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# ENTOMOLOGICAL NEWS

Vol. XXIII.

No. 5



*S. S. Haldeman 1868.*

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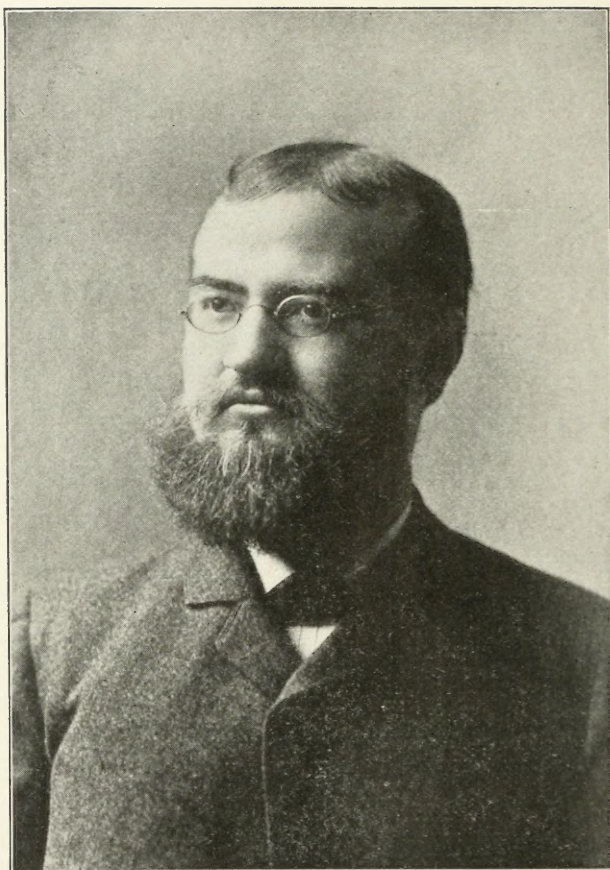
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PROFESSOR JOHN B. SMITH.

# ENTOMOLOGICAL NEWS

AND

## PROCEEDINGS OF THE ENTOMOLOGICAL SECTION

ACADEMY OF NATURAL SCIENCES, PHILADELPHIA.

VOL. XXIII.

MAY, 1912.

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## Professor John Bernhardt Smith, Sc.D.

(Portrait, Plate XI)

Professor John Bernhardt Smith, one of the best known entomologists in this country, and widely known in foreign lands also, died at his home at New Brunswick, New Jersey, on Tuesday morning, March 12th, after an illness of seven months. For some years Professor Smith had been ailing, and in 1906, partly under the advice of his physician, he spent several months in Europe in the hope of regaining his health. He returned a much better man physically; but he was never again his old self, and he frequently alluded in a jocular manner to the fast approaching end to his earthly career. His indomitable energy, however, kept him from becoming a chronic invalid, and even during the last months of his life when he was largely confined to his bed he regularly attended to his correspondence and directed the work under his charge at the New Jersey Agricultural Experiment Station. Bright's disease, with its manifold complications, finally claimed him, and he rapidly sank under its dreaded influence.

Professor Smith was born in New York City on November 21, 1858. He was educated in the Public schools, studied law

and was admitted to the bar in 1879. But the practice of law was not to his especial liking; and, as he himself once expressed it, "a fly on the wall was more interesting to him than the case in hand." In 1884, after a four years' career as a lawyer, he bade adieu to that vocation forever, and accepted the appointment as Special Agent to the United States Department of Agriculture at Washington under the late Dr. C. V. Riley. In 1886 he became Assistant Curator of Entomology in the United States National Museum, and in the three years of his connection with that Institution published a number of excellent papers and monographic works, chief among which are his "Monograph of the Sphingidæ of America north of Mexico," "A Preliminary Catalogue of the Arctiidæ of Temperate North America," "A Revision of the Lepidopterous Family Saturniidæ," some of his "Contributions toward a Monograph of the Family Noctuidæ," and "Notes on the Species of *Lachnosterna* of Temperate North America with descriptions of New Species."

In 1889 he resigned his post in the National Museum to accept a Professorship of entomology at Rutgers College, and to become entomologist to the New Jersey Agricultural Experiment Station at New Brunswick, positions which he held until the time of his death, and to which was added in 1894 the office of State Entomologist of New Jersey. In these three capacities he brought honor and renown to the institutions he served. His annual reports, which all told, form several bulky volumes, are mines of information, and rank with the best ever produced by any experiment station. His numerous bulletins also represent a vast amount of original research along economic lines. His "Contribution toward a Knowledge of the Mouth Parts of the Diptera" (1890) set forth views on the homologies of these organs quite different from those generally accepted.

In 1902 he became intensely interested in the work of the extermination of mosquitoes which had been prosecuted with marked success in various parts of the world, and he immediately urged and secured from the legislature in 1903, under



the most adverse conditions, an appropriation for an investigation of the subject in New Jersey. The final report (1905), which covered a two years' investigation, comprised 482 printed pages and treated elaborately every phase of the subject, economic and systematic. From the time of the appearance of that report on, he annually secured, by dint of hard work, an appropriation to carry the recommendations made in the report into effect. The success of his work has been heralded far and wide, and the ditching scheme for the draining of marshes was developed by him in the highest degree. To Professor Smith is due the credit for having demonstrated the practicability of ridding immense marsh areas of a most pestiferous insect.

During all the years of his work on economic entomology which kept him busy answering a voluminous correspondence, attending Farmers' Institute meetings and experimenting with proprietary insecticides which came on the market, he still found time to pursue his work on the systematic side of the subject and continued to publish incessantly revisions of particular Noctuid genera and papers on new species of Noctuidæ, in which family he was the recognized authority. In 1893 he also published as Bulletin 44 of the United States National Museum his "Catalogue of the Lepidopterous Superfamily Noctuidæ found in Boreal America," which was an excellent illustration not only of the industry of the man but of his wide knowledge of the family which he chose for his specialty.

The popular side of entomology also was not neglected as is shown by his two books "Economic Entomology," and "Our Insect Friends and Enemies;" nor was the general subject, as is shown by his three lists of the insects of New Jersey, each of which was a total revision of the last and really a separate work, his "Explanation of Terms used in Entomology" and his two lists of the Lepidoptera of Boreal America.

As a lecturer he was widely in demand by Farmers' Institutes, public schools and scientific institutions.

Professor Smith was a firm believer in scientific societies and himself belonged to many, including the Brooklyn Entomological Society, of whose journals, "The Bulletin of the Brooklyn Entomological Society" and "Entomologica Americana," he was editor from 1882 to 1890; Newark Entomological Society of which he was an honorary member, Feldman Collecting Social, Entomological Society of Ontario, Entomological Society of America, Association of Economic Entomologists, Society for the promotion of Agricultural Science, Brooklyn Institute, Washington Academy, New Jersey State Microscopical Society, Ottawa Field-Naturalists' Club, etc. He was a fellow of the American Association for the Advancement of Science and of the New York Academy of Sciences, and a corresponding member of the American Entomological Society (elected June 28, 1897). In most of these societies he was an active member, and frequently served in the capacities of president and secretary at one time or another.

In recognition of his high attainments as a scientist, the honorary degree of doctor of science was conferred upon him by Rutgers College in 1891.

To all who knew him he was ever the same jovial, good natured man, always willing to help where assistance was needed. He will be greatly missed not only by his many friends and scientific associates to whom he had endeared himself, but by scientific workers throughout the country.

He is survived by a widow and two grown up children.

JOHN A. GROSSBECK.

---

### The Dragonfly *Argia moesta* and a new species (Odonata).

By E. B. WILLIAMSON, Bluffton, Indiana.

*Agrion moestum* and *putridum*, as described by Hagen, have some slight differences in color and size only to distinguish them. In *Synopsis des Agrionines*, 5me légion, *Argia putrida*

is recognized as very closely related to *moesta*, and an added character, reduced venation, is mentioned as distinguishing *putrida*. At the same time a race (?) from Rock Island, Illinois, is mentioned which equals or slightly exceeds *moesta* in size. Calvert, in *A List and Bibliography of the Species (of Argia)*, *Bull. Mus. Comp. Zool.*, 1902, lists *putrida* as a variety of *moesta*. The same opinion is expressed on page 76 of the *Biol. Cent. Am. Neur.*

In studying some material from Texas and Oklahoma, I have found it necessary to examine carefully the status of these two nominal species, and my conclusion is that, if two species exist, they must be defined in terms of other characters than those used in the past; and I am at present unable to detect any such characters. I have studied specimens from Texas, Oklahoma, Tennessee, Indiana, Ohio, District of Columbia, Pennsylvania, Maine, Michigan and Ontario.

Of these the palest male individual is from Ontario, which has about one-half the mesepisternum and less than one-half the mesepimeron dark colored. This individual has the abdomen black with pale on sides of 1, lateral apical spot on 2, and the customary narrow basal abdominal rings. It has the abdomen 33.5 mm., hind wing 25 mm. The darkest male individual is from Wister, Oklahoma, in which the entire thorax is dark, with a narrow pale antehumeral stripe, not reaching the antealar sinus, and a narrow, abbreviated streak on the metepisternum. This specimen has the abdomen black, with the basal annulations present but dark. Abdomen measures 32.5 mm., hind wing 25 mm.

To facilitate a comparison of thoracic pattern of males the following five types of pattern may be defined and designated by Roman numerals:

I, mesepisternum one-half black, mesepimeron with black in a broken pattern occupying less than one-half the area, metepisternum and metepimeron without black, with the exception of a line, present or absent, on the sutures.

II, mesepisternum one-half black, mesepimeron black excepting a narrow anterior stripe above and a narrow posterior stripe below, metepisternum and metepimeron without black.

III, mesepisternum two-thirds black, pale area not reaching antealar sinus, mesepimeron as in II, with pale slightly reduced, metepisternum and metepimeron pale as in II, but a distinct line on second lateral suture.

IV, mesepisternum two-thirds black, but pale area reaching the antealar sinus, mesepimeron as in III, but posterior ventral pale area reduced to a spot, metepisternum black below and narrowly along second lateral suture, metepimeron black, pale above in a sinuate pattern.

V, thorax all black, but a narrow pale antehumeral stripe not reaching the antealar sinus, and a narrow, abbreviated streak on the metepisternum near its middle, just posterior to the first lateral suture.

In the tabulation which follows, these numerals, followed by + or — mean respectively that the thorax is slightly darker or lighter than the number indicates.

MALES ONLY.

LOCALITY.	COLOR OF THORAX.	LENGTH OF ABDOMEN		LENGTH OF HINDWING	
		Ex-tremes	Average	Ex-tremes	Average
Texas . . .	IV+, IV+, IV—.	32-36	33.6	25-28	26
Oklahoma .	V, V—, V—, IV, V—, IV—, V—	30-33	32	23-25	24
Tennessee .	IV+, IV+, IV+		32		24.5
Indiana . .	II+, IV+, IV+, IV+, II, IV, IV+, II	30-34	31.7	23-25	24
Ohio . . . .	II		32		25
Pennsylvania	III, III, V—, IV+, III, III, III.	27-34	32	22-27	25
Maine . . .	III, III		30		24
Ontario . .	I+		33.5		25

In all the males studied the abdomen is black, with narrow basal rings on 2-7; in one specimen from Wister, Oklahoma, there is some pale color laterally on 1-5, and 9 and 10 have a little pale color laterally; in another male from Clifton, Texas, the pale color on 1-5 is faintly discernible; a male from Auburn,

Indiana, has some gray on either side of 9 and 10; other males from Tennessee, Pennsylvania and Maine have the sides of 1 pale, and a more or less distinct lateral spot on 2.

Females from the same localities show fewer differences. Unless obscured, there is present a longitudinal, dorsal pale area, adjoining or near the black dorsal carina; a similar pale area occupies the mesepimeron in all but its most anterior and dorsal portions; and a similar large pale area occupies the metepimeron, excepting only a narrow border; along the second lateral suture on the metepisternum a narrow area of the same kind is less definitely developed. These pale areas give the impression of a thin coating of paraffin over the general body color. They seem to depend largely on post-mortem changes, and asymmetrical specimens are not rare. One female from Indiana is remarkable; the pale areas on the thorax are of usual size and definiteness, but instead of being surrounded by the usual light brown or pearly gray, the pale areas lie in a field of dark brown or nearly black; the result is a thoracic color pattern not at all suggestive of other individuals of either sex in which, if any dark color appears, it is in the usual pale areas of the normal females; in this case the pale areas remain pale, but the adjoining areas are dark. Two other Indiana specimens suggest this female. In two other Indiana females the thorax is light brown with green dorsal thoracic stripes of indefinite pattern, suggesting *Gynacantha*.

To describe the dorsum of the abdomen of *moesta* as pale colored is only partially correct. About segment 6 the lateral apical and basal black fail to connect in a continuous line as they do on the preceding segments, and the black decreases posteriorly and disappears before 9. If segment 3 or 4 be examined carefully it will be apparent that the dorsum of each segment above the lateral black streak is darker colored than the sides below the streak, and that the definition of the black and paler is obscure on the dorsal side of the streak; there is no well-defined longitudinal dorsal pale area, and the dorsum color (reddish brown) is a very different color from the pale basal rings of obscure bluish.

Females from various localities show the following sizes:

LOCALITY	LENGTH OF ABDOMEN		LENGTH OF HIND WING	
	Extremes	Average	Extremes	Average
Texas . . . . .	31-34	32.5	26-29	27.5
Tennessee . . . . .		31		26
Indiana . . . . .	28.5-33	30.7	24-27	25.6
Pennsylvania . . . . .	30-33	32	25-27	26
Maine . . . . .	28-31	29.5		25
Michigan . . . . .		31.5		26

It is possible that a more intelligent study of larger material may reveal that I have included more than one species in the above discussion, but for the present I am forced to conclude that *putrida* is a synonym of *moesta*. In all the material I have been unable to detect any differences in male abdominal appendages or female mesostigmal laminae.

#### *Argia intruda* n. sp.

Associated with the dark *moesta* at Wister, Oklahoma, are other *Argias* which seem to be specifically distinct from *moesta*, and which, after some correspondence with Dr. Calvert on the subject, I venture to describe as new.

*Male*. Abdomen 33-36, average 34.5, hind wing 25-26, average 25.3.

*Female*. Abdomen 33-37, average 33.8, hind wing 26-29, average 27.2.

*Male*. Head dull pale brown, rear of head black above, pale brown below.

Thorax pale brown, black as follows: A middorsal thoracic stripe, on either side occupying one-half the mesepisternum; a spot on the mesepimeron against the humeral suture where it meets the mesinfraepisternum, and another above against the first lateral suture just in front of (or below) the posterior border; a faint line on humeral suture, widened into a small spot above. This is the palest coloration represented and is shown by four specimens; in others the two spots on the mesepimeron grow towards each other till they form an oblique

irregular stripe across the mesepimeron; from this stage this stripe grows in width posteriorly till it occupies nearly the entire area (pattern II, as described under *moesta*); this stage represents the maximum development of black on the thorax and is attained by only a single specimen.

Abdomen black above, pale below on the sides on all segments but 7, pale narrow blue basal rings on 3-7, a longitudinal middorsal stripe, absent or very reduced on 6-7; 9 and 10 variable, generally gray or light brown, excepting the lower lateral margins and ventrally, and a black lateral spot on either side, near the middle, of 9; this spot on 9 may be wanting or it may be developed into an elongated spot.

Abdominal appendages similar to *moesta* (see Fig. 29, Tab. 4, Biol. Centr. Am. Neur.), but the inferiors are longer than the superiors (not equal), and are terminated by a large, rounded, pale tubercle.

*Female*. Similar to the male. Black area on rear of head reduced to a spot on either side.

Darkest thoracic pattern: A black line on either side of the middorsal thoracic carina, originating just below the antalar sinus and reaching the mesostigmal lamina, separated from the black middorsal carina by pale area equal to the width of the black line, the dark line and the pale area next the carina together occupy less than one-half the area of the mesepisternum. This black area is developed in a pale area which is present on the mesepisternum as well as on the mesepimeron and metepimeron, as described for *moesta*. In other specimens the black dorsal lines on either side of the middorsal carina are reduced and in three specimens they are wanting altogether. No such lines are present in *moesta*. All specimens show more or less distinctly the pale areas above mentioned as present on females of *moesta*.

Abdomen darker than in any *moesta* examined, though, if the reddish brown of *moesta* be considered dark, *moesta* has a more extensive area dark colored, since in *moesta* there is no longitudinal middorsal pale area, while in *intruda* the dorsum is black (instead of reddish brown as in *moesta*), and there is a narrow but sharply defined and distinct pale longitudinal middorsal stripe, narrowest on 7, where it is reduced to the merest line. The lateral black is carried posteriorly on to 9, usually to its apex; 10 is pale colored. Sides of abdomen below the black, pale colored.

The mesostigmal lamina of *intruda* differs from *moesta* as follows: in *moesta* the posterior (or superior) lobe of the lamina is symmetrical with the border of the lamina on either side similarly curved, while the anterior (or inferior) border of the lamina is distinctly concave, the external angle of the lamina being correspondingly acute; in *intruda* the posterior (or superior) border of the lamina external to

the lobe is straighter or less curved than internal to the lobe, resulting in an asymmetrical lobe, and the anterior (or inferior) border is straight or slightly convex, resulting in a less acute external angle.

Wister, Oklahoma, August 2 and 4, 1907; 15 males, 17 females, Frank Collins; all in collection of E. B. Williamson. When this material was studied and the differences detected, specimens were sent to Dr. Calvert for his opinion. He kindly separated the appendages of several males and returned these specimens to me. In his opinion they are specifically distinct from the material which we identify as *moesta* and *putrida*, and it is at his suggestion that I have described them as new.

The material on which the preceding study is based is in my collection and is as follows:

*Argia moesta.*

Texas—Bay City, May 24, 1907, 2 males, 1 female, E. B. W.

Clifton, May 28, June 1, 1907, 16 males, 9 females, E. B. W.

Oklahoma—Wister, June 3, 1907, 1 male, E. B. W.; August 2 and 4, 1907, 6 males, Frank Collins.

Tennessee—Nashville, Cumberland River, September 29 and October 5, 1900, and June 1, 1901, 3 males, 1 female, E. B. W.

Indiana—Saint Paul, August 13, 1911, 11 males, 5 females, E. B. W.

Bluffton, without data, 2 males; July 10, 1900, 1 male; July 27, 1902, male, female; August 9, 1903, 1 male; July 16, 1905, 3 males, 2 females; July 22, 1906, 1 male; August 1, 1909, male, female; June 8, 1911, male, female, E. B. W.

Ft. Wayne, July 17 and 18, 1901, 2 males, 4 females, E. B. W.

James Lake, July 5, 1908, 1 male, E. B. W.

Auburn, July 7, 1911, 1 male, E. B. W.

Ohio—Kent, June 21, 1900, 1 male, J. S. Hine.

District of Columbia—July 18, 1897, 1 male, J. S. Hine.

Pennsylvania—Fayette County, July 2, 1899, 1 male, E. B. W.

Ohio Pyle, June 24, 1900, 2 males, 1 female, E. B. W.; September 8, 1901, 5 males, 3 females, J. L. Graf.

Maine—7 males, 8 females, F. L. Harvey.

Michigan—Emmett County, August 11, 1907, 1 female, L. A. Williamson.

Ontario—Go Home Bay, July 12, 1907, 1 male, E. M. Walker.

*Argia intruda.*

Oklahoma—Wister, August 2 and 4, 1907, 15 males, 17 females, Frank Collins.



All specimens studied have, I believe, a nature color pattern which would not have varied with increasing age, though I do not know how early in the life of the imago this pattern is attained, since I have no teneral material before me, and I have no notes on the colors of recently emerged imagoes. Thoracic pruinescence appears first ventrally, occupying the bases of the legs and the metepimeron, then the pale areas of the thorax, and finally, in older individuals, including the entire thorax and obscuring the thoracic pattern. It can be removed by gentle rubbing or scraping. Pruinescence of the apical abdominal segments appears later in the life of the imago than the first traces of thoracic pruinescence. These two species of *Argia* begin to show thoracic pruinescence earlier in imaginal life than any other dragonflies known to me.

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### Observations on the Lepidoptera of St. Louis, Missouri, and vicinity during 1911.

By the Members of the St. Louis Entomological Club.

Compiled by AUGUST KNETZLER.

The opening of the season, being quickly followed by hot weather and a protracted drouth, brought out some unexpected features, the most striking of which was the wonderful abundance of the entire *Colias* family and the scarcity of *Papilio*s. Particularly surprising was the appearance in large numbers of *Dione vanillae*, specimens of which could be seen daily on the city streets from August till November. The larvae of this beautiful insect were found feeding on *Passiflora* in several gardens. No less remarkable was the first appearance here of the fine large Hesperid, *Calpododes ethlius*, of which not only were there several fine specimens taken, but the larvae also were discovered feeding on *Canna* by Mr. Ernst Schwarz, who bred several with good results, the imagoes emerging even after our first heavy frost. Another new Hesperid, male and female, not yet determined, was taken by Mr. Paul Schroers.

Of Heterocera nearly all species were common during the early half of the season, more particularly *Ecpanteria deflorata*, *Haploa lecontei*, *Haploa vestalis* and *Anisota rubicunda*; while *Cressonia juglandis* and *Ampelophaga choerilus* were not observed. All Saturniidae and Sphingidae were scarce. During the latter part of the season most Heterocera were not nearly as common as in previous seasons. New species were taken as follows: *Eueyrythra phasma*, *Apantesis anna*, *A. persephone*, *Ampelophaga versicolor*, *Erebus odora* and *Cochlidon Y-inversa* by Mr. Paul Schroers; *Pholus vitis* by Mr. Frank Malkmus; *Catocala viduata*, *C. dejecta*, *Schinia chrysellus* and *S. trifascia* by Mr. Geo. Hosenfelt. All larvae were scarce during the latter part of the season.

The following list of Rhopalocera, with remarks applying to the season of 1911, contains the names of all the different species taken in this locality within the last fifteen years:

1. *Danais plexippus*, L. Abundant particularly during October. Their flight this year seemed to be in a southwesterly direction.
2. *Dione vanillae*, L. For once this ever rare insect was common.
3. *Euptoieta claudia*, Cr. Swarming during September and October.
4. *Argynnis diana*, Cr. None observed.
5. *Argynnis idalia*, Dr. One specimen taken by the writer.
6. *Argynnis cybele*, Fab. Common in June.
7. *Phyciodes nycteis*, D. and H. Common in July.
8. *Phyciodes ismeria*, B. and L. None observed.
9. *Phyciodes tharos*, Dr. Common in June.
10. *Phyciodes tharos* v. *marcia*, Edw. Many specimens taken in April.
11. *Phyciodes tharos* v. *morpheus*, Fab. Common, summer and fall.
12. *Phyciodes tharos* v. *packardii*, S. None observed.
13. *Melitaea phaeton*, Dr. None observed.
14. *Grapta interrogationis* v. *umbrosa*, L. Common.
15. *Grapta interrogationis* v. *fabricii*, Edw. Usually common during September and October, very rare this season.
16. *Grapta comma*, H. Scarce.
17. *Grapta comma*, v. *harrisi*, Edw. Scarce.
18. *Grapta comma*, v. *dryas*, Edw. Fairly common.
19. *Grapta progne*, Cr. Observed by Mr. Fred. Schwarz.
20. *Vanessa J-album*, B. and L. None observed.
21. *Vanessa antiopa*, L. Scarce as usual.
22. *Vanessa milberti*, G. Observed by Mr. Paul Schroers.

23. *Pyrameis atalanta*, L. Common in June, but extremely rare later.
24. *Pyrameis huntera*, F. Abundant.
25. *Pyrameis cardui*, L. Common.
26. *Junonia coenia*, H. Perhaps never before so abundant. Mr. Noel Poepping, while on a trip to S. E. Missouri, reported that he saw myriads of this species flying across the Mississippi River, many falling into the water.
27. *Limenitis ursula*, G. Moderate.
28. *Limenitis disippus*, G. Quite abundant.
29. *Apatura celtis*, B. and L. Common.
30. *Apatura clyton*, B. and L. Rare.
31. *Apatura clyton* v. *proserpina*, Sc. Extremely rare.
32. *Anaea andria*, Sc. Not as common as usual.
33. *Debis portlandia*, F. Common.
34. *Neonympha eurytus*, F. Common.
35. *Satyrus alope*, F. Taken at Meramee Highland, Mo., by Messrs. Herman Schwarz and Chas. Dieckmann.
36. *Libythea bachmanni*, K. Common June and July, but not seen later.
37. *Thecla M-album*, B. and L. None observed.
38. *Thecla melinus*, H. Common.
39. *Thecla calanus*, H. Common in June.
40. *Thecla calanus* v. *lorata*, G. and R. None observed.
41. *Thecla liparops*, B. and L. One specimen taken at Forest Park by Mr. Marion Henderson.
42. *Thecla damon* v. *discoidalis*, Sk. One specimen taken at Forest Park by the writer.
43. *Thecla cecrops*, F. Quite abundant.
44. *Thecla irus*, G. Common in April.
45. *Thecla titus*, F. Common in July.
46. *Feniseca tarquinius*, F. Scarce.
47. *Chrysophanus thoe*, B. Common.
48. *Chrysophanus hypophaeas*, B. Common.
49. *Chrysophanus hypophaeas* v. *fasciata*, S. One specimen taken by writer.
50. *Calephelis borealis*, G. and R. None observed.
51. *Lycaena pseudargiolus*, B. and L. Common.
52. *Lycaena pseudargiolus* v. *violacea*, Edw. Scarce.
53. *Lycaena pseudargiolus* v. *marginata*, Edw. Scarce.
54. *Lycaena comyntas*, G. Common.
55. *Lycaena isola*, R. One specimen taken at Forest Park by Mr. Marion Henderson.
56. *Lycaena isola* v. *alce*, Edw. None observed.
57. *Pieris protodice*, B. and L. Abundant all season.

58. *Pieris protodice* v. *vernalis*, Edw. Very scarce. March.
59. *Pieris rapae*, L. Unfortunately common.
60. *Pieris rapae* v. *immaculata*, Sk. and A. None taken.
61. *Pieris rapae* v. *novangliae*, Sc. None taken.
62. *Nathalis iole*. Extremely common.
63. *Euchloe genutia*, F. Two specimens taken by Mr. Ernest Schwarz.
64. *Euchloe olympia* v. *rosa*, Edw. Seems to have become extinct in this locality.
65. *Catopsilia eubule*, L. Exceptionally abundant.
66. *Zerene caesia*, St. Common in July.
67. *Zerene caesia* v. *rosa*, McN. Scarce, October.
68. *Colias eurytheme*, B. With its variations.
69. *Colias ariadne*, Edw. Probably never before more abundant.
70. *Colias eryphile*, Edw. Probably never before more abundant.
71. *Colias keewaydin*, Edw. Probably never before more abundant.
72. *Colias keewaydin* v. *alb.* Probably never before more abundant.
73. *Colias philodice*, G. Not as common as usual.
74. *Colias philodice* v. *alb.*, Sk. Not as common as usual.
75. *Terias mexicana*, B. Many specimens taken.
76. *Terias nicippe*, Cr. Abundant.
77. *Terias nicippe* v. *flava*, St. Scarce.
78. *Terias lisa*, B. Very common in September and October.
79. *Terias lisa* v. *alba*, St. Not common.
80. *Papilio ajax* v. *walshi*, Edw. Common April and early May.
81. *Papilio ajax* v. *telamonides*, F. Extremely rare.
82. *Papilio ajax* v. *marcellus*, B. and L. There seemed to be a direct transition from *walshi* to *marcellus* with *telamonides* eliminated altogether. *Marcellus* appeared in early June in fair numbers, while at its usual time, in late July, it was hardly in evidence.
83. *Papilio philenor*, L. Common in June, very scarce later.
84. *Papilio asterias*, Cr. Scarce all season.
85. *Papilio troilus*, L. Scarce all season.
86. *Papilio cresphontes*, Cr. Scarce all season.
87. *Papilio turnus*, L. Abundant in June, scarce later.
88. *Papilio glaucus*, L. Abundant in June, scarce later.
89. *Ancyloxypha numitor*, F. Common.
90. *Atrytone zabulon*, B. and L. Scarce.
91. *Atrytone hobomok*, H. Common.
92. *Atrytone hobomok* v. *pocahontas*, Sc. Scarce.
93. *Hylephila huron*, Edw. Common, September and October.
94. *Hylephila phylacus*, Dr. Common, October.
95. *Thymelicus otho*, S. and A. Scarce.
96. *Thymelicus cernes*, B. and L. Common.
97. *Thymelicus brettus*, B. and L. Very scarce. Several taken by Messrs. L. P. Arras and G. Hosenfelt.

98. *Polites peckius*, K. Scarce.
99. *Euphyes verna*, Edw. Scarce.
100. *Euphyes metacomet*, H. Scarce.
101. *Euphyes bellus*, Edw. None observed.
102. *Euphyes fusca*, G. and R. None observed.
103. *Limochroes manataagua*, Sc. None observed.
104. *Prenea ocola*, Edw. None observed.
105. *Phycanassa viator*, Edw. One specimen taken by the writer.
106. *Phycanassa delaware*, Edw. None observed.
107. *Calpodus ethlius*, Cr. Discovered breeding here, several specimens taken.
108. *Pholisora catullus*, F. Common.
109. *Pholisora hayhursti*, Edw. Common.
110. *Hesperia tessellata*, Sc. Common.
111. *Anthomaster leonardus*, H. None observed.
112. *Amblyscirtes vialis*, Edw. Rather scarce.
113. *Amblyscirtes samoset*, Sc. Rather scarce.
114. *Eudamus tityrus*, F. Not as common as usual.
115. *Eudamus lycidas*, S. and A. Abundant.
116. *Eudamus bathyllus*, S. and A. Fairly swarming.
117. *Eudamus pylades*, Sc. None observed.
118. *Thanaos brizo*, B. and L. Common.
119. *Thanaos martialis*, Sc. Common.
120. *Thanaos juvenalis*, F. Very scarce.
121. *Thanaos naevius*, L. None observed.

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## A Dry Year's Yield of Catocalae (Lepid.) 1911.

By R. R. ROWLEY and L. BERRY, Louisiana, Missouri.

Everybody remembers how warm the first of February was, in fact how warm the entire season has been. Insects began to fly early.

The first moth from a cocoon was an Indian *Caligula* on the 25th of March. After that *Cricula* and *Antherea* and, all through April, numbers of *Thais polycena*.

The first larva of *Catocala* was of *illecta*, half an inch long, on April 28th. After continued search through May, hardly a dozen caterpillars of this species were found, where the senior author had always before found them abundantly. It was evidently not an *illecta* year.

Some of the few larvae found were but freshly hatched,

very slender, faintly greenish, almost transparent. Head small and of the body color. All were found resting lengthwise along the underside of the small locust thorns, well color-protected.

A large *ilia*-like egg found on the underside of hickory bark, hatched on the 30th of April. The young larva was slender, gray with a tinge of green and with black cross bands. Very noticeably bristly. Head black. It refused hickory and fed on bur oak but died without moulting. In searching for *Catocala* eggs under the bark of shagbark hickory we had occasionally found dead eggs, large and elliptical, apparently of *ilia*. The live egg mentioned and found the winter before, gave an *ilia* larva.

Why are these eggs laid on a tree whose leaves the worm can never eat? Dead egg shells are not uncommon but never in crowded or overlapping masses as in the case of *palaeogama* and other hickory feeders.

A minute, distinctly reddish egg, ribbed as in *Catocala*, and found under hickory bark, hatched but was lost. It was probably *judith*.

The *ilia* and other eggs for rearing, were kept from hatching for nearly a month, on a cold cement floor and the experience was the same as in past years, the larvae did not thrive.

The young *ilia* larvae feed best on bur oak buds. They often refuse the leaves till they are well grown. The first imago of *Actias selene* cut through its cocoon, May 6th.

The cocoons of *Caligula cachara*, *Cricula trifenestrata*, *Antherea roylei* and *Actias selene* were furnished the senior author by Mr. James L. Mitchell of Indianapolis. An overlapping mass of white eggs, found under hickory bark, hatched on the 9th of May.

Eggs of *Catocala innubens* began hatching May 7th and eggs of *C. flebilis*, furnished by Mr. Ernest Schwarz of St. Louis, on May 10th. Eggs of *C. resecta* began hatching on May 11th and those of *C. vidua* and *C. nebulosa* on the 12th of the same month. Part of the *resecta* eggs were furnished the senior author by the junior and all of the *nebulosa* by Mr. Harold Davenport.

The little *nebulosa* worms were reddish brown with the head a little lighter than the body, but no further notes were obtained on this species as the little "crawlers" died without eating, although they were offered foliage of walnut, shellbark hickory, pecan, honey locust, plum, willow, sycamore, grape, linden, ash, poplar, apple, coffee bean, butter nut, elm, bur oak, and all of which they refused.

Larvae of *Catocala flebilis* readily ate hickory and pecan and were light brown, with a small, almost black head, just after hatching.

On the 18th, eight days later, these caterpillars were over half an inch long, dark or lead color lined with lighter longitudinally. Head a little darker than the rest of the body. The V's outlined middorsally.

On the 21st, the larvae were nearly an inch long, light gray, almost white with a darker cross band over the latter half of the 5th abdominal segment, over the 3d pair of prolegs. On the top of the first and second abdominal segments are two black dots and two short black dashes. Head with gray and black dashes. Tubercles black dot-like and each set with a bristle.

On the 25th the larvae of *flebilis* were one and a fourth inches long, light gray, almost white with black "W's" on the dorsal side of the 1st and 2d abdominal segments and a cross band of black or very dark brown on the top of the 5th abdominal segment. The underside of the body whitish green with dark brown, almost black midventral spots. Head dead-leaf brown without lateral dash. True and prolegs flesh color.

On the 30th, after moulting the day before, the larva was nearly two inches long, mottled gray with a lighter middorsal row of "V" spots, not very distinct. Tubercles reddish and studded with bristles. No lateral row of setae. A double black "V" on the dorsal side of the 1st and 2d abdominal segments and the cross black band over the 5th abdominal segment broken on top by the middorsal row of "V's."

On June 3d the larva was full two inches long and almost white with markings as described on May 30th. The head a chestnut brown with white streaks.

On June 6th, the caterpillars were from  $2\frac{1}{4}$  to  $2\frac{1}{2}$  inches long, light gray, almost as white as flour. Underside white with greenish tinge. Mid-ventral row of black spots. The two pairs of double dorsal "V's" on the 1st and 2d abdominal segments, black. A black cross band covers the dorsal side of the lateral half of the 5th abdominal segment but is separated middorsally by an elliptical spot. Tubercles red-brown. A few scattered lateral bristles or setae. True legs and head chestnut

brown with white mottling. No black dash on the side of the head. Prolegs body color. On the side of the 6th and 7th abdominal segments and behind the middorsal ridge on the 7th are black lines or dashes. The first two larvae began spinning inside leaves on June 9th.

The full grown larva of *flebilis* is about  $2\frac{1}{2}$  inches long and has as chief characteristics, a light ashen-gray color, reddish tubercles, lack of row of lateral setae, the broken cross band of dark brown or black over the lateral half of the 5th abdominal segment. Head and true legs flesh color. Head without side black dash. Whole body raspy. Imago July 1st.

The larvae of *Catocala resecta* on May 18th, seven days after hatching, were half an inch long, dark, almost black, striped longitudinally. Head, body color.

On May 21st larvae nearly  $\frac{3}{4}$  of an inch long, very dark, lined longitudinally with black and white. True legs flesh color. Prolegs lighter (ashen). The first two pairs the lightest. Head a little darker than the body color.

On the 25th the larva was  $1\frac{1}{4}$  inches long, bluish with a tinge of red. Tubercles reddish. Body indistinctly streaked longitudinally. Underside of the body greenish with the black, midventral round spots. Head hardly lighter than the body color, streaked longitudinally with white. Slight lateral dash of black. Lateral setae short.

On May 30th, the larva of *resecta* was  $1\frac{1}{2}$  inches long, reddish brown with red tubercles. Bristles dark. Head round with white and red-brown mottling. Front legs flesh color. The mid-dorsal row of spots very indistinct.

On June 1st the caterpillar is two inches long, grayish with a tinge of green. Tubercles reddish. A lateral row of short sparse setae. A cross band of brown on the top of the 5th abdominal segment. Head red-brown with white lines.

On June 5th the larvae were  $2\frac{1}{4}$  inches long, dark gray with central dorsal row of V spots not very distinct. Tubercles reddish. Lateral row of short setae. A cross band of darker brown on the latter half of 5th abdominal segment, dorsally. Head light chestnut with white linear markings. A short lateral black dash either side of the mouth. True legs light flesh color. Prolegs much the same color. The cross dorsal band broken by the middorsal row of "V's." Ventral side of the body white with the mid-row of black spots.

The first larva spun in leaves on the 15th of June and was less than  $1\frac{3}{4}$  inches long.

Compared with the larva of *flebilis*, that of *resecta* is much darker. On some of the grown larvae of *flebilis* there is a narrow stigmatal band, darker than the ashen body color and



black on the 5th, 6th, 8th, and 9th abdominal segments. The absence of the row of lateral setae on *flebilis* would distinguish it from *resecta*.

The first imago of *resecta* emerged on July 13th from a larva that spun on June 17th.

Eggs of *Catocala cara*, *piatrix* and *relicta* began hatching on the 17th of May.

The young larvae from the white eggs of a hickory species of *Catocala*, hatched on May 9th, were over half an inch long on the 18th, lead color, striped longitudinally with white. Head body color.

On the 21st, these caterpillars were over half an inch long and just ready to moult, dark, streaked longitudinally with gray and brown or black.

On the 25th one inch long, very dark with a whitish prunescence, giving the appearance of a blue-black, striped longitudinally. Head slightly browner than the body.

On June 8th, larvae over two inches long, gray, with a tinge of flesh color. A pair each of dorsal black "V's" on the first and second abdominal segments. A dark dorsal shade over the latter half of the 5th abdominal segment. Head gray with flesh tinge. A black line at the mouth. The row of lateral setae (fringe) strong. True and prolegs body color. Ventral side of the body white with a midrow of black spots set in red.

On June 10th larvae over two inches long, very light gray with faint reddish tinge. Double "V's" of black on the dorsal part of the 2d and 3d abdominal segments and brown cross band on the top and sides of the 5th and 6th abdominal segments. A lateral row of stout, short setae, set thickly. Tubercles faint reddish. Head, with pair of elongate hazel brown spots at the upper lobes, front streaked with white and darker. No black lateral dash.

On the 16th, the caterpillars were light gray with a reddish tinge. Tubercles pale flesh color, almost white. Side row of setae. The "V's" on the dorsum of the 2nd and 3rd abdominal segments almost obsolete. The cross black band between the 5th and 6th abdominal segments is continuous, not broken as before the last moult. Head very large, gray and light chestnut. Underside of the body light and the black spots are set in beautiful crimson. There is no black on the head except at the mouth. Over two inches long and near maturity but every larva perished without spinning.

The intensity of the heat probably was responsible for the loss of these interesting things. The eggs of this species were

found in an overlapping cluster on the underside of the bark of shell bark hickory and were white in color and discoidal in shape.

The description of this larva is given with the hope that the life history may be worked out from captured caterpillars, probably not uncommon under hickory bark in the early summer.

Another hickory larva from a dark red brown egg or June 20th was  $2\frac{3}{4}$  inches long, dark brown with light, almost white tubercles. Two pairs of dorsal black dots or short marks on each 1st and 2nd abdominal segments. Legs body color. Head somewhat lighter than the rest of the body. A black dash on either side of the head. No row of lateral setae. Behind the cross ridge on the 8th abdominal segment are black lines or shades, one to each of the two tubercles. Underside pale with the midventral black spots. One larva is almost a light prune color. Like the other hickory larvae just mentioned, these also died without pupating, but when fully grown. Species unknown to the writer.

The intense heat of the latter part of June played havoc with the *Catocala* larvae, the last of the white-egged species dying on the 24th.

The first larva of *Catocala grynea* was taken between shingles on apple on the 25th of May. It was almost white.

Eggs of *Catocala amatrrix* hatched on May 28th and the last of the larvae died on June 24th.

The last of the *ilia* larvae succumbed to the heat May 27th.

A second larva of *grynea* was taken on apple, May 29th.

Larvae of *C. neogama* and *piatrix* were as abundant as usual and the former seemed healthier than for several years past but many of them died after pupating, as did also the *piatrices*.

At first the *piatrix* "worms" thrived, but later many of them died. Full grown larvae of the species were found on June 6th.

The first stage of *Catocala illecta* came from its chrysalis on June 3d.

On the 9th of June, the senior author received from the junior a full grown larva of a *Catocala* taken on apple and a few days later two or three more.

These "worms" were  $1\frac{3}{4}$  inches long, rather dark brown with a narrow middorsal lighter band which was almost white on the two abdominal segments in front of the tubercle and the one behind. The tubercle darker than the body color. The head flattened and lobed above as in *cara* and with an encircling black line (from the right side of the mouth around to the left side). Inside the black line at the dorsal lobes are yellow lunules. A heavy lateral fringe of setae. These larvae differ from the normal larvae of *grynea* but as they all died as chrysalids, there is doubt of their specific affinity.

Larvae and chrysalids of *ultronia* from the same source gave a few imagoes.

From two larvae of *Agnomonis anilis* on wild crab June 10th, secured one imago July 7th.

The last *vidua* larva died June 15th.

The first imagoes of *C. innubens* emerged from chrysalids on the 15th of June. These were specimens bred from the egg, two in number, one normal and one *scintillans*. Many other *innubens* emerged later. This is our healthiest *Catocala*.

The last of the *cara* larvae died on the 26th of June.

The distinctive features of the larva of *Catocala resecta* is the distinct greenish tinge of body color, the four midventral black spots set in beautiful red patches, there being a more or less distinct red patch for every thoracic and abdominal segment, the ones on the 8th, and 9th abdominal segments being faint. The first imago of *resecta* to emerge July 11th, spun its cocoon on the 16th of June. A second on July 12th spun on the 18th of June. A third on July 13th, spun June 17th.

Accompanied by Mr. Harold Davenport, the senior author visited "Catocala Hollow" on the 7th of July and found *C. cara*, *innubens*, and *scintillans* quite common, while *palacogama*, *neogama*, *ilia* and *resecta* were less abundant. Good specimens of *residua* and one fine one of *flebilis* were taken.

On July 9th in company with Lowell Pinkerton two fine *phalanga* and one *amica* were taken, in addition to species captured on the previous trip.

But two or three *amica* were seen during the entire summer. In fact, this species, so common most years, has been very scarce for two or three years past.

On July 13th, the best catches of the season were made. Mr. Lowell Pinkerton took a fine *phalanga*, a splendid *paolina* and an immense *viduata* with a spread of wings of quite four inches. The senior author captured two beautiful *phalanga*, one *habilis* (the only one of the season), *neogama*, *palaeogama* and *residua*. Numbers of *cara* and *innubens* were seen.

On July 15th, the senior author and Mr. Harold Davenport took one *lachrymosa*, normal form, one *residua*, a battered *grynea*, a number of *resecta* and one *parta*, a female, the first taken since June 9th, 1906. A fine *viduata* was located but defied capture.

On July 22d, another *phalanga* was taken.

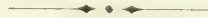
On August 5th, accompanied by Mr. G. W. Dulany of Denver, the senior author took eleven fine specimens of *Catocala luciana* under a rickety wooden bridge over the South Fork of the Platte River, eleven miles north of Denver.

On the 12th of August, Mr. and Mrs. G. W. Dulany visited the same bridge again and succeeded in taking sixteen or more male *luciana* and several females from the latter of which over one hundred eggs were obtained. These Denver trips were the most exciting of the season and, although but one species was taken, yielded the best net results.

Another trip to "Catocala Hollow" on the 19th of August gave us little but ragged *cara*, *innubens*, *neogama*, *ilia*, barring five good specimens of *C. vidua*, all males and all under size, no larger in fact than *resecta*.

September 2d, the senior author captured four *vidua*, two males and two females, one *robinsoni*, the only one seen during the season, and one ragged *piatrix*. No other species of *Catocala* were seen on this trip.

We wish to express our obligations to Miss Margaret Haley for the careful typing of this article.



THE PUGET SOUND MARINE STATION, at Friday Harbor, Washington, will hold its ninth annual session from June 24 to August 3, 1912, under the direction of Professor Trevor Kincaid, of the University of Washington, Seattle, Washington, from whom further information may be obtained.

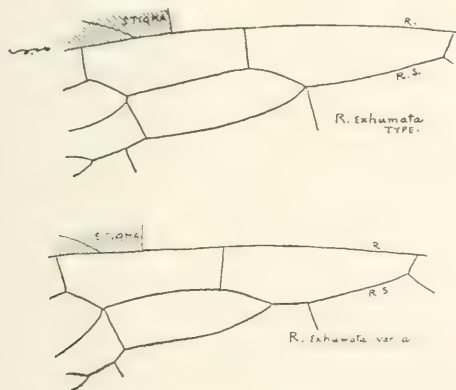
## A Fossil *Raphidia* (Neur., Planip.).

By T. D. A. COCKERELL, Boulder, Colorado.

A well-preserved anterior wing of *Raphidia* was found by my wife in the Miocene shales of Florissant, Colorado, at Station 23. It is about 12.75 mm. long and 3.75 broad. On comparing it with the type of *R. exhumata* Ckll., I find that it corresponds very closely in appearance and structure, but in Rohwer's table (*Amer. Journ. Science*, xxviii, 534) it runs to *R. mortua* Roh., from which it differs by the larger size, darker venation, the greater number (nine) of cross-veins in the costal area, subcosta joining costa much less than length of stigma from stigma, and some other details. It differs from *R. exhumata* principally as follows:

(a.) Only two cells on costa beyond stigma (three in *exhumata*.)

(b.) Second cross-vein connecting radial sector with media a considerable distance basad of forking of sector, as in *R. mortua* (joining base of fork in *exhumata*).



(c.) Fifth branch of radius forked at end, though fourth is simple (both simple in *exhumata*).

Thus the new fossil seems intermediate between *R. exhumata* and *R. mortua*; it may be known as *R. exhumata* var. *a*,

and it now seems probable that *R. mortua* is another variety of the same species.

The species problem among fossil insects is a difficult one. Handlirsch attempts to solve it by treating each distinguishable form as a distinct species; thus in *Contributions to Canadian Palaeontology*, Vol. II, part III (1910) he describes twenty species of the Bibionid genus *Penthetria* from the Tertiary rocks of British Columbia, although it is surely improbable that they are all specifically distinct. Such a plan has the advantage of separating and defining all the available structural types, but it must result in misleading statistics if carried far. It seems better to give specific names only to forms which are probably distinct, using the same criteria as are considered valid in the case of their nearest living allies, and to distinguish others as varieties, with either varietal names or letters of the alphabet.

Handlirsch, in the work just cited, has an interesting discussion of the fossil Raphidiidae, in which he proposes new generic names for two of the Florissant species. *Megaraphidia elegans*, *Raphidia exhumata* and *R. mortua* all agree in having the upper branch of the radial sector simple until it reaches the end, or nearly the end, of the cell in the fork of the sector; a condition very different from that found in the living *R. oblita* and *R. notata*. In the living *R. rhodopica*, however, the condition in this respect is as in the fossils. *R. rhodopica* differs conspicuously from the fossils in the much shorter lower side of the pterostigma. In the basal stalk of M-Cu *R. rhodopica* differs from the fossils, which herein agree with *R. oblita* and *R. notata*. The cross-vein descending from the lower side of the pterostigma is a character which separates the fossils from the recent species; in the latter the cross-vein is beyond the stigma, or in *R. rhodopica* descending from its end. All things considered, it seems impracticable to separate *R. exhumata* and *mortua* from *Raphidia*, and I am now doubtful whether *Megaraphidia* is more than a subgenus, although Handlirsch says it is "undoubtedly a well-founded genus."

## A new *Corizus* from the Northeastern United States (Hemíp., Coreídae).

By J. R. DE LA TORRE BUENO, White Plains, New York.

On occasion, I have called attention to the neglected condition of the Hemiptera in the United States, and to the opportunities this group affords for discoveries of species new to science and much other original research work of great interest and importance. It is from time to time my good fortune to add my mite to the treasures of entomology and on this occasion I present a hitherto undescribed Coreid bug, of the genus *Corizus*. Last year, toward the end of September, I accompanied my good friend, Mr. G. P. Engelhardt, of the Children's Museum, of Brooklyn, N. Y., to Yaphank, in the central part of Long Island, in the pine woods. Here, in a sandy, grassy spot, by sweeping, I got a bug which at once struck me as unfamiliar, and which at first glance was taken for a species of *Nysius*, a Lygaeid.

I called Engelhardt's attention to it, and we were able to secure some fifteen or so specimens, mainly short-winged. A careful examination later showed that my field determination was erroneous, and further study at greater leisure confirmed the opinion already formed as to its being unknown to science. At first, following Hambleton's table, it appeared to run to *C. parvicornis* Sign., and superficially it somewhat resembles this species. Comparison with Mexican specimens of the latter in my collection, however, disposed of this notion and showed that it deserved a name of its own. Its extremely hairy character furnished the name under which I now describe it:

### *Corizus hirtus* n. sp.

Small and stout in general aspect; dark in color and clothed with long erect hairs; hemelytra nearly hyaline throughout with dark streaks on the nervures.

#### Dimensions:

Long-winged form: ♂ long, 4.3 mm.; lat., thorax 1.8 mm., abdomen, 1.9 mm.; ♀ long, 4. to 4.5 mm.; lat., thorax, 1.8 to 1.9 mm.; abdomen, 2 to 2.1 mm.

Short-winged form: ♂ long, 3.5 to 4. mm.; lat., thorax 1.4 to 1.6 mm., abdomen 1.6 to 1.8 mm.

♀ long, 3.9 to 4.4 mm.; lat., thorax 1.4 to 1.8 mm.; abdomen 2. to 2.3 mm.

*Head*.—Antenniferous tubercles absent or but slightly developed. Antennae short, shorter than head and thorax taken together; first segment reaching to or slightly surpassing apex of head. Head including eyes as broad as long. Eyes small and quite distant from the anterior angles of the prothorax, beyond which they extend, making head including eyes wider than the anterior part of pronotum. Antennal joint 1 shortest; 2 and 4 subequal; 3 longer than 1 but shorter than either 2 or 4; 4 fusiform and thickest; all sparsely, shortly pilose. Rostrum reaching beyond middle coxae.

*Pronotum*.—Variable in proportions, thickly punctured with large, coarse punctures and covered with long, erect hairs; anterior margin straight; posterior sinuate; humeral angles rounded, callous, prominent; sides sinuate.

Scutellum, about as long as head, rather broad and rounded at the tip margined by a raised border rather darker than the surface; deeply punctured. Metapleurae projecting noticeably and acutely beyond the abdomen in a free point directed posteriorly.

*Abdomen* wider than the prothorax; connexivum showing broadly beyond hemelytra, especially in the short-winged forms; hairy, especially at the margin.

*Hemelytra* in the winged form are slightly longer than the body but narrower than the abdomen. The short-winged are of varying degrees of length, in some instances not reaching the 4th, in others, the 6th abdominal segment, both corium and membrane being shortened in varying degrees, but neither wholly absent. Membrane hyaline; corium semi-transparent; nervures with dark markings.

Legs; thighs dark, tibiae lighter in color.

Described from 2 long-winged and 8 short-winged females and 1 long-winged and 3 short-winged males. Cotypes in my collection.

In Hambleton's Key\* it runs to section 5, which includes forms with scutellum broad and rounded at the tip, the species being *scutatus*, *tuberculatus* and *indentatus*, from all of which it may at once be separated by its smaller size and the absence of antenniferous tubercles. From *C. parvicornis* Sign. it is distinguished by the smaller scutellum, narrower prothorax, smaller head, thicker antennae, form of genital segments and absence of antenniferous tubercles.

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\*Ann. Ent. Soc. Am. I, No. 1, p. 135 (1908).



*Corizus hirtus* produces a general impression of darkness, especially as regards the upper surface, but it varies in color, a characteristic of the genus. Its hairiness betrays its psammophilous nature. It is the smallest of the four species of the genus so far recognized from the Northeastern United States, which may be easily separated by the following

KEY TO THE SPECIES OF CORIZUS OF THE MIDDLE STATES AND NEW ENGLAND.

1 (2). Metapleurae not sinuate posteriorly; posterior angle rounded, not projecting; without distinct sutures; antennae much longer than head and prothorax taken together; insect between 6. and 8.5 mm. long.

*crassicornis* Linné.

2 (1). Metapleurae posteriorly sinuate; posterior angle acute and produced backward; their surface divided by a transverse impression into 2 parts, the anterior coarsely punctuate, the posterior finely so or not at all.

3 (4). Rostrum long, reaching to or going beyond posterior coxae; antennal joint 2 shorter than 3 or 4; antennae shorter than head and prothorax taken together; connexivum nearly or quite unspotted; length, 5. to 6. mm.

*lateralis* Say.

4 (3). Rostrum not reaching posterior coxae; connexivum spotted, sometimes nearly entirely dark.

5 (6). Antennae, 3d joint shorter than 2 or 4; 4th longest; pronotum with a whitish median callous line, sometimes obscure, terminating in a small callous white spot at the transverse suture; length, 5. to 6. mm.

*bohemani* Sign.

6 (5). Antennae stout, 2d joint longest; 4th nearly as long and notably thickened, fusiform; 3d shorter than 2 or 4; pronotal median line absent; length 3.5 to 4.5 mm.

*hirtus* Bueno.

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### New Microlepidoptera.

By WM. BARNES M.D. & J. McDUNNOUGH, PH.D., Decatur, Illinois.

We have recently received a very interesting lot of Lepidoptera for determination from Mr. G. H. Field, captured in La Puerta Valley and around San Diego, California. Among them were several apparently new species of Microlepidoptera which we herewith describe; the types of these are in Coll.

Barnes, cotypes with Mr. G. H. Field. We might also mention that two specimens of our recently described Cossid, *Hypopta palmata*, were included, these being noticeably larger in size than our type specimens from Gila Co., Arizona.

#### PYRAUSTINAE.

##### *Noctuelia puertalis* sp. nov.

Primaries pale ochreous, heavily shaded with brown, especially in basal and terminal areas, leaving the median space as a broad paler band across the wings; faint traces of a dark basal line; t. a. line dark, rather diffuse inwardly, bent outward slightly below costa then straight to inner margin; t. p. line from costa three-fourths from base, strongly bent inward below cubital vein, slightly dentate on the veins; at the end of cell a prominent black discal lunule, the lower edge of which closely approaches the incurve of the t. p. line; the whole space beyond t. p. line may be heavily shaded with smoky brown or else there may be a paler narrow terminal space, defining a subterminal line by contrast with the brown subterminal area; when present the s. t. line is subparallel to t. p. line, bidentate opposite cell, the two teeth touching the outer margin and forming a W mark; fringes pale, cut with darker median line; secondaries smoky brown; beneath pale smoky with traces of a darker terminal band. Expanse 15 mm.

*Habitat*:—La Puerta Valley, Calif. (G. H. Field) (July 11th). 4 ♂ ♂.

Seems best referred to this genus owing to the rounded frontal prominence; it is a very slight species, rather like a miniature *Schinia* in appearance.

#### SCHOENOBIINAE.

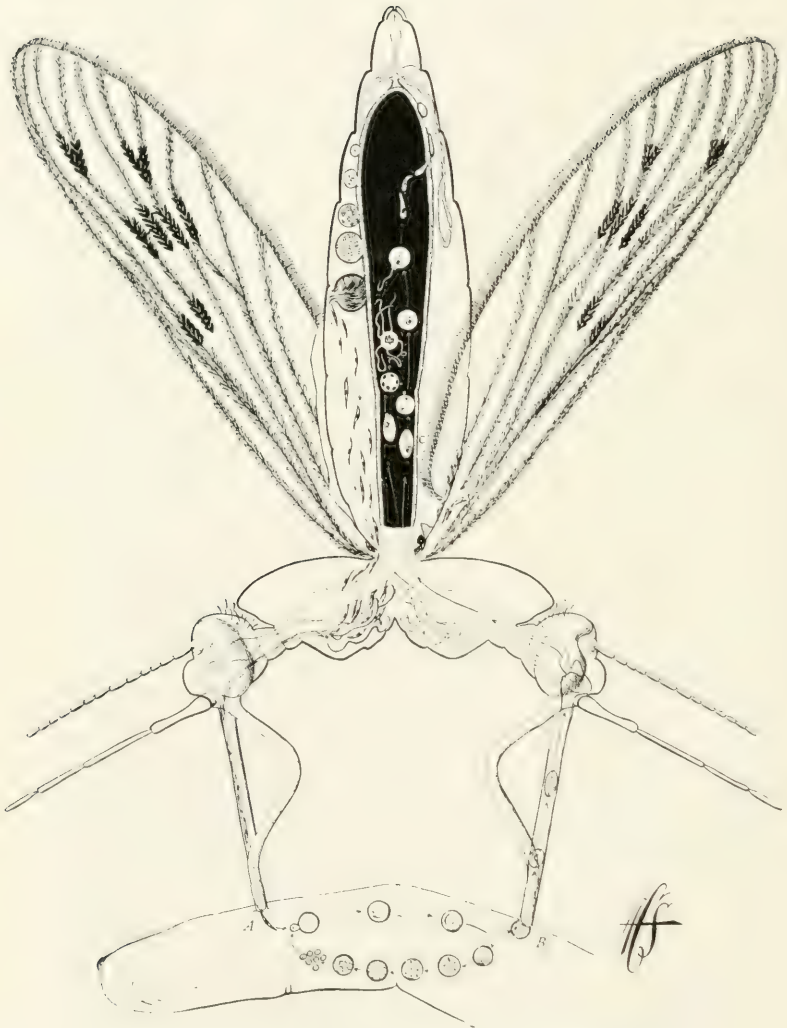
##### *Schoenobius pallulellus* sp. nov.

Palpi, head, thorax, and primaries very pale ochreous, slightly deeper in the male than in the female, immaculate; secondaries glossy white. Beneath as above, primaries of male faintly washed with smoky brown. Expanse ♂ 21 mm., ♀ 26 mm.

*Habitat*:—Puerta Valley, Calif. (G. H. Field) (July 11th). 1 ♂, 2 ♀.

As is usual in this genus the apices of the primaries are more drawn out and pointed in the ♀ than in the ♂.





LIFE CYCLE OF THE MALARIAL PARASITE—STRYKE.

## CRAMBINAE.

*Thaumatopsis fieldella* sp. nov.

♂. Antennae unipectinate; palpi, head and thorax light brown; primaries light ochreous suffused and sprinkled with smoky brown which at times is so extended as to render the whole wing almost unicolorous brown; basal half of costa rather broadly deep brown; a streak of the same color extends from the middle of the cell to the apex of the wing, heaviest and most prominent in the cell, where it is slightly shaded inferiorly with paler ochreous than the ground color of wing; beyond the cell the streak is diffuse and less distinct; from the end of the cell to the middle of inner margin an indistinct oblique brown line, only noticeable in the paler specimens; a distinct brown submarginal line outcurved below costa, with slight inward angle on vein  $Cu^2$ , minutely crenulate, shaded outwardly with pale ochreous, terminal row of minute black dots; fringes dusky. Secondaries smoky, paler at base and outer margin, with a faint dark, irregular, subterminal line. Beneath smoky brown, paler along inner margin of secondaries, costa of primaries at times slightly tinged towards apex with ochreous.

♀. Antennae simple; paler in color than ♂, rather bright ochreous-yellow without much dark shading; basal half of costa not shaded with brown; subterminal line orange-yellow; dark streak in cell as in ♂; secondaries whitish. Beneath primaries pale smoky, secondaries whitish. Expanse ♂ 25-31 mm., ♀ 31 mm.

*Habitat*:—San Diego, Calif. (G. H. Field) (June 6 & 16; July 17 & 27; Aug. 6 & 15). 5 ♂ ♂, 1 ♀.

In the dark forms the subterminal line and the streak in the cell are the most persistent of the markings.

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## The Life-Cycle of the Malarial Parasite.

Contributions from the Entomological Laboratory of Cornell University,  
Ithaca, New York.

By ANNA CLEGG STRYKE.

(Plate XII)

Entomological workers who have occasion to refer in more or less detail to the relation of mosquitoes to malaria usually find that students have difficulty in grasping the essential features of the complicated life-cycle of the malarial parasite. Taking the suggestion from Maxwell-Lefroy's diagram published in his manual of "Indian Insect Life," I have attempted

to represent graphically the main features of this life-cycle, as simply and accurately as possible.

It has seemed worth while to include more of the details and to represent the whole less diagrammatically than in the work cited. The nomenclature adopted is that of Schaudinn.

By means of the double-headed mosquito I have endeavored to show how the infection takes place through the biting of the human victim and how multiplication takes place asexually in the blood of that victim and sexually in the body of the mosquito which has bitten the malarial patient.

At "A" the spindle-shaped sporozoite is injected into the finger together with the salivary secretion of the mosquito. It develops into the pale amœboid schizont which enters the blood corpuscle, and developing there at the expense of the hæmoglobin, it deposits the characteristic melanin granules which are excretory in nature.

These developing parasites are of two kinds. Many of them having become crescent-shaped within the corpuscles may be sucked up by the mosquito biting the malarial patient as at "B." Others however are destined to increase their kind by sporulation in the blood of man. In these individuals the nucleus breaks up, the elements arranging themselves near the wall. Partitions begin to grow in from the wall until the nuclei are entirely separate from one another and finally the individual spores or merozoites are set free in the blood plasma by the disintegration of the corpuscle. Many of these are of course attacked and destroyed by the white corpuscles, but many enter healthy red corpuscles and repeat the entire process or develop into the type which, if swallowed by the mosquito) begin a new development in the stomach of the insect at "C."

The crescents are the gametes. They leave the corpuscles, become spherical in form and develop into either microgametoblasts (male) or macrogametes (female). In the latter case a small round body (perhaps a "polar" body) is extruded and finally thrown off so that at this stage the mature macrogamete is ready for fertilization. In the case of the micro-

gametoblast the nucleus divides into a number of parts (the number depending on the species of parasite) which arrange themselves near the wall, and from each of which is developed a flagellate microgamete. These are freed from the resting cell and being motile may find a macrogamete which one of them enters and fertilizes. The fertilized macrogamete now becomes elongate and ovoid and is termed the oökinete, or wandering cell. It penetrates the wall of the stomach, and, passing through the epithelium, it encysts just under the basement membrane. These cysts occur mostly on the posterior two-thirds of the dilated part of the stomach. The resting cell or oöcyst increases greatly in size as by nuclear division it produces many sporoblasts which in turn develop into sporozoites. When completely matured the cyst bursts liberating the sporozoites in the body cavity of the mosquito.

They are carried around in the blood currents, and, penetrating the salivary gland, surround the central canal down which they finally pass with the salivary secretion. The mosquito in biting its victim, injects them into the blood and the life-cycle is complete.

The nature of the diagram necessitates inaccuracies in structure such as for example the exaggerated length of the dilated portion of the stomach. On the other hand since not all mosquitoes are capable of transmitting the parasite, I have included such characteristics of *Anopheles*, the malarial bearing mosquito, as could be placed in such a diagrammatic representation.

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A STATION FOR INSTRUCTION AND RESEARCH IN BIOLOGY will be maintained by the University of Michigan from July 2 to August 23 inclusive, 1912, near the Bogardus Engineering Camp of the University on a tract of land stretching from Douglas Lake to Burt Lake in Cheboygan County, Michigan. Since the number of students that can be accommodated is limited, immediate registration is necessary to insure admission and no registration will be accepted if received after June 1st. Applications for admission should be addressed to Professor T. E. Rankin, Secretary of the Summer Session, Ann Arbor, Mich. Among the courses offered is one on the Natural History of Insects by Professor Frank Smith and Mr. Paul S. Welch, of the University of Illinois.

# ENTOMOLOGICAL NEWS.

[The Conductors of ENTOMOLOGICAL NEWS solicit and will thankfully receive items of news likely to interest its readers from any source. The author's name will be given in each case, for the information of cataloguers and bibliographers.]

TO CONTRIBUTORS.—All contributions will be considered and passed upon at our earliest convenience, and, as far as may be, will be published according to date of reception. ENTOMOLOGICAL NEWS has reached a circulation, both in numbers and circumference, as to make it necessary to put "copy" into the hands of the printer, for each number, four weeks before date of issue. This should be remembered in sending special or important matter for a certain issue. Twenty-five "extras," without change in form and without covers, will be given free, when they are wanted; if more than twenty-five copies are desired, this should be stated on the MS. The receipt of all papers will be acknowledged. Proof will be sent to authors for correction only when specially requested.—Ed.

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PHILADELPHIA, PA., MAY, 1912.

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## Strict Priority in Nomenclature—or Not?

The editorial on this subject in the News for March, page 128, having brought responses, some of which were printed in our issue for April, page 181, it is proposed to comment here on Mr. Caudell's statement (*l. c.*, page 181) for the case of the strict priorists.

It must be said first that the Editor assumes entire responsibility for that which follows.

The following propositions appear fundamental:

I. Nomenclature is a means, not an end; a means whereby we attempt to designate certain objects of study.

II. The names of animals and of plants are not for the systematist or taxonomist only; they are for the anatomist, the physiologist, the ecologist, the student of habits, of behavior, of distribution, of phylogeny, as well. Their right to use these names is as great as the systematist's.

III. A stable nomenclature is desirable on account of all of these kinds of students.

We maintain also that the "Law" of priority has not given the stability it was expected to give, that recent experience leads one to think that many names, now apparently of earliest date, are quite likely to be rejected as the result of further antiquarian research tomorrow or the day after.



Mr. Caudell implies that it is the desire to retain a long-used, but not prior, name in his own specialty by a taxonomist that impels the latter to vote *against* strict priority in all cases. We urge that it is not the desires of the taxonomic specialists that should be given the chief weight. Every specialist can keep in touch, at least to a great extent, with the nomenclatural changes in his own group. Those who can not and ought not, be compelled to submit to these changes are those who, whether taxonomists or not, are not specialists in the nomenclature of all the subdivisions of the animal kingdom but who, as morphologists, physiologists or laborers in other fields, make constant comparisons between members of different groups of animals. Too much has already been done in these non-taxonomic fields to bury the results under unfamiliar names simply because they are of prior date.

Mr. Caudell also implies that priority, because based on codified laws and rules, is certain of more unanimous consent than any proposal to retain certain long-established and much-used, but not prior, names. This we deny. The attitudes of recent authors in the Diptera, in the Lepidoptera, in the Odonata (to quote no others), show that many students have not accepted the prior names and therefore not accepted the principle of priority. Both the priority principle and the principle of *nomina conservanda* appeal to the common sense and unanimous consent of naturalists and the former has no more certain footing than the latter.

Finally Mr. Caudell implies that the discussion on the *nomina conservanda* question in the recent Washington meeting of the Entomological Society of America was sufficient. This, too, we must deny. The discussion came before the program of papers was finished. To have prolonged it would have deprived more contributors of the opportunity to read their papers than was actually the case. Even as it was, several withdrew on account of the lack of time. We have already expressed our views on this feature of the Society's meetings.\* Because the discussion on the *nomina conservanda* question there was not sufficient, and because of the approaching Congress of Entomology at Oxford, we have opened the pages of the NEWS to its further consideration.

In this number of the NEWS we publish a list of Generic Names in Diptera for inclusion in the Official List of Generic Names of the International Zoological Commission. If these lists, after adoption by the Commission, could be made definitive by that body, so that none of the included names should be disturbed by the results of any future antiquarian research, a long step would be made toward stability and conservation in nomenclature.

We invite further votes on the alternative questions proposed in our March editorial.

\* Ent. News, November, 1911, p. 418; February, 1912, p. 79.

## Notes and News

### ENTOMOLOGICAL GLEANINGS FROM ALL QUARTERS OF THE GLOBE.

STRICT PRIORITY IN NOMENCLATURE—OR NOT?—With regard to the *nomina conservanda*, I should at present only be willing to vote to keep the matter open. I think something will have to be done to preserve us from disastrous nomenclatural changes, but it should be done with care and deliberation and particularly with the knowledge and consent of zoologists generally. I object very much to a recent ruling of the committee on genera without species (last part of opinion 46, also last half of summary), and venture to think that it is contrary to the spirit of the International Rules and to common sense. It is this sort of thing which increases our difficulties, and will eventually convert people to the plan of purely arbitrary selections of *nomina conservanda*.

At the present time I think it is important to get every zoologist to think seriously about these matters, and as many as possible to ascertain precisely what will be the effect of particular rules or rulings on their own special groups. I do not see how, under any circumstances, we could allow two generic names, spelled alike in zoology; but I think a difference of one letter should suffice to prevent homonymy.—THEO. D. A. COCKERELL.

While signing the protest against the strict application of the law of priority, I do so with the provision that any general concurrence in such an opinion should not be accepted as a license for every zoologist to adopt any names that he chooses. I believe that the rules of nomenclature involving the law of priority should be operative in the future in all cases, and in the past in the majority of cases. I believe that no individual should be sanctioned in taking it upon himself to waive them, but that in specific cases where clearly greater convenience will result from setting them aside, that this should be done by a centrally organized and authorized body, presumably the Commission on Zoological Nomenclature. I thoroughly believe that such a body should work toward the compilation of a list of *nomina conservanda*, and that the names of such a list, once adopted, should *never* be open to future change on nomenclatorial grounds.

As far as working justice to the older authors, our present laws are at best *ex post facto*, and are not more likely to effect a real justice than would a list of *nomina conservanda*. But the latter would accomplish a greater debt of justice to future generations, to whom it is more due. It is they, and not the past, who must suffer from our shortcomings. I believe in rules, I believe in laws, but I emphatically believe in their limitations, and to bind ourselves by rules for the

rules' sake after they become an encumbrance and a limitation to endeavor is to merit ridicule.

There is no *a priori* value in the law of priority. It is a means to secure the end of a uniform and stable usage. Use it in so far as it is the best means, but not one step beyond. Yet in many recent applications—comparatively few in number, yet revolutionary in result—it works the opposite way.

There has been no little criticism of the mode of organization of the International Commission on Zoological Nomenclature. It must be conceded that at any International Congress local representation will far outnumber, and will likely outweigh in voting, that from more distant quarters. In a question which so vitally concerns all naturalists as the *names* of animals, adequate provision should be made to secure a consensus of the opinion of all zoologists.

This could be accomplished by having all fundamental questions, and perhaps the election of members of the commission, referred to the zoologists of the world by mail. There would be expense attached to this, but the list could be restricted to those who were willing to pay their share of the cost of such communications, which need not be large, perhaps a dollar a year. Certainly any one who was vitally interested in the nomenclature of zoology would welcome the opportunity of voting upon questions affecting it, and of bearing the necessary expense of obtaining the opportunity, and would feel much more inclined to accept decisions reached in that way than those reached by a Commission in the appointment of which he has had no word. Excellent and logical as many of the opinions of the International Commission on Nomenclature may be, I voice the sentiments of many when I say that they would be far more generally acceptable if they were known to represent a consensus of opinion, rather than that of four or five and especially of one man. A list of *nomina conservanda* voted on and accepted by a majority of the working zoologists of the world would not be ignored by subsequent writers, nor would we ever have to fear subsequent alteration or rejection.—J. CHESTER BRADLEY.

We fully concur in the above statement.—H. D. REED, A. H. WRIGHT, ROBERT MATHESON, G. C. EMBODY, WM. A. RILEY, GLENN W. HERRICK.

The Executive Committee of the German Zoological Society has requested all German zoologists to notify the Secretary of the Society, Prof. Dr. A. Brauer, Berlin, on or before March 15, whether, like the 120 Scandinavian and Finnish investigators, they are against the strict application of the law of priority in all cases and desire that the most important and generally-used names shall be protected against any alteration, or whether they favor, as two Scandinavians did, the strict application of the law of priority in all cases. The result of the vote

will be published in the *Zoologischer Anzeiger*. If the majority favors the first of these propositions, the matter will be brought before the Halle meeting of the Society, May 27-30, 1912, and put in execution as far as possible.

Prof. F. E. Schulze proposes to submit a proposition to the International Nomenclature Commission to be reported to the International Zoological Congress of 1913 to the effect that since some zoologists wish no alteration of long-used generic names, while others prefer the oldest available names, both parties can be met for the present by writing first the oldest justifiable generic name, followed by the long-used later name preceded by the sign of equality and enclosed in parentheses, thus: *Sphenodon* (=Hatteria); *Fasciola* (=Distomum) *hepatica*; *Molge* (=Triton) *alpestris*. (*Zool. Anzeig.*, Feb. 27, 1912.)

This procedure, according to R. Hartmeyer (*l. c.*, p. 336) has been used for several years by specialists in the Ascidiæ, except that square brackets without the sign of equality have been used instead of the parentheses, etc., in order to avoid confusion with the use of a name of lower taxonomic rank, as subgenus, *e. g.*, in parentheses after a generic name.

Prof. Fr. Dahl in an article on "The value of definitively established Rules of Nomenclature" (in German) argues for the preservation of the rules as adopted at the International Zoological Congress of Berlin without any later modifications or exceptions. (*Zool. Anzeig.* Feb. 27, 1912, pp. 205-209.)

A NEW GENERIC NAME FOR CALLOSAMIA CALLETA (WESTWOOD).—In the course of preparing for the press the manuscript on Saturniidae left by Dr. A. S. Packard, it has become evident that *Callosamia calleta* stands quite apart from the typical members of the genus (*promethea* and *angulifera*), and should surely form a distinct genus, to which the name *Eupackardia* may be applied: type *Eupackardia calleta* (Westwood). Dr. H. G. Dyar, to whom I am indebted for some advice in the matter, does not know of any other species which should go with *calleta*. The *calleta* moth differs in venation and markings from *Callosamia*, as Dr. Packard's manuscript fully indicates; but more especially the species differs in the larva, the characters being described by Packard in Proc. American Acad., xxxix (1904), pp. 547-551, and beautifully illustrated by colored plates prepared for the forthcoming volumes.—T. D. A. COCKERELL.

Fossil COCKROACHES FROM TEXAS. (ORTHOP.)—In Publication 146 of the Carnegie Institution of Washington, issued December 20th, 1911, Professor E. H. Sellards has an interesting account of two new cockroaches, *Etblattina texana* and *Etblattina* (?) *robusta*, from the Permian of Texas. The specimens were obtained by Professor E. C. Case, but unfortunately nothing is said of the exact locality. I am

indebted to Professor Case for the information that the specimens were found a few miles almost directly south of the town of Dundee (Archer County), on the banks of the Little Wichita. It seems desirable to record this information, so that the type-locality of the two species can be properly cited.—T. D. A. COCKERELL.

FOURTH LIST OF GENERIC NAMES FOR THE "OFFICIAL LIST OF ZOOLOGICAL NAMES," PROVIDED FOR BY THE GRAZ CONGRESS.—15. \*The following generic names of Diptera are proposed for *inclusion* in the "Official List of Generic Names." The species mentioned are the correct types, according to Coquillett, 1910.

- Anopheles* Meig., 1818, 10, type *bifurcatus*.  
*Anthomyia* Meig., 1803, 281, type *Musca pluvialis*.  
*Chrysops* Meig., 1800, 23, type *caecutiens*.  
*Corethra* Meig., 1803, 260, type *Tipula culiciformis*.  
*Culex* Linn., 1758a, 602, type *pipiens*.  
*Cuterebra* Clark, 1815, 70, type *Oestrus cuniculi*.  
*Gasterophilus* Leach, 1817, 2, type *Oestrus intestinalis* (cf. *Oe. equi*).  
*Haematobia* St. Farg. & Serv., 1828, 499, type *Conops irritans*.  
*Hippelates* Loew, 1863, 36, type *plebejus*.  
*Hippobosca* Linn., 1758a, 607, type *equina*.  
*Hypoderma* Latr., 1818, 272, type *Oestrus bovis*.  
*Lucilia* Desv., 1830, 452, type *Musca caesar*.  
*Musca* Linn., 1758a, 589, type *domestica*.  
*Muscina* Desv., 1830, 406, type *stabulans*.  
*Nycteribia* Latr., 1796, 176, type *Pediculus vespertilionis*.  
*Oestrus* Linn., 1758a, 584, type *ovis*.  
*Ophyra* Desv., 1830, 516, type *Anthomyia leucostoma*.  
*Phora* Latr., 1796, 169, type *Musca aterrima*.  
*Piophilha* Fall., 1810, 20, type *Musca casei*.  
*Psorophora* Desv., 1827, 412, type *Culex ciliatus*.  
*Sarcophaga* Meig., 1826, 14, type *Musca carnaria*.  
*Stegomyia* Theob., 1901, 234, type *Culex calopus*.  
*Stomoxys* Geoffr., 1762, 538, type *Conops calcitrans*.  
*Tabanus* Linn., 1758a, 601, type *bovinus*.  
*Tipula* Linn., 1758a, 585, type *oleracea*.

16. The following generic names of Diptera are proposed for *exclusion* from the "Official List," on the ground that they are absolute homonyms and preoccupied.

- Acanthina* Wiedem., 1830, not Fisch., 1806.  
*Allocotus* Loew, 1872, not Mayr, 1864.  
*Ammobates* Stann., 1831, not Latr., 1809.  
*Anepsius* Loew, 1857, not LeC., 1852.

\*Paragraphs are numbered continuously with the earlier lists.

- Anoplomerus* Rond., 1856, not Latr., 1844.  
*Archilestes* Schin., 1866, not Selys, 1862.  
*Ascia* Meig., 1822, not Scop., 1777.  
*Aspilota* Loew, 1873, not Færst., 1862.  
*Asthenia* Westw., 1842, not Hübn., 1816.  
*Astoma* Lioy, 1864, not Oken, 1815.  
*Atomaria* Bigot, 1854, not Steph., 1830.  
*Atrichia* Loew, 1866, not Schrank, 1803.  
*Blacodes* Loew, 1874, not Dej., 1859.  
*Blax* Loew, 1872, not Thom., 1860.  
*Brachygaster* Meig., 1826, not Leach, 1817.  
*Callopietria* Loew, 1873, not Hübn., 1816.  
*Centor* Loew, 1866, not Schönh., 1847.  
*Ceria* Fabr., 1794, not Scop., 1763.  
*Chauna* Loew, 1847, not Illig., 1811.  
*Chrysonotus* Loew, 1855, not Swains., 1837.  
*Clytia* Desv., 1830, not Lam., 1812.  
*Coprina* Zetters., 1837, not Desv., 1830.  
*Coquillettia* Willist., 1896, not Uhler, 1890.  
*Cyrtosoma* Brauer & Bergens., 1891, not Walk., 1829.  
*Dendrophila* Lioy, 1864, not Swains., 1837.  
*Diabasis* Macq., 1834, not Hoffmanns., 1819.  
*Diphysa* Macq., 1838, not Blainv., 1834.  
*Discocephala* Macq., 1838, not Lap., 1832.  
*Empheria* Winn., 1863, not Hag., 1856.  
*Enicopus* Walk., 1833, not Steph., 1830.  
*Erichsonia* Desv., 1863, not Westw., 1849.  
*Eriogaster* Macq., 1838, not Germ., 1811.  
*Eristicus* Loew, 1848, not Wesm., 1844.  
*Eudora* Desv., 1863, not Less., 1809.  
*Eumetopia* Macq., 1847, not Westw., 1837.  
*Eumetopia* Brauer & Bergenst., 1889, not Westw., 1837.  
*Euphoria* Desv., 1863, not Burm., 1842.  
*Eurycephala* Röd., 1881, not Lap., 1833.  
*Exocheila* Rond., 1868, not Rond., 1857.  
*Fabricia* Meig., 1838, not Blainv., 1828.  
*Fallenia* Meig., 1838, not Meig., 1820.  
*Grassia* Theob., 1902, not Fisch, 1885.  
*Halithea* Hal., 1838, not Sav., 1817.  
*Helobia* St. Farg. & Serv., 1828, not Steph., 1827.  
*Heteroneura* Fall., 1823, not Fall., 1810.  
*Heterostoma* Rond., 1856, not Hart., 1843.  
*Himantostoma* Loew, 1863, not Ag., 1862.  
*Hydrochus* Fall., 1823, not Germ., 1817.

- Hyria* Desv., 1863, not Lam., 1819.  
*Icaria* Schin., 1868, not Sauss., 1853.  
*Idiotypa* Loew, 1873, not Færst., 1856.  
*Isoglossa* Coq., 1895, not Casey, 1893.  
*Itamus* Loew, 1849, not Schm.-Goeb., 1846.  
*Latreillia* Desv., 1830, not Roux, 1827.  
*Laverania* Theob., 1902, not Grassi & Fel., 1890.  
*Leptochilus* Loew, 1872, not Sauss., 1852.  
*Leptopus* Fall., 1823, not Latr., 1809.  
*Leptopus* Hal., 1831, not Latr., 1809.  
*Lissa* Meig., 1826, not Leach, 1815.  
*Lophonotus* Macq., 1838, not Steph., 1829.  
*Macrochira* Zettlers, 1838, not Meig., 1803.  
*Macrurus* Lioy, 1864, not Bonap., 1841.  
*Meckelia* Desv., 1830, not Leuck., 1828.  
*Microcera* Zettlers., 1838, not Meig., 1803.  
*Mochtherus* Loew, 1849, not Schm.-Goeb., 1846.  
*Mycetina* Rond., 1856, not Muls., 1846.  
*Myobia* Desv., 1830, not Heyd., 1826.  
*Odontocera* Macq., 1835, not Serv., 1833.  
*Okenia* Zettlers., 1838, not Leuck., 1826.  
*Omalocephala* Macq., 1843, not Spin., 1839.  
*Pales* Desv., 1830, not Meig., 1800.  
*Panoplites* Theob., 1900, not Gould, 1853.  
*Phoneus* Macq., 1838, not Kaup, 1829.  
*Plagiocera* Macq., 1842, not Klug, 1834.  
*Plagiotoma* Loew, 1873, not Clap. & Lachm., 1858.  
*Plectropus* Hal., 1831, not Kirby, 1826.  
*Polydonta* Macq., 1850, not Fisch., 1807.  
*Psilopus* Meig., 1824, not Poli, 1795.  
*Pygostolus* Loew, 1866, not Hal., 1833.  
*Rhopalomyia* Willist., 1895, not Rübsaam., 1892.  
*Roeselia* Desv., 1830, not Hübn., 1816.  
*Rondania* Jænn., 1867, not Desv., 1850.  
*Sargus* Fabr., 1798, not Walb, 1792.  
*Sicus* Latr., 1796, not Scop., 1763.  
*Stenomacra* Loew, 1873, not Stal, 1870.  
*Stictocephala* Loew, 1873, not Stal, 1869.  
*Subula* Meig., 1820, not Schum., 1817.  
*Tetrachaeta* Brauer & Bergenst., 1894, not Ehrenb., 1844.  
*Tetrachaeta* Stein, 1898, not Ehrenb., 1844.  
*Trichoptera* Lioy, 1864, not Meig., 1803.  
*Triodonta* Willist., 1885, not Bory, 1824.  
*Trupanea* Macq., 1838, not Schrank, 1795.

*Wulpia* Brauer & Bergenst., 1893, not Bigot, 1886.

17. These names are published herewith for the information of all persons interested. They will be forwarded by July 1st, 1912, to the International Commission on Zoological Nomenclature, the Commission on Nomenclature of the International Entomological Congress, and to several Entomological Committees and Societies.

18. A vote will be called on these names at the next meeting of the International Commission on Zoological Nomenclature, in the summer of 1913, and any objection to the proposed action should be filed with the undersigned, and stating ground for the objection, not later than May 1, 1913.

C. W. STILES, *Secretary International Commission on Zoological Nomenclature, Hygienic Laboratory, Washington, D. C.*

A NEW NAME IN ORTHOPTERA.—Mr. A. N. Caudell has called to our attention the fact that the name *Ceratites*, proposed by us for a subgenus of walkingsticks (Proc. Acad. Nat. Sci., Phila., 1909, p. 126), is preoccupied. We find *Ceratites* proposed by de Haan (Monogr. Ammonit. et Goniatit., p. 156, 1825), in Mollusca. To replace the preoccupied name we propose *Rhabdoceratites* ( $\rho\alpha\beta\delta\omicron\varsigma$  a rod,  $\kappa\epsilon\rho\alpha\tau\iota\tau\eta\varsigma$  one that has horns).—JAMES A. G. REHN and MORGAN HEBARD.

AN ENTOMOLOGICAL EXCHANGE.—According to the European style some entomologists of Massachusetts have opened an "Entomological Exchange." This method, now in use for more than 25 years in Europe, has proven to be very satisfactory and we have the sincere hope that such an "Exchange" in America will bring in closer touch the collectors and entomologists of both hemispheres. While I am the curator of the "Exchange," Mr. Rudolph C. B. Bartsch is the secretary. I shall send you later the regulations of the "Exchange."—WILLIAM REIFF, Entomologist of the Massachusetts Gypsy Moth Com., 67 Hampstead Road, Forest Hills, Mass.

[An announcement of this project will be found in the Exchange column at the back of this number.—ED.]

HERMAN H. BREHME, Assistant to the late Professor John B. Smith, has been appointed Acting Executive Officer in charge of the Mosquito Extermination Work at the New Jersey Agricultural Experiment Station, New Brunswick, New Jersey.

TYPES OF XIPHIDIUM SPARTINAE AND NIGROPLEUROIDES (ORTHOP.).—Following a suggestion made to me by Mr. Rehn, I have selected as types of the two species of *Xiphidium* described by me in the March number of this journal (Vol. XXIII, p. 111, seq.), a female of each species from Ocean View, Cape May County, N. J., taken in August, 1911, and have donated them to the collection of the Academy of Natural Sciences of Philadelphia.—HENRY FOX, Collegeville, Pa.



## Entomological Literature.

COMPILED BY E. T. CRESSON, JR., AND J. A. G. REHN.

Under the above head it is intended to note papers received at the Academy of Natural Sciences, of Philadelphia, pertaining to the Entomology of the Americas (North and South), excluding Arachnida and Myriapoda. Articles irrelevant to American entomology will not be noted; but contributions to anatomy, physiology and embryology of insects, however, whether relating to American or exotic species, will be recorded. The numbers in **Heavy-Faced Type** refer to the journals, as numbered in the following list, in which the papers are published, and are all dated the current year unless otherwise noted. This (\*) following a record, denotes that the paper in question contains description of a new North American form.

For record of Economic Literature, see the Experiment Station Record, Office of Experiment Stations, Washington.

4—The Canadian Entomologist. 5—Psyche, Cambridge, Mass. 8—The Entomologist's Monthly Magazine, London. 9—The Entomologist, London. 10—Nature, London. 11—Annals and Magazine of Natural History, London. 22—Zoologischer Anzeiger, Leipzig. 35—Annales, Societe Entomologique de Belgique. 47—The Zoologist, London. 49—Annales historico-naturales Musei Nationalis Hungarici, Budapest. 50—Proceedings, U. S. National Museum. 84—Entomologische Rundschau. 89—Zoologische Jahrbucher, Jena. 97—Zeitschrift fur wissenschaftliche Zoologie, Leipzig. 102—Proceedings, Entomological Society of Washington. 143—Ohio Naturalist. 152—California Agricultural Experiment Station, Berkeley. 166—Internationale Entomologische Zeitschrift, Guben. 184—Journal of Experimental Zoology, Philadelphia. 186—Journal of Economic Biology, London. 189—Pomona Journal of Entomology, Claremont, Cal. 198—Biological Bulletin, Marine Biological Laboratory, Woods Hole, Mass. 216—Entomologische Zeitschrift, Stuttgart. 240—Maine Agricultural Experiment Station, Orono. 265—Proceedings, Delaware County Institute of Science, Media, Pa. 291—Proceedings, Staten Island Association of Arts and Sciences, Lancaster, Pa. 302—Mitteilungen, Naturwissenschaftlichen Vereins an der Universitat Wien. 303—Entomologiske Meddelelser, udgivet af Entomologisk Forening, Copenhagen. 304—Annals, Carnegie Museum. 324—Journal of Animal Behavior, Cambridge, Mass. 335—Smithsonian Miscellaneous Collection. 346—Fauna Exotica. Mitteilungen aus dem Gebiete der exotischen Insektenwelt, Frankfurt am Main. 368—The Monthly Bulletin of the State Commission of Horticulture, Sacramento, Cal. 369—Entomologische Mitteilungen, Berlin-Dahlen. 374—Sitzungsberichte der mathematisch-physikalischen Klasse der K. B. Akademie der Wissenschaften zu Munchen.

**GENERAL SUBJECTS.** Britton, W. E.—Eleventh report of the state entomologist of the Connecticut Agricultural Experiment Sta-

tion, New Haven, Conn., 259-346 pp. **Dahl, Fr.**—Der wert endguel-  
tig fixierter nomenklaturregeln, **22**, xxxix, 205-209. **Davis, W. T.**—  
Miscellaneous observations on the natural history of Long Island,  
N. Y., **291**, iii, 113-115. **Muller, G. W.**—Der enddarm einiger insect-  
enlarven als bewegungsorgan, **89**, Suppl. xv, i, 219-240. **Omen-  
setter, S.**—The speech of insects, **265**, vi, 121-136. **Seidlitz, G.**—Ein  
wort zur rechten zeit. (Ueber entomologische jahresberichte.)  
**369**, i, 65-67.

**APTERA AND NEUROPTERA.** **Bagnall & Hall**—Records of  
some bird-lice (Mallophaga), I, **186**, vii, 5-9. **Crawford, D. L.**—A  
note on certain Psyllidae, **189**, iv, 684. **Patch, E. M.**—Notes on  
Psyllidae: "Livia," **5**, xix, 5-8 (\*). **von Rosen, K.**—Neue Termiten  
aus der zoologischen staatsammlung in Munchen sowie einigen  
anderen sammlungen, **22**, xxxix, 221-232. **Thienemann, A.**—"Rhya-  
cophila laevis," eine fur Deutschland neue Rocherfliege und ihre  
metamorphose, **216**, xxv, 250-251 (cont.). **Wodsedalek, J. E.**—Palm-  
en's organ and its function in nymphs of Ephemeridae, "Hepta-  
genia interpunctata" and "Ecdyurus maculipennis," **198**, xxii, 253-  
272.

**ORTHOPTERA.** **Bruner, L.**—South American Acridoidea, **304**,  
viii, 5-147. **Caudell, A. N.**—A new Proscopiid grasshopper from  
Peru, **5**, xix, 12-13. **Szymanski, J. S.**—Modification of the innate  
behavior of cockroaches, **324**, ii, 81-90.

**HEMIPTERA.** **Cockerell, T. D. A.**—The oldest American Hom-  
opterous insect, **4**, 1912, 93-95 (\*). **Butler, E. A.**—Stridulation in  
British Reduviidae, **8**, 1912, 65. **Davis, W. T.**—A new species of  
"Pselliopus (Milyas)," **5**, xix, 20-21 (\*). The Seventeen-Year Cicada  
on Staten Island between the years 1894-1911, **291**, iii, 120-122. **Es-  
sig, E. O.**—Plant lice affecting citrus trees, **368**, i, 115-135. **Horvath,  
G.**—Miscellanea Hemipterologica, **49**, ix, 423-435. **Quayle, H. J.**—  
The purple scale (*Lepidosaphes beckii*), **152**, Bull. No. 226.

**LEPIDOPTERA.** **Barnes & McDunnough.**—On the early stages  
of certain Geometrid species, **5**, xix, 14-20. **Van Bemmelen, J. F.**—  
Ueber die phylogenie der flugelzeichnung bei tagsschmetterlingen,  
**89**, Suppl. xv, i, 453-478. **Busck, A.**—A new Microlepidopter of  
the genus "Epicallima" from Pennsylvania, **102**, xiv, 44 (\*). De-  
scriptions of n. g. and sp. of Microlepidoptera from Panama, **335**,  
lix, No. 4, 10 pp. **Cook, A. J.**—California peach borer (*Sanninoidea  
opallescens*), **368**, i, 111-113. **Draudt, M.**—Eine neue *Taygetis* aus  
Mexiko, **346**, i, 61-62. **Dyar, H. G.**—Descriptions of n. sp and genera  
of *L.* chiefly from Mexico, **50**, xlii, 36-106 (\*). Descriptions of the  
larvae of some Lepidoptera from Mexico, **102**, xiv, 54-58. **Fruh-  
storfer, H.**—Eine neue Morphid. Neue Satyriden des neotropischen  
gebiets aus der sammlung Staudinger, **84**, xxix, 31. **de Hennin, G.**—  
Notes biologiques sur la chenille de "*Hiloicus pinastri*," **84**, xxix,

38. **Hoffmann, F.**—Zur biologie der "*Cheimatobia brumata*," 216, xxv, 261. **Littlewood, F.**—The early stages of "*Eustroma reticulata*," 9, 1912, 85-89. **Longstaff, G. B.**—Butterfly-hunting in many lands. Notes of a field naturalist; to which are added translations of papers by F. Muller on the scent-organs of butterflies and moths, Longmans, Green & Co., 1912, 728 pp. **Meyrick, E.**—On the generic name "*Rhyacionia*," 9, 1912, 89-90. **Mitterberger, K.**—Zur biologie von "*Depressaria pelasitis*," 84, xxix, 25-27. **Rau, P. & N.**—Longevity in Saturnid moths; an experimental study, 184, xii, 179-204. **Schaus, W.**—New species of Heterocera from Costa Rica, XIV, 11, ix, 289-311. A new Megalopygid from French Guiana, 102, xiv, 53. **Schrader, W.**—Inbreeding of "*Junonia coenia*" under high temperatures through 26 successive generations, 189, iv, 673-677. **Strand, E.**—Funf neue exotische Heterocera, 346, i, 41-44. Was sind "*Agaristidae*"? 346, i, 57. **Weymer, G.**—Grossschmetterlinge der erd. Fauna Americana, 241-248. **Zukowsky, B.**—Sammeltage im Herbst und Winter, 166, v, 345-346.

**DIPTERA.** **Brues, C. T.**—New D. of the family Phoridae from Paraguay, 49, ix, 436-442. **Busck, A.**—On the rearing of a "*Dermatobia hominis*," 102, xiv, 9-11. **Enderlein, G.**—Studien ueber die Tipuliden, Limoniiden, Cylindrotomiden und Psychopteren, 89, xxxii, 1-88. Zur kenntnis aussereuropaischer Dolichopodiden. I. Tribus Psilopodini, 89, Suppl. xv, i, 367-408. **Johannsen, O. A.**—The Mycetophilidae of North America. Part III. The Mycetophilinae, 240, Bull. No. 196, 249-326 (\*). **Johnson, C. W.**—New North American D., 5, xix, 1-5 (\*). **Kepner, W. A.**—The larva of a Sarcophaga, a parasite of *Cistudo carolina* and the histology of its respiratory apparatus, 198, xxii, 163-172. **Krober, O.**—Die Thereviden Sud- und Mittelamerikas, 49, ix, 475-529. **de Meijere, J. C. H.**—Ueber die metamorphose von *Puliciphora* und ueber neue arten der gattungen "*Puliciphora*" und "*Chonocephalus*," 89, Suppl. xv, i, 140-154. **Metcalf, C. L.**—Life-histories of Syrphidae, III. "*Syrphus americanus*," 143, xii, 477-489. **Michl, E.**—Ueber termitophile Dipteren, 302, ix, 53-60. **Pflugstaedt, H.**—Die halteren der Dipteren, 97, c, 1-59. **Schulze, P.**—Entwicklung von "*Drosophila rubrostriata*" in formol: ein beitrag zur kenntnis der lebenweise der Drosophilalarven, 22, xxxix, 199-202. **Townsend, C. H. T.**—A readjustment of Muscoid names, 10, xiv, 45-53. **Walton, W. R.**—Notes on certain species of flies, 102, xiv, 13-14.

**COLEOPTERA.** **Aurivillius, C.**—Coleopterorum catalogus. Par 39. Cerambycinae, 574 pp. **Bernhauer, M.**—Zur Staphylinidenfauna von Nord-Amerika 5, Beitrag, 189, iv, 678-683 (\*). **Casey, T. L.**—Memoirs on the Coleoptera III, 1912, 386 pp. (\*). **Dalgliesh, G.**—Notes on the whirligig beetle (*Gyrinus natator*), 47, xvi, 64-71. **Fall, H. C.**—Four new Myrmecophilous C., 5, xix, 5-12 (\*). **Gunther,**

K.—Die sehorgane der larve und imago von "Dytiscus marginalis," 97, c, 60-115. **Henriksen, K. L.**—Oversigt over de danske Elateride-larver, 303, 1911, 225-252. **Junk, W.**—Die Coleopterologische literatur. Bibliographia Coleopterologica. **Kerremans, C.**—Monographie des Buprestides V, Livr. 21. **Kraus, E. J.**—A revision of the genus "Lasconotus," 102, xiv, 25-44 (\*). **McDermott, F. A.**—The light-emission of American Lampyridae: notes and corrections on former papers, 4, 1912, 73. **Olivier, E.**—Lampyrides faisant partie des collections du Musee de Washington, 35, lvi, 24-27 (\*). **Pierce, W. D.**—Systematic notes and descriptions of some weevils of economic or biological importance, 50, xlii, 155-170 (\*).

**HYMENOPTERA.** **Forel, A.**—Formicides neotropiques, 35, lvi, 28-49. Die ameisen des K. Zoologischen Museums in Munchen, 374, 1911, 249-303. **Friese und Wagner.**—Zoologische studien an hummeln, 89, Suppl. xv, i, 155-210. **Gahan, A. B.**—Descriptions of two n. g. and six n. sp. of parasitic Hymenoptera, 102, xlv, 2-8 (\*). **Girault, A. A.**—On the occurrence of a European species of Myrmecidae in North America, 4, 1912, 88-89. A n. sp. of the myrmecid genus "Polynema" from British Columbia, 102, xiv, 23-24 (\*). **Mace, H.**—The influence of weather on bees, 10, lxxxix, 62-65. **Mocsary, A.**—Species Chrysididarum novae, 49, ix, 443-474. **Sladen, F. W. L.**—How pollen is collected by the honey-bee, 10, 1912, 586-587. **Viereck, H. L.**—Descriptions of five n. g. and 26 n. sp. of Ichneumonidae, 50, xlii, 139-153 (\*). New genus and species of Hy. of the family Braconidae from Panama, 335, lix, No. 5, 2 pp.

**BUTTERFLY HUNTING IN MANY LANDS.** Notes by a Field Naturalist. By George B. Longstaff, M. A., M. D., Oxon; F. R. C. P., F. S. A., F. G. S. Late Vice-Pres. Roy. Stat. Soc. Late Vice-Pres. Ent. Soc. Lond., Hon. Memb. Ent. Soc. Lanc. and Ches. Author "Studies in Statistics." To which are added Translations of papers by Fritz Müller on the Scent-organs of Butterflies and Moths; with a note by E. B. Poulton, D.Sc., F. R. S. 728 pages, sixteen plates, seven colored. Longmans, Green & Co., 39 Paternoster Row, London; New York, Bombay, and Calcutta. Price \$7.00 net.

The author had given to him a copy of "World of Insects," bearing the inscription "To a young Entomologist from an old one, William Spence, October 7, 1858." and he says "I was then under ten." The first chapter is devoted to some early reminiscences that are very interesting, interspersed as they are with notes on insects. The excursions after exotic butterflies began in India in 1903 and ended in New Zealand and Australia in 1910.

The other countries visited were Ceylon, China, Japan, Canada, Algeria, South Africa, West Indies, South America, Egypt and the

Soudan. In addition to records and field notes covering all phases of butterfly life, Dr. Longstaff treats of many other kinds of insects and figures some of them. In addition to the natural history of insects he gives interesting descriptions of the general features of the countries visited, their history, geography, flora and inhabitants. The book will appeal as much to those interested in travel as to the naturalist, as it is delightful reading. He comments on many things and even gives some of the "Sea tales" of his shipmates. It is the kind of book that helps make naturalists and we can't have too many of them.

One unfortunate feature of such books is that many interesting records may be overlooked. The non-Lepidopterist will be likely to overlook the matter devoted to other orders and the labor of going over such a book for records and field notes is not to be despised. Dr. Longstaff is a student and exponent of "mimicry" and gives many notes pertaining to that interesting subject.

The last chapter is on butterfly bionomics. The appendix consisting of translations of valuable papers by Fritz Müller, is very useful and indispensable for those not understanding the original language.

There is much to praise and nothing to condemn in the work and it is a valuable addition to the popular works on natural history and travel.—H. S.

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## Doings of Societies.

### ENTOMOLOGICAL SECTION, ACADEMY OF NATURAL SCIENCES OF PHILADELPHIA.

Meeting of January 25th, 1912, Mr. Philip Laurent, Director, presiding. Eleven persons were present.

Mr. Rehn announced having received a collection of Orthoptera numbering about 160, in exchange, from Prof. Karny, of Elbogen, Bohemia.

Mr. George M. Greene presented 65 specimens of Coleoptera taken in the vicinity of Philadelphia.

Dr. Calvert presented 13 specimens, four species of *Glossina* and 6 specimens, four species of *Tabanus* from Africa, received in exchange from the Entomological Research Committee. Seven specimens, 3 species of *Glossina*, gift of Dr. Allen J. Smith, and three specimens of *Cicada septendecim*, from between Almonesson and Blackwood, New Jersey, June, 1911.

Mr. Rehn made some remarks on the Orthoptera collections

of the German Central African Expedition, loaned to him for study by the Berlin Museum, and on which he had spent the greater portion of the past year. The series contained two hundred and twenty-six species, of which eleven genera and subgenera, and eighty-one species proved to be new. An analysis of the relationship of the Orthopterous fauna of the Central African lake region and Uganda showed that the greater portion of the species not peculiar to the region were of West African forest region relationship, the eastern steppe element being less numerically. This proportion has been found to be carried out in a number of groups of animals and plants similarly analyzed. Some idea of the richness of species in certain localities was given, and a number of striking species from the collection exhibited. He also exhibited a collection of Orthoptera from Egypt, sent for study by Edgard Chakour.

Dr. Calvert made some remarks on the collection he had presented, and said he had been giving a course at the University of Pennsylvania on the transmission of disease to human beings by insects. He gave a history of the disease, nagana, conveyed to animals by *Glossina morsitans* and *brevipalpis*, and sleeping sickness conveyed by *G. palpalis*. A rapid way to determine the sex of *Musca domestica* was mentioned. If the flies are boiled in a solution of caustic potash the ovipositors of the females will be extended.

#### BROOKLYN ENTOMOLOGICAL SOCIETY.

At the annual meeting, held January 11, 1912, resolutions of sympathy were adopted for Prof. John B. Smith, whose continued illness prevented what would otherwise be his unanimous re-election as President and Delegate to the Council of the New York Academy of Sciences.

The officers elected were: Wm. T. Davis, President; Wm. T. Bather, Vice-president; Chris. E. Olsen, Treasurer; R. P. Dow, Secretary; S. C. Wheat, Librarian; Geo. Franck, Curator.

The Society is making steady though slow progress on a





PROFESSOR THOMAS H. MONTGOMERY, JR.



catalogue of Long Island insects of all orders. A surprisingly large number of semi-tropical forms have been discovered.

R. P. Dow, *Secretary*.

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## OBITUARY.

### Professor Thomas H. Montgomery, Jr.

(Portrait, Plate XIII)

Thomas Harrison Montgomery, Jr., Ph.D., Professor of Zoology in the University of Pennsylvania, died on March 19th, at the Pennsylvania Hospital, Philadelphia, after a prolonged attack of pneumonia.

Dr. Montgomery was the son of the late Thomas Harrison Montgomery and Anna Morton, daughter of Samuel George Morton, one of the founders of the sciences of craniology, and president of the Academy of Natural Sciences of Philadelphia. He was born in New York on March 5, 1873, and received his early education at the Episcopal Academy in Philadelphia. After two years as a student in the University of Pennsylvania, 1889 to 1891, he spent three years in the study of Zoology at the University of Berlin and received the degree of Ph. D. at that institution in 1894.

On his return to this country he held a research position at the Wistar Institute for a few years. He was also Professor of Biology and Director of the Museum of the Wagner Institute of Philadelphia. In 1898 he was made Instructor and afterward Assistant Professor of Zoology in the University of Pennsylvania. From 1903 to 1908 he was Professor of Zoology in the University of Texas, but in the latter year he was recalled to take charge of the Department of Zoology in the University of Pennsylvania. Shortly afterward he was intrusted by the University with the chief responsibility for the planning and construction of the new Zoological Laboratory. Into this labor he threw himself with his usual untiring energy, giving personal attention to every detail. The building was completed in 1911, and will stand as a monument to his foresight and his executive ability.

The results of Professor Montgomery's research in the technically difficult problems of cellular structure and its relation to the phenomena of heredity and the determination of sex, in the activities, habits and development of spiders and birds, in the structure and development of various rotifers and insects have been embodied in more than eighty articles. He also published a volume, "Analysis of Racial Descent in Animals," 1906, and has left in manuscript a nearly completed work on cytology.

His chief claim to mention in an entomological journal rests on his work on spiders and on the fact that much of his cytological research was based on insect material.

His taxonomic papers on the Araneads deal with the families Lycosidae, Oxyopidae and Pisauridæ. His studies "On the Spinnerets, Cribellum, Colulus, Tracheæ and Lung-Books" (1909) led him to deny the prevalent view that the Arachnida have developed from the Paleostraca by adaptation to land life. He investigated the embryonic development of *Theridium*, and published many interesting observations on the courtship, mating and cocooning habits of various species, based on spiders which he kept in great numbers of small glass boxes on his tables in the laboratory and at home.

To the NEWS for January, 1902, Prof. Montgomery contributed a list of the Hemiptera Heteroptera of Wood's Hole, Massachusetts, and this group of insects furnished much material for his researches on the sex cells of different families, especially the Pentatomidæ. His discoveries as to the structure and history of the germ cells are many and notable; chief among these may be mentioned the fact, which he first suggested, that the chromosomes (or colorable bodies of the nucleus) unite together in pairs during the ripening of the germ cells, one member of each pair being derived from the father, the other from the mother. Another was of the existence of modified chromosomes in spermatozoa, but not in eggs of the same species. These discoveries have formed the basis of some of the most important recent studies and theories on heredity.

## EXCHANGES.

Not Exceeding Three Lines Free to Subscribers.

These notices are continued as long as our limited space will allow; the new ones are added at the end of the column, and only when necessary those at the top (being longest in) are discontinued

**For Exchange**—350 species of Coleoptera for native or exotic specimens new to my collection. List on application.—Emil Liljebld, 1018 Roscoe St., Chicago, Ill.

**Semiophora tenebrifera**, *Choephora fungorum* and many other desirable species of Nocturnal Lepidoptera offered for exchange.—Fred. Marloff, Oak Station P. O., Allegheny Co., Pa.

**Lepidoptera**—I have for exchange *Catocala nubilis*, *elonympa*, *gracilis*, *grynea*, *ultronia*, *cerogama*, *ilia* and var. *uxor*, *unijuga*, *cara*, *antinympa*, *paleogama*, *neogama* and var. *snowiana*, *piatrix* and *epione*. Desire other *Catocalae*.—John H. West, 2229 N. Mascher Street, Phila., Pa.

**Live ova** and pinned imagoes of *Catocalae*, chrysalids of Sphingides and Papilios and cocoons and pupae of the Saturnidae and Ceratocampidae for exchange.—R. R. Rowley, Supt. Schools, Louisiana, Mo.

**Papilios** of the world wanted, either by exchange or purchase.—C. F. Groth, 45 Poplar Place, New Rochelle, N. Y.

**For Sale**—A copy of the Butterflies of North America, by W. H. Edwards. Copy in beautiful condition.—Dr. F. W. Russell, Winchendon, Mass.

**I collect** in all orders for cash. Locals only. Unique field. Hand written price lists for intending buyers, two cents. Specialists served.—A. H. Manee, Southern Pines, N. C.

**Lepidoptera from Florida**—Several thousand specimens to dispose of in exchange or for cash, also southwestern material.—Henry Engel, 753 Ensign Ave., Pittsburgh, Pa.

**Lepidoptera** for exchange—A number of butterflies from the southwest, such as *A. strigosa*, *Synchlœ californica*, *Melitaea neunoegei*, *M. quino*, *L. mormo*, *C. australis*. Correspondence desired on special material desired from this section.—J. R. Haskin, 936 Manhattan Place, Los Angeles, Cal.

**Tom Spalding** will collect 1912 Utah Lepidoptera, Coleoptera, etc., particularly Papilionidae, *Catocalae*, Cicindelidae.—Provo, Utah.

**Wanted**—Tipulidae (Craneflies) from any part of the Globe, but especially of North America. Will buy for cash or give exchanges in Coleoptera, Lepidoptera or Coleoptera.—Dr. W. G. Dietz, Hazleton, Pa.

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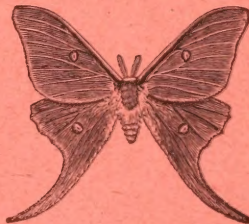
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