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The Canadian Entomologist.

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OBSERVATIONS ON THE EGGS OF CLISIOCAMPA SYLVATICA AND AMERICANA.

BY THE EDITOR.

Some time during the month of October last we were informed by Mr. B. Gott, nurseryman of Arkona, Ont., that he had observed on cutting into clusters of the eggs of *Clisiocampa* that the larvæ were at that time fully formed, a fact he had discovered by the use of a magnifying lens. It was our intention to take an early opportunity of verifying this statement by examination of the eggs under higher powers of the microscope, but delayed doing so for want of time. During the latter part of November Mr. A Puddicombe, one of the members of our Society here, a careful observer and good microscopist, independently made the same discovery by cutting into clusters of these eggs with a sharp knife. He submitted the results of his observations at a meeting of the London Branch of the Entomological Society, held early in December, where the eggs were opened and examined under the microscope. We found the interior of the eggs perfectly dry, with a pearly lustre, the larvæ fully developed and only awaiting warmth before making their escape. When the upper end of the egg was removed, the larvæ would frequently push their heads out and move them actively about, occasionally crawling almost or entirely out of the shell. Examinations have thus since been frequently made with eggs both of *C. sylvatica* and *C. americana*. In several instances where the egg clusters have been kept in a warm room for a week or two, the larvæ, mistaking the warmth for that of spring, have eaten their way out of the shells, and finding no food, have died. These details, we think, are sufficient to establish the interesting fact that the larvæ of both these species mature early in the fall and hybernate inside the egg, waiting the warmth of spring before eating their way out.

Recently we devoted an evening to the microscopic examination of these egg clusters, having previously collected a number of them for this purpose. In many instances it was found that the glutinous coating which covers the clusters was imperfect, that a piece here and there had disappeared, leaving the eggs bare, and in some cases patches of the exposed eggs were empty. To ascertain, if possible, the cause of this, some of such affected clusters were cut into, when they were found to be colonized by mites. The outside gummy matter is of a sufficiently porous texture to afford abundant shelter to these little friends, who had evidently eaten into the eggs and devoured the young larvæ, and had also consumed the missing portions of the gummy covering. In the range of a single section of an egg mass some eggs would be found inhabited by the larvæ uninjured, while out of others would proceed several (in some cases as many as five) active little mites, who, when thus disturbed, would run in and out of their dwelling places, and keep up a peculiar drumming motion with their tiny antennæ. We found what were probably two different forms of the same species of mite, the one so small that four or five or more could find ample room and to spare within a single egg-shell, and these were very active and nearly transparent; the other much larger, of a pale red color, with bright red eyes, sluggish in its movements and only one in each egg; indeed, one specimen nearly filled an egg. On the outside of some of the clusters were found some round pale red eggs, which we presumed were the eggs of these mites. From their structure the mites appeared to belong to the genus *Trombidium*.

We have submitted examples of these insects and egg clusters to Dr. H. Hagen, of Cambridge, Mass., and he has kindly and promptly examined them and confirmed the correctness of the views above advanced. Dr. Hagen says that he found the supposed mite eggs both empty and full of the small, active, white creatures, that these active specimens are doubtless the young of the larger red form, which latter is .04 inch long, and he is of opinion that it belongs to *Trombidium*. He further says: "In the whole European literature I have not been able to find anything about Acari eating eggs, so the fact seems new and is very important."

On almost every cluster we have examined we have found more or less of these mites, and if they are thus generally distributed over the whole district inhabited by the moths, they must prove a most efficient check to the undue multiplication of *Clisiocampa*. In No. 8 of our last

volume we drew attention to the fact of the enormous abundance of the larvæ of *C. sylvatica* last year in many of the western portions of Ontario, and to the further fact that we had found a large number of the larvæ to be infested by parasites, both Dipterous and Hymenopterous. Notwithstanding this, large numbers matured and their egg clusters are numerously distributed over almost every forest and fruit tree. We have no evidence that birds devour many of them, hence we warmly welcome this new found friend, who has doubtless been silently working in our interest for many years past. In 1868 the larva of *sylvatica* was almost as abundant as it was last summer, while in 1869 very few were to be found. By the light of these observations it is easy to see that these destructive insects may be decimated by one of two methods, or by both; in the first place by the enormous increase of these mite enemies, or by the occurrence of a severe frost following a few warm days in spring, during which by the heat of the sun the larvæ have been incited to activity, and having left their snug winter quarters, have, while in a feeble and comparatively unprotected state, been destroyed by cold.

NEW PYRALIDES.

IV.

BY A. R. GROTE, A. M.,

Director of the Museum, Buffalo Society Natural Sciences.

I am indebted to Mr. Jas. Behrens for some Californian Pyralides. Among them is a specimen of *Orobaena octonalis* of Zeller, hitherto found in Texas and Kansas. The specimen is labelled "San Diego, Aug., 1874." Two specimens of *Eurycreon chortalis:* "Soda Sp.," and two of *Botis unifascialis:* "Sauzalito, May 27," are also present.

In the present paper I continue my descriptions and corrections. There are yet a large number of new species of *Botis;* I regret that I cannot identify many of Lederer's from his figures and descriptions.

Arta olivalis, n. s.

♂ ♀. A small species allied to *statalis*, but differing by the olivaceous cast of the fore wings above, crossed by two even parallel faint pale lines, the inner at the middle of the wing, the outer within the middle of the terminal portion; fringes vinous. Hind wings pale purplish with vinous fringes. Beneath the costal and external margins are bright wine-color; a pale common line. Abdomen beneath vinous; legs pale yellowish and purplish. Labial palpi divaricate; ocelli present; ♂ antennæ scaled above, pubescent beneath; shape of the wings much as in *Asopia*, but the costa and internal margins are even more parallel.

Expanse 14 mil. Hab. Texas, Belfrage (No. 405, July and August). This is even a slighter species than *Condylolomia participialis*.

Botis venalis, n. s.

♂ ♀. Allied to *dasconalis* by its plain appearance, but smaller and differently ornamented. Fore wings ochreous, varying in intensity of color, with darker diffuse longitudinal shades along the veins, without lines or spots. Hind wings pale, sub-pellucid, saturated with ochreous, without lines or spots. Beneath whitish, fore wings streaked with fuscous, without lines or spots. Thorax, head and palpi above ochrey, beneath white; abdomen pale ochrey above, beneath with legs whitish; fore tibiæ within darker.

Expanse 26 mil. Not uncommon about Buffalo, N. Y., in June. Easily recognized by its simple ornamentation, which differs from that of any other species known to me.

Botis trimaculalis, n. s.

♂ ♀. Clay-yellow; fore wings narrower and more pointed than usual. Terminally the wing is more or less distinctly shaded with fuscous. Three *open* spots on median space. The orbicular round, reniform lunate and a third and smaller spot on submedian fold also open and spherical, varying in size. The stigmata are annulate with fuscous, their centres are perhaps a little darker yellow than the wing. Interior line even, bent. Exterior line not very uneven; after touching vein 2 it runs inward, rising on the interspace till it nearly meets the lower extremity of the reniform which extends over the base of veins 3 to 5. Head and thorax ochrey; abdomen ochreous on the segments above, annulated with white, beneath

whitish fuscous. Hind wings yellowish, sub-pellucid, with borders of yellowish (♀) or fuscous (♂); an extra median fuscous line and discal streak. Beneath as above, duller and more fuscous.

Expanse 25 mil. *Hab.* Texas, Belfrage, August and October, two specimens, No. 376. Resembles somewhat *Stenophyes serinalis*, but the color is different and the species is stouter.

Botis fuscimaculalis, n. s.

♂ ♀. Resembles *trimaculalis* so closely that it is difficult to distinguish it. The color is a duller yellow, the markings are all fainter, the veins are indicated by pale fuscous. The hind wings are whitish fuscous and the line is only fragmentary. Beneath the wings are more purely fuscous, without the yellowish stain. The three open spots on median space are present, but the reniform is upright, medially constricted and does not spread over the submedian nervules at base, consequently the exterior line does not come so near it inferiorly. Interior line more irregular, also the exterior line, but similarly shaped; the interior line is however deflected on the interspace between submedian vein and vein 1. But the species may be at once separated by the abdomen being whitish or fusco-whitish, not ochreous above as with *trimaculalis*.

Expanse 25 mil. *Hab.* Texas, Belfrage, No. 374; June and November; three specimens. Much narrower-winged and with more pointed apices than *Botis submedialis*.

Botis flavicoloralis, n. s.

Dull yellow, allied to the preceding species. Primaries concolorous, powdery, yellow, not shining; fringes whitish. Reniform open, very faintly outlined. No spot on submedian fold. Exterior line almost obliterate, very faint. Orbicular sub-obsolete, open. Hind wings whitish, with whitish fringes, stained with yellow exteriorly; extra mesial line narrow, lost inferiorly. Beneath hind wings whitish, with the mesial line fragmentary. Thorax above yellow; palpi brown at the sides, whitish beneath. Fore wings beneath pale, with the markings traced in pale fuscous.

Expanse 21 mil. Texas, Belfrage, Oct. 11, No. 374; one female.

Smaller than *fuscimaculalis*, with the lines obliterate and of a brighter yellow.

Botis unifascialis Packard, Ann. N. Y. L. N. H., 1873.

One ♀ specimen resembles Packard's description except that the primaries have the external margin shaded with pale color like the fascia. A second ♂ has the pale shading on hind wings above no more noticeable than in the European *opacalis*, with which the Californian specimens agree in the immaculate secondaries beneath. The European representative of this species, unknown to Packard, is *opacalis*, and it resembles the Californian examples very closely.

Botis subolivalis Packard, Ann. N. Y. L. N. H., 1873.

♂ ♀. This Eastern form has the secondaries in the ♀ rayed beneath and in both sexes immaculate above; it is less like *opacalis* than the Californian examples. Packard's description takes no note of the sex, but, as in *unifascialis*, the female has the wings less pointed. *B. hircinalis* Grote is a synonym. The males have the wings more pointed, the pale fascia sub-obsolete and the hind wings beneath not rayed with fuscous and the ground color more gray.

Botis stenopteralis, n. s.

♀. Allied to *hircinalis*, narrower-winged and darker colored. Fore wings very dark brown; a discal black mark; outer line pale, even, slightly bent. Hind wings black with yellowish basal shades and a mesial yellowish broken band continuous with exterior line on primaries. Abdomen blackish above, annulate with white; beneath white. Wings beneath pale reddish ochrey, with common outer line and discal marks; external margin of both pair fuscous; primaries with the anterior (orbicular) dot present. Palpi black at the sides, whitish beneath.

Expanse 18 mil. *Hab.* Maine, Prof. C. H. Fernald.

Differs from *ablutalis* by the darker color, stouter body, narrow, even exterior line, and black discal mark on primaries above; it is not very nearly related to that species.

Botis talis, n. s.

♂. Form of *adipaloides*. Fore wings bright purple. An irregular-shaped, brown-margined, light yellow patch resting on internal margin within the middle and projected upwards on the cell; preceded on the cell by a small partially confluent similar spot. A similar quadrate patch

over the veins beyond the cell open to costa, along which the yellow color spreads towards the base. Hind wings bright purple with a very broad yellow central fascia tapering inferiorly, edged with brown or black lines. Fringes pale. Beneath paler, but as above; base of hind wings entirely yellowish. Thorax brownish purple; beneath body and legs whitish.

Expanse 20 mil. *Hab.* Marengo Co., Ala., coll. Grote.

So brightly colored and distinctly marked that it can be mistaken for no other species. The fine dark lines edging the yellow patches on primaries may be taken for the ordinary lines and the annuli of the purple stigmata.

Eurycreon anartalis, n. s.

Size of *sticticalis* and *cereralis*, but resembling a species of *Anarta* in color. Fore wings blackish, somewhat grayish about the exterior line, which is broken and fragmentary. Two black discal stains and a black curved streak below submedian vein all faintly visible. Hind wings yellowish white, blackish at base, with broad black borders; before the black borders a curved line of black points. Beneath this curved line is repeated on the yellowish white color which extends to the base of the wing, relieving a rather long curved linear discal streak, the black border as above, interlineated with pale at anal angle. Primaries blackish, with an extra median pale shade. Abdomen yellowish white beneath, blackish above, annulated with white. Clypeus tuberculate.

Expanse 22 mil. Soda Springs, Cal., Mr. Jas. Behrens, two males.

Eurycreon communis Grote.

Mr. Belfrage has sent this variable species under the Nos. 372, 373 and 375. This latter number covers specimen which, from Lederer's Taf. 12, fig. 3, I take to be *rantalis*. Under the name *communis* I have originally described paler, more yellowish specimens (373 of Belfrage) of this same species. They are not *crinitalis* Led., Taf. 12, fig. 2, for they have the interior line present as in the typical form figured by Lederer of *rantalis*. Perhaps Walker has described *communis* under the name *crinisalis*, as he gives the interior line present, and *crinitalis* Led. Zell., which I do not know, may be a different species. Again, it seems to be doubtful whether the Texan species is really the *rantalis* of Gueneé. On page 106 of this volume, line 3, read "a paler form than *rantalis*" for

"a darker form than *vautalis*." Provisionally I retain this name of *communis* for the species; if *rantalis* of Guenée proves identical, the name *communis* will apply merely to the paler, yellowish specimens as a color variety. There is a tendency in several fuscous brown species of this family to vary in the direction of pale yellowish or ochreous, as for instance, *Botis fracturalis* of Zeller and *Botis argyralis* of Hübner.

Crocidophora Led.

C. tuberculalis Led., Taf. 2, fig. 19.

I have taken this species near Buffalo, N. Y., in June.

C. pustuliferalis Led., Taf. 12, fig. 11.

I have taken this species in Alabama. My single ♂ specimen is larger and does not agree very well with Lederer's figure.

C. serratissimalis Zeller.

I have taken one ♂ near Buffalo, and I find that my *Botis subdentalis* is the ♀ of this species, and consequently a synonym, Prof. Zeller's description being earlier.

Homophysa albolineata.

Lipocosma albolineata G. & R., 1, 28, pl. 2, fig. 22.

The ocelli are present. It is not improbable that this is the *glaphyralis* of Guenée

Homophysa peremptalis, n. s.

♂. The smallest species, much smaller than *fulminalis* Led., of which latter I have a specimen from Texas (Belfrage, No. 394) and two from New York. Ocelli present. Fore wings ochre-brown, darker, somewhat fuscous at base. The uniform dark tint unbroken by any paler shading. Interior line exceedingly fine, composed of white scales, forming two large teeth, of which the upper is much the more prominent; the lower outward angulation on submedian fold being less obvious. The outer white line is very faint, near the external margin, evenly and widely arcuate, running inwardly submedially. Both lines very faintly relieved by dark scales. On external margin below apices are three interspaceal dark dots followed within by white ones. It is the commencement of a discontinued series, of which another is faintly visible at internal angle.

Fringes concolorous. The markings must be studied under a microscope to see them clearly. Hind wings pale at base, with a diffuse external ochre-brown patch cut by a narrow white line. A series of terminal dark points and a dark line on the ochrey fringes, both discontinued superiorly. Beneath paler, glistening, shaded with ochre-brown outwardly and with the exterior marked in a darker shade on primaries. Body and legs pale.

Expanse 10 mil. Amherst, Mass., Mr. L. W. Goodell, No. 708.

Homophysa eripalis, n. s.

♀. Size and color of *reniculalis* of Zeller, of which I have a specimen from Texas (Belfrage, No. 396, Oct. 16), but differing by the want of discal maculations on primaries. The fine white relieved lines more distinctly marked on costa of fore wings. Head and appendages ochrey and whitish; thorax ochreous. Fore wings entirely fuscous, with a very fine inner slightly waved line, and the outer line very near the margin, arcuate above, running in submedially and very slightly angulated on internal vein. The concolorous fringes are white tipped. In a second specimen from Alabama the base of the wing is slightly ochre-shaded. Abdomen above fuscous, finely white ringed. Hind wings concolorous, more fuscous exteriorly and inferiorly, where they show the white mesial line relieved by dark scales more distinctly. Beneath the common white relieved exterior line is continuous.

Expanse 16 mil. Texas, Belfrage, No. 394, June 7.

Chalcoela Zeller.

Beitr. 1, 82 (528), Tab. 11, fig. 12, *a* and *b*.

Chalcoela aurifera Zell., Beitr., 1, 83 (1872).

This smaller of the two species which I refer to this genus is yellow ochre in color; the median lines blackish, disconnected, the outer line with an inferior sinus and situate well towards the outer margin of the wing. Median space washed with gray, which spreads over the terminal space inferiorly. Taken in Texas by Belfrage; No. 417.

Chalcoela Robinsonii.

Cataclysta Robinsonii Grote, CAN. ENT., 3, 181 (1871).

The ocelli are absent. This is larger than its ally and darker colored, of a honey brown. Median lines white; outer line with a more acute

discal projection, and without an inferior sinus. The median space is much narrowed inferiorly. The grayish shade over median space is continued to costa; in its ally the costal region is of the ground color of the wing. I do not detect the brilliant line on the external margin of the fore wings in *C. Robinsonii;* the curved apical line is present in both forms. The hind wings are darker in *C. Robinsonii*, and show a clear white line before the series of black and golden marginal dots. The inner line on primaries is white and curved, not straight as in its ally, and the terminal space is wider and freer from grayish shades in *C. Robinsonii.*

OBITUARY NOTICES.

Death has of late been making serious inroads among the ranks of our fellow laborers in the Entomological field. An old veteran among American Naturalists, Dr. J. P. Kirtland, of Cleveland, Ohio, has passed away, while recent advices from across the Atlantic announce the deaths of Mr. Andrew Murray and Mr. T. V. Wollaston. Most of the details given in reference to the lives of the two latter are condensed from memoirs which have just appeared in *The Entomologist*, of London, Eng.

DR. JARED P. KIRTLAND

was born at Wallingford, Conn., on the 10th of November, 1793. His youthful studies were pursued at Wallingford and Cheshire Academies, and being a bright, active boy and an earnest student, he soon made rapid and substantial progress in the classics as well as in English studies. As a boy he was enthusiastic in the study of natural objects; he knew the habits of almost every animal and bird that frequented his youthful haunts, and at twelve years of age was engaged in practical experiments in the cultivation of silk worms. About the same time he began the study of Botany, and soon applied his knowledge to a series of valuable experiments in the crossing of fruit trees with the view of improving the quality of fruits. His success in this department is well known to all intelligent cultivators of fruits in America, his hybrid cherries having won for him a

fame which time can never obliterate. His grandfather was a physician in Connecticut, and at his death his promising nephew, now eighteen years of age, inherited his grandfather's medical library and a sufficient legacy to enable him to acquire a medical education. He had made arrangements to pursue his studies in Edinburgh, when the war with Great Britain prevented him. About this time the medical department of Yale University was opened, and young Kirtland was the first student on its matriculation roll. Subsequently he graduated at the University of Pennsylvania, and in 1815 returned to his native place, where he practised medicine for two years and a half, devoting all his leisure moments to the study of natural science, for which he had developed a passion which influenced all his after life. He next removed to Durham, Conn., where he enjoyed an extensive practice for several years, when the death of his wife and child again unsettled him, and he removed to Poland, Conn. Five years later he was elected to the Legislature, where he served three terms, after which he was called to fill the chair of Theory and Practice of Medicine in the Ohio Medical College at Cincinnatti, which he did with distinguished ability for five years, when the duties becoming irksome to him, he resigned the position.

When in 1848 the first Geological Survey of Ohio was organized, Dr. Kirtland was appointed to superintend the natural history department, and in due time presented a series of reports which attracted general attention. He labored diligently among the Fishes, Birds, Mollusks, Reptiles and Insects of Ohio, sketching many of them with his own pencil and describing them with an enthusiastic fidelity. During his researches he collected a large and valuable cabinet of specimens with the design of forming a State Collection, but Ohio refused the substantial aid which this enterprise required, and as his collections had been made largely at his own expense, he retained possession of them and they were ultimately donated to the Cleveland Society of Natural Sciences, where they are now treasured as a priceless heritage.

In 1837 Dr. Kirtland had purchased a choice fruit farm five miles west of Cleveland, and had there settled, as it proved, for the remainder of his busy life. Four years after this he was appointed a Professor in the Medical Department of the Western Reserve College, in Cleveland, a position he filled with honor for twenty-one years. In 1861 Williams College conferred upon him the degree of L L. D., in recognition of his services, and many learned societies during his lifetime delighted to do

him honor. Among his Entomological papers, that which perhaps attracted most attention was his Notes on the Diurnal Lepidoptera of Western Ohio.

During the summer of 1872 it was our privilege to visit this veteran naturalist. We found him enjoying his quiet retirement among his flowers, fruits and insects, actively interested in everything that was going on about him. He gave us a most cordial welcome, and we spent a delightful afternoon together scanning his botanic and insect treasures. Although nearly 80 years of age, he retained all his faculties in apparent perfection, his eyesight being so well preserved that he could read ordinary print with the greatest ease. He died after a short illness at his home, on the 11th of December, 1877, at the ripe age of eighty-four years. He was among the most genial and winning of men, with a heart warm and steadfast. His temperate, well-ordered life preserved him in the full vigor of manhood far beyond the years at which men ordinarily grow old. He had no dissipation but hard work, no extravagance but lavish generosity to his friends and overflowing charity for the poor. In his seventieth year of patient labor he wrote as his motto over his desk: "Time is money; I have none of either to spare." Thus this tireless man of science labored to the end, laying down the work he loved so well after fourscore and four years of labor and usefulness, only at the call of the Master.

MR. ANDREW MURRAY, F. L. S.

This accomplished naturalist died at his residence, 67 Bedford Gardens, Kensington, on the 10th of January last. Mr. Murray was the eldest son of Wm. Murray, Esq., and was born in Edinburgh on the 19th of February, 1812, where he resided until 1860. In his early years he manifested a fondness for natural science which strengthened as he matured. He was educated for the law, and subsequently devoted some attention to the study of medicine. During the last few years of his life in Edinburgh he labored hard in the interests of science; in 1858 he was elected President of both the Botanical Society and Physical Society, and just previous to his removal to London he contributed an elaborate paper to the Royal Society of Edinburgh, on the "Pediculi Infesting the Various Races of Man." In 1860 Mr. Murray came to London, and was appointed Assistant-Secretary to the Royal Horticultural Society, and from this time he devoted himself to his work as a scientific Botanist and

Entomologist, becoming celebrated in the former as the monographer of the *Coniferæ*, and in the latter as the monographer of the *Nitidulidæ*. From 1852 to 1863 he published thirty-eight separate papers. In 1866 he published his well-known work on the "Geographical Distribution of Mammals," in which he bestows especial attention on the habitat during geological as well as glacial and present epochs, with copious synonymic lists, including locality past and present, geographical classification and colored maps of distribution, showing the result of his own careful research. In 1869 he accompanied Sir Joseph Hooker to the Botanical Congress of St. Petersburgh, as one of the representatives of British Science, his services there being complimentarily acknowledged by the presentation by the Emperor Alexander of a malachite table of great beauty. In 1871 he was entrusted with the superintendence of the arrangements connected with the British contributions to the International Exhibition of Moscow of the following year. He was Secretary to the Oregon Conifer Collection Committee, and in 1873 undertook an expedition to Salt Lake and California, with various scientific objects. On his return from the West he visited Canada and spent a few days with some relatives in London, Ont., during which time we were happy in making his acquaintance and of forming with him a warm friendship which only terminated with his life. During his short sojourn in Utah he contracted an illness which greatly increased in severity, and, indeed, almost prostrated him on his return to Europe. Subsequently he rallied and for several years enjoyed moderate health. In the course of last season further indisposition followed, and he gradually sank, but so assiduously occupied with his labor of scientific usefulness to his latest days, that few were prepared to hear of their close.

But it is with Andrew Murray as an Entomologist that we are most deeply interested. In early life he aided his relative, John Murray (Lord High Advocate), in his wish to provide some practically useful reading for village schools, by writing the little pamphlet, "The Skipjack, or Wire-worm and the Slug," which, though published without his knowledge, may be looked upon as his first contribution to Economic Entomology. He contributed many papers on Entomology to various scientific societies and publications, both home and foreign, but his great work was done in the last ten years of his life, which he devoted to illustrating the study of insects in its natural and practical bearings. It was in 1868 that the charge of receiving and arranging a government collection of Ecc-

nomic Entomology was placed in his hands officially, and from the first he devoted himself unceasingly to the task of making this as perfect as possible. Himself an accomplished draughtsman, and a patient worker and compiler, with a great love for the subject, he spared no pains in his work, whether in availing himself of scientific co-operation or in shaping the aid placed at his service by those less gifted than himself, in the details of field observation, and of museum illustration by colored drawings or fac-simile modelling. This collection is already a nucleus of a very valuable, popular and illustrated history of insect friends and insect foes, the practical value of which is already appreciated and bearing good fruit for public benefit. On this collection, of which one hundred and fifty cases are more or less complete, Mr. Murray was working up to his latest days, leaving a large collection of oak-galls and illustrative drawings still in progress of arrangement. To assist in the circulation of information a series of guides to the collection were projected. These were to take the form of popular hand books to Entomology, and were to be prepared by Mr. Murray and published under government supervision. Of the eight intended volumes only one has appeared; this treats of the Aptera or wingless species, and was noticed in the CANADIAN ENTOMOLOGIST for July, 1877. In the midst of his busy labors he was called away. We have lost in him a man of varied accomplishments, a thorough, painstaking Entomologist and a good Botanist. Those who knew him best will deeply feel his loss; not only will they miss the gifted naturalist, they will also grieve for the sudden removal of a friend so kind and true hearted.

MR. T. V. WOLLASTON, M. A., F. L. S.

This talented Entomologist died on the 4th of January last, at his home in Teignmouth, Devonshire, at the age of 56, from disease of the lungs, with which he had been more or less afflicted for thirty years past. In early life Mr. Wollaston became well known for his valued researches into the Coleoptera of the Maderian, Canarian and Cape Verd Archipelagos, which he personally explored. His valuable writings on the Coleopterous fauna of these islands, and especially his account of the insects of the Madeira group, are well known to Entomologists in the "Insecta Maderiensia," published in 1854. Subsequently he published catalogues of the Coleoptera collected by him in these several groups of

islands. His volume on the variation of species, dedicated to Mr. Chas. Darwin, and published in 1856, is well known. His shorter papers, chiefly relating to Coleoptera, embodying the results of original research, contributed to English and foreign scientific journals, range over a period of more than 30 years. In the autumn of 1875, feeling it desirable to seek a warmer climate, he visited St. Helena, where he devoted himself assiduously to the study of the Coleoptera inhabiting the island, of which work we have the record in his "Coleoptera Sanctæ Helenæ," lately published. This was Mr. Wollaston's last contribution to Entomological science, and is characteristic of its author in the finished elegance as well as clearness of its style. He returned to his home in the early summer of 1877, and thenceforward devoted himself to the task of arranging the valuable mass of information he had accumulated during his absence, and of which he leaves us the record in the work just referred to. He was a man of highly refined and accomplished mind, as well as of great scientific attainments, and will be much missed from the ranks of our leading naturalists, as well as by those whose progress he aided by his encouragement and counsel.

NORTHERN OCCURRENCES OF PAPILIO CRESPHONTES.

BY THOS. E. BEAN, GALENA, ILLINOIS.

The *American Naturalist* for November, 1877, contains on p. 688 the following paragraph :—

"PAPILIO CRESPHONTES IN NEW ENGLAND.—On the 6th of last September Mr. N. Coleman captured in the vicinity of Berlin, Connecticut, the only specimen of this Southern insect ever recorded from New England. As the larva is not known to feed on any other plant than the orange, the butterfly probably hatched from a larva accidentally transported with trees from Florida, or emerged from a chrysalis sent North as a curiosity."

The writer of the paragraph appears to have mislaid certain pages of recent Entomological literature.

The CANADIAN ENTOMOLOGIST has comments upon this butterfly in several of its volumes:—

Vol. 1, p. 19.—*P. thoas* captured at Amherstburg, Ontario, in 1868; said to be quite common there.

Vol. 6, p. 140 (1874).—"*Papilio thoas*—several taken. This insect was quite common in almost every clover field in that neighborhood"—a locality in the county of Essex, Ontario. . . . "Mr. Lowe took two specimens of *thoas* last season on the River St. Clair, near Port Lambton."

Vol. 7, p. 181 (1875).—"Mr. Cook said that *thoas* had been found this year at Lansing," Michigan—"that it occurred there to his knowledge some three years ago, and that last season it was quite common, the larva feeding on prickly ash."

In Vol. 9, p. 160 (1877), Mr. J. M. Denton records capture of *eleven P. thoas* on 1st and 2nd of August, in a field near Amherstburg, Ontario.

In *Proceedings Davenport Academy Nat. Sci.*, vol. 1, Mr. J. D. Putnam cites occurrence of *cresphontes* at Davenport, Iowa, and at Aledo, Illinois, 30 miles south of Davenport.

The insect is known to have occurred in West Virginia, Kansas, Illinois, Wisconsin, Connecticut (as above), Michigan and Ontario.

The fullest note I have found is by Prof. F. H. Snow, in *Trans. Kansas Acad. of Sci.*, vol. 4, p. 30: "Common in 1873 and 1874; rare in 1871, 1872 and 1875; feeds upon the prickly ash and the hop-tree in this region—upon the orange tree in the Southern States."

For this locality (Galena, Illinois) I have only a meagre record:—1872, ♀, August 15, new; 1873, a worn specimen, Sept. 8; 1874, several seen toward end of August.

The record of *cresphontes* in Ontario seems to indicate two broods. Mr. Lowe's captures in Essex County in 1874 were made between 10th and 20th June, and again in 1875 he observed the butterfly in the same locality between 6th and 30th June (CAN. ENT., vol. 7, p. 139-40). But Mr. Denton—as above cited—took eleven specimens early in August, near Amherstburg.

The foregoing references will serve to show that *cresphontes* is in some degree habituated in the North, as regards both climate and food plants, and that no special theory is required to account for the disclosure of an imago in New England.

NOTES ON ARGYNNIS ALCESTIS Edw.

BY C. E. WORTHINGTON, CHICAGO, ILL.

The occurrence of this species in considerable numbers in this vicinity has afforded an opportunity for comparison with *A. aphrodite*, the results of which are appended.

It should be stated that although the number referred to is small, yet the unrecorded comparison of over two hundred examples of both species during the past summer has agreed fully with this. In the line before me are five females each of *alcestis* and *aphrodite*. In every case the general color of the upper surface is duller in *aphrodite*, the basal shading heavier and more extensive, and the black markings on *primaries* heavier; in two examples the color approaches that of *A. cybele*, while the examples of *alcestis* exhibit a uniform clear color with hardly any variation.

On the secondaries the submarginal lunules are serrate in two cases in *alcestis*, all the other black markings being uniformly lighter, especially the ∩ spot in the disk, which is nearly or quite separated into two black spots. No other differences discernible. Beneath *aphrodite* exhibits a narrow, irregular, bright band on secondaries, between the two outer rows of silver spots; this is conspicuous in all the examples I have examined; there are also spots and patches of lighter color on the disk.

The under surface of the secondaries in *alcestis* differs widely from this; the whole of the wing is one sheet of uniform color, broken only by the usual silver spots and some *black* spots, one immediately behind the largest silver spot being very conspicuous in three examples. The silver spots are proportionately larger and closer together, and partially margined with black, much more conspicuously so than in any example of *aphrodite* that I have seen. In none of these is there the faintest trace of a band, while the general color is darker than in any examples of *A. idalia* taken here.

Five males of *aphrodite* and three males of *alcestis* exhibit the same differences above as females, though in a less degree; beneath the band is conspicuous in *aphrodite* ♂ as in the ♀, but obsolete or indicated by a faint shade in *alcestis*. The spots and patches of lighter color are nearly or quite absent in the latter, and the comparative size of silver spots as in ♀. In all cases these spots are more symmetrical in shape in *alcestis* than in *aphrodite*.

It should be added that the males approach each other more closely than the females.

Alcestis is quite abundant on the prairie west and north of this city in July and August; it seems to be quite local, as examples taken a few miles north in a timbered region are almost uniformly *aphrodite*. I have been greatly surprised at the readiness with which a strong *aphrodite* upon the prairie can be distinguished while on the wing from the surrounding *alcestis*, owing mainly to a slight difference in its manner of flight, which resembles that of *cybele*.

The difference of time of the appearance of the sexes in *alcestis* appears rather to exceed that in other species, the order of capture of the first examples of the larger *Argynnidæ* being as follows: *Alcestis* ♂, *idalia* ♂, *aphrodite* ♂, *aphrodite* ♀, *cybele* ♂, *cybele* ♀, *alcestis* ♀, *idalia* ♀.

The habitat of *alcestis* extends farther west and not so far south as that of *aphrodite*. Since the publication of Mr. Edwards' Catalogue I have received good examples from Michigan, and am informed that it has been taken in New York.

In faded examples of *alcestis* (Sept.) a faint shade is observable in certain lights between the outer rows of silver spots on secondaries, but broad and regular like the band of *cybele*, and not in the least resembling that of *aphrodite*.

ANNUAL MEETING OF THE LONDON BRANCH OF THE ENTOMOLOGICAL SOCIETY OF ONTARIO.

The Annual Meeting of the above Branch was held on the evening of Jan'y 15th, 1878, at the residence of Mr. Chas. Chapman, when after the routine business had been transacted, the following gentlemen were elected as officers for the current year:—

President, J. M. Denton; Vice-President, A. Puddicombe; Sec'y-Treasurer, J. H. Bowman; Curator, Chas. Chapman; Council—H. Bock, W. Saunders, J. Williams; Auditors—H. Bock, W. Saunders.

A pleasant hour was then spent in discussions on insects and their habits, after which the members adjourned.

BOOK NOTICES.

Descriptions of Noctuidæ, chiefly from California, by A. R. Grote. Extracted from the Bulletin of United States Geological and Geographical Survey; large 8vo., pp. 18, containing descriptions of thirty-three new species, chiefly of *Agrotis* and *Hadena*.

New Tineina from Texas, Food Plants of Tineina, and Index to the Described Tineina of the U. S. and Canada, by V. T. Chambers; also from the Bulletin of the U. S. Survey; large 8vo., pp. 88. In this pamphlet there are forty-two new species described. A catalogue of the food plants of the Tineina of America, as far as they are known, is given, followed by a very complete and useful index embracing all the described American species.

President's Address before the Appalachian Mountain Club, by Sam'l H. Scudder. Reprinted from Appalachia, Vol. 1, No. 4.; large 8vo., pp. 32. Our thanks are tendered the several authors of the above for their kindness in sending us copies of these pamphlets.

CORRESPONDENCE.

PIERIS VERNALIS AND P. PROTODICE.

DEAR SIR,—

In confirmation of Mr. Bean's conclusions, as given in the November number, I would state that I have long known *vernalis* to be but the spring form of *protodice*, and believe I so wrote to Mr. Edwards some time ago. What is probably the first record of this opinion will be found in my 9th Report on the Insects of Missouri (p. 57). My experience accords with Mr. Bean's as to there being every possible gradation between the extreme *vernalis* form and the typical *protodice*. What is true of these two supposed species will, I am confident, be found to be equally true of several other of Mr. Edwards' described species, especially in *Colias*; but no one perhaps is more willing to admit the fact at present than Mr Edwards himself, or is doing more by careful breeding to decrease the number of his own species.

C. V. RILEY, St. Louis, Mo.

DEAR SIR,—

Having been requested some years ago by Prof. Just, of Carlsruhe, to co-operate in the annual botanical review, I have now agreed to take upon myself the preparation of a report in reference to those vegetable excrescences known as galls, produced by insects.

The greatest difficulty in this work arises from the fact that the literature treating on the subject is scattered throughout a great number of works and various journals, of which we find only a part in our libraries; also, those which we possess, and particularly the later publications, are often of difficult access. It is therefore quite impossible to write a complete report if the editors do not send us the various papers which issue from the press You or your readers will oblige me greatly by sending copies of any writings in reference to galls which have appeared since 1875, as well as those which may be published from time to time. Parties sending extracts from journals will please add the date of publication. As an equivalent I shall be happy to send to any one helping me copies of my own writings on this subject. DR. F. A. W. THOMAS.

Ohrdruf, near Gotha, 14th Sept., 1877.

[We trust that our readers will do what they can to aid Prof. Thomas in this matter.—ED. C. E.]

I have the pleasure of noting the capture, June 23rd, of a fine specimen of the very rare Geometrid, *Eubyja quernaria* Smith & Abb.; it was taken resting on the trunk of a Hickory tree. Early in September I took sixteen specimens of *Aspilates Lintneraria* Pack., among which were several perfect examples of the female. It is an exceedingly variable species, scarcely two specimens being alike. The females were submitted to Dr. Packard, who determined them as the *liberaria* of Walker.

L. W. GOODELL, Amherst, Mass.

I have found *Melitaea phaeton* in large numbers this season in a large swamp on the east side of Mt. Tom, four miles from Holyoke; also *M. Harrisii* in the same locality. Since the middle of August up to the present time I have found over 300 larvæ of *Ceilephila lineata* feeding on Purslane. They seem to be very plentiful this year; never found but a few before. JOSEPH E. CHASE.

Holyoke, Mass., Sept. 20, 1877.