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The Canadian Entomologist.

VOL. II.

TORONTO, JANUARY 1, 1870.

No. 4.

THE ENTOMOLOGICAL SOCIETY OF CANADA.

To-day our Society enters with the New Year upon a new phase of existence. Hitherto it has been entirely dependant upon the unaided contributions and voluntary assistance of its members, who, in the very nature of things, are comparatively few in number, and scattered over a wide area of country; now it has received official recognition, and is furnished with such pecuniary aid as will enable it to carry out more effectually the work that it was intended to perform. We trust, then, that all our members will now bestir themselves, and work zealously and actively for the cause of Entomology in this country, and will show by their labours that the encouragement afforded them has been usefully and worthily bestowed. We have now made our first moult, but still continue in a larval state, with all a caterpillar's voracity for food; unless we get plenty we shall shrivel up and die. The sustenance that we require is more members, more work, more books, more specimens, more scientific contributions, more subscribers to our journal, more active co-operation on the part of all!

The following resolution unanimously adopted at the last meeting of the Council of the Agricultural and Arts Association of Ontario, describes our new position:—

Resolved.—That the sum of four hundred dollars be appropriated in aid of the Entomological Society for the ensuing year, on the condition that the Society furnish an Annual Report, and form a Cabinet of Insects, useful or prejudicial to Agriculture and Horticulture, to be placed at the disposal of this Council, and that they also continue to publish their Journal."

This assistance is very timely and acceptable, but it will be observed that it imposes upon us fresh work which will require the active assistance of our members to perform satisfactorily. The Annual Report is intended to be of a practical character and to resemble those issued by the State Entomologists in the United States; notes and observations in economic Entomology from all parts of the country will be especially needed for this. The cabinet of noxious and beneficial insects will also stand in need of contributions from all our mem-

bers everywhere, and will require an entirely distinct arrangement and system from that adopted in the Society's classified collections. Our readers will perceive that this is work for all to do; the humblest beginner, the merest collector, can render valuable assistance in his own way, as well as the more advanced student of the science. Hearty co-operation, regular systematic observation and work are what we require, and what all can render if they choose.

Since our last issue, two regular meetings of the Society have been held in Toronto. At the first, Nov. 10, 1869, in addition to the ordinary routine business, letters were read from Baron Osten Sacken, and Dr. Hagen, acknowledging their election as Honorary Members of the Society, and from Mr. Sanborn and Mr. D'Urban as Corresponding Members; the thanks of the Society were voted to the Boston Society of Natural History, for the donation to the Library of a copy of the "Harris Correspondence;" and a number of specimens of *Buprestidæ* were exhibited by Messrs. Saunders, Reed, and Beihune. At the second meeting, Dec. 14, 1869, the resolution quoted above was read, and the meeting resolved upon accepting the grant of the Agricultural and Arts Association upon the conditions specified. Mr. F. B. Robertson was elected an Ordinary Member; the Secretary announced the much lamented death of Mr. B. D. Walsh, State Entomologist of Illinois, and obituary resolutions of a similar character to those passed at a meeting of the London branch, were adopted.

DEATH OF THE STATE ENTOMOLOGIST OF ILLINOIS.

It is with feelings of very great grief that we record the death of our much esteemed correspondent, Benjamin D. Walsh, M. A., State Entomologist of Illinois. He was walking, it appears, on the railroad track near the depot, at Rock Island, on Friday, Nov. 12th, when a train coming on him unawares, the engine caught his foot and crushed it. The injured limb was amputated, and for several days no great alarm was felt respecting his condition; it soon however, became evident that he had received serious internal injuries, and that there was no hope of his recovery. He lived till the 18th of the month, and then, after much suffering, breathed his last.

No words of ours are needed to tell the reader of the loss science has sustained by this sad accident. One of the most thorough entomologists in America has been taken from us in the full maturity of his powers; the accumulated stores of knowledge gathered during many years of zealous labors in the field, and in the study, have been closed to us for ever. Deeply do we deplore the bereavement, but humbly must we bow in meek submission to the incomprehensible wisdom of an overruling Providence.

The following resolutions respecting this sad event were adopted at a recent meeting of the London Branch of the Entomological Society of Canada:—

"Resolved.—That the members of this Society have learned with deep regret of the sudden death of Benjamin D. Walsh, State Entomologist of Illinois. We have long admired his zeal and earnestness in endeavouring to advance entomological science, and we feel that our favourite study has lost in him one of its staunchest supporters and advocates, and those of us who had the privilege of his personal acquaintance, a warm friend. We tender our heartfelt sympathy to his bereaved widow and friends, and assure them that his labour of love manifest in his many valuable contributions to entomological literature will ever be fondly cherished in our memories."

"Resolved.—That the Secretary be instructed to transmit copies of the above resolution to the widow of the late B. D. Walsh, and also to the editors of the *American Entomologist* and *Canadian Entomologist*, requesting them to insert the same in their next issues."

A SINGULAR CASE.

Seeing in the last number of the *Canadian Entomologist*, a description of the eggs of *A. Luna*, reminds me to ask of you the explanation of a curious circumstance in the life-history of one bred by me from the larva last year. I will premise that I am writing without my notes, and therefore cannot give figures accurately, but can give the facts. There may be nothing very strange about it, but two of the best entomologists in the United States inform me that it is entirely new to them. It is this:—Some time in the latter part of the summer of 1868 I took, feeding on walnut leaves, a mature larva of *A. Luna*, from which I did not hope to rear the mature insect, because I counted on the larva over twenty eggs like those of a *Tachina*. Underneath some of these eggs I could discern with a lens a minute opening through which the fly-larva had entered the body of the *Luna* larva. The skin of the latter was more or less discoloured under each egg, but under some—under many in fact—there was a dense black spot, sometimes two lines in diameter. I made a slight incision in the skin of the *Luna* larva at the place where a *Tachina* larva seemed to have entered by one of the little holes, to see if I could find the *Tachina* larva. It was a very slight incision, as I did not wish to kill the *Luna* larva, but wanted to rear the flies from it to see if they were the same as those bred from *Saturnia Io*. Before it spun up it changed colour, becoming almost pink. It spun up, and to my surprise, instead of producing *Tachinae*, there last spring emerged from it an unusually large *Luna*. The question which puzzles me is, what became of the parasites? According to all the books, I believe, the entrance of the parasite into the body of its proper host is certain death. Could it have been that the parent *Tachina* made a mistake, and that its progeny, not finding the *Luna* to their taste, died or made their escape? Even if they had died inside the *Luna* larva, must they not have occasioned its death, especially considering the number of them?

I will add that there was no possibility of a mistake, as I had but one other Luna larva, (and it had spun up before I found the infested one, and like it produced a perfect moth, though not so large as that from the infested one), and these were the only two Luna larvæ and the only two Luna moths that I ever saw. I still have both. The infested larva was the last to spin up, but the first to emerge. Can you tell me what became of the Tachinæ?

V. T. CHAMBERS, *Covington, Ky.*

P. S.—Since the above was written, I have referred to my journal, and find that the first larva was taken on Sept. 2; the infested one on Sept. 4. The latter came out on May 6th, and the former on May 15th. Otherwise the facts are as above stated. V. T. C.

NOTES ON SOME OF THE COMMON SPECIES OF CARABIDÆ, FOUND IN TEMPERATE NORTH AMERICA.

BY PHILIP S. SPRAGUE, BOSTON, MASS.

The many difficulties encountered by those entomologists who have neither time nor access to scientific libraries, but who wish to be more than mere collectors, have induced me to try and assist them, more especially those who are to some extent advanced enough to distinguish many of the families and genera of the Coleoptera. I also hope to be of some assistance to those beginners who have a true love of nature and her works. Yet were I to write for this class only, the *Entomologist* would be more than full for years. My first attempt will be to help the reader to classify some of the more common genera of *Carabidæ*, after which I will refer to the species, pointing out their particular differences by comparative descriptions. I shall endeavor to express myself in familiar phraseology, rather than in technical. To those who have not these instruments, a convenient magnifying glass, Le Conte's 'Classification and List of Coleoptera of N. A.,' are absolutely necessary. (1). I have had prepared a highly magnified drawing of one of our common summer beetles, *Harpalus caliginosus*, to plainly represent all those parts which are of the most importance in classification; the names should be printed with a pen on their appropriate parts, very plainly, that you may know them at a glance. You will find it of the greatest advantage to dissect a number of beetles, of the same and allied genera, comparing the different parts with each other and with the cut, and making drawings of the same, thus familiarizing yourself with the form and parts pertaining to the subject; if you are a new beginner, or have never done this, it is absolutely necessary, and you will be surprised to find how much you have learned with so little trouble (2).

The cut only represents the ventral or under surface. When viewed from above you will find at the extreme anterior part of the head, between the mandibles and covering the mouth, the *Labrum*; a little behind this, at the sides just forward of the eyes, are inserted the *antennæ*. The *head* fits into the *thorax*, which extends to the *elytra*, or wing covers, which are sometimes entire (*Cychnus viduus*), sometimes the true wings beneath are entirely wanting (*Pterostichus permundus*). The small triangular piece at the centre and base of the *thorax* and *elytra* is the *scutel*, the characters of which are not used in the classification of this family. The sexual characteristics are of particular importance, and may usually be known by the greater dilatation of the anterior tarsi of the male. In many genera it is absolutely necessary to have the male to be positive; an instance in point is recorded, Proc. Acad. Nat. Sci. Phil., page 392, Dec., 1868 (3). By reference to Le Conte's Classification you will find the family Carabidæ divided into sub-families, the last of which, *Harpalidæ*, the only one we shall now consider, contains the greater number of the species of *Carabidæ*. This sub-family is divided into tribes, these again into groups, two only of which, *Eurytrichi* and *Harpali*, containing most of the common summer beetles, will be now considered. In these forms we have the following plan of arrangement:—*Ligula* free at the apex, *Paraglossæ* distinct, *Elytra* rounded and sinuate at the tip, anterior and middle tarsi of the male usually broadly dilated,—Harpalini, tribe.

Anterior and middle tarsi of the male usually broadly dilated and covered beneath with a dense brush of hairs,—*Eurytrichi*. Group. Anterior and middle tarsi of the male usually strongly dilated, and covered beneath with two rows (one on each side) of bristles.—*Harpali*, Group. As I presupposed in the beginning that you were somewhat acquainted with the different forms of the Genera, you will not confound these with *Pterostichus*, which has in the male only three joints of the anterior tarsi dilated, or with *Chlœnius*, which has bright metallic species, usually pubescent, or with *Oodes*, which very much resembles *Harpalus* in form, but differs by having the eighth and ninth elytral striæ confluent and the ocellate punctures very near the margin; this genus is scarce, and not easily distinguished from a number of others, except by those who have had much experience. We will now take into consideration part of the genera embraced in these Groups, remembering, that where they run into one another you will often be puzzled, and must refer to the classification, where the whole subject is carefully elaborated. The Group *Harpali* contains a number of genera, one of which, *Gynandropus*, with but a single species common at the north, is .25 long, quite slender, shining black, thorax much narrower than the elytra, rounded before and behind, and decidedly convex; it resembles both *Pterostichus* and *Stenolophus*, but differs from all other species by the characters of the Group, and by having three rows of punctures on each elytron on the second, fifth and seventh striæ, and by the anterior tarsi having the last joint elongated and

dilated in the female. This last character is of much importance, as we have a division of *Harpalus* having the elytra punctured in three rows; to you who have this insect named in your collection, the above will enable you to verify it; to others it is of little importance, as it is one of the more difficult forms to determine. *Bradycellus* has the mentum strongly toothed, but with the exception of the two first species in the list, they are quite small, less than .25 long. The species of *Stenolophus* are also small and slender beetles, with the thorax rounded before and behind, which distinguishes them from *Harpalus*. With a common glass you will make but little progress with the two last named genera, for although they are both quite common, their small size and the excellent paper on *Agonoderus*, *Stenolophus* and *Bradycellus* (which is as perfect as the long experience of our greatest American Entomologist can make it), renders it undesirable to treat of them in this paper. There is a division of the Genus *Harpalus* (*Selenophorus*) which, as Dr. Le Conte says, should be a separate genus, and which has the paraglossa flat, longer than the ligula, without lateral bristles, and the ligula is narrow, not dilated at the tip. Nearly all of this division are small and oval, having the form of the smaller common *Amarax*, but have three rows of punctures on each elytron; only two species are commonly found at the north, *H. yugatinus* and *H. iripennis*, which resemble in general form the true *Harpalus*, having the paraglossæ rather thick, not longer than the ligula, and furnished at the sides with a few bristles; the ligula is truncate; they are mostly of medium or large size, and are found in the middle of summer; the mentum tooth is usually wanting, or quite small, except in three or four species, which are quite rare and inhabit the extreme west. The thorax is sub-quadrate (nearly square); the proportions of this part of the insect are quite deceptive, it appearing much longer than it really is, therefore you should measure it accurately until your eyes are familiar with this seeming difference. These beetles are rather broad and oval, varying from brown to black; two or three of the species are metallic green, more or less shining. The anterior and middle-tarsi of the male are dilated, covered beneath with two rows of squamiform papillae. The posterior tarsi of the male are like all of those of the female. Some have the elytra reticulate in both sexes, others in the female only. The apex of the elytra of the female in some species is prolonged into a short spine called the sutural spine, as it is a prolongation of the suture.

In my next paper I shall commence the description of the species, having given you here an outline of the genera.

1. The Watchmakers' common jewellery glass, having two lenses of about a half-inch focus, will answer for all but the most minute forms. It costs less than one dollar, U. S. The Smithsonian Classification of the Coleoptera of N. A., by John L. Le Conte, M. D., 1861-1862, and the List of Coleoptera of N. A., 1863-1865, are indispensable; be particular to get the latest edition; these pamphlets can be had at the Naturalists' Book Agency, Salem, Mass.

2. A cheap and convenient dissecting board, which will answer all requirements, can be made by taking a smooth piece of board, one inch thick, 8 × 12 inch, glueing to the middle a piece of soft wood or cork, about two inches square, one-half thick; put up a standard three inches high on one side of the board near the middle; next twist a small piece of annealed wire around your eye-glass, leaving one end long enough to pass around or through the side of the standard, thus bringing your glass over the centre of the board; the wire can then be bent so as to have the focus come where you please. Cover the small centre piece with white paper; on this you can pin or glue the specimen as you please, and now, with your glass in position, you have both hands to work with. Take two or more pieces of wood like the small tip of a penholder; force a fine needle into the end of each; heat the points in a flame, and by quickly pressing them against a piece of iron or glass you have a set of dissecting hooks; with these you can hold the insect and separate the various parts.

3. Proc. Acad. Nat. Sci. Phil., page 382, Dec., 1868.—*Bradycellus (Geobæus) arenarius* Lec. "is proved by the discovery of the male to belong to the genus *Amara*." Therefore, those having this beetle named *Bradycellus* must change the label to *Amara*.

4. This valuable paper, which is advertised under the title of "Species of *Baridius* of U. S., 1868," can be had at the Naturalists' Book Agency, Salem, Mass., Price 10 cts., postage U. S. 2 cents.

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THE CURRANT WORM AGAIN.

BY W. SAUNDERS, LONDON, ONT.

In the last number of the *Entomologist* our late esteemed friend, Mr. B. D. Walsh, whose sudden death we most deeply deplore, calls in question the correctness of my inference regarding the occasional hibernation of the currant worm, intimating that my conclusions were based upon insufficient data. He says, "I can see no reason why a larva might not have hatched out from the egg in London, C. W., in the first week in May, 1869, spun up on Mr. Saunders' paper bag on May 30th, 1869, and the cocoon been noticed by that gentleman for the first time, as he informs us, May 30th, 1869. Yet Mr. S. from these data arrives at the conclusion that such a larva *must* have remained

unchanged during the winter and constructed its cocoon after the 22nd of May."

I am sure our much lamented friend must have overlooked one portion of the paragraph to which he refers, which was written with the express intention of removing such an objection as he urges, should it arise. I there stated that on the 22nd of May I was trying some experiments in crossing gooseberries—fertilizing the flowers of the Houghton seedling with pollen from some of the English varieties. Anyone who has thought for a moment on this subject will see that to ensure success in hybridization, it is necessary to open the flowers before they are ready to burst of themselves and remove the male organs before the pollen is fully matured, so as to prevent natural impregnation; and also to avoid another source of danger, that of the carrying of pollen by insects from other flowers and its deposition on the stigma of the flower on which you wish to operate. It is well known by those who have cultivated the gooseberry that the flowers are open before the leaves are fully expanded, and that the whole process, from the bursting of the buds to the opening of the flowers, is accomplished in a very short time—usually, I think, within five or six days. I believe that all entomologists agree that the eggs of the saw fly are *invariably* laid on the under side of the leaves, and usually attached to the larger veins. On the date before referred to, the 22nd of May, as the flowers were not then open, there would be scarcely a leaf on the bush sufficiently developed to serve the purpose of the female fly as a resting place for her eggs, and yet nine days after this the cocoon was found attached to the paper bag, and quite firm in its texture, as if it might have placed itself there several days before. From 10 to 14 days would probably elapse from the time of depositing the egg to the appearance of the young larva, and two weeks more, at least—perhaps three—would be required to bring it to its full growth. This work of a month or five weeks could not possibly have been crowded into the space of eight days or less, and I think I can scarcely be accused of rashness in forming the conclusion I did, that in this instance the larva *must* have remained unchanged during the winter, probably under the surface of the ground, then crawled up the bush, attaching itself to the paper bag, and there constructing its cocoon some time between the 22nd and 30th of May.

The hemipterous insect Mr. Walsh refers to in the closing paragraph of his paper I have succeeded in rearing. It is not yet determined, but as far as I can learn, is distinct from either of the species referred to by myself or Mr. Walsh; as soon as it is correctly determined I shall give its name publicity.

REMARKS ON THE HISTORY AND ARCHITECTURE OF THE
WOOD PAPER-MAKING WASPS.

BY WILLIAM COUPER, OTTAWA, ONT.

The history of the wasps of temperate America has not been recorded. It appears that entomologists have no great desire to study those interesting insects; and although several species occur in Canada, we know little or nothing of their natural history. One species, the spotted wood wasp (*Vespa maculata*, Linn.), occurs commonly, as near as I can determine, about every third year, in our northern woods. Having partially studied its habits, and collected a series of the nests in all their stages, it is particularly in regard to the latter that I claim attention. But before I proceed to relate what I have ascertained regarding their architecture, it will suffice to state that each large nest which we notice suspended from trees towards the end of summer consisted of a colony of males, females and workers, or imperfect females, as they are termed. The large nest is certainly the second, probably the third structure which has been formed by an industrious colony of workers during the warm months of summer. In this latitude, late in the fall and early in spring, we find large and small females in a torpid state. They are the generators of the forthcoming colonies, and the only living remnant of the large number of distinct individuals which inhabited one of the deserted nests of the previous season. These females leave the nest on the approach of cold weather in October, or according to the latitude where they occur, and they then carry impregnated ovaries from which are produced eggs to constitute a young colony of from eight to twelve workers in the following spring. The gradual warmth, generally in the early part of May, awakens the torpid female, and she emerges from her winter's abode to perpetuate her species. After partaking of such food as can be procured at this season, she is now prepared to fulfil another part of her mission—instinct teaches her that she must be her own builder—and for this purpose she goes forth to select a suitable sheltered situation. When this is found, she collects and prepares woody fibre from weather-worn fences, &c., by which, in the course of a week or ten days, she forms a little pretty spherical paper nest. After it is perfected, she attaches a single tier of hexagonal cells, in each of which an egg is deposited. The first egg is placed in the central cell, and as far as I have been able to watch the parent, and from examination of several of these small nests, I am of the opinion that she does not deposit all her eggs simultaneously, but that there is a lapse of time between the deposition of each egg. I am led to this conclusion because in several nests which I have examined larvae occupied the central cells, while some of the surrounding ones contained eggs; besides, I have ascertained that the young workers issue from their cells at stated periods, one after another. Here, then, we

see a beautiful provision Providence has made for the perpetuity of what we look upon as an insignificant wasp. It has been provided with instinct to guide her; indeed, it appears to me that she has a kind of understanding that her progeny are to be brought forth gradually, therefore she only deposits a single egg at a time, when a lapse of a day or more occurs between each, which is no doubt caused in order that her labor in the collecting of food (for they are ravenous eaters in their larval state) may be brought about with greater facility, or, correctly speaking, that the time for procuring food and watching the nest will be equally divided. She is therefore only compelled to feed two at a time; and by the period of the issue of larvæ from advanced eggs, the first two have ceased to feed and are no more trouble to her, as they are prepared to spin cocoons to enclose themselves in their cells to undergo the third stage of their life. The parent wasp has also the accuracy and knowledge of a bird in regard to the locality of its nest; indeed, the attachment is as great, and which is not abandoned until it is deserted by her progeny to construct the second. I have had the pleasure of watching the formation of the parent nests of *Vespa maculata* and *germanica* from the time they were commenced until completion, and I now record a difference in their mode of working from the European *V. vulgaris* or its American representative, *i. e.*, that the pedicel and the tier of cells are the last portions of the work finished. In some rare examples, the inner dome and part of the second exterior envelope are not fully completed when the pedicel and tier of cells is attached to the roof; but there may be a force of nature in these deviations from the general plan of architecture, which I am not prepared to solve. Kirby says: "That the common wasp of Europe (*Vespa vulgaris*, Linn.) only partially completes the dome before the uppermost tier of cells are begun, and when the first tier is finished, the continuation of the roof or walls of the building is brought down lower; a new tier of cells is erected, and this work successively proceeds until the whole is finished."—*Introduction to Entomology*, Vol. I., p. 504-5. The first and second nests of *V. maculata* and *germanica*, with the exception of the rare specimens before mentioned, are not formed in this manner, for all those which I have examined had their exterior covering and the aperture fully formed before the first or second tiers of cells were commenced. In order to confirm my former statement that the parent nest is abandoned by the first issue of wasps, and that it is not enlarged, as many people suppose, one of these little nests was found occupying the full extent of a cavity in an old tree stump. It contained a single tier of eighteen perfect cells, which I believe is the maximum number of the parent nest. They are found from one and a half to three inches in diameter, and contain from one to four partitions or envelopes. These distinctions may be attributed to the bulk and strength of the parent architect—for I find a great difference in the size of hibernial females—one found under bark of a tree at Quebec, on the 20th of May, measured seven-eighths of an inch, and two others which I found under decayed leaves in the

woods near Ottawa measured five-eighths of an inch in length. There is some motive for these varied proportions which as yet requires explanation. *Vespa maculata* invariably suspends its nest from the branches of beech and maple trees. These may be found common during some seasons between the months of July and October. The structural conformity of those of the second colony are remarkable from being only about half the size of the third—for there cannot be a doubt on my mind but that *maculata* constructs a third—and that is the large nest we find in the fall of the year, and the one in which the males are produced. It is during the season that the second form of nest is inhabited that these insects should be watched, and I am sorry that I have not had that opportunity, as I should have determined the existence or not of males at this period.

The parent wasps are very fond of building their nests in the neighborhood of our dwellings. Sometimes they are found attached to sheltered situations in out-houses, and their object in selecting these situations is no doubt to be close to localities where they can procure food to rear their young quickly. The entomologist may look for these little nests early in May; thenceforward he can find them in all stages of progress, but few will be found containing eggs before the 25th of May, which is about the time that the first egg is deposited. Larvæ appear about the 7th of June. *Vespa maculata* was the species prevalent in the woods near this city in the summer of 1868. Last year *Vespa germanica* was predominant, and I append two or three notes regarding them.

May 30th—Found a nest of *V. germanica* under a piece of old bark, on the ground. Appearance of nest similar to that of *V. maculata*. There was only one egg in the central cell.

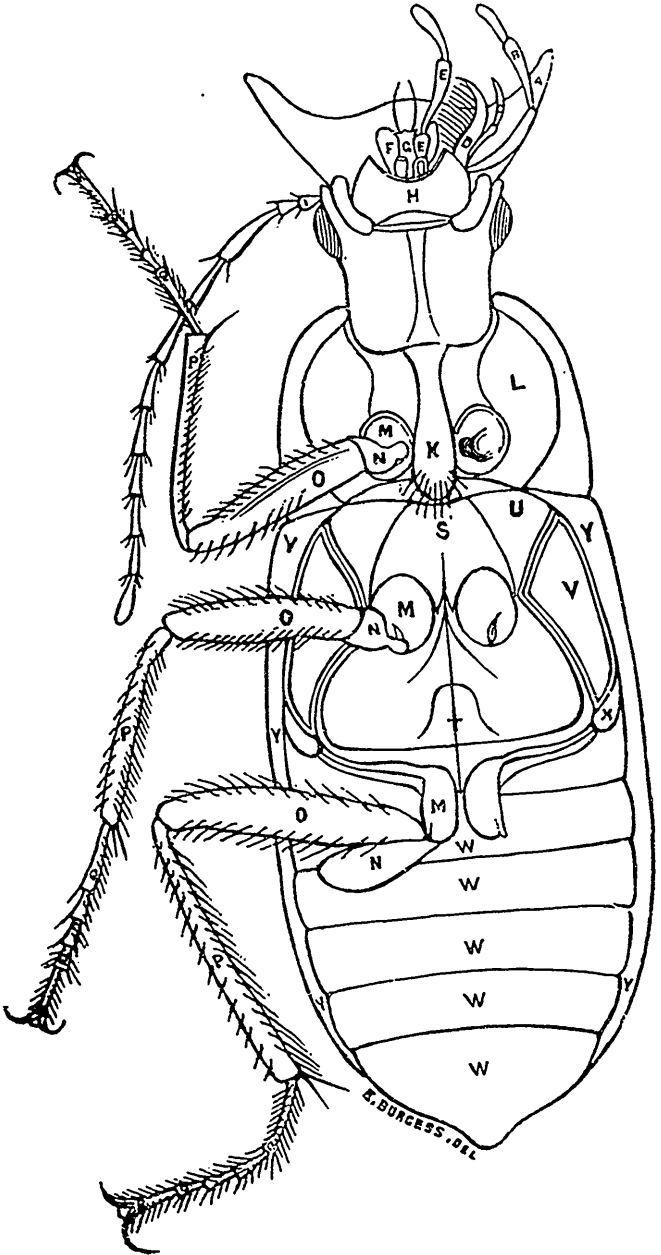
June 7th—Found a second nest of *V. germanica*. It contained twelve cells, ten of which had eggs, and the two central contained larvæ, apparently hatched a few days previous. The eggs are attached to the inner wall at the bottom of each cell. This nest had three partitions of similar construction to that of *V. maculata*.

June 13th—Examined the nest found on the 30th ultimo. It appeared to have been increased by an additional envelope. In taking up the piece of bark and holding the aperture so that the rays of the sun could enter it, I detected larvæ in the central cells, but they were very small. When I first found this nest, the parent came out and flew about my head, but on this occasion I had to blow into the aperture ere she came out, and when she did there was no fear exhibited, nor did she fly away, but stood on the outside of the wall while I examined the interior.

One part of the history of this species, I am sorry to say, I have not had an opportunity to investigate—that is, their economy while in the second nest, for I believe that it is during this stage of progress that a true account of the individuals which constitute the colony can be determined. Here we could, no

doubt, arrive at some conclusion regarding the correct dates of the appearance of the sexes which are said to occur towards the autumn. Reaumer states that there are two sizes among the males. It would be interesting to know if they are permanent kinds. Kirby, and other writers on Insects (see Westwood's Int. to the Modern Class. of Insects) state that the neuters, or what are now termed undeveloped females, "massacre the later brood of larvae which are not able to undergo their transformation before the setting in of the winter." This may, no doubt, be the end of the later larvae of the two species here spoken of, but it is not the case with the pupae which occupy the cells of *V. maculata* in the autumn, as I procured living specimens from nests brought home in October. The second nest of *V. germanica* contains two tiers of cells, which are generally enveloped with six or more partitions. During the warm season in which it is occupied, proper ventilation is necessary to insure the health and increase of the colony; therefore the wasps never neglect this important mode by which the interior is kept at an equal temperature. The innermost partition encircles the double tier of cells, but its aperture is larger than the next outermost, and the aperture of each decreases towards the exterior one until it is only of sufficient size to admit one or two insects. In order that pure air be properly obtained, and that the circulation should be sufficient to force foul air from the interior, we find other apertures on the exterior partition, which lead in zigzag passages from one partition to another until they reach the interior. This mode of ventilation is beautifully illustrated in the large autumnal nests, and for a good reason, we generally find them containing from four to five tiers of cells and a numerous colony, which obtains its full strength in this nest. In a nest lately examined the latter number of tiers was found; the two uppermost consisted of small cells, and those of the two central were of larger dimension, and had been evidently occupied by males and females, while the fifth or lowermost tier does not appear to have been occupied; but it is nevertheless curious *that it agrees in size, number and form of cells to that found in the parent nest in spring.*

Notwithstanding the powerful sting with which some of them are provided, wasps are liable to the attacks of other insects, and their nests are entered by parasites belonging to the orders of Coleoptera, Hymenoptera and Diptera, for the purpose of depositing their eggs in the cells containing the larvæ. Nests of the second and third colonies which I took from branches about fourteen feet from the ground, at the end of October, 1868, are infested with a Hymenopterous parasite. One of these species issued from a cell of *maculata* about six days after it was in my possession. Five came from one cell. I sent this Hymenopter to Mr. Cresson, of Philadelphia, and he has since described it as a new species, *Enceros burrus* (*Canadian Entomologist*, i., p. 104). This parasite occupied a longitudinal position in the cell of the wasp, and its cocoons were slightly made, and stood side by side. I also remarked that they issued from a cell which was covered with the cap which is generally spun by the



HARPALUS CALIGINOSUS, Say. ♀.

PARTS OF CUT.

Ventral surface of *Harpalus caliginosus*.

A Mandible.	K Prosternum.	S Mesosternum.
B Maxillary palpus.	L Episternum of protho-	T Metasternum.
C Outer lobe of maxilla.	rax.	U Episternum of meso-
D Inner lobe of maxilla.	M Coxæ.	thorax.
E Labial palpus.	N Trochanter.	V Episternum of meta-
F Paraglossæ.	O Femora.	thorax.
G Ligula.	P Tibiæ.	W Ventral segments.
H Mentum.	Q Tarsi.	X Epimeron of metatho-
I Antenna.	R Ungues.	Y Epipleura. [rax.

EXPLANATION OF TERMS.

Base—That point of any organ nearest the centre of the insect.

Apex—That point of any organ farthest from the centre of the insect.

Dorsal—Upper surface.

Ventral—Under surface.

Emarginate—Sharp indentation.

- Sinuate*—Curved indentation.
Lateral—Pertaining to the sides.
Marginate—With the edge surrounded by a border.
Truncate—Squarely cut.
Transverse—Crosswise.
Obtuse—Rounded, not acute.
Acute—Pointed.
Thorax—Usually the dorsal surface between the head and elytra.
Prothorax—Usually the ventral surface to which the anterior legs are attached.
Mesothorax—That part to which the middle legs are attached.
Metathorax—That part to which the posterior legs are attached.
Elytra—The wing covers.
Elytral striæ—Longitudinal grooves in wing covers.
Elytral interstices—Spaces between the striæ.
Elytral dorsal punctures—Small impressions usually between the first and third striæ.
Scutel—Triangular piece at the base of the suture of wing covers.
Scutellar striæ—Abbreviated striæ each side of the scutel.
Suture—The longitudinal line of juncture between the wing covers.
Sutural stria—The groove next to the suture.
Rugose—Wrinkled.
Sulcate—Broad shallow groove.
Fovea—Large impression.
Connate—Joined together.
Reticulate—Covered with lines intersecting each other like a net.

wasp larva prior to its changing into a pupa. Therefore I think that *E. burrus* is a wasp pupa parasite. There are at present cocoons of what I take to be another species occupying about two-thirds of the cells of a nest of *Vespa maculata*, but differently shaped from the cocoons of *E. burrus*, being generally triangular in shape externally, but having an interior cocoon occupied at present with the larva. The curious shaped cocoons, of chestnut color, are all situated at the bottom of the cells, and only in those cells which are open, but having the larval lining to the walls of the cells, and in every instance uncovered. For this reason I believe that this parasitic larva, which has now lain in cocoon since October, 1868, and is not yet developed into the perfect insect, is probably a wasp larvæ parasite, and they illustrate what entomologists term "the metropolis of a species." When they issue, we may conclude it to be their prolific year.

LIST OF COLEOPTERA.

TAKEN AT GRIMSBY, ONTARIO, BY J. PETTIT.

(Continued from page 18.)

GYRINIDÆ.

GYRINUS, <i>Linn.</i>	*Aeneolus, <i>Lec.</i>	DINEUTES, <i>McLeay.</i>
*Picipes, <i>Aubé.</i>	Fraternus, <i>Couper.</i>	Americanus, <i>Linn.</i>
*Ventralis, <i>Kirby.</i>	*Lugens, <i>Zimm.</i>	*Carolinus, <i>Lec.</i>
*Analis, <i>Say.</i>	*Limbatus, <i>Say.</i> ¹	

HYDROPHILIDÆ.

HELOPHORUS, <i>Fab.</i>	HYDROCHUS, <i>Germ.</i>	HYDRÆNA, <i>Klug.</i>
Lacustris, <i>Lec.</i>	Squamifer, <i>Lec.</i>	*Pennsylvanica, <i>Kies.</i>
Lineatus, <i>Say.</i>	*Excavatus, <i>Lec.</i>	HYDROPHILUS, <i>Geoff.</i>
Scaber, <i>Lec.</i>	*Simplex, <i>Lec.</i>	Triangularis, <i>Say.</i>

*Species marked with an asterisk have not before been included in the list of Canadian Coleoptera.

¹From Canada East.

HYDROPHILUS, <i>Geoff. cont.</i>	HYDROBIUS, <i>Leach.</i>	Ochraceus, <i>Mels.</i>
<i>Lateralis, Hbst.</i>	* <i>Insculptus, Lec.</i>	<i>Cinctus, Say.</i>
* <i>Ovalis, Zieg.</i> ²	* <i>Digestus, Lec.</i>	* <i>Bifidus, Lec.</i>
HYDROCHARIS, <i>Latr.</i>	* <i>Subcupreus, Say.</i>	CERCYON, <i>Leach.</i>
<i>Obtusatus, Say.</i>	PHILHYDRUS, <i>Sol.</i>	<i>Flavipes, Er.</i>
BEROSUS, <i>Leach.</i>	* <i>Fimbriatus, Mels.</i>	* <i>Prætextatum, Muls.</i>
<i>Striatus, Say.</i>	* <i>Maculicollis, (Muls).</i>	CRYPTOPLEURUM, <i>Muls.</i>
LACCOBIUS, <i>Er.</i>	* <i>Nebulosus, Say.</i>	<i>Vagans, Lec.</i>
<i>Agilis, Rand.</i>	<i>Perplexus, Lec.</i>	
	SILPHIDÆ.	
NECROPHORUS, <i>Fab.</i>	<i>Surinamensis, Fab.</i>	ANISOTOMA, <i>Ill.</i>
<i>Marginatus, Fab.</i>	<i>Laponica, Hbst.</i>	<i>Obsoleta, Lec.</i>
<i>Pustulatus, Herschel.</i>	<i>Marginalis, Fab.</i>	LIODES, <i>Latr.</i>
<i>Mortuorum, Fab.</i>	<i>Inæqualis, Fab.</i>	<i>Globosa, Lec.</i>
* <i>Pygmæus, Kirby.</i> ³	<i>Peltata, Catesby.</i>	* <i>Polita, Lec.</i>
<i>Orbicollis, Say.</i>	NECROPHILUS, <i>Latr.</i>	* <i>Dichroa, Lec.</i>
<i>Sayi, Lap. (lunatus</i>	* <i>Subterraneus, Fab.</i>	AGATHIDIUM, <i>Ill.</i>
<i>Lec.)</i>	CATOPS, <i>Fab.</i>	* <i>Oniscoides, Beauv.</i>
<i>Velutinus, Fab.</i>	<i>Opacus, Say.</i>	<i>Exiguum, Mels.</i>
<i>Obscurus, Kirby.</i>	* <i>Terminans, Lec.</i>	<i>Revolvens, Lec.</i>
SILPHA, <i>Linn.</i>	* <i>Parasitus, Lec.</i>	
	SCYDMÆNIDÆ.	
SCYDMÆNUS, <i>Latr.</i>	* <i>Capillosulus, Lec.</i>	<i>Rasus, Lec.</i>
* <i>Fossiger, Lec.</i>	* <i>Basalis, Lec.</i>	
	PSELAPHIDÆ—(BRENDÉL'S SYNOPSIS).	
CTENISTES, <i>Reich.</i>	<i>Rubicunda, Aubé.</i>	EUPLECTUS, <i>Leach.</i>
* <i>Piceus, Lec.</i>	DECARTHON, <i>Brend.</i>	* <i>Confluens, Lec.</i>
BRYAXIS, <i>Leach.</i>	* <i>Abnorme, Lec.</i>	RHEXIUS, <i>Lec.</i>
* <i>Perforata, Brend.</i>	BATRISUS, <i>Aubé.</i>	* <i>Insculptus, Lec.</i>
* <i>Illinoisensis, Brend.</i>	* <i>Lineaticollis, Aubé.</i>	

(To be Continued.)

MISCELLANEOUS NOTES.

PIERIS RAPÆ, Linn.—In your "Miscellaneous Notes" of Nov. 15, your correspondent, T. L. Mead, of New York, speaks of having captured "a specimen of *P. rapæ* on flowers in a salt marsh on the New Jersey side of the

²A single specimen taken several years ago on the shore of the Lake, only lately identified.

³Dr. Le Conte, in his List, has placed *N. pygmæus*, Kirby, as a synonym of *N. mortuorum*, Fab., but, as Dr. Horn informs me, now considers them distinct. A fine specimen of the variety *crispetus*, Motsch, was taken here by Dr. Milward.

Hudson River." If he had 'hunted' the 'Hill' on which Hudson City stands, instead of the 'salt marsh' at its foot, he might have captured a hundred specimens instead of *one*. The increase of this insect during the last two years is marvellous.—W. V. ANDREWS, New York.

LIMENITIS PROSERPINA, Edw.—Mr. J. M. Jones sent us a coloured drawing of a specimen captured near Halifax, Nova Scotia, which we consider to be a specimen of *L. proserpina* Edw. We sent the drawing, however, to Mr. Edwards, the highest authority, who replied as follows:—"I think the figure is of *Proserpina*; the white band is rather unusually broad on the upper surface, but no two of the specimens I have seen are alike in this respect. If you examine a series of *Arthemis* you will notice a large range of variation in all respects, and probably *Proserpina* varies as much."—C. J. S. B.

BOOKS RECEIVED.

We regret that our limited space will not permit us to give more than a line of acknowledgment to the many books, papers, etc., that we have received since our last notice. Our regular exchanges will please accept our thanks for their favours during the past year, and our request for their continuance in the future.

Packard's *Guide to the Study of Insects*. Part X., October, 1869. This thick part, of nearly 150 pages, illustrated with three full-page plates and 80 wood-cuts, completes this valuable work, which ought to be in the library of every entomologist in America. The part before us contains an account of the Neuroptera, Arachnida and Myriapoda; an Entomological Calendar, Glossary, copious Index to the whole work, and the Author's Preface and acknowledgments.

Notice of the Crustacea collected by Prof. C. F. Hartt on the coast of Brazil in 1868, with a list of Brazilian Podophthalmia. By Sidney I. Smith.

Description of a new species of Grapta, and Notes on G. interrogationis. By J. A. Lintner.

A Descriptive Catalogue of Medical and Scientific Books. By J. Y. Green, Newport, Vt.

Le Naturaliste Canadien. Vol. ii., No. 1, Dec., 1869. Quebec. We rejoice to observe the tokens of prosperity manifested in the handsome wrapper and generally improved appearance of our French contemporary. We sincerely wish the editor and proprietor, M. l'abbé Provancher, unbounded success in his laudable undertaking.

Once a Month, Arthur's Home Magazine, and The Children's Hour. January, 1870. T. S. Arthur & Sons, 809 and 811 Chestnut Street, Philadelphia. Three well-known and highly popular illustrated magazines, decidedly American, of course, in their style and matter, but withal instructive and readable.

Hardwicke's Science Gossip. Sept. to Dec., 1859. London, Eng. Full of interesting matter.

Newman's Entomologist. Nos. 71 and 72. From Mr. Reeks.

- The American Naturalist.* Vol. iii., Nos. 8, 9 and 10. Salem, Mass.
The American Entomologist. Vol. ii., Nos. 1 and 2. St. Louis, Mo.
The American Agriculturist. New York.
The Canada Farmer. Toronto.
The Maine Farmer. Augusta, Me.
The (Weekly) N. Y. Sun. New York.
Proceedings of the Boston Soc. Nat. Hist. Vol. xiii., pages 1 to 160.
The Educator. London, Ont. Vol. ii., No. 12. An illustrated monthly.

TO CORRESPONDENTS.

W. V. A., New York.—Your subscription to vol. ii. was duly received and put to your credit; by an oversight it was omitted from the list of acknowledgments. You were quite right in sending \$1.25; \$1 is the price in *gold*, the basis of our Canadian currency.

BACK NUMBERS.—In answer to numerous enquiries we beg to state that we can supply a limited number of copies of our *first* volume, neatly bound in the wrapper, for one dollar each. We have also plenty of copies of all the numbers from the beginning except Nos. 1, 3 and 4 of vol. i.; we shall gladly pay ten cents a piece for copies of any of these three numbers sent to us in good order.

S. H., Boston.—We have a few feet left of the extra thick cork, at 24 cents per square foot, but none of the ordinary thickness. We shall get a fresh supply of the latter from England shortly.

PINS.—We have still on hand a quantity of Klaeger's entomological pins, Nos. 4, 5 and 6, price 50 cents (gold) per packet of 500. These are the coarser sizes; we have ordered a fresh supply of Nos. 1, 2 and 3.

SUBSCRIPTIONS.—Members of the Society are reminded that their subscriptions for the year 1870 (\$2) are now due.

DONATION.—Mr. J. Pettit, of Grimsby, in making a remittance, kindly presented the balance, \$2.25, to the publication fund.

* * In future we shall acknowledge subscriptions to the *Canadian Entomologist* by enclosing a receipt for the amount received in the subscriber's copy, as the law permits, instead of in our pages as heretofore.

We crave the indulgence of many of our correspondents for having permitted their letters to remain so long unanswered. Entomology is with us a labour of love; other, and more pressing and important duties frequently prevent our devoting to it as much time as we would.

CLUB RATES.—In addition to the club rates announced on the second page of the wrapper, we are enabled to offer the following:—

The *American Agriculturist* (\$1.50) and the *Canadian Entomologist* (\$1) for \$2.00.

Once a Month (\$2) and the *Canadian Entomologist* (\$1) for \$2.25.

Arthur's Home Magazine (\$2) and the *Canadian Entomologist* (\$1) for \$2.25.

The *Children's Hour* (\$1.25) and the *Canadian Entomologist* (\$1) for \$1.75.

The *Educator* (36 cents) and the *Canadian Entomologist* (\$1) for \$1.05.