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The Canadian Entomologist.

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No. II.

AN EXTREME CASE OF SEASONAL DIMORPHISM IN COLIAS.

BY T. D. A. COCKERELL, WEST CLIFF, COLORADO.

It was thought strange when it was proved that *Colias kee-waydin* and *C. eurhytheme* were seasonal forms of a single species. Still stranger did it seem when Mr. W. H. Edwards proved by breeding that *C. eriphyle* (alias *Hagenii*) was also a form of *eurhytheme*, but even after this I was not quite prepared for the conclusion, forced upon me by irresistible facts, that in this locality the orange and yellow forms were not only of one species, but actually alternated seasonally, the former being the summer, and the latter the winter form. The locality in question is the eastern slope of the Sangre de Cristo range, in Custer County, Colorado, in the neighborhood of Swift Creek, at altitudes varying from about 7,800 to 8,400 feet. Only two forms of *C. eurhytheme* are found (exclusive of the pale females), and neither of these agrees precisely with those already described, so that ("West American Scientist," 1888, p. 42,) I called the orange one *intermedia*, and the sulphur yellow form *autumnalis*, this last being very close to *C. eriphyle*.

The facts of the case are best shown by extracts from my diary, all bearing upon this locality:—

July 13th, 1887.—Arrived here, found *intermedia* flying abundantly, and so until the middle of August, when I left for a trip to the western slope. No *autumnalis* seen.

October 22nd.—Returned to this locality; a few worn *intermedia* seen, the last of brood.

November 9th.—Caught a ♀ *autumnalis*, the first I had seen.

May 13th, 1888.—Caught a ♀ *autumnalis*—the first of the year. Soon after *autumnalis* became common, but no *intermedia* seen. The first ♂ was caught May 19th. (The ♀'s of both forms of *eurhytheme*, and also of *C. alexandra*, seem to emerge here sooner than the ♂'s.)

June 4th.—The first *intermedia* of the year seen.

June 8th.—*Autumnalis* still abundant, but some *intermedia* seen.

June 12th.—*Intermedia* becoming common, and *autumnalis* scarce.

June 26th.—*Intermedia* abundant, a single *autumnalis*, a ♂, taken, and this is the last seen.

C. eurytheme var. *intermedia* is now (July 17th) abundant, and *C. alexandra* is flying very freely. It is a curious circumstance that the so called "albino" females (var. *pallida*) do not appear to occur in *autumnalis*, or if they do are very rare, while they are so frequent in *intermedia* that I have sometimes fancied they even outnumbered the typical females. In both forms, I think, the females outnumber the males.

From the above facts, I think that it is hard to come to any other conclusion than that the orange and yellow forms alternate, and that this should be so, presents perhaps one of the most remarkable cases of seasonal dimorphism at present known.

There is a very large Asiliid fly found here, which occasionally preys upon *C. eurytheme* var. *intermedia* in the perfect state.

DESCRIPTION OF A NEW SPECIES OF ORTHESIA FROM CALIFORNIA.

BY WILLIAM H. ASHMEAD, JACKSONVILLE, FLA.

In a collection of Hemiptera sent me some time since for identification, were two male specimens of a coccid, and a single white waxy sac, from which one had issued, attached to the upper surface of a small, oval leaf, which at the time, from a superficial examination, I took to be a mealy bug, *Dactylopius longifilis* Comstock; but recently on a more careful examination I find to be a species of that interesting genus *Orthesia* Bosc.

But a single species has been described in this genus in our fauna, *i.e.*, *Orthesia Americana* Walker. A good description of what is supposed to be this species was given by Prof. Comstock in the U. S. Agricultural Report; 1880, page 349. As the present species does not agree with that description, it is apparently undescribed, and below I give a description of it, naming it in honour of its discoverer, Mr. Hy. Edwards, who took it at Grass Valley, Nepa County, California.

Orthesia Edwardsii n. sp.

Male sac.—This is broadly oval, pure white, .15 of an inch long by .12 of an inch in breadth. It was evidently formed by a secretion of fine, waxy flakes, the regularity of which has been lost as the insect reached maturity, the dorsal disk being entire, and the flakes only being partially distinguishable at the margins.

Male.—Length .12 inch; style about .04 inch. Entirely black, excepting a reddish cast on the mesothorax, scutellum, metathorax, abdomen at sides and beneath, and the epipleura of the mesothorax; while the head beneath the insertion of the antennæ is pale yellowish white. Head small, nearly quadrate, being but slightly narrowed posteriorly. The eyes consist of 5 or 6 ocelli placed at the side of the head, while the mouth consists of two large, quite prominent ocelli. Antennæ very long, the points of which have four or five irregular nodose swellings, with irregular whorls of long, delicate bristles; the first two joints are very short, not as long as wide, the 3rd and 5th joints the longest, about an equal length, the 4th, 6th, 7th, 8th and 9th shorter and gradually subequal, the 10th or apical joint more thickened, fusiform, about four-fifths the length of the penultimate joint. Thorax short, less than one-half the length of abdomen; the prothorax is hardly distinguishable from above, being but a delicate ridge or collar; mesothorax quite short, somewhat trapezoidal in outline, and obliquely ascending towards the scutellum, but with a depression in the middle, the lateral lobes distinct; scutellum highly convex, polished, with some short hairs on the disk, abruptly transversely divided by a deep, yellowish fissure posteriorly. Metathorax very short. Legs very long, rather slender, black, and with a long, fine hair pubescence; tibiæ longer than their femora, slender, cylindrical; tarsi less than one-third the length of tibiæ and more slender, gradually acuminate toward apex and terminating in a small, delicate claw; no digitules. Abdomen, on the dorsum, wrinkled, at sides towards apex covered with a white, waxy substance, and terminating in two very long caudal setæ, more than double the length of the insect, rather thickly covered with a white, waxy substance, especially at base, so that in reality they are much more slender than they appear. Style long, blackish. Wings two, white, of the ordinary shape, but I can detect a spurious vein, springing from near the base of the longitudinal vein, between it and the costal margin, and running parallel with it to half the

length of the wings. I have examined many male coccids, but never before noticed this spurious vein, and consequently think it of great importance. Halteres linear, terminating in a hook with two teeth; one of the halteres is attached to a fold or thickening in the front wing, and as has before been observed, evidently greatly assists the insect in its flights; the other one was loose, and thus enabled me to make out the two small teeth.

STRAY NOTES ON MYRMELEONIDÆ, PART 5.

BY DR. H. A. HAGEN, CAMBRIDGE, MASS.

(Continued from page 191.)

Myrmeleon mobilis Hag.

M. mobilis Hag. Stett. Z., vol. xxi., 368; vol. xxvi., 444. (No description.)

M. immaculatus Burm. Vol. ii., 994, 5 (not De Geer)--Hagen Syn. N. Am. 231, 14, partim.

The face above the epistom blackish brown, shining; mouth and a ring around the eyes yellowish; palpi yellowish; maxillary thin, apical joint cylindrical, notched on tip; labial of same length, apical joint fusiform, the conical tip notched.

Antennæ as long as head and thorax, thicker at tip, which is clavate, fuscous, annulated with yellow, except on club; basal joint yellow above, second black; antennæ below largely yellow.

Head dull luteous, with some flat pitchy-fuscous spots; vertex transverse-ovoid, elevate, anteriorly finely rugulose; on the middle two pairs of twin bands, one behind the other; the anterior pair with hind end of its band bent outward; a round spot on each side of the bands; the posterior pair straight; on each side two triangular spots, near the eye; behind the vertex on each side a transversal band, near the eyes.

Prothorax broader than long, sides about straight, front margin semi-circular, luteous with some black hairs besides; anterior part before the transverse sulcus on each side with a black crescent and indistinct median band; hind part on each side with an indistinct black mark; thorax dull luteous, with some indistinct brown shadows besides and below.

Abdomen much shorter than the wings, slender, dull luteous, more yellowish on the apex, articulations pale; covered with very short pale villosity.

Female—Last segment short, yellow, split below near the ventral margin with two, thick, black shining cylindrical appendages, which are as long as the segment and covered with very long black hairs and spines; out of the superior part of this segment is protruded an additional short segment with two short quadrangular yellow plates with black margins, and below two transversal rows of very strong black spines.

Male—Abdomen not longer than of the female; ventral part of last segment not split below, yellow with long black hairs, forming a large spoon-shaped part; there are no cylindrical appendages; the additional segment forming two yellow plates which are shorter but much more prolonged below and a little enlarged; margin black with long black hairs below, without the rows of spines; above on dorsum with a bunch of hairs.

Legs slender, pale, with black hairs; the femur, tibia and all joints of tarsus black on tip; a fine black ring on tibia not far from the knee; spurs as long as the basal joint, straight fuscous. Wings long, narrow, front wings with the costa straight, curved strongly on tip, which is short, about rectangular; hind margin very slightly incurved, so that the wing is broadest near the apical third; hind wing nearly as long, a little narrower, sharply pointed; hind margin a little sinuate on the apical half, broadest near the middle of its length; hyaline, hairy, veins fine, dark; subcosta, mediana and submediana interrupted with pale yellow; pterostigma small, whitish.

Length of body, 30 to 34 mm.; exp. al. 80 mm.

Hab.—Burmeister's type from Savannah, Georgia, very probably collected by Dr. Zimmermann; it is a female, and was described out of Winthem's coll.; the label, *immaculatus* De Geër, in Burmeister's handwriting, is still on the pin. I have raised male and female in July, 1883, out of larvæ from Alabama, given by Prof. Lyon; I have the full grown larva, larva skin, nympha skin and cocoon. The larva is called Doodle, and it is a favourite pleasure of children to kneel in the sand near the holes and to sing in a monotonous way, "Doodle, Doodle, etc." It is believed that the animal comes out to receive food. But I have to remark that the larva of *Tetracha Carolina* is treated similarly.

The type is just transformed, as is proved by specimens from Alabama, which made their transformation on the same day; one has all four wings developed, one only the fore wings, and the third has all wings crumpled. Nevertheless they have all the same colours of the type, and it is to be supposed that older specimens will show a darker coloration.

I have never seen more specimens. When I published the synopsis I had before me the type of Burmeister and two specimens of *M. immaculatus*, and believed all three to belong to the same species.

Myrmeleon formicalynx L.

The synonymy need not be repeated here; compare Stett. Ent. Zeit., 1866, p. 439.

Face shining black, above with two impressions, which are variable in shape and size, and an engraved spot in the middle between the antennæ; around the eyes a yellow ring, interrupted near the vertex; epistoma yellow, with two black spots connected with the colour of the face; mouth yellow.

Maxillary palpi slender cylindrical, black shining, pale on tip; apical joint notched on tip, third joint incurvate; the two basal joints globular, dull yellowish, the second blackish externally; labial palpi longer and stronger, shining black; second joint incurvate, thickened on tip; last joint thick, ovoid, with an engraved spot externally before the tip, which is pyramidal, pointed.

Antennæ shorter than the thorax; tip clavate, dull black, below shining black on base; basal joint yellow, below black in middle, and with a yellow ring around the base.

Head dull black anteriorly, with rare white hairs, finely rugose, the lines diverging; vertex transversally ovoid, elevated, divided by a more or less pronounced median impression, on top with a transversal corrugated band, and some glossy flat spots; two approximate anteriorly and two posteriorly, and on each side a larger round one; behind the vertex near the eye an oval similar spot.

Prothorax short, broader than long, enlarged behind, rounded before, dull pitchy black; margin yellow except in middle anteriorly; yellowish near the thorax; on each side with some longer black hairs; mesothorax and metathorax pitchy black; the body paler,

Abdomen slender, compressed, shorter than the wings, pitchy black; apical margin of the last segments pale; villosity white, rather scarce.

Female genitals with two transverse rows of black bristles, two cylindrical black appendages with very long black hairs, and between them an advanced black part of the margin with strong bristles. (Rambur says with two appendages "formant deux petites saillies an peu plus épaisses" —which I cannot find.)

Male genitals similar to *M. mobilis*, the spoon-shaped part shorter, triangular, yellow.

Legs slender, reddish-yellow; apical half of femur black; tibia blackish; the posterior legs externally reddish-yellow, except on tip; tarsi blackish, sometimes yellowish at base; spurs about as long as the basal joint, straight; claws brown.

Wings in shape and venation like *M. immaculatus*, with the hind margin convex; hyaline; veins black, interrupted with yellow; pterostigma milk-white, blackish interiorly.

Length of body, 25 to 32 mm.; exp. al., 55 to 84 mm. Breadth of hind wings, 6 to 8 mm.

Hab.—Everywhere in Europe, only England and the islands in the Mediterranean excepted. A pair collected in Castilia by Staudinger is quoted by myself Stett. Ent. Z., xxvii, p. 290. A. Costa figures it from Naples. In Russia it is known from Livland to Astrachan and Nertschinsk, Siberia.

I have eight specimens, male and female, before me from Sweden, Prussia, Silesia, Switzerland. The imago flies from July to September. I have raised this species, which is common in Germany.

In the collection of Linnæus a specimen of this species *on the characteristic Linnean pin, bearing in his own handwriting on the label the name "formicalynx,"* is still present. I have seen it in 1857 and 1861.

The high authority of my friend McLachlan, and the emphasis with which he declines to acknowledge this specimen as typical (Tr. Lond. Ent. Soc., 1871, p. 443), oblige me to state why I hold decidedly the contrary opinion. Mr. McLachlan bases his objection solely on the fact that the specimen is identical with the Swedish species, and that the African habitat, given by Linnæus for his *M. formicalynx*, must belong to a different species (though the few words of the diagnosis given will apply

to this insect so far as they go.—McL.), because no specimen from Africa is known to him; and “that the collection of Linnæus has been maltreated by additions, destruction and displacement of labels.” The discovery of a true African specimen would make McLachlan’s objection untenable. Nobody would be surprised that an insect, with such a large distribution, and found in Castilia and Naples, should be found in Africa. For the statement of the displacement of labels in the Linnean collection McLachlan quotes the preface of Staudinger’s *Catalog der Lepidopteren*, 1871, p. xvi.—xvii. This quotation is indeed very unfortunate, as the German original is essentially different (p. xvi) from the French translation (p. xvii.) which is alone used by McL.:—“C’est malheureusement un fait certain que l’acquéreur de la collection de Linné a eu la déplorable idée de remplacer quelquefois des exemplaires endommagés par des exemplaires frais—*vielleicht* vorhandene schlechte Exemplare durch bessere ersetzte.” So long as McLachlan gives not any other evidence for his opinion, it is apparently not admissible.

Concerning the Neuroptera in the Linn. collection, I have published (*Stett. Ent. Z.*, vol. vi., 1845, p. 155) the list *still before me*, made in 1844 by Mr. R. Kippist, then Secretary of the Linn. Soc.

Of the 83 species described in *Syst. Nat. Ed.*, xii., were present 50 species, but 17 of them were later additions, with labels written *not by Linnæus*, but probably by Mr. Smith, with the occasional addition “exdescript Linn.” These 17 species are marked *only with pencil* in Linnæus’s own copy of *Syst. Nat. Ed.*, xii. The other 33 species have labels in Linnæus’s own handwriting, and are marked in the copy of *Syst. Nat. Ed.*, xii., with ink. From these alone it is certain that they were in the collection of Linnæus, and *among these is M. formicalynx*. I have compared myself the collection in 1857 and 1861. I found nothing changed and no indication of displacements.

Illiger’s paper, 1801, in his *Magazin*, vol. i., p. 7.

Westwood’s paper of the Linnean *Staphylinus* (*Tr. Ent. Soc.*, Ser. I., vol. iv., p. 45); Schaum “*neber zweifelhafte Kaefer Linné’s nach seiner Sammlung*,” *Stett. Ent. Z.*, 1847, p. 276; Haliday *ibid.*, 1851, p. 131; Motschulsky, 1855, *Etudes. Ent.*, iv., p. 25, will show that the sweeping charges in McL. paper can not be considered as warranted.

The description of *M. formicalynx* in Ed. x. is the same as in Ed. xii., excepting the clerical error “*antennæ setacæ*” for *clavatæ*, as given in

the character of the genus. The quoted figure of Roesel well represents this species. The insects in Linné's collection have been labelled by him in accordance with Ed. x. of his Syst. Nat. At this time the imago of the Swedish species (1758) was unknown to him, and was only published later (1761) in the Ed. ii., of his Fn. Suecica. It is evident that Linnæus has believed Reaumur's species and the Swedish one to be identical, as he says in Ed. xii., "Alae nostratis obsque maculis fuscis," and as he has called this species *M. formicarium*, instead of *M. formicaleo*, as in all his anterior works. Now every student of Neuroptera, since half a century ago, knows very well that Linné has combined two different species, and that a new name would be needed for one of them; but as a second species had been described also by Linnæus this name was accepted for the Swedish species as *M. formicalynx*. Therefore, indeed, no mistake and no uncertainty was possible. McLachlan has given no proof for his opinion that *M. formicalynx* from Africa belongs to a different unknown species. McLachlan's quotation l. c., p. 441 and 442, "In the first edition of the Fn. Suec., 1746, he (Linné) says of an antlion *alae obsolete nebulosae*," is not to be found at all in this book, and could not be found, as Linné described only the larva. The words *obsolete nebulosae* occur in no work of Linné, nor in any other work known to me describing this insect; but I have now the kind information by McL. that those words were taken out of the interleaved copy of the Fauna Suecica, and that my friend is now sure that they belong not at all to *Myrmeleon*.

McLachlan proposes to use the name *M. formicarium*, which every body has used for more than a century, since Syst. Nat., Edit. xii., 1767, for Reaumur's species; for the Swedish species. McLachlan proposed for Reaumur's species at first the name *M. formicaleo* used by Linné in Ed. x. and by Poda; later he proposed to call it *M. Europæus*, which was adopted by Mr Redtenbacher and Prof. Brauer, though the latter remarked that if a new name was needed *M. nostras* Fourcroy would have the priority.

Concerning such changes of names, should be studied the excellent dissertation of Dr. Elias Fries, Ofver Vexterne Namn Upsala, 1842 (also in Fries's Botaniska Utflugter, T. i., p. 113, and German Transl. in Horschuch Archiv., 1855, T. i.), where also about Linné's collection, the former idolatry and the later belittling in England, excellent advice and notice will be found.

Myrmeleon formicarius, Linn.

The curious habits of this insect are known for nearly two centuries and quoted so often that in my Synops. Hemerobidarum, p. 439, about half a page is filled by them. There is much written pro and con about this name. I believe the change of the name is simply a matter of taste, and I remember with merriness the page on which the late R. Crotch, my old friend McLachlan and myself were hacked to pieces for our heresy in nomenclature by A. Lewis. I consider the paper of McLachlan, Tr. Lond. Ent. Soc., 1871, p. 441, to be a very fair one. Of my two objections one has been removed by himself as I mentioned by *M. formicalynx*.

Myrmeleon rusticus Hag.

M. rusticus Hag. Syn. N. Amer. Neur. 233, 17.

Front a little convex, nigro-piceous, shining, above with two transverse small impressions; epistom black, or on each side with a yellow oval spot, which may encroach a little on the front, and a triangular yellow middle spot, largest anteriorly; rhinarium bright yellow, labrum largely notched, brownish; maxillary palpi yellowish, apical joint a little darker, cylindrical, notched at tip, scarcely longer than the preceding; labial palpi longer, yellowish, second joint thin, incurved, thickened at tip; apical joint about as long, strongly ovate, blackish, with an impressed spot outside, suddenly contracted before end, which is thin, pyramidal, a little incurved; head below and a narrow ring encircling the eyes bright yellow; antennæ strongly clavate, longer than head and prothorax, dark, annulated with yellow.

Vertex obscure ferruginous, shining, elevated, with a median furrow, dull grayish in front above the antennæ; a yellow spot on each side near the eye; two flat interrupted median stripes and on each side a larger flat shining spot.

Prothorax short, broader than long, narrowed before, front margin rounded; clothed on margins and behind laterally with short white villosity; dull yellowish, with two approximated median bands more visible before the furrow, and on each side with a broader dark fuscous band more visible after the furrow; thorax dull pitchy, obscurely margined with dull yellow; besides, below the wings pitchy with a few yellow spots.

Abdomen shorter than the wings, luteo-fuscous ; posterior margin of segments, and sometimes a faint middle line, yellow.

Genitals of male and the last segment black, below a row of strong black spines ; an inferior conical part with long black hairs ; abdomen of female shorter, the superior parts blunt, below a row of black bristles ; two small appendages (probably) inferiors.

Legs yellowish, not very short, the intermediate finely sprinkled ; femora and tibia darker inside, except in the middle pair ; tibia with an apical dark ring ; tarsus about longer than tibia, tips of joints darker ; spurs scarcely as long as first joint, straight, dark.

Wings hyaline, moderately pointed ; pterostigma small, milk white, a small dark dot before it ; venation pale, median and submedian veins distinctly interrupted with fuscous ; costals simple.

Length of body, ♂ 30, ♀ 26 mm.; exp. al. 54 to 60 mm.

Hab.—New Mexico (formerly W. Texas), Pecos River, August 4th, Capt. Pope's Exped.; Mexico, Matamoras, same expedition.

THE ANNUAL MEETING OF THE ENTOMOLOGICAL SOCIETY OF ONTARIO.

The Annual Meeting of the Society was held in the City Hall, Ottawa, on Friday and Saturday, October 5th and 6th, 1888. A Council meeting was held on Friday morning at 10.30 o'clock in a Committee room of the City Hall, at which the following members were present:—The President, Mr. James Fletcher, Ottawa ; Mr. E. Baynes Reed, Mr. W. E. Saunders and Mr. J. M. Denton, London ; Rev. C. J. S. Bethune, Port Hope ; Rev. T. W. Fyles, Quebec ; Mr. James Moffat, Hamilton ; Mr. H. H. Lyman, Montreal. After the transaction of routine business, the sum of \$200 was voted to the Library Fund for the purchase of books and the binding of periodicals and pamphlets. An Executive Committee, to consist of the President, the Editor, the Secretary-Treasurer and the members of the Council resident in London, was appointed to deal with the financial affairs of the Society and to provide for the representation of the Society at the annual meeting of the American Association for the Advancement of Science. The work of arranging the Society's collections and putting them in good order was directed to be

continued, and Mr. Moffatt was requested to do for the Coleoptera what he has already so successfully accomplished with the Lepidoptera.

In the afternoon the Society met at 2 o'clock. Mr. W. H. Harrington was present in addition to those above mentioned. Mr. Lyman exhibited a series of specimens of the different species of *Callimorpha* which he had described in his paper last year (C. E. xix., p. 181) and remarked upon their various peculiarities. He thought it most desirable that names should be attached to the different varieties, even though they may hereafter be found to belong to the same species. Messrs. Fletcher, Fyles and Moffat made remarks upon the subject, and agreed that all distinct forms should have separate names.

Mr. Fletcher gave an account of his visit to Nepigon, Lake Superior, early in July, in company with Mr. S. H. Scudder, of Cambridge, Mass., for the purpose of collecting the eggs of various rare species of butterflies. He described the various modes they had employed in order to induce the females to deposit their eggs, and recounted the great success achieved in securing the eggs of no less than seventeen species of butterflies and capturing a number of others.

Rev. Dr. Bethune exhibited a number of specimens of *Colias eurytheme*, chiefly of the form *eriphyle*, which he had taken at Port Arthur on the 1st of September last, and gave an account of his trip to the Nepigon River, exhibiting a large number of specimens of butterflies and other insects captured there on August 21st, 22nd, and 30th. Among these may be especially mentioned *Colias interior* and *eurytheme*, *Argynnis electa*, *atlantis*, *chariclea* and *bellona*, *Phyciodes tharos*, *Grapta faunus* and *progne*, *Pyrameis huntera* and *cardui*, *Limenitis arthemis*, etc.

Rev. T. W. Fyles read a paper on *Chionobas Jutta*, in which he recounted his success in rearing the insect through all its stages.

Mr. Fletcher and Dr. Bethune spoke of the desirability of issuing a series of papers on popular and economic entomology in the CANADIAN ENTOMOLOGIST, and urged upon the members present the necessity of co-operating in the work. The Editor also drew the attention of the meeting to the duty of at once providing the material required for the Annual Report of the Society.

The President laid on the table specimen sheets and plates of Mr. Scudder's great work on the Butterflies of the Eastern States and Canada, which were examined by the members with much interest. He also

brought up for discussion the subject of the disease known as "Silver-top" in hay, which is believed to be caused by a species of Thrips, and requested the members to investigate the matter in their various localities. The only remedy at present suggested is the plowing up of old hay-fields which are found to be the most seriously attacked. The depredations of Grasshoppers during the past season were next considered. Mr. Fletcher suggested that much might be done to reduce their numbers by cutting the hay about the 20th of June, if practicable, and thus preventing the maturity of the insects by depriving them of their food before they were able to fly to a distance for it. Mr. Denton reported that the Chinch Bug had been observed in the Township of Delaware, near London, and that it was likely to become very injurious if measures were not taken to counteract it.

The meeting adjourned at 5.30 p.m.

EVENING SESSION.

In the evening the Society held a public meeting in the Council Chamber of the City Hall at 8 o'clock, at which there were about sixty persons present, including the Hon. C. W. Drury, the recently appointed Minister of Agriculture for Ontario; Mr. John Lowe, Deputy Minister of Agriculture for the Dominion of Canada; Prof. Saunders, Director of the Experimental Farms of the Dominion; Sir James Grant, M.D.; Mr. R. B. Whyte, President of the Ottawa Field Naturalists' Club; Mrs. Macleod Stewart; Mrs. R. B. Whyte, Mrs. Davidson, and several other ladies as well as a number of farmers and gardeners from the city and neighbourhood.

The proceedings of the evening began with an able and practical address from the Prèsident, Mr. James Fletcher, of Ottawa, upon "Insects Injurious to Crops." (The address will be published in full in the Annual Report of the Society.) The speaker stated that it was a well-known fact that at least one-tenth of all the crops grown in this country was destroyed by noxious insects. In order to combat these insects it was necessary to know their life-histories, and to acquire and disseminate this knowledge was the main object of our Entomological Society. He described in simple terms the two systems of structure in insects, in accordance with which one class live by sucking out the juices of plants and the other by biting and gnawing the substance, and related the various means adopted to counteract the ravages of each. In his position as Dominion Entomologist he found it possible to give to nearly

all enquirers useful information about the insects that might be affecting their crops or gardens. He then referred to many common injuries and related the best means of dealing with them, and gave an account of what might be termed the "first-class pests" of the season, among these he specially mentioned the cut-worms and grass-hoppers, which had been more than usually numerous and destructive in many parts of the Province. He concluded his address, which was listened to with great interest and attention for upwards of an hour, by expressing the pleasure it gave to the members of the Society to observe the growth of their science in popularity, a fact evidenced by the attendance that evening of so many distinguished persons.

The Hon. C. W. Drury next addressed the meeting. He said that he had not come to deliver a speech, but he had travelled five hundred miles in order that as the head of the Agricultural Department of Ontario he might show the importance which the Government he represented attached to the work of the Entomologists. He considered that the small grant annually made to the funds of the Society was amply repaid by its practical work, and mentioned as an instance the immense saving to the country effected by the discovery of the remedy for the clover-seed midge

Sir James Grant spoke in graceful terms and delivered a very interesting address. He described the importance of Entomology in its various aspects, and referred to the work of some of its greatest masters, from Aristotle and Pliny, in ancient times, to LeConte, who had described so enormous a number of species of beetles and whose lamented death was so great a loss to science. He described its relation to other departments, especially to medicine, and mentioned as an instance the fact that bacteria had been introduced into the blood by the bite of mosquitoes. He paid a high compliment to the President for his practical and interesting address, and for his enthusiastic devotion to the science which had deservedly won for him the recognition of the Dominion Government.

Professor Saunders rose to move a vote of thanks to the President for his valuable address. He gave a short account of the history of the Society and its work, and mentioned the fact that there were only two of the original members present besides himself, viz.: Dr. Bethune and Mr. E. Baynes Reed, who had been concerned in its organization twenty-five years ago. Sir James Grant seconded the vote of thanks, which was put to the meeting by Dr. Bethune and unanimously carried.

Rev. Dr. Bethune then proceeded to give a brief address, in which he strongly urged the importance of encouraging young people in their instinctive fondness for collecting insects. It was not only a most useful pursuit from an educational point of view, but led to great results in developing a love for science and a steady increase in the number of its votaries. As one of the pioneers of the Society he was delighted to see for the first time at one of its meetings the Provincial Minister of Agriculture and also the Dominion Deputy-Minister; he expressed his pleasure also at the presence of so many ladies, and trusted that they would bring to the aid of Entomology all those gifts of deftness and neatness which they so eminently possessed. For their encouragement he mentioned that the most distinguished entomologist in England at the present time is a lady, Miss E. Ormerod, of St. Albans.

In acknowledging the vote of thanks, Mr. Fletcher took occasion to refer to one point which he had overlooked, namely, the injuries inflicted by "that miscreant, the English sparrow," whose extermination he strongly advocated. The Hon. Mr. Drury stated that this destructive bird was no longer under the protection of the Act of Parliament respecting insectivorous birds, and that everyone was at liberty to aid in reducing its numbers. The meeting then adjourned.

SATURDAY'S SESSION.

Saturday, October 6th.—At 10 o'clock a. m. a meeting of the Council, was held for the transaction of business, and after its adjournment the Society continued its proceedings. The reports of the Secretary-Treasurer, the Librarian, the delegate to the Royal Society of Canada, the Montreal Branch, and the delegates to the Entomological Club of the American Association for the Advancement of Science were presented and adopted.

The following gentlemen were elected officers for the ensuing year:—

President—James Fletcher, F.R.S.C., F.L.S., Ottawa.

Vice-President—E. Baynes Reed, London.

Secretary-Treasurer—W. E. Saunders, London.

Librarian—E. Baynes Reed, London.

Curator—Henry S. Saunders, London.

Council—J. M. Denton, London; J. Alston Moffat, Hamilton; Gamble Geddes, Toronto; W. H. Harrington, Ottawa; Rev. T. W. Fyles, M. A., South Quebec (and the former Presidents, who are ex-officio members

viz., Prof. Saunders, F.R.S.C., F.L.S., F.C.S., and Rev. C. J. S. Bethune).
 Editor of the CANADIAN ENTOMOLOGIST—Rev. C. J. S. Bethune,
 M.A., D.C.L., Port Hope.

Editing Committee—The President, Prof. Saunders, J. M. Denton,
 H. H. Lyman (Montreal), Dr. W. Brodie (Toronto).

Auditors—J. M. Denton and E. B. Reed.

Delegate to the Royal Society of Canada—H. H. Lyman, Montreal.

Papers were read by (1) the Rev. T. W. Fyles on "The Hyphenidæ of the Province of Quebec;" (2) Mr. J. A. Moffat on "Some Curious Proceedings of the Larvæ of *Euchætes egle* Feeding upon the Milk-weed;" (3) Mr. W. E. Saunders on the English Sparrow, strongly recommending its extermination; (4) Rev. T. W. Fyles on "The Sphingidæ of the Province of Quebec." Mr. Fletcher, in discussing this paper, remarked upon the colours of *Sphinx 5-maculata*, and said that the dark forms seemed to be hardier than the pale green; he had observed also in *Papilio asterias* that some green pupæ emerged much sooner than the brown; he had obtained no less than four broods of this insect this year. (5) Rev. T. W. Fyles read "A Memoir of the late Philip H. Gosse," and exhibited a photograph of this eminent naturalist and his late residence. (The above papers will all be published in the annual report of the Society.)

Mr. Moffat stated that he had taken *Papilio cresphontes* this summer at Hamilton, and that he had seen in that neighbourhood a specimen of the now rare *Pieris protodice*. Mr. Fyles mentioned that he had taken *Grapta gracilis* and *faunus* at Quebec in September, *Hepialus gracilis* in the Township of Dunham, and *Hepialus auratus* in the Township of Brome. Dr. Bethune had found *Grapta J. album* numerous at Port Hope in September, and brought some living specimens to the meeting; these will be taken care of during their hibernation, and efforts will be made to obtain their eggs in the spring.

The following gentlemen were elected members of the Society:—Rev. Prof. Symonds, Trinity College, Toronto; Rowland Hill, London; Mr. Brown, *Free Press*, London; A. L. Poudrier, Donald, B. C.; Arthur M. Bethune, Port Hope; E. M. Morris, Toronto.

It was decided to hold the next annual meeting in London immediately after the close of the meeting of the American Association in Toronto in August.

After passing a vote of thanks to the Mayor and Council for the use of the City Hall the meeting adjourned.

BOOK NOTICES.

ENTOMOLOGY FOR BEGINNERS, for the use of Young Folks, Fruit Growers, Farmers and Gardeners. By A. S. PACKARD, M. D. New York: Henry Holt & Co.—1 vol., 8 vo., pp. 367.

It is with much pleasure that we draw the attention of our readers to the publication of this work. For many years past, we have been repeatedly asked to recommend some book that would serve as an introduction to the study of Entomology, and enable young collectors to make a satisfactory beginning in the pursuit. Hitherto, we have been unable to mention any single work that would answer the purpose, and we have felt constrained to tell enquirers that they must procure several books, for instance, Kirby & Spence's Entomology, Harris's Insects Injurious to Vegetation, etc., and even then not have what they want. Dr. Packard's new book is certainly one that has long been wanted, though we fear that it is a little too technical in its language, and too abstruse in its treatment of some of the subjects to exactly meet the requirements of beginnerst We think, too, that the author has not been judicious in the arrangement of the matter; the first two chapters on the structure of insects and their growth and metamorphosis will, we fear, prove rather repellant to one who has collected a few specimens and wants to know something about them and what to do with them. They are carefully written, and give an admirable summary of what every student of Entomology requires to know; but they are a little beyond the youthful mind, or the uninstructed powers of the ordinary farmer. We, therefore, strongly advise all beginners who procure this book—and we recommend them to get it without fail—to commence their reading with Chapter vi., which contains very interesting and useful directions for collecting, preserving and rearing insects; they might then turn back and read Chapters iv. and v. on insect architecture, and insects injurious and beneficial to agriculture. By this time, we have no doubt, they will have become so deeply interested in the work that they will not be discouraged by the drier details and the harder words in the remainder of the book. The third chapter, which fills over a hundred pages, gives an admirable synopsis of the classification of insects, and should enable a beginner to arrange with some degree of system any specimens that he collects. The author has departed from the usually received divisions of insects, and sets forth no less than sixteen orders; this number he obtains by sub-dividing the Neuroptera, Orthoptera and Diptera. To the new orders thus formed, he applies the novel terms Plectoptera, Platyptera, Mecaptera, etc. We feel rather doubtful about their general acceptance, and think it a pity that they should have been put forth in an elementary work of this kind before they had been dis-

cussed and approved of by Entomologists in general. We do not, however, wish to disparage the work ; it is certainly a valuable compendium, and we cordially recommend it to our readers who are beginners in Entomology. The book is well written and excellently illustrated throughout, and must prove a great help to the science by furnishing young students, in a convenient form, with information that hitherto they could not readily procure.

C. J. S. BETHUNE.

THE BUTTERFLIES OF THE EASTERN UNITED STATES AND CANADA, with special reference to New England, by S. H. SCUDDER. Imp. 8 vo. Cambridge, pp. 1-40 and 105-208, Part I, 1st Nov., 1888.

For some months Lepidopterists and Librarians have been anxiously awaiting the appearance of Mr. Scudder's monumental work on the Butterflies of New England, which, as is well known, has been constantly engaging the attention of this keen observer and careful student for the last 20 years. Through the courtesy of the author we have been favoured with advance sheets and plates of Part I, which is to appear on 1st Nov., 1888. From the well known high character of Mr. Scudder's past work, doubtless much will be expected by the scientific world of this long promised book. Judging from the number under consideration we believe few will be disappointed. No work has ever appeared, in any branch of science, where such thorough and complete information is given of the objects discussed, nor which has been so copiously and accurately illustrated. An Introduction treats, with the greatest detail, of the general structure of butterflies from the egg to the imago, and includes a chapter upon their classification. This is followed by a systematic treatise in which "not only every species," (embraced within the scope of the work) "but also every genus, tribe, sub-family and family is described and discussed with a fullness never before attempted, except in individual cases, including in each instance not merely the perfect form, but, when possible, the egg, the caterpillar at birth and in the succeeding stages, and the chrysalis, together with the distribution, life-history, habits and environments of the insect, in which a great accumulation of new facts and observations is embodied."

In the Part before us we have pages 1 to 40 of the Introduction covering the structure of the egg, the caterpillar and the chrysalis, and the beginning of the description of the perfect insect. There is then a break and the pagination continues again at page 105, where the second section

begins with a short chapter on the families of butterflies. This is a reproduction, slightly altered, of the table of classification which Mr. Scudder has already published in the CAN. ENT., xix., 201, in which he divides the butterflies into *Nymphalidae*, *Lycaenidae*, *Papilionidae* and *Hesperiidae*, an arrangement virtually the same as that given by Bates and adopted by Packard, in which the genera *Æneis* and *Cercyonis* are considered the highest of the butterflies.

At page 109 the systematic treatise begins with the *Nymphalidae* or "Brush-footed butterflies." With this family, as with sub-families and genera throughout the work, when possible analytical tables are given for their arrangement, based upon the egg, the caterpillar at birth, the caterpillar at maturity, the chrysalis and the imago. The first sub-family is the *Satyrinae*, including six genera, of which *Æneis* is described first. Under each species we find first complete and careful technical descriptive details of structure for all the known stages. These are printed in rather smaller type than the rest of the book, a fact which will considerably facilitate reference. Then follows a general description, giving any interesting features in the distribution and habits of the perfect insect and larva, the food plant, variations and enemies, and lastly a list of the points upon which further information is needed.

On page 127 appears the first of a series of essays, of which there are to be over 70 distributed throughout the work, and to which the author has applied the somewhat inelegant title of "Excursuses." These discuss separately all the interesting problems which arise in the study of butterflies (whether of distribution, structure, history, or relation to the outer world), in themselves forming a complete treatise on the life of these insects. These will be a charming feature of the work by means of which a book, which must necessarily contain a large amount of technical scientific description, will be made attractive to many who will subscribe to it merely to possess the most extensive and beautiful book which has ever appeared on the diurnal Lepidoptera of North America. The scope of these may be inferred from the titles of those which occur in the first part.

1. The White Mountains of New Hampshire as a home for butterflies.
2. The clothing of caterpillars.
3. The general changes in a butterfly's life and form.
4. The eggs of butterflies.
5. The modes of suspension of caterpillars.

The species described in the first part are *Æneis semidea* and *Æ. jutta*, *Cercyonis alope* and *C. nephele*, *Enodia portlandia*, *Satyrodes curydice*, *Neonympha phocion* and the beginning of the description of the genus *Cissia*.

The nomenclature, we are told in the prospectus, follows the rules of the American Ornithologists' Union. As is well known Mr. Scudder's views upon some points with regard to nomenclature are very extreme, and it must be conceded that he has so far few followers. This state of affairs, however, we anticipate will be changed. After many years of close study upon a special subject by so able a student, the writer, at any rate, is prepared to weigh carefully, without previously condemning them, his views as expressed in this his greatest work.

The illustrations are, as above stated, most profuse, superbly executed, and each is accompanied by copious explanatory text, which will be bound opposite each plate.

The eight plates in Part I. are as follows: No. 1 is a beautifully coloured chromo-lithograph of butterflies, showing in most instances both the upper and lower sides. The complete work will contain about twelve of these plates. The second plate, No. 14, is uncoloured, but is exquisitely engraved, and by some may possibly be preferred to the last. It shows seventeen figures of butterflies artistically grouped. There are to be five plates similar to this. The next plate, No. 18, comprises eight small maps, showing separately the distribution of the different species treated of in Part I. There will be fifteen of these sets of maps. No. 46 shows scales of butterflies, and there will be six of this nature. No. 52 gives the heads of butterflies. The work on this plate, drawn by J. H. Emerton, is very beautiful. There are to be eight others like it. No. 67 is the first of three plates showing the micropyles of eggs magnified highly. No. 70 is devoted to magnified figures of young larvæ just after leaving the eggs, and there will be three others like it. No. 93 is a physical map of New England, prepared specially for this work by John H. Klemroth, under the supervision of the Geographer of the U. S. Survey. These, however, do not by any mean exhaust the styles of plates which will appear, for in subsequent numbers new sorts of subjects will come forward, all of which will be fully illustrated whenever figures can make the text more intelligible. Special articles upon hymenopterous and dipterous parasites are to be prepared by the able specialists, Messrs. L. O. Howard, of Washington, and Dr. Williston. In fact, all the phases of life passed by the insects treated of as well as the important circumstances connected therewith, will be presented to the reader in the most complete manner possible. There will be about two thousand figures on ninety-six plates, of which over forty will be coloured. The small inconvenience of not always having all the plates referred to in the text issued at the same time with it, cannot of course possibly be obviated in a systematic work, where everything is treated fully in its proper place under each species, and in which the number of subjects needing illustration in each part is greater than can be shown on the quatum of plates for that part. The whole will be issued in a year, in 12 parts, each to contain 8 plates and about 150 pages of text.

JAMES FLETCHER.