. (Prof. Smith says his type from Colorado is smaller and less marked.)
- Hyppa xylinoides*, Gn. A few at light, and on fences early in July. Does not appear to be so plentiful as in the East.
- Homohadena badistriga*, Grt. A few at light, with seasons about the middle of July.
- Homohadena stabilis*, Smith. Taken at light on the wing, about the same time, and by no means common.
- Oncocnemis atrifasciata*, Morr. Taken at Brandon, Carberry, Cartwright, and Rounthwaite, but not yet at Winnipeg. Mr. Boger and Mr. Marmont have taken this beautiful insect at light, the latter, I believe,

- in some numbers. I was lucky enough to take one at Rounthwaite at bloom, after dark on August 26th (1897), and on September 14th (1898) I got another at Carberry, flying in the sun about golden-rod.
- Oncocnemis Saundersiana*, Grt. One at Carberry, on the same occasion as above recorded.
- Oncocnemis Chandleri*, Grt. Brandon and Rounthwaite.
- “ *cibalis*, Grt. Cartwright.
- Oncocnemis viriditincta*, Smith. A pair at Brandon, and one at Rounthwaite.

(To be continued.)

## TWO BRITISH AMERICAN NOCTUIDS.

BY JOHN B. SMITH, SC. D., RUTGERS COLLEGE, NEW BRUNSWICK, N. J.

Among the material sent me for determination by Mr. A. W. Hanham were several species that appear to be undescribed. Some of these have been already published, and others are in the hands of publishers. The following two species are presented at this time because they are referred to in Mr. Hanham's list now published in the CANADIAN ENTOMOLOGIST.

### *Feltia robustior*, n. sp.

Ground colour a sooty gray or brown, with black and white powderings on the body and fore wings. Head slightly darker inferiorly and again behind the antennæ. Collar with a black or brown central line, and a less defined dusky shade edged with white scales at tip. Patagiæ with a brown submarginal line, and the vague discal tufting is also edged with dusky. Abdomen of the usual dirty pale gray. Primaries with the markings fairly well defined. Basal line whitish, diffuse, not well marked, extending into the submedian interspace. T. a. line geminate, black, the included space marked with white scales: from the costa at one-third from base, inwardly oblique to the median vein where it forms nearly a right angle, is then outwardly curved to the internal vein, below which it runs obliquely outward to the inner margin at its middle. The tendency seems to be to obscure the lower portion of this line. T. p. line single, blackish, broken, followed and emphasized by white scales which tend to lighten the s. t. space. As a whole it is outcurved over the cell and very evenly oblique from that point. S. t. line marked by white scales, preceded by a series of black, saggitate marks and forming a W which reaches the outer margin on veins 3 and 4. A series of black terminal

lanules. Fringes with a pale line at base and with a brown interline. All the veins are narrowly black and edged on each side with white scales, which gives the wing a rayed appearance. Claviform long, extending to the middle of the median space, very heavily outlined in black, so as to form the most prominent feature of the wing. Orbicular small, ovate, of the ground colour, black margined. Reniform small, of the ground colour or a little paler, partly outlined in black. Secondaries almost evenly smoky gray, with a vague brown discal lunule and terminal line. Beneath, primaries smoky gray, with a vague discal spot and a series of distinct black terminal lunules. Secondaries powdery white, with a large blackish discal blotch and a series of distinct black terminal lunules.

Expands 1.60-1.68 inches = 40 to 42 mm.

*Habitat*.—Brandon, Manitoba, August 27, Sept. 1, 1898.

Two male specimens, No. 441, from Mr. Hanham, who says there is a third in Mr. Boger's collection. The new species is near *venerabilis*, but the pectinations of the antennæ are not so long, and, while the body is fully as heavy, the primaries are proportionately longer. The median lines are unusually distinct as compared with its allies, while the pale edging on the median and vein 2 does not tend to form a pale or discoloured streak or band, as in the other species. The antennæ extend to the inception of the t. p. line on the primaries, are well pectinated (male), the branches very densely ciliated.

*Philometra Hanhami*, n. sp.

Ground colour dark sooty brown, the secondaries lighter in tint. Head and thorax without markings, the abdomen deep mouse gray, also immaculate. Primaries with all the ordinary lines present, but very faint and not at all contrasting. Basal line single, black, very close to the base of the wing and usually marked only by a black dot on the median vein. T. a. line single, blackish, with two wide and one small outcurve, also little outcurved as a whole. T. p. line blackish, single, narrow, irregular, outcurved over the cell and a little incurved in the s. m. interspace. S. t. line pale, preceded by a black shading, which relieves it, with three outcurves which, on the inward bends, are marked by obtuse angles instead of curves. Orbicular wanting. Reniform kidney-shaped, moderate in size and intensely black, making it the most obvious ornamental character. A vague median shade is visible in some specimens. Secondaries paler basally, with a yellowish tinge. Outwardly there is a diffuse,

pale s. t. line, and at about the middle is a narrow smoky transverse line. Beneath smoky brown, paler toward base. A smoky median line, a brown discal spot and a vague outer pale transverse line: all variable in distinctness. The antennæ of the male are pectinated, the branches setose and shorter than in the other described species. The legs are defective in the single example before me, but one remaining fore leg indicates the usual brushlike tuftings. The antennæ in the female have the joints marked and furnished with well-defined lateral bristles.

Expands 1-1.10 inches = 25-27 mm.

*Habitat*.—Winnipeg, Manitoba; Centre, N. Y., July 4, 1879.

Seven specimens are before me, 1 male and 6 females, all more or less imperfect, having met with hard usage in transit. All but one were collected by Mr. A. W. Hanham, who has others, and does not find the species uncommon.

One female was taken by the late W. W. Hill, of Albany, and bears a label in Mr. Grote's handwriting: "Probably new: too poor to serve as type." The specimen reached me some years ago for determination, but has not until the present time found fellows to which it could be referred.

The new form differs at once from the other species of *Philometra* by its dark sooty brown primaries, and from all the species in the subfamily by the contrasting black reniform. The palpi are more sickle-shaped than usual in this genus and more as in *Zanclognatha*, to which I was inclined to refer the species until the male came to hand; but the antennæ do not show the peculiar nodosity at basal third, which is always present in that genus.

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#### ASPIDIOTUS CONVEXUS, COMST. — A CORRECTION.

BY C. L. MARLATT, WASHINGTON, D. C.

The pioneer work done by Prof. Comstock on the Coccidæ of America has put all workers in this group of insects under lasting obligation to him. It was inevitable, however, that, taking up a new subject and handling a vast amount of material for the first time, mistakes should have occurred. An instance in point is the curious mixing up of the material which occurred in the case of the description of the species known as *Aspidiotus convexus*, Comst.

In October, 1880, Prof. Comstock brought from Mr. Ellwood

Cooper's ranch at Santa Barbara, Cal., a scale insect infesting the leaves and twigs of eucalyptus, olive, pear, and fig. The same insect was found on willow at Los Angeles, Cal. From this material, and from other specimens received from various parts of the country, was described the species *Aspidiotus rapax*, Comst. (= *camelliae*, Sign.), which was named the greedy scale on account of its wide range of food plants.

Collected at Santa Barbara at the same time as the above was a scale, described as being identical with the last, except appearing somewhat larger. It occurred on the bark of the trunk and larger limbs of willow trees, the original specimens being now in the Department collection. Prof. Comstock, in his description of *Aspidiotus convexus*, designates this as the type material of the species named. An examination made some years later, however, showed that the willow scale in question, supposed to represent *convexus*, was in reality Comstock's *rapax*, which latter had also been found on willow in California, as noted, as well as in other places.

It was evident that some mistake or confusion of slides had been made, and the species *convexus* was deemed non-existent. Later, however, a scale insect was received from the West, on willow, which seemed to agree with the description of *convexus* and was referred to this species, and in the course of years a considerable quantity of material referable to *convexus* accumulated in the Department collection, the supposition now being that the type, accidentally or otherwise, had actually been before Prof. Comstock, and had subsequently either been lost or mislaid. The fact, however, that there existed no type material of *convexus* left the matter still open to some doubt, and made it desirable to study, if possible, the preparations in the private collection of Prof. Comstock representing the species.

At the request of the writer, Prof. Comstock kindly sent for examination his type slides of *convexus*. The material received consisted of seven slides, three of which are marked "*convexus*, Comst., type," and proved, astonishingly enough, to belong to *ancylus*, as did also two of the other slides labelled "240 Sub. 1." The other two slides labelled "240 Sub. 2" proved to be *juglans regia*. The "type slides" of *convexus* are labelled "No. 746, *Aspidiotus* on willow; Santa Barbara, Cal.," apparently connecting them with the willow scale collected at that place.

An examination of the type material now brought together for the

first time, and of Prof. Comstock's description of the species in the Agricultural Report for 1880 (page 219), and also his figure of the species (l.c., Plate XII., fig. 8), throws a good deal of light on the difficulty and clears up the confusion which had hitherto existed.

The scale on willow collected at Santa Barbara, Cal., is typical *rapax* (= *camelliae*), agreeing with the other material of this species collected at the same time and place. The old slide material in the Department of Agriculture, made from the willow scale in question, and later preparations made by the writer, confirm this determination.

The slide material taken away by Prof. Comstock, and labeled as type material, is *ancylus*; the additional material referred to the species being divided between *ancylus* and *juglans regia*, as noted.

In the characterization of "*convexus*," Prof. Comstock undoubtedly had this willow material before him, and, in fact, recognized the scales as being indistinguishable from those of *rapax*, a fact noted in the description. At the same time he studied balsam preparations associated with the pinned willow bark, and which he naturally supposed to have been made from the same, noted the presence of the grouped glands distinguishing the species at once from *rapax*, and characterized the insect as a distinct species. In the second paragraph of the description, however, he points out the resemblance in the terminal segment of the "*convexus*" female with the female of *ancylus*. Furthermore, an examination of the figure given of *convexus* indicates that it was undoubtedly drawn from one of the misplaced slides of *ancylus*, of which species it is a characteristic delineation, and is subgenerically distinct from the group to which *rapax* and the supposed *convexus* belong. Through some unfortunate accident, these slides of *ancylus* had become associated with the convex willow scale from California, and an error, very difficult to discover and correct, was made.

It has already been noted that a large quantity of material has accumulated in the collection of the Department which has been referred to *convexus*, and the actual existence of a species closely allied to *rapax*, but distinguished from the latter by the presence of grouped glands, is well established. This scale, in fact, has been described two or three times. It is undoubtedly the species described by Prof. Comstock as *cydonia* from quince in Florida. Prof. Comstock recognized

the close relationship of this species to his *convexus*, but having described and figured the adult female of the latter from *ancylus*, the fact of the identity of the two was obscured.

The scale material which we have determined as *convexus* must, therefore, now be referred to *cydoniæ*, Comst. The name *convexus* becomes a synonym of both *camelliæ* and *ancylus*, since the covering scale was described from material representing the former, and the female insect from material representing the latter, species.

*Aspidiotus cydoniæ*, Comst., has been three times since described as distinct by Prof. T. D. A. Cockerell, his species *Crawii*, *punica*, and his variety *lateralis* of Newstead's species *diffinis* belonging to *cydoniæ*. The error in referring "lateralis" to *diffinis* was doubtless occasioned by the fact that the material from which the variety was described for the most part represented immature females, judging from an examination of part of the type material deposited in the National collection.

The *cydoniæ* recognized by E. E. Green in Ceylon (Coccidæ of Ceylon, I., p. 62, Pl. XIV.), and afterwards made the type of *Greenii* by Cockerell, was correctly placed by Green. I may add that the material in the National collection determined by Professor Cockerell as *Greenii* is a mixture of *camelliæ* and *cydoniæ*. The material on banana collected by Mr. Townsend in Mexico (7857) is referable to *cydoniæ*, and also the palm scale collected by Cockerell at Mesilla, N. Mex. The scale on Japanese palm collected at Mexico City, Mex., December 6th, 1897, is a mixture of *cydoniæ* and *camelliæ* in the proportion of about 3 to 1, judging from a single slide mount which contains three females of *cydoniæ* and one of *camelliæ*.

The synonymy of the two species, *cydoniæ* and *camelliæ*, is as follows:

<i>Aspidiotus camelliæ</i> , Sign.	<i>Aspidiotus cydoniæ</i> , Comst.
Synonyms: <i>convexus</i> , Comst. (in pars).	Synonyms: <i>Crawii</i> , Ckll.
<i>euonymi</i> , Targ.	<i>diffinis</i> , Newst., var.
<i>lucumæ</i> , Ckll. & Twn. (M. S.)	<i>lateralis</i> , Ckll.
<i>rapax</i> , Comst.	<i>Greenii</i> , Ckll.
	<i>punica</i> , Ckll.



CLASSIFICATION OF THE ENTOMOPHILOUS WASPS, OR THE SUPERFAMILY SPHEGOIDEA.

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(Paper No. 3.)

SUBFAMILY IV.—Thyreopinæ.

The absence of a distinct ridge, carina or crest on the mesopleura just in front of the middle coxæ, an important structural character first made use of by Kohl, the recurrent nervure in the front wings joining the first cubital cell at or at least nearer the middle than the apex, and the great differences noticeable in the antennæ and the metathorax, readily separate this group from the Crabroninæ.

To me the Thyreopinæ seem to represent a large and distinct group, allied to the others it is true, but yet quite distinct, and divisible into many easily recognizable subgenera. It will be seen also that instead of suppressing the genera erected by some of the older entomologists, which fall in this group, and lumping them with Crabro, as has been done by Kohl and Fox, I have instead recognized all of the genera of Latreille, Dahlbom, Lepeletier, etc., and besides have founded some additional genera. All of these, I think, can be easily recognized by the student, with the use of the following table :

Table of Genera.

Ocelli arranged in an equilateral triangle or nearly . . . , the lateral ocelli about as far from each other as to the front ocellus ; thorax more or less smooth or polished, shining, the metathorax feebly sculptured, almost smooth, its posterior face sometimes rugulose . . . . . 6.

Ocelli arranged in an obtuse triangle . . . , the lateral ocelli being about twice as wide from each other as to the front ocellus ; thorax with at least the metathorax rugulose, opaque, often very coarsely sculptured, the metanotum usually without, or with a poorly defined triangular or semi-circular area, the posterior face often with a distinctly defined *cordate area* ; the recurrent nervure joins the cubitus at or distinctly beyond the middle of the first cubital cell ; abdomen always marked with yellow above ; pygidium in ♀ always flat, triangular.

Males . . . . . 4.

Females :

Superorbital foveæ sharply defined, large oblique, or at least

indicated by a large oblique depression on the surface. . . . . 3.

Superorbital foveæ always wanting, never sharply defined, at most indicated only by a scarcely perceptible depression between the lateral ocelli and the eyes.

Third antennal joint longer than the fourth ; metanotum with the semicircular area very coarsely, irregularly reticulate or rugose, the posterior face reticulate or transversely wrinkled, with a deep median sulcus; recurrent nervure uniting with the cubitus at or a little before the apical third of the cubital cell ; abdomen alutaceous or coriaceous, impunctate, the first segment highly polished . . . . . *Anothyreus*, Dahlb.

[Type A. *lapponicus*, Dahlb.]

Third antennal joint shorter than the fourth ; metathorax coarsely irregularly reticulate, the posterior face smoother, not transversely wrinkled ; mandibles at apex truncate or bluntly rounded, with a small tooth within before apex ; clypeus anteriorly quadrately produced medially, with acute lateral angles. . . . . *Paranothyreus*, Kohl.

[Type C. *hilaris*, Smith.]

3. Mandibles at apex bidentate, the inner tooth the larger, bluntly rounded ; thorax closely punctate, opaque, and often with longitudinal aciculations ; metathorax punctate, with a median longitudinal sulcus posteriorly, the triangular area at base rather small reticulate or alveolate.

Clypeus anteriorly broadly quadrately produced ; recurrent nervure in front wings received by the cubital cell much before its apical third. . . . . *Synothyreopus*, Ashm., n. g.

[Type C. *tumidus*, Pack.]

Clypeus anteriorly, not quadrately produced, rounded, or at most semicircularly produced ; recurrent nervure in front wings received by the cubital cell at or beyond the apical third, rarely before. . . . . *Thyreopus*, Latreille.

[Type C. *cribrarius*, Fabr.]

4. Anterior legs abnormally developed, the trochanters, the femora or tibiæ, or altogether broadened, most frequently with a shieldlike expansion on the tibiæ. . . . . 5.  
Anterior legs normally developed, the tibiæ without a shieldlike expansion.

Superorbital foveæ wanting, never sharply defined, at the most represented by slight glabrous depressions; middle tibiæ with an apical spur.

Metathorax coarsely irregularly rugose, with a deep furrow on the posterior face, the latter also usually transversely wrinkled; mesonotum finely coriaceous, opaque, very sparsely punctate; anterior and middle tibiæ with a sparse flocculus beneath.....Anothyreus, Dahlbom.

[Type A. lapponicus, Dahlb.]

Metathorax coarsely reticulate; pronotum with acute lateral angles anteriorly; mesonotum closely punctate, opaque, not aciculate; mesopleura with a conical tubercle before the middle coxæ; trochanters and femora beneath clothed with a rather long, thick, white flocculus.....

Paranothyreus, Kohl.

[Type C. hilaris, Smith.]

5. Superorbital foveæ sharply defined, distinct, oblique, usually dull or opaque at bottom; metathorax rugose, opaque, with a deep median sulcus on posterior face; mesonotum closely punctate, opaque, often longitudinally aciculate or striate.

Antennæ with the flagellum not fusiform, hardly compressed, the joints not or scarcely wider than long, the first two always longer than wide; clypeus anteriorly quadrately produced; anterior tarsi not especially broad, without an

appendage.....Synothyreopus, Ashm., n. g.

[Type C. tumidus, Pack.]

Antennæ with the flagellum fusiform, compressed, the joints much widened, the first three or four joints fully twice as wide, or wider, than long; clypeus anteriorly, not quadrately produced, at the most semicircularly produced; anterior tarsi broad, dilated, with an appendage.....Thyreopus, Lep., et. Br.

[Type C. cribarius, Fabr.]

6. The recurrent nervure in front wings received by the cubital cell at or near the middle, or only slightly beyond the middle; abdomen usually immaculate, without yellow marks; mandibles at apex bidentate or tridentate; eyes strongly convergent below, the antennal sockets in consequence being very close to the eye margin.....7.

The recurrent nervure in front wings received by the cubital cell distinctly or considerably beyond the middle; abdomen most frequently marked with yellow, rarely immaculate; metathorax feebly sculptured, with a well-defined cordate area on the posterior face. . . g.

7. Males . . . . . 8.

Females :

Superorbital foveæ sharply defined, linear or wedge-shaped, and usually connected with a depression behind the lateral ocelli; abdomen polished impunctate, or at most finely, microscopically punctate; pygidium narrowed, foveated. *Blepharipus*, Lepel., et. Br.  
[ = *Cœlocrabro*, Thoms.\* ]  
[Type B. *nigrita*, Lepel.]

Superorbital foveæ wanting, or never sharply defined, indicated only by a slight cicatrix or glabrous mark; metanotum with a well-defined semicircular area, divided by a median grooved line; abdomen smooth, impunctate, the pygidium flat, triangular, not excavated, and clothed with glittering hairs. . . . . *Crossocerus*, Lep., et. Br.  
[Type C. *scutatus*, Lepel.]

8. Superorbital foveæ sharply defined; metathorax with the cordate area *not* well defined, usually subobsolete; front legs and antennæ normal; middle tibiæ with an apical spur.

Clypeus anteriorly narrowly produced and roundly emarginate; head quadrate or subquadrate, the superorbital foveæ linear or wedge-shaped; abdomen not or scarcely longer than the head and thorax united, polished. . . . . *Blepharipus*, Lepel.  
= *Cœlocrabro*, Thoms.  
[Type B. *nigrita*, Lepel.]

Clypeus narrowly produced medially and sinuate on each side of the production; head large, nearly quadrate, the superorbital foveæ distinct but not large, pyriform; abdomen not very long. . . . . *Epicrossocerus*, Ashm., n. g.  
[Type C. *insolens*, Fox.]

Clypeus subsemicircularly produced, not emarginate; superorbital foveæ curved, linear or lunulate; hind tibiæ strongly clavate; abdomen greatly elongate, about twice as long as the head and

\* *Blepharipus* was subdivided by Morawitz and others before Thomson, which left *nigrita* as the type.

thorax united. (♀ unknown). Alaska. Dolichocrabro, Ashm., n.g.

[Type D. Wickhamii, Ashm.]

Superorbital foveæ not sharply defined, wanting, or at most indicated by a cicatrix or a slightly depressed glabrous line; metathorax with a well-defined cordate area; clypeus not emarginate anteriorly.

Front legs abnormal, the tibiæ *with* a shieldlike

expansion . . . . . Crossocerus, Lepel.

[Type C. scutatus, Fabr.]

Front legs normal or nearly, the tibiæ *without* a shieldlike expansion, the tarsi somewhat flattened, or at

most subdilated. . . . . Stenocrabro, Ashm., n. g.

[Type C. planipes, Fox.]

9. Males . . . . . 10.

Females :

Superorbital foveæ wanting, or at most indicated by a glabrous depression, the occipital line or margin produced into a tooth beneath the temples; mandibles without a tooth within, truncate or blunt at apex, indistinctly bidentate; metathorax very feebly sculptured, with a well-defined, smooth, semicircular area at base; abdomen smooth, sometimes with yellow maculæ; anal lobe in hind wings as long as the submedian cell. Hoplocrabro, Thomson.

[Type C. quadrimaculatus, Fabr.]

Superorbital foveæ distinct, sharply defined, pear-shaped or broadly depressed, the occipital line normal, not ending in a tooth beneath the temples; ocelli in an equilateral triangle; mandibles with a tooth within near the middle, at apex tridentate; metathorax almost smooth, shining, with a well-defined semicircular area at base; abdomen polished; the first segment somewhat lengthened, the pygidium triangular, punctate; anal lobe in hind wings shorter than the submedian cell. . . . . Cuphopterus, Morawitz.

= Blepharipus, Auc. *pars*.

[Type C. subulatus, Dahlb.]

10. Superorbital foveæ wanting, or at most indicated by a glabrous depression, never sharply defined, the occipital line or margin produced into a tooth beneath the temples; mandibles *without* a tooth within; at apex bidentate. . . . . Hoplocrabro, Thomson.

Superorbital foveæ distinct, sharply defined, pear-shaped, or broadly depressed; mandibles *with* a tooth within, at apex bidentate. . . . . Cuphopterus, Morawitz.

## North American Species.

- (19) ANOTHYREUS, Dahlbom. (23) BLEPHARIPUS, Lepel. et Brullé.  
 (1) *A. hispidus*, Fox, ♀. (1) *B. impressifrons*, Smith, ♀ ♂  
 =tibialis, Say, nec Fab.  
 (20) PARANOOTHYREUS, Kohl. (2) *B. Harringtonii*, Fox, ♀.  
 (1) *P. cingulatus*, Pack., ♀ ♂. (3) *B. nigricornis*, Prov., ♀ ♂.  
 (2) *P. cognatus*, Fox, ♀ ♂. (4) *B. nigrior*, Fox, ♀.  
 (3) *P. hilaris*, Smith, ♀ ♂. (5) *B. cinctipes*, Prov., ♀ ♂.  
 (4) *P. Snowii*, Fox. (6) *B. ater*, Cr., ♀ ♂.  
 (21) SYNOTHYREOPUS, Ashmead. (24) EPICROSSOCERUS, Ashmead.  
 (1) *S. conspicuus*, Cr., ♀. (1) *E. insolens*, Fox.  
 (2) *S. advenus*, Smith, ♀ ♂. (25) DOLICHOCRABRO, Ashmead.  
 (3) *S. thyreophorus*, Kohl, ♀ ♂. (1) *D. Wickhamii*, Ashm., ♂.  
 (4) *S. vernalis*, Pack., ♀ ♂. (26) CROSSOCERUS, Lepel. et Brullé.  
 (5) *S. virgatus*, Fox, ♂. (1) *C. Harrisii*, Pack., ♂.  
 (6) *S. incertus*, Fox, ♀ ♂. (2) *C. sulcus*, Fox, ♀ ♂.  
 (7) *S. tumidus*, Pack., ♀ ♂. (3) *C. pictipes*, Fox, ♂.  
 (8) *S. tenuiglossus*, Pack., ♀ ♂. (4) *C. incavus*, Fox, ♀.  
 (22) THYREOPUS, Latreille. (5) *C. minimus*, Pack., ♀.  
 (1) *T. largior*, Fox, ♀ ♂. (6) *C. propinquus*, Fox.  
 (2) *T. pleuralis*, Fox, ♀ ♂. (7) *C. maculiclypeus*, Fox, ♀ ♂.  
 (3) *T. monticola*, Pack., ♀ ♂. (8) *C. lentus*, Fox, ♀.  
 (4) *T. pallidus*, Fox, ♀ ♂. (27) STENOCRABRO, Ashmead.  
 (5) *T. aequalis*, Fox, ♀. (1) *S. planipes*, Fox, ♂.  
 (6) *T. discretus*, Fox, ♀. (2) *S. tarsalis*, Fox, ♂.  
 (7) *T. argus*, Pack., ♀ ♂. (3) (?) *unicus*, Pattn., ♀.  
 (8) *T. tenuis*, Fox, ♀ ♂. (28) HOPIOCRABRO, Thomson.  
 (9) *T. medius*, Fox, ♀ ♂. (29) CUPHOPTERUS, Morawitz.  
 (10) *T. Provancheri*, Fox, ♀. (1) *C. maculipennis*, Smith, ♀ ♂.  
 (11) *T. crebellifer*, Pack., ♂. (2) *C. confertus*, Lepel.  
 (12) *T. latipes*, Smith, ♀. (3) *C. nitidiventris*, Fox, ♀ ♂.  
 (13) *T. vicinus*, Cr., ♀. (4) *C. ventralis*, Fox, ♀.  
 (14) *T. alpestris*, Cam., ♂.  
 (15) *T. alticola*, Cam., ♂.  
 (16) *T. peltasta*, Kohl, ♂.

## SUBFAMILY IV.—Rhopalinæ.

This group is readily separated from the others by the petiolate abdomen, or at least by the long and petioliform first abdominal segment, which is usually without distinct lateral carinæ.

The subfamily otherwise, however, seems to be closely allied in the structure of the thorax, and in wing characteristics, to both the *Lindeniine* and the *Thyreopine*; but besides the long, petioliform first abdominal segment, which separates the group from both, it is also separated from the former by the bidentate, not simple, mandibles, while from the latter it is also distinguished, as a rule, by antennal, mandibular, palpal and other differences.

The group may be divided into the following subgenera :

Table of Genera.

Maxillary palpi 5-jointed ; labial palpi 3-jointed ; mandibles bidentate at apex. very exceptionally blunt at apex in ♀ ..... 3.

Maxillary palpi 6-jointed.

Labial palpi 3-jointed ; mandibles bidentate..... 2.

Labial palpi 4-jointed.

Mandibles at apex in ♀ tridentate, in ♂ bidentate ; mesopleura bounded anteriorly and posteriorly by a sharp ridge or carina ; head, thorax and abdomen opaque, very finely rugulose ; body of abdomen oval or subovate, marked with yellow, the petiole or first segment subclavate ; pygidial area in ♀ narrowed, foveate ; recurrent nervure in front wings received by the cubital cell beyond the middle ; antennæ in ♀ 12-, in ♂ 13-jointed..... *Dasyproctus*, Lep. et Br.

=*Megapodium*, Dahlb.

[Type *D. bipunctatus*, Lep.]

Mandibles in both sexes bidentate ; ocelli triangularly arranged ; mesopleura bounded by a sharp carina anteriorly, but not posteriorly ; head and thorax finely, closely, minutely punctate ; metanotal area distinct, smooth, polished, with some striæ at base, the posterior face with the cordate area well defined ; abdomen clavate, impunctate, not marked with yellow, the petiole subclavate ; pygidial area triangular, flat, not foveate ; recurrent nervure in front wings received by the cubital cell a little before the middle ; antennæ in ♀ 12-jointed, the third joint the longest, twice the length of the pedicel. (Male unknown)..... *Synorhopalum*, Ashm., n. g.

[Type *C. decorus*, Fox.]

2. Face below rather broad, the eyes only slightly convergent towards

the clypeus; clypeus very short, not triangularly acute; antennal sockets somewhat distant from each other, but still wider from the eye margin than to each other; third antennal joint much shorter than the fourth, the latter being the longest joint; abdomen marked with yellow, the pygidium in ♀ narrow, somewhat lengthened.....

Brachymerus, Dahlb.

= Tracheliodes, Morawitz.

Fertonius, Perez.

[Type *B. megerlei*, Dahlb.]

Face narrowed below, the eyes convergent towards the clypeus; ocelli subtriangularly arranged; clypeus anteriorly medially produced, the angles of same acute; antennal sockets nearer to the eye margin than to each other, but still close together; third antennal joint not longer than the fourth, but shorter than the second or pedicel; mesopleura not bounded by a carina posteriorly; metanotal area smooth, with some short striæ at base; abdomen clavate, not marked with yellow, the pygidial area triangular, rounded at apex; antennæ in ♂ 13-jointed, normal, none of the joints emarginate or compressed; mandibles with a large tooth or process beneath near the base.....

Alliognathus, Ashm., n. g.

[Type *C. occidentalis*, Fox.]

3. Abdominal petiole clavate, subglobosely swollen at apex.....4.  
Abdominal petiole subclavate, or very gradually thickened towards apex, never subglobosely swollen at apex.

Mesosternal suture wanting or indistinct.

Head obtrapezoidal; eyes pyriform, convergent anteriorly towards the clypeus; ocelli arranged in a regular triangle; body feebly coriaceously opaque; recurrent nervure in front wings received by the cubital cell at about the middle; pygidium triangular, punctate, distinct.....

Microcrabro, Saussure.

[Type *M. micromegus*, Sauss.]

Head similar, but larger, a little longer than wide, the temples very broad; superorbital foveæ sharply defined, linear; ocelli arranged in an equilateral triangle, and rather widely separated; a strong spine between bases of antennæ; head and thorax somewhat coarsely, rugosely punctate; recurrent nervure in front wings received by the cubital cell a little before the middle; pygidium triangular, flat; antennæ in ♀



12-, in ♂ 13-jointed; the terminal joint in the latter compressed, dilated; the others normal. . . *Moniæcera*, Ashm., n. g.  
[Type C. abdominalis, Fox.]

Mesosternal suture distinct, extending to the middle coxæ, and distinctly separating the mesosternum.

Head subquadrate or obtrapezoidal, wider than long, the temples not especially broad; mandibles at apex in ♀ truncate, blunt, in ♂ bidentate; antennæ in ♀ 12-, in ♂ 13-jointed, the latter deformed, some of the joints emarginate beneath; metathorax coarsely rugose; recurrent nervure in front wings received by the cubital cell distinctly beyond the middle; pygidium in ♀ flat, triangular. . . *Podagrītus*, Spinola.  
[Type P. Gayi, Spin.]

4. Mesosternal suture wanting; mandibles in both sexes bidentate; ocelli triangularly arranged.

Metathorax smooth, the cordate area on the posterior face, more or less distinctly defined; antennæ in ♀ 12-, in ♂ 13-jointed, the latter deformed, some of the flagellar joints depressed or emarginate beneath; recurrent nervure in front wings received by the cubital cell far beyond the middle. . . . *Rhopalum*, Kirby.  
= *Corynopus*, Lep., et Br.

[Type R. tibiale, Fabr.]

Metathorax feebly punctate, the cordate area less distinct; antennæ in ♀ 12-, in ♂ 13-jointed, the latter normal, none of the joints emarginate; recurrent nervure in front wings received by the cubital cell at or near the middle. . . *Physoscelis*, Lepel., et Br.

[Type C. clavipes, Linne.]

[= *rufiventris*, Panz.]

#### North American Species.

- |  |   |
|--|---|
| (30) <i>DASYPROCTUS</i> , Lepeletier and Brullé. | (2) <i>M. asperatus</i> , Fox, ♂.                 |
| (31) <i>SYNORHOPALUM</i> , Ashmead.              | (36) <i>PODAGRITUS</i> , Spinola.<br>? uncertain. |
| (1) <i>S. decorus</i> , Fox, ♀.                  | (1) <i>P. fulvohirtus</i> , Cam.                  |
| (32) <i>BRACHYMERUS</i> , Dahlbom.               | (2) <i>P. maculitarsis</i> , Cam.                 |
| (33) <i>ALLIOGNATHUS</i> , Ashmead.              | (3) <i>P. jason</i> , Cam.                        |
| (1) <i>A. occidentalis</i> , Fox, ♀ ♂.           | (37) <i>RHOPALUM</i> , Kirby.                     |
| (34) <i>MICROCRABRO</i> , Saussure.              | (1) <i>R. pedicellatum</i> , Pack., ♀ ♂.          |
| (35) <i>MONIÆCERA</i> , Ashmead.                 | (2) <i>rufigaster</i> , Pack., ♀ ♂.               |
| (1) <i>M. abdominalis</i> , Fox, ♀.              |   |

## FAMILY XVII.—Pemphredonidæ.

The difference in venation of the hind wings and the distinctly petiolate abdomen, as well as the venation of the front wings, readily distinguish this family from the *Crabronidæ*. In the former family the median cell is fully twice as long as the submedian, while in the *Pemphredonidæ* it is not twice as long as the submedian cell.

Two subfamilies have been recognized, distinguished as follows :

## Table of Subfamilies.

Antennæ inserted close to the base of the clypeus ; front wings with two cubital cells, rarely with one only . . Subfamily I., Pemphredoninæ.

Antennæ inserted far above the clypeus on or near the middle of the face ; front wings with three cubital cells . . . Subfamily II., Pseninæ.

## SUBFAMILY I.—Pemphredoninæ.

The insertion of the antennæ far forward, close to the base of the clypeus, is the only reliable character to separate the subfamily from the Pseninæ, although, as a rule, the head is larger, more quadrate, and the venation of the front wings is also different.

The genera may be recognized by the use of the following table :

## Table of Genera.

- Front wings with two recurrent nervures . . . . . 4.  
 Front wings with only one recurrent nervure.  
 Front wings with two cubital cells . . . . . 2.  
 Front wings with only one cubital cell.  
 Marginal cell short, triangular ; clypeus triangularly pointed anteriorly or with a slight median production ; mandibles bidentate, the lower tooth the longer . . . . . Ammoplanus, Girard.
2. Petiole of abdomen long . . . . . 3.  
 Petiole of abdomen short.  
 Second cubital cell quadrate ; recurrent nervure interstitial with the first transverse cubitus or nearly ; mandibles bidentate . . . . . Spilomena, Shuckard.
3. Recurrent nervure received by the first cubital cell near its middle or little beyond ; second cubital cell quadrate ; ventral plate in ♂ normal ; mandibles bidentate . . . . . Stigmus, Jurine.  
 Recurrent nervure received by the second cubital cell at its lower basal angle or interstitial with the first transverse cubitus ;

- second cubital cell triangular ; ventral plate in ♀ armed with a spine.....Harpactophilus, Smith.
4. Abdomen with the petiole never longer than the hind coxæ.....5.  
Abdomen with the petiole longer than the hind coxæ ; mandibles 3-dentate.  
First cubital cell receiving both recurrent nervures, or the second recurrent is interstitial with the first transverse cubitus..... Cemonus, Jurine.  
=Diplebus, Westw.
- First and second cubital cells each receiving a recurrent nervure ; second cubital cell large, usually quadrate.....Pempfredon, Shuckard.
5. Hind tibiæ along the outer face spinous or subserrate.....6.  
Hind tibiæ along the outer face smooth, unarmed.  
Head armed with a spine or tubercle between the antennæ ; labrum not triangularly produced.....Ceratophorus, Shuckard.  
Head unarmed ; labrum triangularly produced..Passalocus, Shuck.
6. Head seen from in front wider than long ; clypeus at apex emarginate ; abdomen ovate, not longer than the head and thorax united, the petiole very short.....Diodontus, Curtis.  
Head seen from in front elongate, longer than wide ; clypeus not emarginate ; abdomen elongate, slender, cylindrical, longer than the head and thorax united.....Polymistus, Saussure.

## North American Species.

- |   |                                      |
|---|--------------------------------------|
| (1) AMMOPLANUS, Girard.                           | (4) <i>S. fulvipes</i> , Fox, ♀.     |
| (1) <i>A. columbianus</i> , Kohl., ♀.             | (5) <i>S. parallelus</i> , Say, ♀.   |
| (2) <i>A. constrictus</i> , Prov. (Anacrabro), ♀. | (6) <i>S. podagritus</i> , Kohl, ♀.  |
| (3) <i>A. laevis</i> , Prov. (Anacrabro), ♀.      | (7) <i>S. montivagus</i> , Cam., ♀.  |
|   | (4) HARPACTOPHILUS, Smith.           |
|   | (5) CEMONUS, Jurine.                 |
| (2) SPILOMENA, Shuckard.                          | (1) <i>C. inornatus</i> , Say.       |
| (1) <i>S. pusilla</i> , Say, ♀.                   | (2) <i>C. bipartior</i> , Fox, ♀.    |
| (2) <i>S. Foxii</i> , Ckll.                       | (3) <i>C. tenax</i> , Fox, ♀ ♂.      |
| (3) STIGMUS, Jurine.                              | (6) PEMPHREDON, Shuckard.            |
| (1) <i>S. americanus</i> , Pack., ♀ ♂.            | (1) <i>P. concolor</i> , Say, ♀ ♂.   |
| (2) <i>S. inordinatus</i> , Fox, ♀ ♂.             | (2) <i>P. angularis</i> , Fox, ♀ ♂.  |
| (3) <i>S. fraternus</i> , Say, ♀ ♂.               | (3) <i>P. nearticus</i> , Kohl, ♀ ♂. |

- |  |  |
|--|--|
| (4) <i>P. Rileyi</i> , Fox, ♀ ♂.         | (5) <i>P. dispar</i> , Fox, ♂.   |
| (5) <i>P. confertim</i> , Fox, ♂.        | (6) <i>P. cuspidatus</i> , Smith, ♀.                                   |
| (6) <i>P. Provancheri</i> , Ashm., ♀.    | (7) <i>P. armeniaca</i> , Ckll. and<br>= concolor, Prov., nec.<br>Say. |
| (7) <i>P. montanus</i> , Dahlb., ♀ ♂.    | (9) <i>DIODONTUS</i> , Curtis.   |
| (8) <i>P. (?) marginatus</i> , Say.      | (1) <i>D. occidentalis</i> , Fox, ♀ ♂.                                 |
| (7) <i>CERATOPHORUS</i> , Shuckard.      | (2) <i>D. rugosus</i> , Fox, ♂.  |
| (8) <i>PASSALOEUCUS</i> , Shuckard.      | (3) <i>D. flavitarsis</i> , Fox, ♂.                                    |
| (1) <i>P. annulatus</i> , Say, ♀ ♂.      | (4) <i>D. americanus</i> , Pack., ♀ ♂.                                 |
| (2) <i>P. relativus</i> , Fox, ♂.        | (5) <i>D. Gillettei</i> , Fox, ♀.                                      |
| (3) <i>P. distinctus</i> , Fox, ♂.       | (6) <i>D. luguminiferus</i> , Ckll, ♂.                                 |
| (4) <i>P. mandibularis</i> , Cress, ♀ ♂. | (7) <i>D. nigritus</i> , Fox, ♀.                                       |
|  | (10) <i>POLYMISTUS</i> , Saussure.                                     |

## SUBFAMILY II.—Pseninae.

In this subfamily, the species, as a rule, are narrower and more elongate; the head less distinctly quadrate, more transverse, with narrower temples; the front wings with three cubital cells; while *the antennae are always inserted on or near the middle of the face, far above the clypeus.*

*Psen*, Latreille, was the first genus to be described, but the description was a broad one, and included all the species known at that time. It was subsequently, however, subdivided by Shuckard and others, and in order to do justice to these authors, and to prevent the erection of new generic names, I prefer to follow them in preference to Kohl, who would restrict all to a single genus, with *Sphex atra*, Fabr. (Panzer), as the type.

This was also the *status* of the subgenera up to the appearance of Kohl's work in 1896, and was acceded to and accepted by all active Hymenopterologists, and I can see no good reason for making a change in our definition of these subgenera at this late date, and thus bring confusion into our nomenclature and text-books.

The genera recognized may be tabulated as follows:

## Table of Genera.

- Cubitus in hind wings originating *beyond* the transverse median nerve, the latter short and straight, perpendicular. . . . . 2.
- Cubitus in hind wings originating *before* the transverse median nerve, the latter long and oblique or slightly bent, but *not* perpendicular.

Second cubital cell receiving both recurrent nervures, *rarely* with the first recurrent nervure interstitial with the first transverse

cubitus, or the second recurrent interstitial with the second transverse cubitus; inner spur of hind tibiæ dilated; metathorax with a median sulcus, the area at base striate or alveolate; petiole of abdomen long, usually furrowed laterally; clypeus convex or subconvex, separated, anteriorly more or less rounded, and with a slight vein, but without a median sinus; labrum hidden.....Mimesa, Shuckard.

=Aporia, Wesm.

[Type *M. equestris*, Lind.]

Second and third cubital cells each receiving a recurrent nervure, or the first recurrent nervure is interstitial with the first transverse cubitus; head with a spine between the antennæ; clypeus anteriorly rimmed, and with a median

sinus.....Dahlbomia, Wissmann.

=Mesopora, Wesmael.

=Psen, Kohl.

[Type *Sphex atra*, Panz.]

2. Submedian cell in front wings a little shorter than the median, the transverse median nervure being not quite interstitial with the basal nervure; second cubital cell usually much narrower above.

Second and third cubital cells each receiving a recurrent nervure, rarely with the first recurrent nervure interstitial with the first transverse cubitus.....Psen, Latreille.

=Psenulus, Kohl pars.

[Type *P. atratus*, Panz.]

Second cubital cell receiving both recurrent nerv-

ures.....Psenulus, Kohl.

[Type *M. fuscipennis*, Dahlb.]

North American Species.

(11) *MIMESA*, Shuckard.

(1) *M. chalcifrons*, Pack., ♀.

(2) *M. argentifrons*, Cross., ♀ ♂.

(3) *M. Cressonii*, Pack., ♀ ♂.

(4) *M. borealis*, Smith, ♀ ♂.

(5) *M. clypeata*, Fox, ♀ ♂.

(6) *M. pauper*, Pack., ♀ ♂.

(7) *M. uncinata*, Cress., ♀ ♂.

(8) *M. proxima*, Cress., ♀.

(9) *M. basirufa*, Pack., ♀ ♂.

(10) *M. cylindricus*, Fox., ♀ ♂.

(11) *M. regularis*, Fox, ♀.

(12) *M. niger*, Pack., ♀ ♂.

(13) *M. mixta*, Fox, ♀ ♂.

(14) *M. leucopus*, Pack., ♀ ♂.

(15) *M. cingulata*, Pack. ♂.

(16) *M. granulosus*, Fox., ♂.

(17) *M. gregaria*, Fox, ♂.

- (18) *M. maculipes*, Fox, ♂. (12) DAHLBOMIA, Wissman.  
 (19) *M. longicornis*, Fox, ♂. (13) PSEN, Latreille.  
 (20) *M. mellipes*, Say, ♀ ♂. (1) *P. frontalis*, Fox, ♀.  
 (21) *M. monticola*, Pack., ♀ ♂. (2) *P. trisulcus*, Fox, ♀.  
 (22) *M. Mexicana*, Cam, ♀. (3) *P. kohlia*, Fox, ♀ ♂.  
 (23) *M. pulchra*, Cam., ♀. (4) *P. punctatus*, Fox, ♀.  
 (24) *M. striolata*, Cam., ♀. (5) *P. simplicicornis*, Fox, ♂.  
 (25) *M. longiventris*, Cam., ♀. (6) *P. fuscipes*, Pack.  
 (26) *M. Cameroni*, Ashm., ♀. (7) *P. tibialis*, Cr., ♀ ♂.  
     = *monticola*, Cam., nec., Pack. (8) *P. suffusus*, Fox, ♀.  
 (27) *M. Montezuma*, Cam., ♀. (9) *P. annulipes*, Cam.  
 (28) *M. claviventris*, Cam., ♀. (14) PSENIUS, Kohl.

CONTRIBUTIONS TO THE KNOWLEDGE OF MASSACHUSETTS COCCIDÆ.--III.

BY GEO. B. KING, LAWRENCE, MASS.

*Diaspineæ.*

- (46) *Aspidiotus hederæ*, Vall.; 1829-1897. I.

This is a very common pest in all greenhouses at Lawrence, and no doubt in all greenhouses in the State. It is found at Lawrence on Ivy, Palms and Cycas. A variety determined by Prof. Cockerell as probably *ericæ*, Boisd., on heather (*Erica*) in a greenhouse at Lawrence. The scale is longer than typical *hederæ*, and of a yellowish cast, and also covered more or less with the epidermis of the plant. *Hederæ* has been recorded from Kansas, Utah, Illinois, California, Florida, Colorado, New Mexico, and New York, on Ivy, China-tree, Lemon, Oleander, Orange, Lace-fern = *Asparagus plumosa*, Acacia, Maple, Yucca, Plum, Cherry, Currant, Melia, Grass and Clover.

- (47) *Aspidiotus aurantii*, Mask.; 1878-1897. I.

Very common species on orange and lemon exposed for sale in fruit stores. Some of the fruit was completely covered with the scales and unfit for sale. They came from California and Florida. It is recorded from Arizona, California, and Illinois, on orange, lemon, grape, and rose.

- (48) *Aspidiotus perniciosus*, Comst.; 1881-1895. N.

Recorded from 19 localities in this State, on apple, pear, peach, and rose. It has been reported from Alabama, Arizona, Colorado, California, North Carolina, Connecticut, Delaware, Florida, Georgia, Illinois, Idaho,

Indiana, New Jersey, Kansas, Kentucky, Louisiana, Missouri, Michigan, New Mexico, New York, Nevada, Oregon, Oklahoma, Ohio, Pennsylvania, Washington St., Virginia, West Virginia, and Vermont, on apple, peach, plum, prune, pear, quince, rose, grape, spiræa, apricot, currant, elm, walnut, corn, sugar-cane, etc. Mr. Schwarz has found the young of *pernicius* in an ants' nest, *Monomorium minutum*, Mayr., in Virginia.

(49) *Aspidiotus ancylus*, Putn.; 1877-1898. N.

Injurious in a few instances, at Malden, Charles Bank Park, Everett, and Lawrence, Mass., on Apple, Honey Locust, and *Spiræa aruncus*. Recorded from Colorado, Illinois, Iowa, Kansas, Maryland, Minnesota, New York, New Mexico, Ohio, Virginia, Washington, D. C., and Washington St., on Fay currant, quince, Wrightii apple, English oak, pear, osage orange, peach, water-locust, maple, linden, hackberry, black nut, beech, and ash.

(50) *Aspidiotus ficus*, Ashm.; 1888-1897. I.

Frequently found in greenhouses at Lawrence, Mass., on orange, rubber plant, palms, and on orange, lemon, and banana in fruit stores. Recorded from Texas, Florida, New Mexico, Louisiana, Georgia, Ohio, and Colorado, on orange, lemon, Ficus, sp. *Laurus virginiana*, cocoanut palm, *Oreodoxa regia*, *Curcuma longa*, *Pandanus*, *Cælogyne cristata*, *gambolana*, *Myrtus Hillii*, camphor, and rose.

(51) *Aspidiotus articulatus*, Morg.; 1889-1898. I.

Found on limes in a fruit store at Lawrence, probably from Jamaica. It is known from West Africa, Demerara, Trinidad, Jamaica, and Nevis. It is not known to inhabit any portion of the United States.

(52) *Aspidiotus Forbesi*, Johnson; 1896-1898. N.

At Reading and Shady Hill, Mass., on *Acer pseudoplatanus* and apple; coll. Mr. Kirkland. It is found at New Mexico, Kansas, Illinois, Maryland, Georgia, and West Virginia, on apple and cherry.

(53) *Aspidiotus Fernaldi*, Ckll.; 1898-1898. N.

Found at Charles Bank Park on *Gleditschia triacanthos*, by Messrs. Kirkland and Cooley.

(54) *Aspidiotus smilacis*, Comst.; 1883-1898. N.

On Smilax, at Woods' Holl, Mass.; found by Prof. Trelease (Comstock, Cornell Rept., 1883).

- (55) *Aspidiotus* sp. (prob. young of *A. dictyospermi*, Morg.); 1889-1898. I.

Found by Mr. J. W. Folsom at the Botanic Gardens, Cambridge, Mass. (Ckll. in litt.). It is recorded from Colorado, found in a greenhouse on *Champæropsis elegans*.

- (56) *Aspidiotus Crawii*, Ckll.; 1897-1899. I.

On ivy, *Hedera*, in a greenhouse at Lawrence, Mass., only known hitherto from Mexico, found there by Prof. C. H. T. Townsend, on fruit of some palm.

- (57) *Aspidiotus cyanophylli*, Sign.; 1869-1899. I.

In a greenhouse at Lawrence, Mass., on a plant called *Cobo japonica*, on *Ficus*, M. S. (Comstock, Cornell Rpt., 1883, p. 39), on *Cyanophyllum*, at Paris, in a greenhouse (Signoret) on palm and *Cycas* in Ceylon according to Green. Also in Mexico.

- (58) *Diaspis carueli*, Targ.; 1868-1895. I.

Mr. J. G. Jack found this species at Jamaica Plain, Mass., on *Juniperus spherica*. It has been found at Washington, D. C., on various species of Juniperus.

- (59) *Diaspis amygdali*, Tryon; 1889-1898. I.

At Jamaica Plain on *Prunus nume* and *P. subhirtella*; also at Charles Bank Park, Boston, on *Gledistschia triacanthos*, by Mr. Kirkland. It is said to occur at Ohio on Japan flowering cherry. As *lanatus* it is reported from Washington, D. C., Georgia, Florida, and California.

- (60) *Aulacaspis rosæ*, Bouché; 1833-1898. I. Syn. *Diaspis rosæ*, Bouché.

A common pest on *Rubus canadensis*, *R. strigosus*, *R. occidentalis*, and a number of species of rose bushes, also wild rose bush at Lawrence, Methuen and Andover, Mass.; recorded from New Jersey, Pennsylvania, Ohio, Missouri, Illinois, Delaware, California, and Arizona, on rose, raspberry and blackberry. A *Chiloneurus*, n. sp., has been reared from scales found at Andover, Mass., 1898.

- (61) *Aulacaspis bromeliæ*, Kerner; 1788-1862. I.

At Plum Island, Amherst and Cambridge, Mass., on *Acacia*, *Olea fragans*, *Guidia? simplex* and ivy. In greenhouses at Amherst and Cambridge, also in the Botanic Gardens at Cambridge. It is recorded from California on pineapple in a greenhouse.



(62) *Aulacaspis Boisduvalii*, Sign; 1869-1897. I.

On palms in greenhouses at Lawrence, Mass.; also at Denver Colorado, on palms in greenhouse.

(63) *Aulacaspis elegans*, Leon; 1899. I. Syn. *Howardia elegans*.

On *Cycas revoluta* in a greenhouse at Lawrence, Mass. The plant was imported from Bermuda last year. The species was only known from Portici, Italy, on *Cycas revoluta*.

(64) *Parlatoria proteus*, Curt., var. *Pergandei*, Comst.; 1881-1897. I.

Very common on oranges and lemons at Lawrence, Mass., in markets. It is recorded from Florida on orange and lemon; at California on imported date palm.

(65) *Parlatoria zizyphus*, Lucas; 1853-1897. I.

On lemons exposed for sale in fruit stores. I have no record of its being found infesting any trees in the United States. It is recorded from Africa.

(66) *Parlatoria* (prob. *proteus*, var. *crotonis*), Ckll.; 1895-1898. I.

Found at the Cambridge Botanic Gardens by Mr. J. W. Folsom (Ckll. in litt.).

(67) *Mytilaspis pomorum*, Bouché; 1851-1862. I.

One of the most common coccid pests at Lawrence, Methuen, Andover and Springfield, Mass., and no doubt in every town in the State, on willow, poplar, lilac, *Viburnum*, *Spiræa aruncus*, rose, apple, and *Cornus alternifolia*. It is recorded from Alabama, Connecticut, California, South Carolina, Delaware, Georgia, New Hampshire, Illinois, Idaho, Indiana, Rhode Island, New Jersey, Kansas, Maryland, Michigan, Maine, Missouri, New York, Nevada, Nebraska, Ohio, Pennsylvania, Tennessee, Vermont, Virginia, West Virginia, Wisconsin, Washington St., and Washington, D. C., on apple, pear, quince, raspberry, currant, hawthorn, buckthorn, linden, hop-tree, bladder-nut, horse-chestnut, maple, waterlocust, honeysuckle, ash, elm, hackberry, cottonwood, willow, poplar, prune, birch, *Cornus* sp. and *Cornus californicus*, plum, wild red cherry, wild grape, *spiræa*, fig, and rose bushes. The parasite, *Aphelinus mytilaspidis*, Le B., was reared from scales at Methuen, Mass.

(68) *Mytilaspis citricola*, Pack.; 1870-1897. N.

On orange and lemon, in fruit stores, exposed for sale at Lawrence,

Mass. It is known from California, Colorado, Florida, and Georgia, on orange and lemon.

(69) *Mytilaspis Gloverii*, Pack.; 1869-1897. N.

At Lawrence, Mass., on orange and lemon in fruit stores, and recorded from California, Louisiana, Florida, Georgia, and New York, on orange and lemon.

(70) *Pinnaspis pandani*, Comst.; 1881-1880. I.

At Cambridge Botanic Gardens, coll. by J. W. Folsom, 1898 (Ckll. in litt.). Originally described from Harvard Botanic Garden under the genus *Mytilaspis*.

### CORRESPONDENCE.

#### A CALIFORNIAN TICK.

SIR,—Herewith I send a specimen of an *Arachnide* which looks to me to belong to the genus *Argas*, or so it was called when I was studying that group of *Arthrozoa*.

At the same time, I send you an account of observations upon the effect of the bite of the *Argas*, which observations seem to me to throw some light on the conflicting statements regarding the effect of the bite of the reputed *Argas Persicus*.

From the observations of my correspondent, Mr. R. A. Plaskett, who resides in a district in the Santa Lucia Mountains infested by this very local *Arachnide*, it appears that horses, which animals are generally bitten just above the hoof, seem not to suffer. The *Argas* drinks only from three to five minutes and then drops without leaving a swelling. This is unlike the *Ixodes* and *Trombidium*, which will suck for a day or two, frequently causing swelling and suppuration. These are generally reputed to be the result of methods used in extracting the animal, but they are occasionally observed where the animal has left of its own free will after having satisfied its appetite.

Another peculiar characteristic in the habits of the animal is its dislike of green vegetation. It is always found on the top of dry, leafless twigs or in dust, never amidst foliage, as are *Trombidium* and *Ixodes*; but this part of my friend's observations has to be taken *cum grano salis*, as he is not an experienced entomologist, and amidst green foliage it is

not so easy to discover a dust-coloured insect as when it is isolated on the top of a dry twig, whence it lets itself drop upon the passer-by.

As to the effect of the *Argas* bite on the human species, the symptoms vary as well as the time of suction following the bite. The effect seems to depend chiefly on personal idiosyncrasy, which probably also accounts for the comparative immunities and receptivities reported in reference to the bite of *Acanthia (Cimex) lectularia*, *Reduvius*, and of the different *Tipulides* and *Culicides*. R. A. Plaskett has been bitten twice, and in each case it took about twenty-four hours before fever and swelling set in. The numbness of the bitten parts, which is so characteristic of the bite of *Arachnides*, *Myriopodes*, and of some Hymenopterous stings, was not noticed in a single instance. Now, these observations agree very well with the statements that are in our possession regarding the effects of the bites of other *Argas*, and at the same time they explain the discrepancies in the statements of the effects of the bite of the dreaded *Argas Persicus*, which seems to be as local as our California insect.

The fatal termination in cases where persons have been bitten by *Argas Persicus*, which are mentioned by old Herodotus, and by Pallas in modern times, may have their origin in malarious fevers, which are very common in that district of the Persian Province Ghilan, between the Caspian Sea and the Elbrus Mountains, where the *Argas* is found. The bite of the animal is probably only a coincidence, of course not favourable to the condition of a patient already weakened by malaria. Here in California we have had to face an analogous error with regard to the fatal effects of *Rhus diversiloba*. All the fatal cases were malaria patients, sick for a considerable time before they came in contact with the *Rhus*.

As to the effect of the bite of *Argas Persicus*, even if not fatal, the consequences in some instances must be serious enough to induce the inhabitants of Persian villages to change the location of their settlement, as is mentioned in Kotzebue's report of his travels through Ghilan. At the same time, this change of location as a remedy is another proof of the very local distribution of *Argas Persicus*, a peculiarity shared in common with *Argas Columbæ* of Europe and our own Santa Lucia species.

Our Santa Lucia species seems to be both diurnal and nocturnal. The *Argas Columbæ* of Europe is nocturnal, and in its habits bears a

close resemblance to the common bedbug. The local name of our Californian species is Pajaronela, a word evidently derived from the Spanish Pajaro, a bird, and it would indicate to me a similar manner of living to that of *Argas Columbae*, were not the statements of Mr. Plaskett, which are founded on repeated observations of this locally very common insect, diametrically opposed to such a supposition.

I hope that the publication of these statements will excite some interest amongst practical students of entomology, and that they may lead to a closer study of those insects which interfere with the well-being of our own race.

It may be that a closer study of the facts will furnish us with data that will explain why the sting of an insect, in some instances producing serious consequences, is in others perfectly harmless. Such data might throw some light on the mysterious play of idiosyncrasies.

H. H. BEHR.

The specimen sent by Dr. Behr has been submitted for identification to the United States Entomologist, Dr. Howard, from whose Division the following reply has been received :

"In the absence of Dr. Howard, I have to reply to your letter of the 3rd instant, transmitting a copy of an article by Dr. H. H. Behr, and a specimen of tick for identification. Mr. Banks, our authority on ticks, has examined the specimen in question, and is responsible for the following identification and note :

"The tick is *Ornithodoros Americanus*, Marx, and probably the same as *O. turicata*, Megnin, from Mexico. Neumann, in his recent revision of the group, uses Megnin's name. It is well known to attack various animals. It is not common in the Southwest. There are four species of Argasids in our country : *Argas Americanus*, Pack.; *A. Sanchezii*, Dugès ; *Ornithodoros Americanus*, Marx, and *O. Megnini*, Dugès. Another species, *A. talajae*, Guerin, may also occur in the region near Mexico.'

"The specimen and manuscript are returned herewith.

"C. L. MARLATT,

"Acting Entomologist."

## LUCANUS MASAMA, LEC.

SIR,—I found this evening (28th June, 1899,) a male specimen of *Lucanus Masama* (Lec.), on the ground at the foot of a dead cotton tree. Investigating the place, I noticed several large holes around the tree, and discovered in one of them a pair of beetles, which were evidently intending to mate. At the foot of another cotton tree stump near by, a male was crawling slowly on the ground; another male came flying and alighted, and a short search was rewarded by the discovery of a female, hidden in a hole. Another dead cotton tree yielded three males (two of them crawling and one flying) and one female, at the foot of the tree on the ground.

It seems that the metamorphosis of the larva to the adult *Lucanus masama* takes place underground, the female probably not leaving the ground; whereas the males fly around in search of the opposite sex. I noticed some large holes in the trees under which the specimens were found, and if these holes were made by the larva of *L. masama*, then the above ventured hypothesis is wrong, and the females simply hide in the ground, after having completed their metamorphosis in the substance of the tree, and seek the ground possibly for the deposition of their eggs.

I would be greatly obliged to any reader of this notice for the life history of the other N. American species of *Lucanus*.

A. FENYES, M. D.,  
Santa Fè, New Mexico.

## ACKNOWLEDGMENT.

SIR,—I desire, on behalf of the Entomological Society of Ontario, to make public acknowledgment of its indebtedness to Mr. C. T. Ramsden, of Santiago de Cuba, for many curious and interesting entomological specimens of various kinds, his own collecting in that now famed locality. A more extended notice may be taken of some of them at a future time.

J. ALSTON MOFFAT, Curator.

The Rev. C. J. S. Bethune, editor of this magazine, begs to announce that he has resigned his position as Head Master of Trinity College School, Port Hope, which he has held for the last twenty-nine years, and that his address, after August 24th, will be 500 Dufferin Avenue, London, Ontario.