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No. 7.

ON THE ORTHOPTERA OF NORTHERN ONTARIO.

BY E. M. WALKER, TORONTO.

(Continued from p. 178.)

16. *Podisma glacialis Canadensis*, E. M. Walker.

Fort William, Aug. 26, 1907, 1 ♂, 1 ♀; Temagami District: Obabika Portage, Sept. 13, 1908, 1 ♂; Portage, at upper end of Cross Lake, Sept. 3, 1908, 1 ♂; Portage, between Cross and Temagami Lakes, Sept. 4, 1908, 1 ♂.

In the specimen from Cross Lake the hind femora are like those of typical *variegata* in the strongly-fasciate outer surface, otherwise the specimens are typical of the race *Canadensis*, none approaching race *glacialis* very closely.

The female from Fort William was found upon the trunk of a spruce tree beside the road through the spruce swamp, about five feet from the ground. The male was taken in a little opening in the neighbouring woods. The male from the portage between Cross and Temagami Lakes was found adhering to the trunk of a spruce in a damp wood. The other two were taken from bushes at the ends of the portages.

This insect seems to be, on the whole, quite scarce and local. North Bay and certain parts of Algonquin Park are the only places where I have found it in any considerable numbers.

Three specimens of this species were taken by the late Dr. Fletcher at Windy Lake, on the C. P. R., near Sudbury, Ont., Oct. 4, 1907, upon *Comptonia asplenifolia*. They were mentioned in the Entomological Record for 1907 (Ann. Rep. Ent. Soc. Ont., 1907), under the name "*Pezotettix borealis*, Scudd."

17. *Melanoplus Bruneri*, Scudd.

This species was found in great abundance at Nipigon, and also occurred at Ft. William. At Nipigon it far outnumbered all the other *Melanopli* together, and was particularly abundant in a rough bushy clearing on a sandy loam, where it was associated with large numbers of *Camnula pellucida*.

The Nipigon specimens exhibit great range of variation in size, coloration, wing-length and in the development of the depression or notch below the apical margin of the subgenital plate in the male. This depression is not, as described by Scudder, the result of drying, but is present in life, and all gradations exist between individuals in which the apical margin is entire and only a shallow depression beneath it occurs, and those in which the margin itself is as deeply or more deeply notched than in *Mel. atlanis*. The former are typical *Bruneri*, while the latter agree perfectly with Scudder's description and figure of *Mel. Alaskanus*. A considerable series of specimens from Saskatchewan and Alberta exhibit similar variations, but the *Alaskanus* type seems to be everywhere comparatively rare. The reduction of this supposed species to a variety of *Bruneri* also unites two of Scudder's series in the genus *Melanoplus*, viz., the *Utahensis* and the *spretus* series.

As regards wing-length, no definite separation into macropterous and brachypterous forms is possible, but the tegmina show considerable variation in length, in some scarcely reaching beyond the tips of the hind femora, in others surpassing them by fully the length of the fore femora. The majority fall between these extremes. One male from Nipigon is remarkable for its large size and pale ochre-yellow coloration. It measures as follows: Length of body, 25 mm.; pronotum, 5.5 mm.; tegmen, 20; hind femur, 14. The largest female is from Fort William, and has also the longest tegmina, relatively as well as actually. It measures as follows: Length of body, 28 mm.; pronotum, 6 mm.; tegmen, 24 mm.; hind femur, 14 mm.

This species was not met with at Temagami, but has been recorded by the writer from the vicinity of Dwight, near Algonquin Park. They were quite local here, and showed very little variation of any kind.

18. *Melanoplus atlanis*, Riley.

This widely-distributed species was abundant in the fields and pastures on Bear Island, Lake Temagami, and occurred in smaller numbers in most of the clearings in the Temagami District. It was common in fields at Fort William and at the base of Mt. McKay, but the only examples observed at Nipigon were a few taken in a pasture across the river from the village. As it was raining heavily when these specimens were captured, only a few minutes were spent here and nothing else was taken. It is noteworthy, however, that the only *Melanopli* seen here were *atlanis*, while on the other side of the river *Bruneri* was the abundant species, and no *atlanis* were taken.

This species has also been recorded from Sudbury (Scudder), Kenora ("Rat Portage," Walker), Heyden and Searchmon' (Williamson).

19. *Melanoplus femur-rubrum*, De Geer.

Common and generally distributed. It was common in fields at Ft. William and on Bear Island, Lake Temagami, and was frequently met with in small numbers in clearings and open swamps in other parts of the Temagami District. It was not observed at Nipigon.

20. *Melanoplus extremus*, Walk.

Fort William and Nipigon, common, the brachypterous form greatly outnumbering the macropterous; Stony Lake, Heyden (Williamson); Algoma, near Lake Kabinakagami (Walker). Elsewhere in Ontario this species is known only from Go Home, Georgian Bay.

21. *Melanoplus angustipennis*, Dodge.

The red legged form (*coccineipes*) is reported by Scudder from Sudbury. Mr. Norman Criddle has sent me both forms from Aweme, Man.

22. *Melanoplus fasciatus*, Walk.

Common in open woods at Fort William and Nipigon; a few taken in the Temagami District.

On Mt. McKay the macropterous form was observed more frequently than the brachypterous. It was common on the summit and on the talus slope. A single macropterous female was taken from the edge of the heath-bog on Diamond Lake, Temagami District.

23. *Melanoplus altitudinum*, Scudd.

Fort William, Aug. 27th, two brachypterous females taken in the open scrubby woods on the top of Mt. McKay; Nipigon, Aug. 28th, one male, brachypterous, taken among the bushes at the edge of a low wood bordering the river; Aug. 30, one female, macropterous, found clinging to a reed in the river, several rods from the shore.

Caudell has pointed out the identity of *Mel. Huroni*, Blatchley, with this species, and having seen the specimens in the U. S. National Museum, including one of Blatchley's specimens, I am perfectly satisfied that his opinion is correct.

Measurements: Length of body, male 21 mm., female 29-32.5 mm.; pronotum, male 5 mm., female 6.5-7 mm.; tegmen, male 10 mm., female 13-14 mm. (brach.), 21 mm. (macr.); hind femur, male 12.5 mm., female 15-16 mm.

In the macropterous female the tegmina surpass the hind femora by about 1.5 mm.

24. *Melanoplus islandicus*, Blatchley.

Fort William; not uncommon on paths and in openings in the woods, especially at the top of Mt. McKay. I have no specimens from Nipigon, but it was certainly observed there. Temagami: occasionally found in bushy clearings or openings on portages in the woods, always in small numbers.

It has also been taken near Lake Kabinakagami, Algoma (Walker), which is the most northern record for the species.

25. *Melanoplus luridus*, Dodge.

This species was not observed at Fort William, Nipigon nor in the Temagami District, but I have elsewhere recorded the capture of a male from Hawk Lake, near Kenora, Rainy River District, and found it common at North Bay.

Some of the specimens from the latter locality have the tegmina longer than usual.

26. *Melanoplus bivittatus*, Say.

Abundant at Fort William and Nipigon; moderately common in the Temagami District. All the examples seen were red-legged (*femoratus*), though I have taken a single female of the typical form at North Bay.

At Fort William this species was found to possess longer tegmina and wings than usual, and to be capable of stronger and more sustained flight. Unfortunately, only three specimens were taken, two males and one female, but in all three the tegmina exceed the maximum measurements given by Morse in his "Notes on New England Acridiidae," for New England specimens of this species, these measurements being based on 142 males and 100 females.

Measurements: Length of body, male 26 mm., female 35 mm.; hind femur, male 14.5-15 mm., female 18.25 mm.; tegmen, male 24-24.8 mm., surpassing the hind femora by 5 mm., female 28 mm., surpassing the hind femora by 3.5 mm.

27. *Scudderia pistillata*, Brunner.

Common on bushes in clearings and open swamps. Fort William; common, especially on the road through the spruce swamps, upon the rank growth of bushes along the roadside. Temagami; generally distributed in open swamps and heath-bogs, but not numerous. In a large open bog on Diamond Lake, covered almost entirely by Ericaceous shrubs, this was the only species of Orthoptera met with.

Scudderia furcata ranges as far north as North Bay, Lake Nipissing, where I captured a single specimen in September, 1900. This is probably near its northern limit in this part of the country.

28. *Xiphidion fasciatum*, De Geer.

This widely-distributed insect was found in small numbers at Fort William, Nipigon and in the Temagami District.

At Nipigon it was the only Orthopteroous insect, except *Mecostethus lineatus*, occurring in the open marsh surrounding the island in the river. Both species were rare, the vegetation being coarse and unsuited to the development of many Orthoptera. At Temagami this species was occasionally met with in long grass growing in sphagnum-bogs.

29. *Idionotus brevipes*, Caudell (Pl. 7, figs. 3, 3a).

Syn. *Platycleis Fletcheri*, Caud.

Four males of this species were taken while stridulating in the open grassy plains east of the river at Fort William. One of these (Pl. 7, fig. 3a) is macropterous, the others brachypterous. Another macropterous male was seen, but not captured. All were taken in rather long grass. I first determined these specimens as *I. brevipes* with some doubt, owing to the statement in Caudell's description of this species, that the lateral carinæ of the pronotum are well developed and somewhat acute. I sent a specimen to Mr. Caudell, who wrote me that it was the male of his *Platycleis Fletcheri*, described in his recent Revision of the N. A. Decticinae from a single female. Shortly afterwards, while at Washington, Mr. Caudell kindly showed me the type of *P. Fletcheri*, and I was satisfied that it belonged to the same species as mine. The close agreement between my specimens and the description of *Idionotus brevipes* was, however, again brought to my notice while making a further study of the insect, so I sent a specimen to Professor Morse, who kindly compared it with the type of *I. brevipes* in the Scudder collection and found them identical. The type specimen is somewhat shrunken from immersion in alcohol, and the lateral carinæ of the pronotum thus appear sharper than they are in life.

Although I have no specimens of the type species of this genus, *I. Brunneus*, Scudd., the descriptions and figures of Scudder and Caudell have led me strongly to the belief that *I. brevipes* is generically distinct from it, probably constituting a new genus. It does not appear to me to be closely related to *Platycleis*, as shown by the much larger and more

ampliate pronotum, and the great development and posterior prolongation of the last dorsal segment of the male, which almost conceals the cerci in a dorsal view. The form of the cerci, too, differs considerably from that which is characteristic of *Platypleis*. Owing to lack of material in this subfamily, I prefer to let the specimens stand for the present in the genus *Idionotus*.

I have also specimens of the brachypterous form from Aweme, Man., collected by Mr. Norman Criddle. It has also been reported from Millarville and Calgary, Alberta, and the type specimen was collected by Kennicott in "Arctic America," so that the known range of the species is from Northwestern Ontario to Western Alberta and northwards into Arctic America.

This species is the only North American Dectician known to be dimorphic in wing-length. Several European species of *Platypleis* also exhibit this feature.

30. *Ceuthophilus pallidipes*, E. M. Walker.

While camping in the woods near Temagami Falls, I found an immature female of this species inside the tent. No other specimens could be found in this district.

31. *Ceuthophilus terrestris*, Scudd.

A female of this species, labelled "Nipigon," was sent to me by the late Dr. Fletcher. I have not met with it in Northern Ontario. Considerable search for *Ceuthophili* was made on Mt. McKay, but without success.

32. *Gryllus Pennsylvanicus*, Burm.

Common on Bear Island and occurring in small numbers in many parts of the Temagami District. Not found at Fort William nor at Nipigon.

I am convinced that this species is not specifically distinct from *G. abbreviatus*, Serv. Every gradation exists between typical examples of both forms. The ovipositor is certainly relatively longer in the larger examples as a general rule, but this distinction is by no means constant, nor does the relative size of the head in the male offer any reliable diagnostic character.

G. Pennsylvanicus seems, in fact, to be a depauperate form of *G. abbreviatus*, having much the same relation to it that *Nemobius fasciatus abortivus*, Caud., bears to typical *N. fasciatus*. The name *Pennsylvanicus* having priority, *abbreviatus* must fall to the rank of a varietal name.

33. *Nemobius fasciatus*, De Geer.

Abundant on Bear Island and occasionally met with elsewhere in the Temagami District. The examples seen were mostly of rather small size. No macropterous individuals were observed.

34. *Nemobius Carolinus*, Scudd.

Under this name I place the species which I described as *N. angusticollis* (CAN. ENT., 36, 1904, p. 186). It is a very variable species, and has apparently been described several times under different names. A few years ago Prof. Morse drew my attention to the probable identity of my *N. angusticollis* with Scudder's *N. Carolinus*, which is not the species usually quoted under that name. Since then I have seen the specimens of *N. Carolinus* in the Scudder collection, and although my examination of these was brief and hurried, I am pretty well satisfied that Professor Morse's suggestion was well-founded. My species, moreover, agrees very well with Scudder's original description (Proc. Bost. Soc. Nat. Hist., 19, March, 1877, p. 36), except in this statement that the ovipositor is longer than in *N. vittatus* (= *N. fasciatus*, De G.), which is an obvious error, as it is contrary to the measurements given in the description itself. At the time I described the species as *angusticollis*, however, I had not considered the possibility of my species being *Carolinus*, on account of its not having been recognized as such by Dr. Scudder himself, and also owing to the fact already mentioned, that the name *Carolinus* has been employed to designate another species altogether.

There are several other names which are apparently synonyms of *N. Carolinus*. The earliest of these is *N. (Anaxipha) septentrionalis*, Scudd. (Nat. Canad., IX, Oct., 1877, p. 292), which is given here to replace *N. exiguus*, Say, under which name a species of *Nemobius* was described by Provancher in his "Petite Faune Entomologique du Canada" (Nat. Canad., VIII, Feb., 1875, p. 61). There can be little doubt that this description applies to the macropterous form of *N. Carolinus*, which I have taken occasionally in Ontario, but does not appear to have been noticed elsewhere. The only point in which the description does not fit *Carolinus* is in the statement, "Appendices abdominaux presque aussi longs que le corps," which may have been an error of observation.

N. affinis, Beutenm., seems to me to be another synonym of *N. Carolinus*, as is probably also the species described by Blatchley as the female of his *N. confusus*. Prof. Morse tells me the male *confusus* is a distinct species.

N. Carolinus is fairly common in Temagami District, its high-pitched trill being often heard among the boulders along the rocky shores of the lakes. On densely-wooded islands this species is the only representative of its order, and is confined to the shores. It also frequents low pastures, mossy bogs and other wet places.

A NEW STRATIOMYID FROM TEXAS.

BY D. W. COQUILLET, WASHINGTON, D. C.

Hermetia Hunteri, n. sp.—Male: A robust species with glabrous eyes and tricolorous abdomen (black, brown and yellow), its pubescence short, sparse and inconspicuous. Head yellow, front and face with a median black stripe, that of the front branching below and prolonged upon the face; antennæ and mouth-parts yellow, the last annulus and the lamella of the former black. Thorax yellow, three broad stripes on the mesonotum (the median one not extending behind the suture, the lateral ones throwing off a spur along the suture to the lateral margin), a narrow one on middle of pleura, greatly dilated anteriorly, the breast and middle of metanotum black. Scutellum black, the margin yellow. Abdomen on the first segment yellow, margined with black; the three following segments yellow, the middle of the base narrowly black, which colour is greatly extended toward the lateral margin, without reaching the latter; the black base is followed by a brown spot, which is greatly narrowed posteriorly, and reaches the hind margin of the segment; fifth segment yellow, the narrow base and three stripes issuing from it and nearly crossing the segment, black; of the latter the median stripe is very broad, the lateral ones narrow and extending just inside of the lateral margin. Legs brown. Wings smoky black, a yellowish streak in front of the middle and extending from base of wing to apex of discal cell, stigma a clearer yellow; contact of the discal with the fifth posterior cell unusually short, almost punctiform. Length, 15 mm.

Female: Same as the male, except that the lower half of the front and the face are wholly yellow, the ground colour of the scutellum is brown, and the fifth segment of the abdomen, instead of having the median black stripe, has a much wider brown one, equalling about half the width of the segment. Length, 17 mm.

Hondo and Cotulla, Texas. Four males and three females bred from cactus at the boll-weevil laboratory, in charge of Mr. W. D. Hunter, for whom this fine species is named.

Type No. 12323, U. S. National Museum.

July, 1909

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ARTHUR GIBSON, Central Experimental Farm, Ottawa, Treasurer.

June 15, 1909.

TWO FOSSIL CHRYSOPIDÆ.

BY T. D. A. COCKERELL, UNIVERSITY OF COLORADO, BOULDER, COLO.

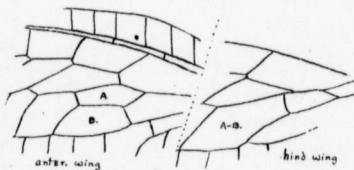
Palæochrysa concinnula, sp. nov. (Fig. 5.)

Length of anterior wing about 12 mm; venation dark brown.

Anterior wing: Costal cells about 14; cells between radial sector and media 10, successively shorter from the fourth on, but without any abrupt change of size, as in *Tribochrysa*; "third cubital cell" (M_{3+1}) divided longitudinally, as shown in the figure; cells beyond "third cubital" 9, but the cell counted as the tenth of the series above may as well belong to this series, reversing the numbers cited; six veins forked on the lower margin, but the fork of the fifth very small.

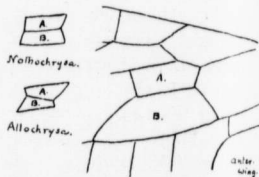
Posterior wing: "Third cubital" not divided; other characters are shown in the figure. (In all the figures A and B are the "third cubital.")

Hab.—Miocene shales of Florissant, Station 14. (*S. A. Rohwer.*)



Palæochrysa concinnula Ckll.

FIG. 5.—*Palæochrysa concinnula*, Ckll.



Palæochrysa ferruginea Ckll.

FIG. 6.—*Palæochrysa ferruginea*, Ckll.

Palæochrysa ferruginea, sp. nov. (Fig. 6.)

Length of anterior wing 11½ mm.; venation as preserved ferruginous, possibly green in life.

July, 1909.

Anterior wing: First cell between radius and radial sector not greatly longer than third; cell M_3 (upper division of "third cubital") not extending so far basad as cell M_4 ; at least seven forked veins on lower margin, the first fork very large. The figure shows other important characters.

Hab.—Miocene shales of Florissant, Station 13 B. (*S. A. Rohwer.*)

For comparison, I show the "third cubital" of the allied living genera *Nothochrysa* and *Allochrysa*, the figures copied from Banks. (*Trans. Am. Ent. Soc.*, Vol. XXIX.) It will be seen that *Allochrysa* shows an exaggeration of the condition found in *P. concinnula*; while *P. ferruginea* combines the characters of *Allochrysa* and *Nothochrysa*. In the cells between the radius and radial sector *P. ferruginea* is like *P. stricta*, Scudd., but the latter is considerably larger, and differs in other details.

For other notes on fossil Chrysopidæ, see CANADIAN ENTOMOLOGIST, March, 1908, p. 90.

ENTOMOLOGICAL SOCIETY OF ONTARIO.

MONTREAL BRANCH.

The 36th annual, and 302nd regular, meeting of the Montreal Branch was held at 74 McTavish street, on May 8th, the President, Mr. Geo. A. Moore, in the chair, 12 members being present. The reports of the Council, the Sec.-Treasurer and Curator and Librarian were read and adopted. The retiring President gave an interesting address on the work the Branch is doing, and urged the members to make definite plans as to the filling up of gaps in their collections, or obtaining knowledge of life-histories or habits of certain species with which they are not familiar, and to strive during the summer to obtain the desired results. The Mount Royal Entomological Club was amalgamated with our Society at the beginning of the present year, and the Branch is in a flourishing state, a number of young and enthusiastic members having been recently added to the roll. The election of officers for the ensuing year resulted as follows: President, Henry H. Lyman; Vice-President, G. A. Southee; Sec.-Treasurer, A. F. Winn; Curator and Librarian, L. Gibb; Council, Geo. A. Moore, G. Chagnon, E. C. Barwick, F. Parkins, Jr.

Mr. Lyman read a paper entitled "A Spring Outing," illustrated by specimens of Lepidoptera, and pressed plants collected on a trip to Washington, D. C., about the end of April of last year.

The first field day of the season was arranged to be held at St. Hilaire, Que., on Victoria Day, May 24th.

A. F. WINN, Sec.

CENTRAL EXPERIMENTAL FARM, OTTAWA.

The following appointments have been made to fill the place of the late Dr. Fletcher, the work that he so successfully carried out having been divided: Mr. C. Gordon Hewitt, B.Sc., of Manchester University, has been appointed Entomologist, and Mr. H. T. Gussow, Botanist.

Both of these gentlemen are very highly spoken of, and from the testimonials and other information received by the Commissioners appear to be highly-qualified men. Mr. Hewitt has published some excellent papers on injurious and other insects, illustrated by beautiful plates of his own drawing. He has had considerable experience in dealing with economic questions, and will no doubt soon become familiar with the problems which confront us in this country. Mr. Gussow was brought up in Breslau, studied also in Leipzig, and, in addition, has spent some time in the Pasteur Institute in France. During the last six years he has been assistant to Dr. Carruthers in connection with the Royal Agricultural Society of England. Both these gentlemen will no doubt prove great acquisitions to the scientific staff of the Farm and to the country at large.

We hope that Mr. Arthur Gibson will be retained as assistant. He has had ten years' training under Dr. Fletcher, is now an accomplished economic Entomologist, his specialty being the Lepidoptera, and his knowledge of that order is of great value. There is no doubt plenty of work to be done in these departments by a much larger staff than the Farm has ever possessed.

GEORGE W. PECK.

We regret to record the death of another of our veteran entomologists, in the person of Mr. George W. Peck, of Roselle Park, N. J. He died on the 18th of May, at the age of seventy-two; he was born in Boston, and was a descendant of one of the Mayflower Pilgrims. After being engaged in business in Boston for some years, he removed to New York and became the part owner and head of a wholesale business in glass and tin supplies. His heart, however, was engrossed with nature studies, and he acquired no little reputation in his own neighbourhood as an entomologist and horticulturist. His collection of Lepidoptera is one of the best in New Jersey. He never made any contributions to entomological publications, but, being an enthusiastic collector, he was well known to a great many.

A SUMMER WITH CHRYSOPHANUS DORCAS, KIRBY.

BY WILLIAM W. NEWCOMB, M. D., DETROIT, MICH.

Chrysophanus dorcas is a very interesting little butterfly for several reasons: its boreal origin, in southern Michigan, confined as it is to certain detached islands or areas of decided northern character, wherein its food-plant occurs, its unworked life-history, its supposed rarity and little known distribution, all have made it an attractive field for investigation. It is also worth while to note the confusion which attaches to its identity, two other distinct species, *epixanthe* and *heloïdes*, having been mistaken for it.

Scattered throughout Southern Michigan, along the borders of streams, in the vicinity of lakes and in other low wet places, are numerous peat bogs, in which the vegetation is of a different type from the surrounding growth. I can here simply call attention to the existence of these northern bog areas in a region of more pronounced southern aspect. Certain boreal insects, among them *Chrysophanus dorcas*, occur in this latitude only in these peculiar bog habitats.*

Oakland county, one of the counties of south-eastern Michigan, is full of little lakes ranging in size from an acre or two to several square miles. It is particularly rich in the number and variety of the bog areas which it contains, and consequently many of the bog plants of the north occur abundantly. Among them there is one, the shrubby cinquefoil (*Dasiphora fruticosa*), with which we are particularly concerned. Doubtless the conditions necessary for the continued existence of this plant in this latitude are unusually favourable in the bogs of this county. Invariably around the pretty yellow flowers of the cinquefoil bushes at the proper time of the year, July, are to be found the little butterflies of *dorcas*.

The particular place where most of the observations upon this insect were made was in the Bloomfield Hills region, about twenty-four miles from Detroit. It was chosen because it was the nearest spot to the city where a goodly amount of the cinquefoil grew, and because of its accessibility. The country about is diversified by low hills and little valleys, and a small stream, a branch of the River Rouge, arising in the lakes to the westward, flows through the locality. There is considerable low, wet ground about the borders of the stream, and within half a mile to the

*See Edgar N. Transeau: The Bogs and Bog Flora of the Huron River Valley: Botanical Gazette, 40: 351-375, 418-448, and 41: 17-42. On the Geographic Distribution and Ecological Relations of the Bog Plant Societies of North America: Bot. Gaz., 36: 401-420.

north a tamarack swamp, the trees of which are mainly small and stunted. At one point close to the little stream, covering an area of less than two acres, the cinquefoil grows very plentifully. A large portion of it is only a foot or two high, but a few clumps reach a height of three or four feet. This particular area is not a pure one, for besides the bog plants present it contains others without northern affinities. Scattered about with the cinquefoil is a good deal of the Ohio golden-rod (*Solidago Ohioensis*) and the white mint (*Koellia Virginiana*). The elevation above sea-level at Bloomfield is 834 feet, the hills in the neighbourhood some thirty odd feet higher.

During the summer of 1908 I determined to find out all I could about *dorcas*, especially to discover the food-plant, and if possible to rear the butterfly through all its stages. Up to this time I had not made any special effort to study it, partly because it was to be found only at some distance from the city. The late Dr. James Fletcher, who had learned of its occurrence near Detroit, and had been "specially interested in this species for several years," corresponded with me regarding it. I shall quote from his letters as his remarks bear upon the subject.

Jan. 13, 1908, he wrote :

"It would be a grand thing if you could secure eggs of *dorcas* during the coming summer, so that we might try to breed the species. Dr. Brodie, of Toronto, assures me that this species feeds on *Hypericum perforatum*, but I cannot help thinking that he is mistaken. With us *epixanthe* flies only in peat bogs. I notice that your specimens of *dorcas* are labelled Bloomfield Hills. Will you please let me know the nature of the locality where you find them. Is it really on the sides of hills or is it in peat bogs near hills? It would be a great triumph if we could secure eggs and breed the species. It is not known what *epixanthe* feeds upon, but I have an idea that every species of *Chrysopehanus* will eat Dock."

Again in his letter of July 11, 1908, he wrote :

"With regard to getting eggs of *dorcas*, I would suggest your catching some females after they have passed their prime, and then tying some of these in gauze bags, both over *Hypericum perforatum*, which is alleged to be one of the food-plants, and also over the little Doorweed, *Polygonum aviculare*, upon which *C. helloides* feeds."

On July 9 I found *dorcas* out for the first time of the year at the Bloomfield bog. On the first and the fifth I had visited two other localities without finding any of the butterflies. I think that they were somewhat

delayed in emerging on account of the backward season, and in a more normal year I should look for them a week or ten days earlier. As I approached the cinquefoil area I espied a female, and almost immediately a second one. I then crossed a fence into the main body of the plant, where I found the butterflies out in the largest numbers I have ever seen them. I should think there were hundreds in a space of less than two acres, perhaps even thousands, for they were everywhere flying about and alighting upon the pretty yellow flowers of the *fruticosa*. A few would occasionally stop on some other flower in the vicinity, but the cinquefoil flowers were evidently the favourites. The butterflies were mostly fresh, and many of them looked as if they were just out of the chrysalids. Males greatly predominated, of which I should think there might have been as many as forty to one female. I watched particularly for signs of mating. Early in the afternoon I saw a female with three male attendants, and later on between half-past three and five I saw seven or eight females each with a male near-by, and in two instances found the male flirting his abdomen over to the female, but in no case did I observe any sexual union.

After four p.m. the butterflies began to take up a position on the leaves of the weeds and shrubs other than the cinquefoil, with their wings outstretched flat, the upper surfaces exposed to the sun's rays, their heads as a rule directed away from the rays. As the sun settled lower, the cinquefoil flowers were less frequented, finally became deserted, and more of the butterflies were observed sunning themselves in the manner noted. Later they gradually disappeared, evidently dropping into the thick mat of vegetation, until when I left about half-past six only one or two could be seen. I located a number of females during the late afternoon by discovering that several males would cluster upon the same main upright plant stem (particularly of a species of birch), when upon closer examination a female would be found among them. The males invariably fly upward into the net when it is placed over them, the females on the contrary give a flop, landing lower down in the plant carpet. Later on I gave up the use of the net almost entirely, for I found that the butterflies were so tame that all that was needed was to place the open end of the poison tube down over them as they were seated on the cinquefoil flowers. On the wing one learns to distinguish the sexes readily by the flight alone. The males fly more quickly, hither and thither, with less directness, while the females are slower and take a straighter path. The purple colour of the male, even at several feet away, lets his sex be known.

I made a second trip to Bloomfield on July 11th. Females were now more in evidence, and although in several instances males were about the females, in no case did I observe any pairs in copulation. No hint of egg-laying was obtained.

Thinking that perhaps I might learn something new from other colonies of *dorcas*, on the 15th I visited a spot about one mile beyond the Bloomfield bog. *Dorcas* appeared in good numbers, but as the extent of the cinquefoil was small, the butterflies were less in evidence than in the first location. Females were plentiful, and I observed four pairs in copulation for the first time. I did not succeed in observing a female in the act of egg-laying. About three p.m. some of the males were again seen sunning themselves.

On July 18th I went to Rochester, Mich., walking out to the Parke, Davis & Co. farm on Stony Creek. Here I found the largest area of the *fruticosa* which I have yet run across. The butterflies of *dorcas* were abundant, but the males were all worn, and many of the females, although some of the latter were still bright. Again I could not gather from the actions of any female the secret of where she laid her eggs. There was a very little *Hypericum perforatum* on a hillside above the cinquefoil area, but I never regarded this seriously as a food-plant, for I knew where it grew abundantly within nine miles of the city, without any hint that *dorcas* lived in the neighbourhood.

Dasiphora fruticosa has always seemed to me to be the most probable food-plant, for as long as I have known this butterfly (at least twenty years), I invariably found it flying in its vicinity. Accordingly, on my next visit, on July 21st, to the Bloomfield bog, I confined three females over the cinquefoil, and also some over two other plants abundant there, three females over white mint, and two over Ohio golden-rod. I observed no *H. perforatum*, *P. aviculare* nor any dock growing near the *fruticosa*. I brought home six live female butterflies, placing them in a box near a window, with fresh stems of the cinquefoil flowers and leaves. On this trip the males that were flying were all worn, and in less numbers than the females, which were still plentiful. In the middle of the afternoon the males were again observed sunning themselves, and the habit of clustering of both sexes, as previously explained, was also noted.

On July 24th I found eight eggs on the sprays of cinquefoil in the box with the six female butterflies. On the previous morning I had looked, but could find none. On the 30th I found three more eggs, and the last of these butterflies had died.

The butterflies confined on the plants at the Bloomfield bog were examined on the 25th. They were all dead, and not a trace of an egg could be found on the white mint or the golden-rod, but when I looked over the cinquefoil I was rewarded by finding fifty-four eggs. It now seemed certain that the *fruticosa* was the right food-plant, and I became convinced of it when I found nine more eggs by searching on the growing plant. When I returned home ten additional eggs were discovered on some cinquefoil which had been gathered in the bog.

I now found no trouble to get eggs abundantly, both from females confined in the open and at home. In the latter case conditions were always made as attractive as possible for the butterflies; fresh flowers and leaves, with the stems kept in water, were provided in a large, light, airy box. In this way, from fourteen females confined at the same time I obtained two hundred and fifty-one eggs, an average of eighteen to each female, lacking one. A single butterfly confined alone in the same way, but in a large glass jar, laid twenty-four eggs, which, with seven eggs dissected from the abdomen after her death, gave a total of thirty-one eggs, the largest number obtained from any single female. From ten females confined in the open I secured one hundred and sixteen eggs, an average of eleven and one-half eggs, with one egg over. Of course some eggs were undoubtedly deposited before the butterflies had been taken, so that I am inclined to think that the average number laid by a single female is not far from thirty.

I quote from Dr. Fletcher's letter of Aug. 6, 1908 :

"I don't know which I am shouting loudest, thanks to you for sending me the precious eggs of *dorcas* or congratulations for having found the food-plant. I must say I am surprised at this. As a piece of collateral evidence that you are right in the food-plant, Dr. Brodie reported, you remember, that he found the larvæ on *Hypericum perforatum*, or rather perhaps a plant which I may have understood him to mean for *Hypericum perforatum*. Now, there is a sufficient resemblance between that plant and *Potentilla fruticosa*, when described superficially, for his plant to have been that species, and where he found his eggs there is little doubt that the *Potentilla* grows. I am very much surprised that it should have been a *Potentilla*, but from your finding the eggs on the plant in the open, there is little doubt that you are right. . . . I think it just possible that these eggs will not hatch until spring. This is the case with *thoe*, sometimes at any rate. . . . It will be well for you to leave some of the eggs on the plants out of doors, where they were laid, and watch

them in the field to see if any hatch this autumn. On one occasion when I had eggs of *thoe*; several of them hatched in the autumn, and it was from these that I got the insect through all its stages, the first time I bred it."

Again from his letter of Aug. 19th :

"Your success in getting these eggs is certainly remarkable. . . . I think probably that these eggs will follow the same course as those of *gorgon*. I remember once having from Mr. W. H. Edwards larvæ to hibernate for him of *C. Snowi*, which passed the winter as half-grown larvæ. . . . It would be very interesting if you could find eggs of *dorcas* in the open, and then mark the plant and watch them to see what they do under natural conditions."

At the Bloomfield bog, on July 30th, there were a few worn males flying, and while females were more abundant, it was evident that *dorcas* was near the end of its flight for the season. On this date ten females were confined in the open. At my next visit, on August 22nd, a rough count through the gauze bag gave me seventy-four eggs, which were left for future developments. A search on the growing cinquefoil yielded seventeen eggs, all of which except one (accidentally removed) were left on the plants. These were marked with strings, or in the case of three eggs on the same plant covered with gauze. On October 15th I visited the locality again; the three eggs under the gauze were found on the dried leaves where the latter had fallen, and were as bright as any eggs when first laid. Two of the eggs on the plants marked with strings were also found, while no eggs at all could be located on some of the others. As the eggs are usually laid on the leaves, in the last case they had probably fallen with them to the ground. The bag in which the ten females had been confined was still in place, but on November 15th I found that it had been removed. It was lying, however, not far off, and contained only forty-two eggs. At no time had I discovered any larvæ, and none of the eggs brought home had hatched. In a single instance I had found what looked like the base of an egg attached to a dead leaf, as if the larvæ had eaten the rest of the egg, but there was not enough of the egg to make this certain. From all the data at hand then, I concluded that *dorcas* passed the winter in the egg state, and that if any eggs hatched in the summer or fall it was a very small proportion, as yet undetermined.

The female butterfly under natural conditions lays her eggs near the top of the cinquefoil bush. Usually it is on the pinnate leaf, within four inches of the tip of the branch. In forty-one examinations only four eggs were lower than this, the lowest being eight inches. Most of the eggs in

the open were found on the smaller bushes. The egg is almost always placed on the under surface of the leaflet. Out of sixty-three eggs only two were placed on the calyx, and of the other sixty-one, fifty-five, or over ninety per cent., were between the centre of the leaflet and the tip, the remainder being between the base and the centre of the leaflet. In confinement the butterfly lays her eggs on the leaves, sepals and petals, upper or lower surfaces, indiscriminately, but even here the larger number of the eggs will be located on the under surfaces of the leaflets.

An enemy of *dorcas* was discovered in a lemon-yellow spider. Several times I caught a spider with one of the butterflies in its grasp. In this connection I observed a peculiar thing: sitting on one of the yellow flowers was a small pale-coloured spider, probably the same as the lemon-coloured one. A butterfly was approaching the flower, when suddenly within about a foot and a half he gave a quick jerk, turning in another direction as if he had seen the menace to his safety in the waiting spider. His leisurely approach, abrupt turn and startled flight were at least suggestive. Once I found an egg with a circular puncture, but outside of the spider no enemy has yet been detected.

There are two or three further observations of interest. It was found that the butterflies when seated on the flowers usually held their wings upright or nearly so in the case of the males, and horizontally in the females. After a few visits with the butterflies I became able to distinguish the females when on the wing, even at some distance, not from the character of the flight, but from the shade of colour of the under side of the wings. This side is more in evidence when the insect is flying, and the feature presenting the difference of the sexes was the uniformity of the bright colour of the under side in the female. In the males there is a faint purplish tint on this surface on the hind wings and on the tips of the fore wings, lacking or feebly expressed in the females.

A peculiar disparity in the lengths of the antennæ occurred in four butterflies taken at the same place on the same day. The normal length of the antenna in the male is between 6.5 and 7 mm., in the female about 0.5 mm. shorter. In the male specimen taken the left antenna was of normal length, while the right measured 5.5 mm. In two females the left antenna was normal in each, the right 4 mm. long in one, 4.5 mm. in the other. In the fourth specimen, a female, both antennæ were short, the left 4 mm., the right 5 mm. long.

When Michigan becomes better known entomologically, *dorcas* will undoubtedly be found over a large portion of it, both north and south, for

its food-plant is common through most of the State. In south-eastern Michigan I know it so far only from Oakland County, although it probably occurs in the adjacent counties, but less frequently on account of the smaller number of bog areas. Dr. Wolcott* mentions *C. epixanthe* from Lambertton Lake, in western Michigan. As it was spoken of as flying over shrubby cinquefoil, I have little doubt but that the butterfly was *dorcas*.

The home of this species is in British North America, and it has been found in southern Labrador in the east, Sitka and Kodiak (Alaska) in the west, and in the Nahanni Mountains on the Mackenzie River (Lat. 62°), the most northerly point. It is known also from localities in between and as far south as Colorado, and colonies probably exist in many of our western cordilleras. Its most southerly limit may possibly be in Arizona, for *Potentilla fruticosa* has been recorded from the San Francisco Mountains in that State.

Regarding the validity of *dorcas* as a true species, I can best quote the emphatic words of Dr. Fletcher, to whom I sent specimens.

He wrote in his letter of Jan. 13, 1908 :

"I have no doubt at all that this is true *dorcas*, an insect which I have found very rare in collections. It is quite different from *epixanthe*. . . . I think you will see the differences at a glance. *Epixanthe* is of a duller gray, always pale beneath instead of ruddy fulvous, and regularly slightly smaller than *dorcas*. The males of *dorcas* always show more spots above, and have much less of the submarginal band at anal angle of secondaries above. The red markings of this submarginal band beneath are less angular than in *dorcas*. The two chief characteristics by which *dorcas* can be separated from *epixanthe* are the larger size and the much richer ruddy hue beneath."

In his letter of Feb. 22, 1908 :

"It is funny to me how few people really understand this species, which they mix up with *helloides* and *epixanthe*."

Again Aug. 6, 1908 :

"Few of our American entomologists believe in *dorcas* as a species, some thinking it to be merely *helloides*, and others *epixanthe*."

When one has these three species before him there is little doubt of the distinctness of each. The fact that the food-plants of all three are now known, and that they are different in each case, is of course significant.

*Robt. H. Wolcott: Butterflies of Grand Rapids, Mich., CAN. ENT., Vol. XXV, p. 103.

Florus is a variety of the female of *dorcas*. It occurs in Oakland county, but is much less frequent than the usual form of the female. Wm. H. Edwards, in describing *florus*, says: "Upper side dark brown, a little mottled with obscure yellow on disk of primaries at end of cell and outside the black spots in median interspaces only. . . ."

I find this yellow existing as a mere trace in the first median interspace to a patch of yellow outside of every black spot in the transverse row of spots on the outer third of the wings, excepting the first spot next the costa on the fore wings and the first two spots on the hind wings. The yellow at the end of the cell in my series is less frequent than the yellow outside the row of black spots. *Dorcas* males vary little, this being chiefly in the width of the black border on the upper surfaces of the wings.

I wish to express my appreciation of the deep interest which the late Dr. Fletcher took in my observations upon this species. It is with the greatest regret that I realize I am to receive no more of his instructive and enthusiastic letters. As for the full history of *dorcas*, I am trusting that the eggs will hatch, and that the larvæ may be raised to maturity.

NEW GEOMETRIDS OF THE GENUS *HYDRIOMENA*.

BY L. W. SWETT, BOSTON, MASS.

Hydriomena Barnesata, n. sp.—Expanse, 29–35 mm.; palpi very long, 2 mm., and beak-like, black-scaled, white-tipped, front of head gray, thorax and abdomen light gray. Fore wings ash colour, with greenish shading basally and near border of wing; hind wings smoke coloured. The fore wings have indication of a band close to body, then an ash-coloured space about 2 mm. wide from basal band, then a black band running straight from costa to inner margin, as in most of the *Hydriomenas*, a greenish space, then another black band same as first, only slightly wider and more irregular in course, with a tendency to bend outward on median vein, then a greenish space and a third line running straight across same as others, only much narrower after it leaves the costa, where it starts from a large spot. These three dark, wide bands form a mesial band as it were, then from this mesial band of three straight bands is an irregular, quite wide, pale, more or less mottled space, edged externally by an irregular, narrow black line which runs from costa, where it starts from black patch running to vein 3, where it is broken, thence to inner margin. Between this and outer margin is another black line, broad near costa, and tapering as it reaches inner margin; near apex of wing a black dash, which runs to this irregular line, as is the case in most of the

Hydriomenas; beyond this line is a clear outer margin with dots at the ends of the veins at base of fringe, which is quite long and brownish, with a line running through. Hind wings brownish, showing traces of two irregular dark lines, pale between, fringe whitish, with intervenular dots. Tip of abdomen tufted, as are all the Hydriomenas. Beneath, fore wings pale ash-gray, showing faintly the lines above, the two near outer border being plainest, and the apical streak. Hind wings same colour as fore wings, with only one of the black lines showing, that being the inner one, which makes quite a dip. This species can be readily distinguished by the long palpi and straight mesial bands, which are peculiar for this group. I take pleasure in naming this geometer after Dr. Barnes, who has done so much to increase our knowledge of the western species.

Types, 3 ♂'s, two from Dr. Barnes, Huachuca Mts., Ariz., and one from Mr. Grossbeck, Arizona, and in their collections.

Hydriomena Cochiseata, n. sp.—Expanse, 31–33 mm.; palpi short, about 1 mm. in length, brownish, white-tipped; wings full and rounded, more like *Mesoleuca*; front of head whitish; thorax and abdomen gray. Fore wings dark gray, with a reddish tinge in one specimen. Basal band smoke-coloured, then a light space; median space made up of the usual three bands, the first basally irregular and bent outwards, particularly on median vein, thence to inner margin in two scallops; the second band is hardly distinguishable, but is broad and irregular, as the median band has no clear space between the lines, but is suffused with smoke-colour; the outer band is also very irregular, starting from a black patch on costa, whence it runs to inner margin, meeting middle line and fusing with it to form a Y, as in *furcata* = *sordidata* of Europe; in some cases the mesial space is narrow and irregular, being not over 4 mm. at widest part, which is rather striking in this group; this band is in one example white, and in the second suffused with gray; the outer line bordering mesial space starts very irregularly near costa in a series of notches, and is quite wide till 4 mm. below costa, then it is an irregular black hair line to inner margin. From this line to outer margin both specimens are suffused with dark gray; a second irregular line is scarcely visible near outer border, there being a reddish shading on either side. Marginal dots and moderately long brown fringe. Hind wings brown, with two characteristic pale lines. Beneath, pale gray on fore wings, with the white mesial space showing plainly and black outer line. Hind wings same colour as fore wings, and with inner line showing.

Types, 2 ♂'s, Palmerlee, Cochise Co., Arizona, from Mr. Broadwell's collection.

Hydriomena Glenwoodata, n. sp.—Expanse, 25 mm; *palpi* rather long and slender, blackish; front of head grayish; thorax and abdomen gray. Fore wings light ash-gray, with slightly greenish tinge of a more or less mottled appearance. Line at base of wing hardly discernible, first line of the mesial band bent outwards very strongly between median vein and costa, below it runs almost straight from vein to inner margin; second line fairly wide, rather irregular in course, appearing in three blotches on costa, median vein and inner margin; outer line, starts outward from costa, and then in a peculiar S-like curve, which in one specimen is rather broad to inner margin, where it forms a black patch, a characteristic marking of a good many of this group. The mesial space is pale and rather suffused with dark gray, discal spots easily distinguished, linear. Line bordering mesial space externally starts as black patch on costa, then a fine line discernible as dots on veins to inner margin. Marginal band irregular and smoke-coloured, rather broad, exterior margin clear, except for dots at end of veins at base of fringe. Apical streak appears as a spot; fringe light ash and short. Hind wings dark ash, two pale outer lines hardly visible, discal dot, unless looked for especially, is so minute as to escape detection. Beneath the fore wings are quite a dark smoke colour, with the linear discal dot showing faintly. The submarginal line shows quite plainly from costa to median vein, and is shaded lighter externally, the general course being a low curve. Hind wings lighter than fore wings, discal spot hardly visible, faint outer line showing. The long slender palpi and the peculiar double curve of the outer line of mesial band will serve to distinguish it from *autumnalis* or other forms.

Types, 1 ♂, July 16-23, Glenwood Springs, Colo., 1 ♀, Aug. 1-7, Glenwood Springs, Colo., 1 ♀, Colo. (Bruce). All from Dr. Barnes. One ♀, Half-Way House, Pike's Peak, Colo., 9,000 feet altitude, July 16-18, 1902, from H. H. Newcomb, in my collection.

Hydriomena Chiricahuata, n. sp.—Expanse, 25-28 mm.; *palpi* moderate, 1 mm. in length; front of head dark gray, same colour as palpi. Fore wings rather long and pointed, of a reddish ash colour in the mesial space and greenish on mesial band and outer margin (basal band, if any, does not show); first line curved outward from costa to inner margin; second line hardly visible, narrow and rather zigzag in its course; third line of mesial band bends quite sharply inward from costa almost to

mesial vein, then bends sharply outward to vein 3, then inward to vein 2, then outward to inner margin, where it ends in a large black blotch. Mesial space light ash with reddish shading, discal spot small, black and linear. The mesial band is narrower than any of the other species, not more than 3 mm. in widest portion. Outer black line of mesial space bends sharply outward from costa to vein 7, then sharply inward towards discal point, sending a black streak almost to it, from which it doubles back towards outer margin in two scallops to vein 3, whence it runs almost straight to inner margin, ending in a black spot. The usual smoke-coloured irregular band between this line and outer margin, beyond which the wing is clear, except for intervenular spots, also the usual black apical streak; fringe short and light ash-coloured. Hind wings pale ash, discal spots showing plainly. The inner characteristic line of this group showing in dots on veins which is rather unusual, the outer pale line being normal. Beneath, fore wings pale ash, and showing same markings as above, except that the extradiscal line shows quite plainly at costa as a black patch, discal points visible on fore and hind wings. Hind wings light ash, inner band showing in dots on vein as above.

Types, 2 ♂'s, Huachuca and Chiricahua Mts., Arizona, from Dr. Barnes.

This species may be known by the peculiar narrow mesial band, the course of third line, and three black patches on inner margin and by the dotted line on hind wing.

Hydriomena Edenata, n. sp.—Expanse, 30–34 mm.; *palpi long*, 2 mm., rather bushy, black scaled; front of head yellowish-ash; thorax and abdomen light ash. Antennæ minutely ringed with white. Fore wings long and narrow, ash-gray, with rust-red shadings in mesial band and outer border. Base of wing clear ash. There is no basal line as in *ruberata*, European or North American forms. At a distance out from the body the first black line of mesial band starts from the costa, diagonally across wing to inner margin, with a slight bend outwards at median vein, which is shaded with red. Next the usual wide irregular bluish band from costa to inner margin, shaded outwardly with red; the third line is almost thread-like, and runs zigzag on each vein from costa to inner margin. From this line on inner margin to the first line there extends across the entire mesial band a wide black bar, which is extremely striking. The mesial space is pale ash tinged with red, with a black linear discal spot. The extradiscal line is black and narrow, runs outward to apical dash, then inward, forming a sharp-pointed tooth, bending outward to median

vein, below which it takes a deep outward curve to vein 3, then almost straight to inner margin. Beyond this line is a reddish band, then the usual wide sinuate bluish band, shaded outwardly with red, the outer margin being clear ashen-gray, with minute dots at end of veins; fringe light ash, with black line running through it. There are three black dashes on the veins from the apex of the wing, the lower being the longest and touching the extradiscal line. Hind wings light ash, with the usual two pale lines somewhat scalloped on veins, discal dot showing plainly. Beneath, fore wings grayish, with only the extradiscal black bands and discal spots showing; the same is true of the hind wings. This species runs close to *ruberata*, Freyer, of Europe, which I have, and also examples from Maine of the same, submitted to Mr. L. B. Prout, of England, who said I had identified the species correctly. *Edenata* may be a variety of *ruberata*, but at least not one of the described ones, although I think it is a distinct species. In the Berliner Ent. Zeit., Vol. 51, 1906, p. 256, Freiherr von Hoyningen-Huene discusses the *trifasciata-ruberata* group and describes several new varieties, showing that it is a somewhat variable species.

Types, 1 ♂, Monterey Co., Colo., from Mr. Grossbeck; 5 ♂'s, Eden Vale, Monterey Co., Colo., June, from Mt. Broadwell and Mr. Grossbeck.

MOSQUITO OBSERVATIONS.

BY C. S. LUDLOW, PH. D.

Laboratory of the Office of the Surgeon-General, U. S. Army, Washington, D. C.

Beyond the limits of this article it is not my intention to reply to Dr. Dyar's comments.*

A few points in his recent article may be referred to:

- (a) The senior author is responsible for what appears under his name, whether he wrote it or not.
- (b) It would probably have simplified matters if it had occurred to me to state definitely that, while the specimens are shipped to me in boxes, the collection has never been kept in them. This would have enabled Dr. Dyar to differentiate between these two conditions, for, as he has never seen my collection, he could necessarily know nothing about them; moreover, my method of keeping my collection, even were it as "unfortunate" as Dr. Dyar persistently insinuates, is strictly a personal matter, and lies quite outside Dr. Dyar's province.

*Mosquito Comment, CAN. ENT., March, 1909, p. 101.

(c) Finally, Dr. Dyar's comment as to the disposition of my types shows a lack of acquaintance with the literature bearing on this point.

(d) Since shortly after the publication of the genus *Calvertia*, mihi, I have known of the existence of the genus *Calvertius*, Sharpe, but I have found no reference to *Calvertia*, Warren. However, as I prefer to give the genus a fairly safe name, I propose to call it *Calvertina*, Ludlow. It will therefore appear as

Calvertina, Ludlow.

(*Calvertia*, Ludlow.)

Some recent collections from the Philippine Islands show a number of species not heretofore reported from this locality.

Nyssorhynchus Stephensi, Liston. *Tæniorhynchus brevicellus*, ? Theob. *Uranotania testacea*, Theob. *Neomacleaya Indica*, Theob., and some apparently new forms.

Tæniorhynchus (?) *aureosquamatus*, n. sp.—Female: Head dark brown, with whitish and yellow curved scales from occiput to vertex, dark brown, almost black fork scales at occiput, and light yellowish-white flat scales laterally; antennæ brown, verticels and pubescence brown, white, unscaled at the joints; palpi dark brown; proboscis dark brown; eyes brown, partly contiguous; clypeus brown.

Thorax dark brown; prothoracic lobes with a few bristles; mesonotum with bright golden or brassy-coloured slender-curved scales arranged in lines on the cephalad half, the caudad half very dark brown, long brown bristles, especially over the wing joint; pleura dark brown, with white-scaled spots; scutellum light, almost bare, very slender curved light and brown scales arranged in the submedian lines, the apices directed laterad, four long bristles on the median, and three on the lateral lobes, otherwise practically nude; metanotum brown, nude.

Abdomen densely covered with dark brown scales, with purple iridescence and tiny basal lateral white spots on some segments; venter mostly dark scaled, but some basal light bands.

Legs: coxæ and trochanters light, femora ventrally light, and slightly so at the bases, more marked on the hind legs, the remainder of the legs dark, with purple and gold reflections; ungues simple and equal.

Wings clear and heavily scaled with long *tæniorhynchus*-like scales; 1st submarginal cell a little longer and narrower than the 2nd, posterior, about the length of the stems; the posterior cross-vein longer than the mid, and interior from the mid about its own length. Length, 6 mm., of

which 2.2 is proboscis. Habitat: Parang, Mindanao, P. I. Taken in December.

The wing-scales suggest *Teniorhynchus*, but the eyes are more contiguous than is usual in that genus and the scutellar scaling is peculiar. The colouring suggests already described *Teniorhynchi*, but the legs are entirely unbanded.

Uranotenia Powellii, n. sp.—Female: head covered with brilliant blue flat scales, except a band of dark brown flat scales, and a few dark brown fork scales in the nape, a very few bristles projecting forward between and around the eyes; antennæ brown, verticels and pubescence brown, basal joint testaceous; palpi dark brown; proboscis dark brown, very long; clypeus brown, with "frosty tomentum"; eyes dark brown.

Thorax: prothoracic lobes testaceous, covered with dark brown flat scales and a few brown bristles; mesonotum light testaceous on the cephalad and laterad portions, and dark brown in the median portion, widening near the wing and extending to the scutellum, the whole covered with very slender dark brown hair-like curved scales; scutellum light testaceous in the median part of the mid lobe, otherwise dark and covered with dark brown flat scales; pleura dark brown, heavily covered with white flat scales; metanotum brown.

Abdomen: first segment entirely brown-scaled, the rest banded with brilliant white scales near the apex of the segments, the brown base of each segment wider than the brown apex; venter with soft light yellow scales.

Legs: coxæ and trochanters almost white, with a few dark scales; femora all light ventrally, dark brown dorsally, while on the cephalic aspect there are on the fore legs two brilliant white spots, on the mid legs a basal white line extending nearly half the length of the femora, with two white spots nearer the apex, and on the hind femora two white spots, otherwise the legs are very dark brown, though the scales may look even ochraceous in some lights; unguis small, simple and equal.

Wings clear, heavily scaled with dark brown scales; the cells are short, the first submarginal the same length as, but much narrower than, the second posterior; supernumerary and mid cross-veins meet and are nearly equal, the posterior a trifle shorter than the mid and about its own length distant. Halteres light stem and dark knob, but heavily dark scaled on both. The scales on the costa are noticeably spine-line.

Length, without proboscis, 4.5 mm.; proboscis, 3 mm. Habitat: Camp Wilhelm, Yayabas, P. I. (Dr. W. A. Powell.) Taken Jan. 3, 1909.

(To be continued.)

INTERNATIONAL CONGRESS OF ENTOMOLOGISTS.

It is proposed to hold the first International Congress of all interested in Entomology at Brussels, Belgium, from August 1st to 6th, 1910. A preliminary meeting of British and Continental Entomologists was recently held in London for the purpose of drawing up a programme and arranging various details. It was decided to form a central executive committee, and to invite various countries to appoint local national committees to co-operate in the organization of the Congress, and to enlist the sympathy and assistance of as many Entomologists as possible in all parts of the world. Among other appointments, Professor Bethune, of the Ontario Agricultural College, Guelph, was selected as Chairman for the Dominion of Canada, and to him may be addressed any requests for further information from residents in this country.

Professor Lameere (President Soc. Ent. Belg.) was selected as President of the Congress, and Mr. G. Severin, 31 Rue Vautier, Bruxelles, General Secretary. The following gentlemen form the preliminary Executive Committee: Prof. Poulton, Messrs. Bouvier, Jordan, Champion, Dixey, Rowland, Brown, Ganglbauer, Horn, Janet, Lameere, Langstaff, and Severin. Dr. K. Jordan, Zoological Museum, Tring, Herts., England, is the Secretary, to whom correspondence should be addressed. A tentative programme will be issued very shortly, and be distributed through the various Entomological journals to all their subscribers.

It is intended that the membership of the Congress should include all interested in any department of Entomology, whether relating to Agriculture, Horticulture, Forestry, Hygiene, Sericulture or Apiculture, as well as to the more directly scientific side of systematic Entomology, insect Psychology, variation, etc. Universities and Colleges in which Entomology forms a part of the curriculum, Experiment Stations, Museums, Natural History Societies, and other organizations, will be invited to send delegates. Every effort will be made to ensure the success of the first Congress, and to make it the beginning of a long series of similar gatherings during the years to come.

COLIAS PHILODICE, VAR. LUTEITINCTA, WOLCOTT.

On August 9th last I captured, a few miles east of Montreal, a beautiful male specimen of the orange-flushed variety of *C. philodice*, described by Mr. R. H. Wolcott in CAN. ENT., XXV, 104, 1893, as var. *luteitincta*. This is the first specimen I have ever taken, and I would like to hear whether it has been recently taken by others, and whether all captures have been made in midsummer, as were the types, or whether it also occurs in either spring or fall.—ALBERT F. WINN, Westmount, Que.

NOTES ON PACHYBRACHYS AND DESCRIPTIONS OF NEW SPECIES.

BY FRED. C. BOWDITCH, BROOKLINE, MASS.

In what is regarded as the most typical *Pachybrachys*, the thorax has a well-defined M-like mark; it varies with different species from an almost complete M through various partial marks and clouds until, in some cases, it is hardly visible; but of the thoracic markings, most are variations of this M, and for brevity in description it is called the M; this is often supplemented by a transverse impression in the rear, terminating on each side in a small shaded depressed area, the depression forming the ends of the M arms; almost invariably the darker portions of the head and thorax are the most densely punctured.

In the species showing striate, punctate elytra, the best developed (*pallidipennis*, Suff.) shows ten regular striæ and a marginal stria, but, in nearly all our species, these striæ are more or less broken; of the costæ or intervals, the third, fifth and humeral are the most enduring, and in most species some, or all, of these spaces are more or less indicated; the third is the most important of the three, and reaches its highest development in forms like *balsas*, nov. sp. The striæ on either side are perfect, and form a regular space from base to apex, the inner or third stria is dilated in the middle towards the suture, and forms the elytral or sutural shield, a smooth area about the middle of the elytra, and in many species a marked feature, varying from a regular circle (*inclusus*, Jac.), or triangular spot (*labyrinthicus*, Suff.), to nothing. The punctured scutellar area includes everything between the base, the third interval and the elytral shield or a trifle beyond. In counting the striæ, I call the sutural the first.

Where the elytra have dark spots or marks, the typical or standard form seems to be three spots on, or near, the margin, one at, or near, the humerus, one about the middle, and the last about the convexity, and three more spots on the inside, parallel to the suture; the first is on, or about, the third interval, a little back of the forward edge, the second behind it in the middle, and the third further back on the convexity. All the spots are parallel to each other and the elytral suture. These marks may be spread out so as to join either longitudinally or sideways or be partially or wholly absent; this spotting or some variation is used in many of the species, and may, for convenience in description, be called the standard form of spots. The most enduring of the spots is the humeral, and when only symptoms of the others appear the humerus will usually be dark. The marginal stria varies greatly in situation behind the curve of

the humerus, from almost straight (*melanostictus*, Suff.), to plainly sinuate; the elytral edge or inflexed side of the elytra begins in the elevated ridge at the base of the elytra, turns round the knob of the shoulder, and is drawn out in a more or less acute edge on the outside of the marginal stria, the curved part below the shoulder is called the lobe, its length, width, curve and punctuation vary considerably.

The following forms seem new:

Pachybrachys brunneus, nov. sp.—Pubescent light brown, sometimes more or less confused with blackish, elytra with stripes of punctures. Length, $2\frac{1}{2}$ –4 mm.

Head convex in front, finely and closely punctate, with a well-defined triangular depression occupying the usual frontal dark space; eyes distant; antennæ, ♀ very short and thin, scarcely attaining the middle of body, a little longer in ♂, darker towards the tip, thorax rather elongated and notably narrowed in front, sides lightly bowed, subangulate in ♀, straight in ♂, depressed behind, with a well-marked ante-scutellar lobe, surface diffusely and very finely punctate, M faintly indicated in livid; elytra slightly narrowed towards the rear, finely punctate striate, the striae showing in the ♀ a triseriate tendency, which in the best developed specimens forms five quite regular stripes, of which one is sutural and the others occupy about the place of the second, fourth, humeral and marginal intervals, and are traceable nearly to the apex; owing to the pubescence, this arrangement scarcely shows except in a certain light, the intervals are quite wide, smooth and regular; the four examples of what I call the ♂ of this species are much smaller, and have the elytra diffusely punctate, with two or three intervals showing indistinctly, marginal stria very slightly curved at humerus and almost straight behind, the inflexed edge or lobe is of the same width from the curve forward, and abruptly narrowed behind, with a few very fine marginal punctures; below, with the epimera, sides of abdomen, last segment and pygidium, yellowish, with dark rings on thighs; fossa of ♀ deep and shining; some specimens are more or less suffused with black, so as to cover everything except the edges of the elytra and sides of the thorax; in these examples the under side is also dark. Comes near *analis*, Lec.

Pheenix and Prescott, Arizona, five ♀'s, four ♂'s. Type coll., Bowditch.

Pachybrachys Wickhami, nov. sp.—Thickly silvery, pubescent, slender, cylindrical, black, with indeterminate red markings on the elytra. Length, $2\frac{3}{4}$ –3 mm.

Front slightly convex, punctured, eyes distant in both sexes, antennæ very short, barely reaching the middle of the body in ♀, slightly longer in ♂, darkened towards the tip, thorax rather broad, slightly contracted both front and rear, punctures almost invisible through the pubescence, depressed behind with a fairly-developed lobe, hind angles much rounded, leaving the remainder of the lateral edge almost straight, elytra parallel, fairly regular, punctate striate, but much obscured by the pubescence, the red markings seem indeterminate, but consist primarily of root marks on the second, third and humeral intervals, a band below the humerus, running obliquely to the third interval, before the middle; a transverse spot at the middle of the side before the convexity, the tips and a spot just anterior to it. The three ♀ specimens before me vary somewhat in extent of markings, and the only ♂ has the spots considerably suffused and spread out, so that the elytra are almost luteous, below and legs black, more or less picked out with luteous on the usual places.

Three ♀'s, 1 ♂, Tucson, Arizona. Type coll., Bowditch. Should be placed near *hematodes*, Suff.

Pachybrachys discoideus, nov. sp.—Stout, black, elytra orange-yellow, with discoidal black mark. Length, $3\frac{1}{2}$ mm.

Head flat, with punctured impressed line; antennæ dusky-yellow, with the end joint smoky, very short, reaching only a little beyond thorax (♀); eyes distant (♀), thorax much wider than long, very much narrowed, or almost compressed in front; transversely impressed behind, ante-scutellar lobe not marked; sides subangulate, sinuate behind, surface thickly punctured, grossly so at the anterior angles, elytra moderately, regularly striate, punctate, except the scutellar area; entirely orange-yellow, except a common sutural stripe which runs from the base to a point in the suture just over the edge of the convexity; the rear ends are beveled to a point from the outside to the suture, marginal stria moderately curved and sinuate, lobe well developed, with a black edge and fine row of marginal punctures, scutel piceous; below and legs black, fossa (♀) round, deep, shiny and small. Near *limbatus*, Newm.

One ♀, P. Orange, Florida. Type in Snow collections.

Pachybrachys marginatus, nov. sp.—Black, with wide, red marginal border from head to tip. Length, 3 mm.

Head black, front convex, thickly punctulate, sparsely pubescent; labrum and antennæ yellowish, latter darker towards the tip, which in ♂ reaches a little beyond the hind coxa; eyes distant; thorax black, the

lateral edge with a wide, red border; semi-shining, thickly and evenly punctured, and with a smooth and slightly raised median line; narrowed in front, depressed and somewhat narrowed behind, with an impressed marginal line, making a prominent ante-scutella lobe, lateral edge curved; elytra black, with a wide red border, which is partially interrupted on the edge, at the convexity; this border makes an almost straight continuation of the thoracic border, surface closely and diffusely punctate, except the two side intervals are well marked, and in the rear the two intervals nearest the suture are plain; in some parts of the others the punctuation is finer and sparser at the rear, all below black, with silvery pubescence. Near *limbatus*, Neum.

One ♂. Prescott, Arizona. Type coll., Bowditch.

Pachybrachys Jacobyi, nov. sp.—Colour above pale yellowish-gray; form stout, robust, shiny, suffusely punctate, slightly narrowed towards the front. Length, $2\frac{1}{2}$ –4 mm.

Head broad and flattened, thickly and coarsely, very light brown punctured, with impressed frontal line; eyes notably distant in both sexes, and rather small compared with the size of the head, antennæ reaching about the hind coxæ in ♂, not quite as long in ♀; first five joints yellow, the remainder gradually dark, with bases of six and seven light; thorax stout cylindrical, slightly narrowed towards the front, rear edge swollen and depressed, thickly and irregularly finely light brown punctured, the sides excepted; lateral edge moderately curved, slightly sinuate in ♀ toward the rear; elytra diffusely and thickly, finely light brown punctate, not, however, as diffusely as thorax, the punctures arranged towards the rear and sides in lines of greater or less length, but not costate or ridged, except that the third, fifth and humeral intervals are at times traceable to a greater or less extent, and a sutural shield is sometimes indicated in the usual place; curve of the marginal stria very moderate, round the shoulder, and the almost straight edge and lobe rather swollen, especially noticeably in ♀ round the shoulder-hump; very lightly punctulate on the edge of the curve; neither of these features are as noticeable in the ♂. All below with legs entirely pallid, except that the meso- and metasternum and the rings of the abdomen are somewhat suffused with brownish-black; ♀ fossa moderately deep, punctured.

The typical form occurs in California, Arizona, Utah; certain specimens from La Junta, Colorado, which I refer to this species are much more coarsely punctured and have a greenish tint to the elytra; in some

of the Colorado ♀'s the punctuation is so coarse that it is almost scabrous, the Bridgport ♀ has a dark mark on the vertex of the head, and the thorax with a very indefinite M; elytra with the standard outside dark marks indicated by faint indistinct clouds. This is the form called *livens*? Lec., by Jacoby in *Biologia*, VI, Pt. I, Supp. p. 151.

Amedee and Bridgport, California; Winslow, Arizona; St. George, Utah. Collected by Wickham, 9 ♀'s, 3 ♂'s, two Arizona, one Texas. Four ♀'s, 4 ♂'s, La Junta, Colorado. Type coll., Bowditch.

Pachybrachys mellitus, n. sp.—Form and size of *Jacobyi*, n. sp., but upper side entirely dark honey-yellow, shining.

Head large and flat, coarsely punctate, almost rugosely so on the usual dark frontal and vertex marks; antennæ with five or six basal joints yellow, rest dark, shorter than *Jacobyi*, not reaching the hind coxæ in ♂; thorax broad: depressed behind, coarsely punctate, the punctures grouped so as to leave irregular, smooth, shiny, elevated areas, with sometimes a smooth median line; the thickly punctured spaces are most noticeable where the dark parts of a thoracic M would naturally occur, and raised areas are most marked at the sides and in ♀'s, thoracic edge lightly subangulate; elytra stout and parallel, punctures as a whole finer than those of the thorax, confused in the scutellar area and behind the humerus, the remainder of the elytral surface striate, punctate, the third, fifth and humeral intervals being the best developed; very few of the thoracic or elytral punctures have any dark colour in them, the elytra are also very lightly transversely wrinkled, this being most noticeable anteriorly, and the effect is to make the elytra a little less shiny than the thorax; the scutellum is also rather long and more pointed than *Jacobyi*, the marginal stria is well marked, lightly sinuate behind the humeral curve, lobe rather abruptly narrowed in rear, with a row of strong punctures reaching well forward of the shoulder; below clothed with silvery pubescence, dark rufous and yellow, with the epimera and sides of abdomen picked out in the lighter colours; legs rufous, with usual lighter spots.

Inyo Mts., ♂, ♀; Mojave, one ♀; Darwin, California, one ♂; Tucson, Arizona, ♂, ♀; St. George, Utah, five ♂'s, one ♀, all coll. by Wickham. Type coll., Bowditch.

The large size and shining yellow colour make this species easy to recognize. The Darwin and Mojave specimens have the punctures of the lobe less well defined.

Pachybrachys Coloradensis, nov. sp.—Small, above pale grayish-white, form elongate, slender, elytra parallel, striate, punctate. Length, $1\frac{3}{4}$ – $2\frac{1}{2}$ mm.

Head large, front nearly flat, rather thickly, brownly punctate, with narrow brownish frontal line, and more or less of a cloud on the vertex; eyes distant, antennæ with first five joints and base of sixth light, after that dark, a little more than half the length of the body; thorax thickly and rather evenly brown punctate, except the edges, depressed behind and often with a small brown spot in the depression before the scutel, edge very lightly and indefinitely rounded; elytra cylinder-shaped, covered with striæ of dark brown punctures, which are diffused in the vicinity of the scutellum and slightly irregular behind and below the humerus; lobe moderate, ♀ with a very well marked row of marginal punctures from upper edge of the curve to end of sinuation, ♂ usually not quite as numerous nor well marked, below black, with epimera, sides of abdomen, venter and pygidium whitish-yellow; legs yellow, with darker spots or clouds on thighs; in some specimens the black of the body under the elytra seems to show through the elytra; the sutural row of punctures is on the edge, and gives the appearance of a very fine black line.

Seven ♂'s, five ♀'s, Colorado Springs, Colorado; Coolidge, New Mexico; Clear Lake, Utah. All coll. by Wickham. Type coll., Bowditch.

Of about the size and shape of *P. densus*, Bow., but lighter in colour and at once separated by the punctate striate elytra.

Pachybrachys densus, nov. sp.—Small, above pale testaceous, or dirty-yellow, very thickly and finely, diffusely, brown punctate. Length, $1\frac{3}{4}$ – $2\frac{1}{2}$ mm.

Head slightly convex in front, the usual dark frontal markings hardly visible, thickly and finely punctulate; eyes distant; antennæ dirty-brown, reaching to first segment of abdomen in ♀; thorax wider than long, thickly and evenly punctate without darker clouds, depressed behind, sides subangulate; elytra of same colour as thorax and entirely, diffusely, thickly punctate, though in one specimen the course of the third, fifth and humeral intervals can be traced; lobe small, wholly occupied by punctures, marginal stria very lightly curved and barely sinuate behind; body beneath dark, with the epimera, abdominal sides and pygidium picked out in lighter colour; legs light, with dark rings on thighs.

♂, ♀, Arizona. Type coll., Bowditch.

Pachybrachys minor, nov. sp.—Small, curved (as seen from the side), dirty, shining yellow, fairly regularly punctate striate. Length, $1\frac{3}{4}$ – $2\frac{1}{4}$ mm.

Head yellow, front convex, very finely punctured, median and vertex lines small, not at all prominent, also with supplemental marks from the upper edges of the eyes, which are distant; antennæ yellow, darker after the middle, reaching in the male to the second segment of the abdomen, thorax yellow, moderately narrowed in front, thickly punctured, the M very indefinitely indicated in brown clouds, transverse depression very light, sides subangulate; elytra yellow, a little wider than the thorax, regularly brown punctate striate, except the scutellar area, which is diffuse and with a confusion behind the humerus, which seems to vary from well marked to almost nothing, the marginal stria is very lightly curved at the humerus and lightly sinuate behind, the lobe is small, with a row of punctures; there is no well-defined shield; the body beneath is black, with the epimera, sides and end of abdomen and pygidium broadly testaceous, especially in the ♀, which has a well-marked fossa; legs yellow, with ferruginous marks, the general upper outline viewed from the side is curved. Two ♂'s, one ♀, Walnut, Arizona. Type coll., Bowditch.

A careful examination of my specimens satisfies me that the form which shows the most disturbance of the elytral intervals behind the humerus is abnormal, and that probably the normal example has only a slight disturbance of the regularity. The ♂'s are narrow and appear curved.

Pachybrachys Lodingi, nov. sp.—Small, stout, almost entirely dirty-yellow, fairly regularly punctate striate. Length, 2 – $2\frac{1}{2}$ mm.

Head flat, medium punctate, usual dark mark on centre and vertex, antennæ yellow, darker, and stouter towards the end and reaching a trifle beyond the middle of the body, ♂, considerably shorter in ♀; thorax tubularly compressed in front, rather evenly coarsely punctured, not crowded (in some specimens the punctures are almost sparse and a good deal finer), the M very indistinctly indicated by clouds, more distinct in the sparsely-punctured specimens, lobe well marked before the scutel, and with the rear edge somewhat swollen and smooth, sides slightly bowed in ♂, rounded in ♀, elytra showing a dark spot on the point of the humerus and sometimes very faintly some of the standard spots, and narrowly black along the suture; punctures moderate in size, confused in the scutellar area and backward along the suture to the convexity, otherwise regularly arranged in striae, showing intervals, which are fairly regular, except that the sixth and

seventh are a little mixed back of the shoulder and the marginal is a good deal disturbed above and back of the lobe, third is complete and well developed, and exhibits a pretty well-defined elytral shield; the general effect is of quite regular intervals; marginal stria almost subangulate at the lobe in ♂ and sinuate back of that; ♀ not so pronounced, lobe inconspicuous; body below dark with epimera, sides and middle of abdomen, last segment and pygidium yellow, legs pale, with slightly livid clouds, fossa of ♀ large, shallow and round.

Two ♂'s, Spring Hill, three ♀'s, Grand Bay, Alabama, three North Carolina, one Florida. Type coll., Bowditch.

Sent me by Mr. Loding with other species. Three examples from Florida placed provisionally with this species differ by being much more regularly striate and more lightly punctate, and are probably a different species.

(To be continued)

NOTE ON EUPELETERIA, TOWNSEND AND ALLIED GENERA.—The genus *Eupeleteria* was erected on page 111, Tax. Musc. Flies, Smithson. Miscell. Coll., No. 1803 (May, 1908), and three species named as included in it. I herewith propose *Echinomyia fera*, L., as the type of *Eupeleteria*. The genus cannot include *E. magnicornis*, Zett., which must be taken as the type of *Eudoromyia*, Bezzi. I am indebted to Professor M. Bezzi for directing my attention to this point. *E. praeceps* is the type of the genus *Pareudora*, Wachtl. I retain *Tachina grossa*, L., as the type of *Echinomyia*, as originally proposed by Brauer and von Bergenstamm.—C. H. T. TOWNSEND.

BOOK NOTICE.

QUATERNARY MYRIAPODS AND INSECTS OF CALIFORNIA, Univ. of California Publications, Geology, Vol. 5, No. 12, by Fordyce Grinnell, Jr.

A report on the fossil *Myriapods* and *Coleoptera* found in the limestone caves of Shasta County, and in the asphalt beds at Rosemary, near Los Angeles. In the *Myriapoda*, two new *Iulids* and a *Spirobolus* are described. Sixteen species of *Coleoptera* are listed, of which three, belonging to the genus *Eleodes*, are described as new. There are two plates, with 44 figures, depicting all of the species. Little work has been done on the fossil insect fauna of California, and many interesting discoveries await the student.—KARL R. COOLIDGE, Pacific Grove, Cal.

Mailed July 7th, 1909.