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# REPORT

OF THE

# STATE ENTOMOLOGIST

TO THE

REGENTS OF THE UNIVERSITY OF THE STATE OF NEW YORK...

FOR THE YEAR 1886.

ISSUED DECEMBER, 1887.

270095

[FROM THE 40TH REPORT OF THE N. Y. STATE MUSEUM OF NATURAL HISTORY.]

ALBANY:  
THE ARGUS COMPANY, PRINTERS.  
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# R E P O R T .

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OFFICE OF THE STATE ENTOMOLOGIST, }  
ALBANY, *December 15, 1886.* }

*To the Honorable Board of Regents of the University of the State of New York :*

GENTLEMEN.—I beg leave to present herewith a report of some of the operations of my department and results of some of my studies during the current year, 1886.

The report is necessarily brief, owing to the discovery during the present month of a provision in a statute of the last legislature which is construed as a requirement that the reports of the State officers shall be placed in the hands of the State printer by the fifteenth of December of each year. I may, therefore, desire later to present a special report, and to ask its publication at your hands, or your consent for its transmissal directly to the Legislature to be issued as the third of the series of legislative reports.

The present year has been signalized by a remarkable abundance of aphides, or, as more commonly termed, plant-lice. About the twentieth of April, the first report of the appearance of the newly-hatched apple-tree aphid, *Aphis mali*, clustering upon and covering the terminal buds, was received. Other reports from various localities in the State of New York and in the New England States, followed. The operations of the aphid upon the young leaves as they developed greatly alarmed the orchardists, as the loss of the apple crop was threatened. To the requests made for the best method of destroying the insects, washes were recommended for use in the event of the attack not being speedily arrested by a heavy rainfall such as we often have during the early spring. Fortunately, the desired rain followed, destroying myriads of the aphides, and preventing any serious injuries from them later in the season. But the apple crop had already been greatly reduced by the early demonstration of the insects.

“Black and white aphides” on plum and cherry trees were very destructive in western New York. The new shoots were attacked by myriads, distorting and destroying the foliage and the fruit. Scarcely a tree in the vicinity of Rochester had escaped injury. (*Country Gentleman* for July 8, 1886, page 525.)

In the month of July, a far more serious aphid attack than that upon apple trees was made by the hop aphid, *Phorodon humuli*. Hops throughout the State suddenly became infested by the aphid to an extent far exceeding any demonstration of the kind for many years. The leaves and buds dried and fell off; the vines assumed a woody appearance and their roots upon examination showed a pulpy condition. Entire yards were destroyed. Others hardly paid for the gathering. As a result, the hop crop throughout the State of New York the present year has proved almost an entire failure. It is estimated that only about eight per cent of an average crop has been secured — 12,000 bales in lieu of 150,000.

During the same month, a severe attack of an aphid upon potato plants was reported to me from localities in Pennsylvania and Massachusetts. The examples received were in too poor condition to admit of comparison with our known species, and it therefore remains at the present unidentified.

Plant-lice were also reported as injuring carrots and parsnips in Massachusetts — in some instances completely destroying entire beds and fields. No injury to these crops by aphides had been recorded in the United States, and it will be of interest to determine the species now for the first time infesting them.

During the autumn the grain aphid, *Siphonophora avena*, made its appearance under circumstances that gave ground for the fear that its ravages upon some of our grain crops experienced in former years would be repeated the coming year.

Large numbers of the spring canker-worm, *Anisopteryx vernata*, appeared in several localities in New York, inflicting considerable injury, and indicating a steady increase of the pest among us. Mr. C. M. Hooker reports it as steadily gaining ground in Monroe county, and very destructive last year, but that Paris green and water would free an orchard from it very cheaply and easily. Mr. E. C. Pierson reports that it had occurred in many orchards in the northern part of Seneca county, but a timely and liberal spray-



ing of the trees, with London purple, had the desired effect and prevented much damage.

In Milbrook, Dutchess county, the presence of canker-worms was reported May seventeenth, but they were not proving very destructive.

At Easton, Washington county, at the same date, fruit trees were suffering from the ravages of the apple-tree tent caterpillar, *Clisiocampa Americana* Harris. A month later, the currant worm, *Nematus ventricosus* Klug, had invaded every garden and was rapidly consuming the foliage of the currant bushes.

A letter from Middletown, Orange county, of June twenty-ninth, to the New York Times, asserts a loss, the present year, of one-third of an average crop of 400,000 bushels of onions, as caused by the onion-fly, *Phorbia ceparum* Meigen (for an account of which see my First Report, pp. 171-181). The same letter states that "the fly had also attacked the leaf of the beet, depositing its egg beneath the epidermis, where the grub feeds upon the green matter until it reaches maturity and seeks a hiding place in the ground." This latter attack was not by the onion-fly, but by one of the beet-leaf miners, probably *Chortophila betarum* or *Pegomyia vicina*, described, and habits given by me, *loc. cit.* pp. 203-211.

The "grapevine beetle," probably the small chrysomelid, which often proves a great trial to grape growers, *Graptodera chalybea* Illiger, was reported, in May, as injuring some vineyards on Lake Kenka by eating the buds before the leaves expanded. The beetles, which had hibernated in their perfect stage, after feeding as above, deposited their orange-colored eggs in clusters upon the under side of the young leaves, from which larvæ shortly hatched, to continue the attack by riddling or entirely devouring the foliage.

In Kingston, Dutchess county, the curculio, *Conotrachelus nenuphar* Herbst, was more injurious than usual to plums.

As an illustration of the concealment under which the early stages of the lives of some of our insects are passed, some observations made by me upon the preparatory stages of a fly, whose existence in this country was previously unknown, were of peculiar interest to me.

Catkins of the white birch, *Betula alba*, were sent to me with the inquiry, what insect deposits its eggs in the seeds? The first examination disclosed no insect presence, but close observation

showed that, in several instances, a seed had been transformed from its normal alate shape into a globose gall, and displayed on its side a round spot where the shell had inwardly been eaten to a thin pellicle to admit of the escape of the contained insect. The insect within was found to be a mature larva, apparently nearly ready for its pupation. It was evidently a Cecidomyian. In May, examples of the perfect insect emerged from the galls, and were referred to the genus *Cecidomyia*. No United States species corresponding to it was known. It was given a manuscript name of *C. betulæ*, but before publication it would be proper to compare it with the European forms. It was accordingly sent to Baron Osten-Sacken, of Heidelberg, Prussia, our authority in North American Diptera. Answer was returned by him, that careful comparison showed it to be absolutely identical with the *Cecidomyia betulæ*, of Europe, as described by Winnertz.

My principal collections of the year were made during a two-week's sojourn at Keene Valley, in the Adirondack mountains, in the month of August. The locality proved quite unfavorable to large collections. The Lepidoptera and Coleoptera were but few in number. The Hymenoptera and the Hemiptera, constituting the bulk of the collection, were almost entirely confined to the golden-rods, for the spiræas which in the previous year I had found so attractive to these forms, were not in bloom at "Beede's," at the upper end of the valley, although it was met with in full flower on my return at three hundred feet lower of elevation. As there has not yet been the opportunity for studying the insects obtained at the time, I am unable at the present to offer any special report upon them. It is believed, however, that many interesting forms have been secured, a few of which may prove new to science.

The additions to the Department by contribution will be given in the concluding pages of this report.

With the above general remarks, the following notices of several insects and insect attacks, which it is hoped will be of interest and value to our agriculturists and others, are

Respectfully submitted,

J. A. LINTNER.

## A NEW ATTACK ON WHEAT BY A SAW-FLY LARVA.

An insect, with habits hitherto unrecorded, made its appearance in wheat fields in New Jersey and Pennsylvania in the early part of June, which, from the character and extent of its injuries, caused considerable anxiety. A gentleman from Salem, New York, sent this note of inquiry :

I enclose a green worm, with brown head, taken to-day from my wheat field. These worms do not eat the blade or the head ; they crawl up the stalk, strip off the head, and feed on the headless stalk. The ground is strewn with the heads — I suppose a loss of ten per cent of the crop. The worms do not travel, are found singly, and always eating the headless stalk. You have to look pretty close to see them, as they are usually the color of the wheat. Will you say what its name is? How long does it stay in one locality? (We have had it two years.) Can any remedy be suggested? Several of my neighbors have them.

From another correspondent from Slab, York county, Pennsylvania, the following note, with examples of the larva, was received :

I enclose a worm that has appeared in this vicinity this spring for the first time. The full-grown worm is about an inch long, of greenish color, with brownish head ; body tapering from head back ; no tail ; ten pairs of feet. It is found on the wheat, cutting it off about one inch below the head, and then eating the soft green straw. Some fields here are strewn with wheat heads cut off by this worm. It may be an old enemy to wheat in some States or other countries, but it is new to us. Can you give us any light as to name, habits, and whether and where it has proved very destructive to wheat or any other crop?

A correspondent of the *Philadelphia Weekly Press* of June 30, 1886, wrote as follows :

A worm which is a new enemy to the growing wheat has appeared in many fields in portions of the county. It is armed with a pair of strong nippers at its head, is reddish-gray in color when first seen and about half an inch in length, but afterwards becomes green ; when of full size, an inch in length, and of the thickness of a wheat straw. It attacks the upper portion of the stalk of wheat, just below the head, and by sucking the sap therefrom, around the stalk at the same level, gradually cuts it off as if done with a sharp blade. In this respect it resembles the "army worm" by which the eastern counties of the State were visited several years ago, but it does not congregate and move in bodies as that insect was described as doing. In fact, but few can be seen at the same time, one worm doing its damage over a considerable area. Early in the season occasionally a headless stalk could be

seen. Now the ground is thickly scattered with cut-off heads, and at the same rate of progress by the time the grain is ripe a considerable reduction in the yield per acre must be the result. Many farmers seem to know nothing of its presence. Its damaging work will escape the notice of any who do not enter their fields for a close inspection. Last year its damage in reported cases was very slight. This year, in some fields, a loss of one bushel in yield per acre to date would be a fair estimate.

Editorial mention is also made in the "Weekly Press," that the insect is reported in the "Wilmington Every Evening" as ravaging the wheat fields of Delaware.

The above inquiries and notice refer to the same insect. I think that I am safe in designating it as a new insect attack, for nothing of the kind has before been brought to my observation. I find no reference to it in any of our entomological writings; nor is it noticed in such European works as I have been able to consult.

The chief interest of the attack, next to the injury that appears to be resulting from it — a loss of ten per cent in the fields attacked — lies in the fact that the depredator is the larva of a saw-fly, holding a family relationship to our well-known currant saw-fly, *Nematus ventricosus*. None of our saw-fly larvæ hitherto known to us, possess this cutting habit, or attack the wheat; thus, the honey-suckle saw-fly, the gooseberry saw-fly the currant saw-fly, the strawberry, raspberry and ash saw-flies, all eat the leaves, making incisions into the margins; others eat the surface of the leaves, as the rose-slug; some produce galls. A species occurring in Europe, known as the corn saw-fly, *Cephus pygmaeus*, eats into the stalk of the wheat, and then burrows downward in the stem.

Curtis, in his "Farm Insects," has given an interesting account of the sudden appearance of a saw-fly larva, in large numbers resting upon the heads of the wheat or fastened in the awns. They were nearly dead when seen and had probably come there to die, but where they came from could not be discovered. His description of the larva corresponds so closely with an example of this new wheat depredator above noticed, that it may possibly prove to be the same. The mature insect was not obtained by Curtis, but judging from the larval structure, he thought that it might be a species of *Tenthredo*.

The larva now before me is quietly feeding upon a tender stalk of grass given it, stretched out to a length of an inch and a tenth

upon the stalk, with which it nearly agrees in color, holding firmly by its three pairs of long legs and eight pairs of conspicuous pro-legs, with its flattened, round, large head, which is white in front black on the sides and brown above, busily plying its quadrate black mandibles as it bites from the tip of the stalk, and turns its head and part of its body about the stalk for that purpose. If disturbed, it simply draws its head inward without curling sideways, or elevating its terminal end, or emitting a liquid after the manner of so many of the saw-fly larvæ.

The number of legs that this larva has — twenty-two — will at once serve to distinguish it from the caterpillars of our moths and butterflies, which never have more than sixteen legs. The general resemblance to a caterpillar in most of its other features has given to the group the name of “false caterpillars.”

I would be very glad, if this attack is observed elsewhere, particularly in the State of New York, that the information be sent me, together with a number of the larvæ for rearing the perfect insect that the new depredator may be ascertained.

Until we know what the insect is, and its habits and transformations, the information asked for in the above communication cannot be given.

Effort was made to rear the larvæ that were sent me, but they came in so poor condition that but one made its cocoon, and that will probably not mature.

Mr. L. O. Howard, of the Division of Entomology, Department of Agriculture at Washington, in a communication made to me based upon publications of this insect attack in the *Country Gentleman* of June twenty-fourth, writes:

I beg to call your attention to pages 387, 388 of Prof. Riley's report for 1884. One of the larvæ described by Mr. Webster is identical with the species which has done so much damage this season in New Jersey, Pennsylvania and Delaware. We have reared and figured at the department three distinct species feeding on wheat, and the one which you have is probably *Dolerus arvensis* Say.

I had previously examined the larval descriptions of Prof. Webster and could not reconcile either of them with the examples before me.

In Bulletin No. 4, Division of Entomology of the Department of Agriculture, 1884, page 76, mention is made of some larvæ

discovered in inconsiderable numbers on wheat heads in Minerva, Ohio, which "take a portion of the grains out of the heads that they attack."

The same larva was reported by W. S. Chamberlain, secretary of the Ohio State Board of Agriculture, as occurring on wheat at Columbus. No mention was made of its severing the heads. An example of the larva was sent to Washington, but from the condition in which it was received it could only be identified at Washington as one of the *Tenthredininae*, none of which at that time had been recorded as injuring wheat in this country.

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#### THE RED-HUMPED APPLE-TREE CATERPILLAR AND PARASITE.

From Mr. G. W. Duvall, of Annapolis, Md., some caterpillars were received July first which were infesting his apple trees at that date, and had also been injurious the preceding year.

They are of the species known as the red-humped apple-tree caterpillar, or *Ædemasia concinna* (Sm.-Abb.). They have a prominent red hump on the top of the fourth segment; the head is coral-red, the body is striped in yellow, black, and white lines and bears above two rows of short, black spines and shorter ones upon the sides. The hind end is elevated in walking. The caterpillars usually congregate on a single limb, and are sometimes quite destructive, particularly to small trees.

The specimens sent presented a very curious appearance. Each had been preyed upon by a parasite, which had eaten out the entire contents of the caterpillar and had used the outer skin for its cocoon. The cocoons were seen as white oval forms, between three and four-tenths of an inch long, impressed with six or eight more conspicuous rings (the larval segments), each of which is ringed with a row of short, black spines. The head of the larva, now changed to shining black, marks one end of the cocoon and the black terminal prolegs the other. The parasite, which is a small wasp-like creature, with yellow legs and the tibial joint of the hinder pair banded with black and white, eats its way out of the cocoon through a large round hole invariably placed near the larval head. Altogether it is one of the most peculiar looking cocoons that we have met with in the large family of *Ichneumonidae*. The parasite is known as *Limneria fugitiva* (Say).

The same curious cocoons (transformations of the same caterpillar) were also sent to me during August by Mr. A. S. Fuller, of Ridgewood, New Jersey, he having received them from a friend in Virginia, with the statement that the caterpillars had eaten off all the leaves of his apple trees.

It is interesting that this *Limmeria* parasite manifests a special fondness for the cocoon-spinning moths of the silk-worm family — the *Bombycidæ*. It is known to infest *Euchates egle* (Drury), *Eidemasia concinna* (Sm.-Abb.), *Hemileuca Maia* (Drury), *Anisota stigma* (Fabr.), *A. senatoria* (Sm.-Abb.), *Dryocampa rubicunda* (Fabr.), and *Clisiocampa sylvatica* Harris. Dr. Fitch has recorded it as infesting the larva of one of our butterflies, *Pyrameis cardui*.

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#### THE FOREST TENT-CATERPILLAR.

##### *Clisiocampa sylvatica* Harris.

Although the insect above named has long been known, and much has been written of it, yet the following note received from Mr. H. Babcock, of St. Albans, Vt., gives some particulars of its habits that have not been recorded.

I find on my apple trees colonies of caterpillars, unlike the common apple-tree worm. They are found *en masse* anywhere on the trunk or limbs, and when disturbed will drop and spin a silken thread like a spider, but have no nests. They are of different sizes, evidently not full-grown. The head is large, and of a dark blue color. The backs of the largest ones are jet black, with a row of bright yellow spots extending the whole length. On the side is a dull blue stripe, bordered by very minute orange-colored lines. There seems to be not much hair on the backs, but the belly is covered with long yellow-brown hairs. They are alike on cherry, plum, and apple trees. Last year I saw such colonies on two or three plum and cherry trees, and supposed them to be full-sized common apple-tree worms that had crawled from some neglected nest, and swept them down and put them in the stove. This year the same worms are thick on my apple trees, and knowing that I had thoroughly fought the common worms, I examined and found them to be a different species. There is also a species that in late summer or early fall build nests on the ends of the limbs, inclosing leaves in their nests.

The caterpillar described and its habits given in the above communication, is the *Clisiocampa sylvatica* of Dr. Harris, named

also by him the "Forest tent-caterpillar," in distinction from the common apple-tree tent caterpillar. The two species in appearance closely resemble one another, the principal difference being that while the latter is marked along its back with a white line, the former has a row of somewhat oval spots, which are either white or yellowish. Their habits are quite different, for while the apple-tree species spins large and conspicuous web-nests in the forks of the limbs in which it congregates at night, the webs of the other are seldom seen, as they are usually placed upon the surface of the trunk of the tree, and covered and concealed by the larvæ, which use it merely as a resting place and not for a shelter.

The common name of this insect is an unfortunate one, for it is probably observed as often upon apple trees as upon forest trees. Although Dr. Harris gave as its habit, "living in communities under a common web or tent made against the trunk or beneath some of the principal branches of the trees," yet this so seldom occurs that it has been questioned. Prof. Riley, however, records (*Third Report Insects of Missouri* p. 126) that he has seen exceptional instances of their collecting within or beneath their web, especially when young. I do not find that Dr. Fitch confirms Dr. Harris by stating that "the worms live under a large cobweb nest," as quoted by Prof. Riley (*loc. cit.*), but that "these caterpillars build their nest against the side of the tree instead of in a fork of the limbs" (*First and Second Reports on the Insects of New York*, p. 198). The statements upon page 199 that "a few of the caterpillars remain upon the tree and continue to occupy the nest," and, also, "many of the cocoons found in the old nests," etc., obviously refer to *Clisiocampa Americana*, in continuation of its history as given on page 194.

In reply to a request made to Mr. Babcock for some additional information upon this insect, as it was evident that he had observed it with more than ordinary care, he has written me under date of May twenty-fifth, as follows :

At the time of sending my first communication, there was not a nest in sight; now they have nests much flatter than those of the apple-tree worm. One that I saw this morning encircled a limb of four inches in diameter for over half a yard. When I first saw the caterpillars they were in patches on the trunks and larger limbs, about eight or ten inches long by two to four inches wide all lying parallel to each other. The patches were generally in



two parts, and the stragglers seemed to be moving to reach the other cluster — the whole evidently advancing upward. The clusters that I have found have been on apple, plum, cherry and maple trees. They seemed thicker on the maples. I was plowing in a garden under an apple tree, when, having been disturbed by my horse, I suddenly found myself in a cloud of them, dropping down on their silken thread like spiders. I had swabbed out the nests of the common kind with kerosene, when they were not a half-inch long, for several days in succession, until there was not a nest in either orchard, when all at once we were overrun with this species.

This statement of Mr. Babcock contains items of interest in the history and habits of this species, and therefore deserves record.

The species referred to in his communication as building nests on the ends of the limbs and inclosing leaves, in the early autumn, is the "fall web-worm," *Hyphantria textor* Harris.

*Remedies* — The remedies for the forest tent-caterpillar are the following: Hunt for and destroy the eggs late in the season after the leaves have fallen, which will be found encircling twigs in short rings, like the well-known egg-clusters of the common apple-tree caterpillar. These are distinguished by terminating flatly at the ends instead of being rounded, and in not being covered with a thick coating of a varnish-like substance. Or, jar the tree suddenly upon which they occur, and as they drop and hang suspended by their silken threads, sweep them off and destroy them. Another way: Search for the colonies in the early morning or late in the day, when not scattered for feeding, and crush them upon the limbs or trunks.

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#### THE SPRING CANKER-WORM.

*Anisopteryx vernata* (Peck).

The inquiries received for information concerning this pest of our apple orchards have been quite frequent, and among them have been several from different sections of the State of New York, showing an increase of its depredations and a lamentable lack of knowledge respecting its natural history and means for preventing its ravages. Mr. Henry D. Barry, of Dutchess county, N. Y., has written of it as follows:

The past two years my apple orchard has been stripped of leaves by a worm which comes the last of April or first of May and disappears the last of June or first of July. The worm is three-

quarters of an inch to an inch long when it has its growth, of dark color, travels like a measuring-worm, and on jarring the tree spins down on a fine single web. The trees look as if they had been scorched by fire after the worms get through. Please give me what information you possess as to the name and characteristics of the worm; also, what will prevent their coming, or drive them away when here?

The spring canker-worm and its characteristic depredations are described in the above note of inquiry.

The increase and spread of this apple-tree pest throughout our State should arouse our orchardists to the importance of employing active measures against it upon its first notice. If operations are commenced in time, it can be exterminated with comparatively little labor. The insect — one of the moth family — is not distributed by flight, as are nearly all our insect pests, as the female moth is destitute of wings. For a year or two, or for a longer time, its attack may be limited to a single tree in an orchard. Whenever it appears in a new locality its introduction is probably through human agency.

The following brief description of the insect will aid in its recognition by those who are unacquainted with it:

The caterpillar, when its operations disclose its presence, is about half an inch in length. It is a slender creature, which travels by arching its body after the manner of the other "measuring-worms," to which class it belongs. At first of a dark olive-green or brown color, it becomes darker with age, as it approaches maturity, when it changes to a dark brown color — in some cases almost black. It is marked longitudinally with several pale or yellowish stripes, particularly upon its sides. When full grown it measures about an inch in length.

The female moth is without wings, clothed with grayish hairs, which are sprinkled with black, and with a black stripe upon the back of its abdomen. Its general appearance is spider-like and the ordinary observer would not suspect its being a moth. The male moth, which rarely comes under notice, has an expanse of about one inch. The wings are large in proportion to the body, thin, gray in color, with usually three crooked, transverse, dusky lines upon the front pair. The hinder pair are without markings.

The remedies to be used against this pest have been so often published in our agricultural papers that it hardly seems necessary

to repeat them as often as inquiry is made. The best approved preventive and remedial measures have been given by me in detail in the *Country Gentleman* for May 18, 1882, page 393, and for July 10, 1884, page 577. A reference to these will furnish the information asked for in the above note of inquiry. My *Second Report on the Insects of New York*, pages 7-9, may also be consulted.

It may be well to state that at the time when the frost is leaving the ground myriads of the pupæ of the insect may be destroyed by breaking up the ground beneath the trees to the depth of six inches. Swine have often been found of service in this work and for feeding at the same time on other apple insects.

Almost entire protection has been obtained by the use of bands about the trunks of apple trees, of tar and molasses, of printers' ink, of special mixtures sold for the purpose by dealers in agricultural supplies, of tin bands prepared after instructions given, of tin troughs containing kerosene oil, etc. All of these are used for the purpose of preventing the wingless moth, after hatching from her pupal case in the ground beneath the tree, from climbing up the trunk and depositing her eggs upon the limbs.

Probably a less laborious and expensive method is to poison the caterpillars very soon after they have commenced to feed and before they have had time to injure to any serious extent the foliage. The poison may be arsenic dissolved in boiling water to the strength of one pound to 200 gallons of water, Paris green, or London purple. The last will be found the easiest in preparation and in use. To be told just *how to do it* will perhaps lead many into *doing* it. A correspondent has given the method as follows:

I placed three empty coal-oil barrels, having a capacity of about fifty gallons each, in a wagon and filled them with water. I then took a pound of London purple for each barrel, first mixing it well in a pail of water and pouring it into the barrel. The wagon was driven along the windward side of the row of trees, if there was much wind; and with a fountain pump with a fine rose, the liquid was thrown over the tree. The water in the barrels must be constantly stirred during the operation to prevent the poison from settling. Great care should be taken not to breathe any of it, nor to allow the wind to carry the liquid toward men or horses. With two teams and four men three or four hundred trees could be sprayed in a day. The entire cost, including pumps, barrels, poison and labor, was about *three cents a tree* for twice spraying. In rainy weather the application should be repeated two or three times.

The above proportion of the purple would not be needed for killing the young and tender larvæ, and might possibly brown the newly opening leaves. Of course no greater strength should be used than necessary. As the eggs hatch unequally a second spraying after the lapse of a week may be important, even in the absence of rain.

An apparatus has been lately devised by Messrs. Moody & Sons, nurserymen, of Lockport, N. Y., by means of which the power for the agitation of the liquid and the working of the force pump is obtained from the revolution of the wheels of the wagon holding the tank, as it is driven through the orchard, and the discharge pipe is held and directed by the driver.

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#### AN UNKNOWN GRASS PEST.

An attack upon grass which has long been noted, but never investigated, has recently been brought to my notice through specimens of the injured grass sent to me from Emmett, Ohio, with inquiry of its cause. The communication states that more than thirty per cent of the stalks of the June grass have been dead since the tenth of May.

The same attack occurs in specimens of June grass sent to me from Union Springs, N. Y., by Mr. J. J. Thomas, who had observed it for many years. I also find it in a small grass plat in my own garden, at the present time (last of June). Examination fails to disclose the presence of any insect, either within the sheath or the stalk itself. The stalk, in most examples, appears to have been eaten after the manner of the wheat-stem maggot, which produces the fly described by Dr. Fitch, in his second New York report, as *Meromyza Americana*, an account of which is given at some length in my *First Report on the Insects of New York* (pp. 221-227), together with a figure showing the manner in which the larva preys upon the stem. The operations of the grass-stem insect may be supposed to be similar to this; and if it be looked for about the middle of May, it should be found working upon the stem in the same manner. It is not unlikely that it is some small fly belonging to the family of *Oscinidæ*, which contains many species injurious to grain crops in Europe and in this country.

The following note probably refers to the same attack :

At the commencement of the past summer, an early species of grass, called June grass in this vicinity, was in several localities prematurely destroyed soon after flowering, the stalks, from some one of the joints, upward, withering and turning to a straw color, and to such an extent that one person informs me, on casually approaching his meadow one morning, it presented so white an appearance that his first thought was that it was covered with hoar-frost. The connection of the stem immediately above the joint seemed to be entirely destroyed, so that the slightest force withdrew it from its sheath, by which it alone continued to be sustained in an upright position. From the analogy of this affection to that produced by the Hessian fly in wheat, I infer it to have been caused by a kindred species of *Cecidomyia*. (*Quarterly Journal of Agriculture and Science*, 1, 1845, p. 263.)

In some examinations made by me, I have found the stem not roughened and eroded, but simply shriveled almost to a thread, but its outer surface unbroken. If this is also the result of insect attack, it must be from another species, which enters the stem and feeds within it. Possibly this is a later attack than the preceding, for in some of the stalks of grass sent to me by Mr. J. J. Thomas, showing apparent external erosion directly above the two upper joints, one contained, just within the sheath of the grass blade, a half dozen globular, transparent, rather large eggs, which have subsequently hatched, and the young larvæ are now being fed by me *within* sections of grass stems which I have given them. These larvæ are of some species of moth, and when observed, in changing their food to fresh stems, show themselves as remarkably active loopers or measuring worms. (They failed to reach maturity.)

Under another sheath were found some dark-colored eggs, shaped like a banana, which apparently belong to some bug of the order of Hemiptera.

It would seem from the above that there still remains much to be learned of our grass insects.

Prof. Peck, State Botanist, has expressed his opinion that the shriveling of the stem, as above noticed, is not the result of any diseased condition of the grass. He thinks that in former years he has observed small larvæ associated with the eroded condition of the stem.

An editorial notice of the attack in the *New England Farmer* for June, 19, 1886, ascribes it to "a species of thrips." This may

prove to be correct, but as it is unsupported by any statement of observation and identification, we fear that it is based mainly upon a disposition to refer many obscure attacks to the operations of "thrips,"—a family of insects of which we really know very little. Whatever the insect may be, the recommendation made for its destruction in the notice which we quote, will probably prove of material value.

In many localities June grass, *Poa pratensis*, is being much injured by a minute insect, a species of thrips, which inhabits the stalk just above the upper joint, and by sucking the juice of the grass causes that part above it to wilt and die. In some old fields and door yards where the grass has been mowed many years, more than half the heads of the June grass will be found white and dead, causing quite a depreciation in the value of the hay. The insect in its larval state is scarcely large enough to be seen readily by the naked eye, being not more than a tenth of an inch long and very slender. Where it is not desirable to plough the ground, as in yards about the buildings, we would advise cutting the grass as soon as the heads begin to turn white. Feeding it out green immediately will destroy the insects, and probably if the grass is made into hay very early it will tend to prevent the thrips from coming to maturity. We should judge that the transformations occur in the field and near to the place of birth. A field that was badly infested last year is found equally so this year, while an old pasture that has been kept fed down close for several years, but not pastured this year, is almost free from the insect. Except in lawns, we should recommend ploughing and planting a couple of years to clear the land entirely of this little pest.

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#### A NEW STRAWBERRY INSECT.

*Bembidium quadrimaculatum* (Linn.).

Mr. J. P. Little, of Columbia, Conn., has sent the following note of inquiry of an insect attack upon his strawberry plants:

A new enemy to the strawberry plant has appeared on my newly-set plants; at least it is new to me. It is a small brown bug which eats the leaves of the newly-set plants, and thus entirely destroys them. I send samples of the pest herewith.

The beetles received are *Bembidium quadrimaculatum* (Linn.). Their occurrence, as at present found, is quite interesting, for, although the insect has long been known, and is referred to by Dr. Fitch as "very common in our garden" (Eleventh Report, p. 504, *Transactions of New York State Agricultural Society*),

it has never, so far as known to me, been recorded as feeding upon vegetable material. Dr. Fitch remarks of it, after pointing out its resemblance to the four-spotted variety of the striped flea-beetle, *Phyllotreta vittata*: "Its motion will readily distinguish it from this beetle. It never hops, but sparkling like a diamond in the bright sunshine, it runs briskly in a very serpentine or zig-zag track, a few inches, till it gains some crack in the ground or other covert, in which it abruptly disappears. It feeds on other insects — its strength and agility enabling it to overpower those that are much larger than it in size."

Notwithstanding the ascription of carnivorous habits to this beetle by Dr Fitch and others, yet from the circumstance under which it has been brought to notice, it is quite probable that it is guilty of the charge made against it, of injury to strawberries. True, it belongs to a blood-thirsty family, the *Carabide*, which embraces a large number of our eminently predaceous beetles, most of the species of which are insectivorous, and of essential service in diminishing the number of the injurious pests of our garden and fields. They are not, however, exclusively carnivorous, for, according to Westwood, some of the species in Europe are known to feed upon growing grain. Thus *Zabrus gibbus* occasionally destroys entire fields of corn by eating off the young shoots at night; and species of the genus *Amara* find their chief support in the pith and stems of grain and succulent roots, while they also eat the larvæ of other insects (*Westwood's Introduction* i, pp. 62, 63).

As features of the attack of this insect, Mr. Little states that in a bed of five rows of strawberry plants near a stone-wall, the first row was entirely destroyed; the second, nearly so; the third, badly injured, while the fourth and fifth were eaten but little. Another bed, twenty rods from this, had not been injured at all. The explanation of the greatest injury nearest the wall may be found, probably, in the known habit of the Bembidium beetles of hiding beneath stones and in crevices of walls.

The slight doubt that still exists of the Bembidium being the real depredator upon the strawberry will be settled by the experiments to be made of confining it with uneaten leaves. Its carnivorous tastes will also be tested by inclosing small insects with it.

[The insects needed for the above tests could not be obtained when application was made for them.]

A MEAL INSECT—*Læmophlæus alternans*.

A barrel of "Arlington wheat meal" was found (in Massachusetts) to be infested — to what extent not stated — with a small insect, which, as near as could be determined from the examples received, was *Læmophlæus alternans* Er.

Upon inquiry of the manufacturers of the meal, reply was made that the insect was entirely new to them, and no complaint of its occurrence had previously been received by them.

With our limited knowledge of these insects, we are unable to say when they were introduced in the meal or what drew them thither. Most of the members of the family of *Cucujidae*, to which *Læmophlæus* belongs, are carnivorous in their larval stage. Many live under the bark of trees where they subsist upon other insects, acari, etc. The *Læmophlæus* larva may possibly have been present in the meal for feeding upon the flour-mite, *Tyroglyphus siro* (Linn.), with which the meal may have also been infested without their minute forms having been noticed. Perhaps the mature beetle may feed on meal, but of this nothing as yet is known.

It will be difficult to name a remedy for this beetle when infesting meal. It is so small—less than one-twelfth of an inch in length—that it could not be removed through sifting. The experiment might be made of placing in the flour a small package of gum camphor, naphthaline or some other substance of strong odor that may prove disagreeable to the insects, and thus drive them out. If but a few are present, and the natural prejudice against eating insect-food could be overcome, no harm would follow if some of them should happen to be served up with the cooked meal.

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A GRASS-BURROWING BEETLE.

*Cebrio bicolor* (Fabr.).

A beetle sent from Nashville, Tenn., was accompanied with the statement that in a grass-plat, which had been sodded late in the preceding year, whenever it rained, this insect threw up small mounds of earth, and had filled the ground with holes of about one-fourth of an inch in diameter. A remedy for its defacement of the grass-plat was desired.



The beetle was identified as *Cebrionia bicolor* (Fabr.). It is a very interesting species, belonging to the extensive family of *Elaterridæ*, or snapping beetles, and to the sub-family of *Cebrioninæ* (formerly regarded as of family value), which has but few representatives in our country, and those confined mainly to the Southern States. In the eastern continent they inhabit the south of Europe and the north of Africa. The females are destitute of wings, which, indeed, would be useless to them from their habit of living beneath the surface of the ground. They usually carry their burrows to the surface after or during heavy rains, at which time they are found by the males — a more slender insect, with longer antennæ and fully developed wings — and copulation takes place.

Westwood relates (*Introduction to the Classification of Insects*, vol. 1, pp. 244, 245), that in Europe, *C. gigas* appears only during the early autumnal showers; at which period, if the weather be fine, few only are to be found; but if very wet, great numbers of males are observed creeping about the ground (from which they have recently emerged) and eagerly searching for the females. At the time of coupling, the female protrudes from the ground a long horny tube, the extremity of which contains the organs of generation.

Judging from the habits of other of the *Elaterridæ* or snapping beetles, most of the popular remedies employed against the ravages of the well-known larvæ, "the wire worms" would be efficacious with these. In a grass-plot, the frequent plowing or turning over of the surface soil, so generally recommended, could not be conveniently resorted to. An effective method of destroying the beetles might be, if the burrows were not very numerous, to pour hot water in them. An equally efficient method of destruction, and one which would better subserve the purposes of science, would be to dig up each female when the burrow appears, drop it in a small bottle of spirits, and send the bottle, packed in sawdust, to the New York State Entomologist, who would gladly place the specimens in various collections in the Northern States, where the species, from its subterranean habits, is a rarity. If this were faithfully done for one season, from the first indication of the presence of the insect, the infested grass-plot could furnish but few, if any, additional specimens the following season for further distribution.

## A DUNG BEETLE.

*Aphodius inquinatus* (Herbst).

Insects are sent for name and history from Annapolis, Md., which, in the month of October, are represented as filling the air with their numbers. Farmers in the vicinity know it as "the young tumbler bug." Ducks are very fond of them, and consume a great many.

The insect is a small beetle about one-fifth of an inch in length. Its antennæ are club-shaped, terminating in three lamellæ or flat lobes, showing it to belong to the lamellicorn beetles, of which the sacred Scarabæus of Egypt is a well known representative. Its head is black and two-thirds as broad as the thorax, which is also shining black and nearly as broad as the abdomen. The abdomen is oblong, depressed and rounded behind. The wing-covers have about nine rows of minutely pitted stripes and are of a brown color, with longitudinal black markings on the anterior, posterior and lateral portions. The legs are hairy and armed with several teeth.

The beetle is known as *Aphodius inquinatus* (Hb.). It is a European species, which, with other of its congeners, has been introduced into this country. It has two annual broods, occurring both in the spring and in the autumn, and has often been observed in immense numbers, as in this present instance. Its eggs are deposited in the excrement of animals, upon the partially decomposed portions of which the young, when hatched, subsist. The tribal group of *Aphodiini* to which it belongs, follows next in systematic arrangement to that of the *Coprini*, in which is contained the common tumble-dung beetle — *Cunthon lævis* (Drury). It is therefore probable that its habits are so closely allied to that species as to have suggested the name which has been given to it, as above stated — "the young tumbler-bug," but I do not know that it deposits its eggs in a pellet of excrement, and rolls it about until it finds some suitable place for its burial, after the manner of *C. lævis*.

All the species of the genus are of small size, rarely exceeding a quarter of an inch in length. They are usually black, but in some instances have red or brown wing-covers, or marked in these colors. No less than seventy North American species of the genus are

recorded in Henshaw's check-list of the Coleoptera. *A. fimetarius* (Fabr.), is also a common species which has been observed abundantly, according to Dr. Packard, on the carriage road of Mount Washington. *A. fossor* (Linn.), has also been introduced from Europe.

These species pass the winter in the larval and pupal states, to appear in the spring as perfect beetles, which are readily attracted to the newly dropped excrement of horses and cows, and may often be observed swarming over it.

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#### THE SUGAR MAPLE BORER. .

##### *Glycobius speciosus* (Say).

A lady writing from Canajoharie, New York, complains with much feeling of the ravages of a borer which is rapidly destroying some highly valued maples which shade and adorn her home.

From the account given of its operations, it is undoubtedly the maple borer above named, which was first described by Say in 1824, in *Long's Second Expedition to the Source of St. Peter's River* (ii. p. 290), as a rare insect. In addition to the specimen taken on the Wisconsin river during the expedition, one other only was known, which had probably been taken in Pennsylvania and was in the possession of the Philadelphia museum. It was subsequently illustrated in Say's *American Entomology*. Dr. Harris has noticed and figured it in his *Insects Injurious to Vegetation* giving at the same time one of those popular and graphic descriptions which enable his readers to recognize the insect unaided by illustration, and have lent such a charm to his invaluable report. Of later years the beetle has become comparatively abundant, being found in nearly all collections, and having been frequently written of and figured. It is one of our most beautiful species, as its specific name of *speciosus*, meaning beautiful, imports, being a member of the family of longicorns (*Cerambycidae*), measuring over an inch in length, marked with the strongly contrasting colors of orange and black, and bearing conspicuously a W-like character on the front part of its wing-covers.

Despite its beauty, it is a highly pernicious insect. Not content, as are most of its associates, with burrowing in dead or sickly vegetation, its attack is usually made on perfectly healthy trees.

It was my privilege several years ago to follow an attack of this insect on a row of maples at Schoharie, New York, which I passed daily, and had for years observed with pleasure their vigorous and healthful growth. As adding to the testimony of Dr. Packard of the attack of healthy trees (*Insects Injurious to Forest and Shade Trees* — Bulletin No. 7 of the United States Entomological Division, p. 103, 104), I herewith copy the record made under date of November 30, 1859:

“I have noticed this autumn, for the first time, that our sugar maples, which we have always regarded as our most valuable shade tree, from the almost complete immunity which they have enjoyed in trunk and leaf from insect depredation, have been attacked by a *borer* so pernicious in its work as to threaten their destruction unless some means shall be found to check its ravages.

In its simplest form it reveals itself by the bark parting longitudinally and breaking away, disclosing the wood of the tree in a narrow strip for some five or six inches in length. On the surface of the wood can be seen the furrow of the grub, cut to a slight depth, gradually increasing in its dimensions as it descends, and at the lower end entering the trunk of the tree. Over the borders of the groove the growth of sapwood made since the injury, impinges. This, I presume to be the work of a grub proceeding from an egg deposited late in the season and compelled to seek an early refuge by approaching winter. A wound no more serious than this, would close over in two or three years and no permanent injury result. But when the grub has had full time allowed it for its work the injury is far more important.

In several instances I have traced the furrow, packed tightly with fine powder for two feet or more in extent, with an average breadth at its lower portion of over half an inch and nearly one-fourth of an inch in depth. To render it the more serious the grub almost invariably before entering the tree, leaves its downward path and winds nearly horizontally around the trunk until it completes about half a circuit. It then enters the trunk an inch or thereabouts back from the end of its burrow, ascending at an angle of about ten degrees. The perfect insect emerges from the tree above through an opening which can be probed horizontally for three or four inches, the mouth of which is smoothly cut and somewhat elliptical, the broadest diameter being about .35 of an inch.

¶One maple which I have examined, of some ten inches diameter at the base, which has been more seriously affected than others, and probably the first to be attacked, has been nearly destroyed. Several of the grubs have commenced their ravages side by side, and by their united cuttings have in places exposed the trunk for over a hand's breadth. The tree has been attacked in various

places from above its first limbs nearly to its base, extending beneath the surface of the ground. The entire circumference of the tree has been grooved, although not continuously. Circulation is still maintained by winding around and among the burrows, but one more season's work, will, it seems, take the life of the tree.

In a row of maples bordering a lawn scarcely a single tree is entirely exempt from injury — all apparently the work of this grub. If these injuries are to continue and increase, and I see nothing to prevent it, our maples, which we prize so highly, will share the fate of the locust and be abandoned to the borer as too unsightly a tree for ornamental use."

The "beautiful Clytus" is a difficult insect to control, and very many of the fine old maples, which have ornamented our streets and afforded us so agreeable shade, have been or are being killed by it. A few years ago it was a source of much pain to me to see at Bennington, Vt., the large number of old maples that were standing dead upon the street or rapidly dying from the merciless burrows of this borer that had scarred and excavated their trunks. Recently the same ravages, although not as yet to the same extent, were observed by me at Glens Falls, N. Y.

Probably the best method of arresting the ravages of this pernicious borer would be to watch for the commencement of the operations and kill the young larva. The eggs are laid in July and August. It is said that the place where the egg has been deposited upon the bark of the trunk may be detected "by a rusty discoloration of the bark about the size of a cent: and especially by the frass or castings which, to the length of an inch or more, are attached like a broken corkscrew to the bark." The larvæ upon hatching burrow upward, remaining in the bark until the following spring, when they leave the bark and burrow into the solid wood. At this season of the year [October] the larvæ may be found beneath or not far from these discolored spots of egg deposit. If by cutting into these the burrow is found to have extended too far to follow it with the knife without injury to the tree, a flexible wire may be used as a probe for reaching and destroying it, as is done for the notorious apple-tree borer, *Saperda candida* Fabr.

## THE POTATO STALK WEEVIL.

*Trichobaris trinotata* (Say).

A communication to the *American Rural Home*, of July 24, 1886, gives information of a severe attack of the above named insect upon the potato crop in Arizona, from which it will be seen that it is a more serious evil in that region than it has thus far been in the Eastern States. This may, in part, be due to the larger form that the beetle assumes in its western distribution — in Upper and Lower California and in Arizona, according to Dr. Le Conte (*Rhynchophora of North America*, 1876, p. 288):

*To the Editor:*

SIR.— I send inclosed, specimens of a bug that has almost entirely destroyed the potato crop in this section this season. I never saw it before, nor have any of my neighbors. It bores into the heart of the stalk at the top of the ground while small, in the larva stage, and, completing its growth, passes the chrysalis stage and emerges the specimens inclosed, leaving the plants in a shriveled and dying condition. There are from one to six or eight worms in almost every vine, sometimes boring the entire inside out of the stalk for from three to ten inches of its length.

Can you tell me what it is? Is there any remedy or preventive? By answering the above you will greatly oblige the readers of your paper in this place. We plant our potatoes in this climate in February, and they ripen in June. Some of the earliest escaped, as the potatoes were sufficiently matured not to be much affected, but the later ones are almost a total failure, as the tubers remain in whatever stage of growth they are when the worms begin on the vines.

GEO. P. DYKES.

ZENOS, MARICOPA COUNTY, ARIZONA.

The above communication gives us some additional knowledge of the destructive habits of the larva of a snout beetle (one of the *Cureulionidæ*), popularly known as the potato stalk weevil, and scientifically as *Trichobaris trinotata* (Say). It is about three-twentieths of an inch long; oval, with the characteristic projecting curved beak of the curculios, of an ash-gray color from its clothing of short gray hairs, and with three small black spots (whence its specific name), one on each hind angle of the thorax and another behind its middle angle. It is figured in Dr. Harris' *Treatise on Insects Injurious to Vegetation*, as *Baridius trinotatus*, and referred to as not known in New England, but occurring in the Middle

States. I have heard no complaint of its injuries in the State of New York, nor is it mentioned in the Fitch New York Reports, but it has proved quite destructive in Pennsylvania and in some of the Western States. It appears to be more abundant and injurious in the south-western portion of the United States.

The injuries inflicted by the beetle are correctly stated in the accompanying communication, while the attack seems to be more formidable than hitherto reported. Prof. Riley, in his notice of the insect (*First Report on the Insects of Missouri*, 1859, pp. 93, 95, where description and illustration are given), states that the female deposits a single egg in an oblong slit about one-eighth of an inch long, which she had made with her beak; but in this attack, from six to eight eggs are said to be placed in each vine.

Fortunately, the remedy for this destruction of the vines in successive seasons, is found in the habit of the insect changing to its pupal and perfect stages within the vines. As soon as the plants begin to wilt, pull them up and burn them, with the insects contained in the stalks or roots. If this be done by all potato growers, as the insect, so far as known, confines itself to the potato, the continuance of the species in the infested locality will be arrested.

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“AN UGLY BEE-SLAYER.”

*Phymata erosa* Her.-Sch.

Mr. G. W. Duvall, of Annapolis, Md., to whom we are indebted for many valuable observations on insects, has contributed to the *Country Gentleman* the following account of the habits of the carnivorous insect above-named — a member of the order of Hemiptera, comprising bugs proper, and a common species of general distribution in the United States:

I send by this post a bottle containing an ugly bee-slayer, on a twig of golden-rod, their favorite bloom, in which they conceal themselves, so as to spring upon the unwary honey-gatherer; also two of its victims — a small butterfly and a bee. They secrete themselves in the yellow bloom (which is nearly their own color) of the golden-rods, false sunflower (*H. autumnale*), and others of the *Compositæ* which yield honey and have a white or yellow bloom, and are so tucked away among the thick efflorescence, that they are not perceived by the busy and unsuspecting honey-seeker, until he actually crawls into their deadly embrace. They suck the

blood and juices of their prey, which is accomplished in a few moments, through their proboscis, when they leave it hanging among the bloom, and ensconce themselves in their fragrant and cozy retreats for fresh ones. Their victims are killed instantaneously, without a struggle; and are grasped by their powerful sickle-like claws, drawn in and stabbed with their proboscis. They are as fierce looking as the fabled dragons.

The interesting account above given relates to the "stinging bug," as it is sometimes called, the scientific name of which is *Phymata erosa*. In the *American Entomologist* (vol. ii, p. 25), the following account is given of it in reply to a correspondent: "It is a singular, craggy-looking bug, about 0.38 of an inch long, of a yellowish-green color, variegated with brown, with the legs green and a transverse deep brown band running superiorly across from one side to the other of the dilated abdomen. The genus is characterized by the immensely swollen front thighs, and by the last joint of the antennæ being also swollen. The statement that one of these bugs stung you does not surprise us. The stinging was, of course, done by the beak, which is three-jointed and somewhat resembles that of *Harpactor cinctus* (Fabr.). The plant on which you found these bugs we take to be *Parthenium integrifolium*. We have noticed them ourselves in the latter part of summer lying quietly in wait for their prey upon a great variety of wild flowers, but mostly on such as like themselves are of a yellowish color so as to conceal them from view. We have also often seen this bug with its beak inserted into a small bee or a small wasp, which it is wide-awake enough to hold at arms length with its prehensile forelegs, so that the poor unfortunate captive has no chance to sting it."

The butterfly sent with the bug as one of its victims is an example of *Chrysophanus Americanus* D'Urban — a common species throughout the Middle and Northern United States and British America.

Prof. Glover, in his *Manuscript Notes on the Hemiptera*, states that a specimen of the bug was taken near the Maryland Agricultural College as it was lying concealed among the petals of a rose busily engaged in sucking out the juices of a small blue butterfly which it had caught and killed, and that many others were observed apparently lying in wait in various flowers for the insects attracted to them.



Mr. F. G. Sanborn is quoted in the *American Naturalist* (vol. 1, p. 329), as ascribing much smaller game to this insect than bees, wasps, and butterflies. He states of it: "These insects have been taken in great numbers upon the linden trees in the city of Boston, and were seen in the act of devouring the aphides which have infested the shade trees of that city for several years past. They are described by a gentleman who watches their operations with great interest, as 'stealing up to a louse, coolly seizing it and tucking it under the arm, then inserting the beak and sucking it dry.' They are supposed to feed also on other vegetable-eating insects as well as on the plant-louse." A figure of the bug accompanies this statement, and one is also given by Prof. Glover (*op. cit.*, plate iii, fig. 13).

Its beneficial character, in mitigation of its destruction of honey bees, is also confirmed by the observations of Dr. Uhler, of Baltimore, who represents it as very useful in Maryland in destroying caterpillars and other vegetable feeding insects, but he is compelled to state that it is not very discriminating in its taste, as it would as soon seize the useful honey-bee, as the pernicious saw-fly. Its hiding place has at times been observed to be in the axil of a leaf or stem — probably on flowerless plants or when they are not in bloom.

Mr. B. D. Walsh refers to this species (*American Entomologist*, vol. 1, p. 141) as common everywhere in the Northern States, and found even in the streets of New York city. It was met with by me abundantly in my collections in Keene valley, in August last, upon golden-rod, as also in Long Lake (both Adirondack localities), the preceding year.

Prof. Riley, in his report to the Department of Agriculture for 1883, records the insect as destroying the imported cabbage butterfly, *Pieris rapæ*. See, also, a notice of its habits by Prof. A. J. Cook, in the *Canadian Entomologist* (xi, 1879, pp. 17-20), as "a bee enemy," in which he describes the structural peculiarities of its formidable raptorial claws and proboscis, by means of which it so readily seizes and sucks the juice of the various species of insects upon which it preys.

Prof. Barnard has also given an interesting notice of it in the *Proceedings of the American Association for the Advancement of Science*, for 1880.

From the critical revision to which our Hemiptera have been subjected by Dr. Uhler, in his recently published *Check-List of the Hemiptera Heteroptera of North America*, it would appear that the familiar name under which we have so long known this insect, viz., *erosa*, and so descriptive of its appearance of having had its sides eaten out or eroded, will have to be abandoned for an unmeaning proper name — that of *Wolffii*, given to it by Stal. In the Check-List referred to, *erosa* is reserved for a Mexican form.

In Stal's *Enumeratio Hemipt.* (part 5, p. 133) the author has used the name *erosa* Linn. for a species from Surinam, the *erosa* of Her-Sch. for a species from South America (Mexico, Uhler), and the *erosa* of Guer. for a species from the West Indies.

Stal cites as synonymous of *Wolffii*, "*Acanthia erosa* Wolff (*Icones Cim.* 3, p. 89, f. 83), *Phymata erosa* A. & S. (*Hemiptères*, 1843, p. 290, 2)."

For the above citations I am indebted to Mr. E. P. Van Duzee, of the Grosvenor Library at Buffalo, N. Y., who is devoting special attention to the collection and study of our greatly neglected Hemiptera.

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#### MELON VINES ATTACKED BY THE SQUASH BUG.

##### *Anasa tristis* De Geer.

A correspondent writes: "My melon vines for the past two years have been nearly destroyed by a long-legged bug, from one-half to three-fourths of an inch long, of a dark brown color, and in form (of its back) somewhat kite-shaped. They girdle the main stalk of the vines, and later I find that the young ones have partly burrowed about the root-stalk, the younger of which are of a semi-white color."

The bug above described as destroying melon vines is probably the notorious squash bug, *Anasa tristis* of De Geer. Although accounts of its injuries have been for the most part confined to the squash and the pumpkin, yet it also attacks others of the *Cucurbitaceæ*. We find no mention of its injuries to melon vines in the writings of any of our economic entomologists, yet that it is injurious at times appears from the above statement, and also from that of Miss Murtfeldt that its eggs occurring very abundantly upon some melon vines under her observation had been parasitized

to an extent of ninety per cent by a small chalcid fly, in July, a species of *Telenomus* (*American Naturalist*, 1882, page 915).

This is a very injurious species, at times, when allowed to prosecute its depredations unmolested. Fortunately, much can be done to mitigate its injuries. First, the parent bugs that, after passing the winter as perfect insects, come forth from their hiding places during the latter part of June or early July should be captured and destroyed before they have deposited their eggs. As they do not lay their eggs all at one time, for several days at this season a search for them, where they are abundant, will be repaid. They are usually to be found upon the plants near the ground, or upon the ground adjacent, where they pass the day hiding quietly, to come abroad at night for oviposition. Later the patches of their eggs which are round and flattened on two sides, may be found on the under side of the leaves and crushed. When first hatched the young bugs have a green body with the head, thorax, and antennæ pink. At this time they are usually associated in little companies. Two days after hatching the body becomes ash-gray and the other portions black.

During the fore part of July the vines should be inspected daily for the egg patches and clusters of young, and if this be faithfully done, most of the future damage from the insects will be prevented. The bug molts four times before it obtains its wings and the color and form which is so familiar to most gardeners during the months of September and October. A figure of it may be found in Dr. Harris' *Insects Injurious to Vegetation*, edition of 1862, page 194, together with an interesting account of it.

Another method of reducing the number of the bugs is to trap them by laying pieces of board on the ground near the hills and examining them morning and evening. Still better success is said to attend trimming off the lower leaves that touch the ground and spreading them under the plants. As the bugs display a special fondness for wilted leaves they may often be found in numbers beneath them, feeding on their juices. (*American Entomologist*, ii, 1870, p. 91.)

The complaint made of the girdling of the main stalk of the vine, which is effected by the bugs congregating there to suck its juices, is best to be met (when they have not all been killed by the methods above indicated) by drawing away the ground from the

roots and putting in a mixture of dry ashes and salt. Without this precaution it is said that the bugs will at times burrow in the ground out of sight to feed upon the sap of the stalk. Fertilizing freely is an excellent preventive of injury from this insect and, indeed, from most all others.

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#### THE GRAIN APHIS.

##### *Siphonophora avenæ* (Fabr.).

The grain aphid, which has borne several different names, as *Aphis avenæ* Fabr., *A. granaria* Kirby, *A. cerealis* Kalt., and *A. hordei* Kyber, is an introduction from Europe, which has been very destructive in some years in portions of the United States, as recorded by Dr. Fitch in the year 1861, when "over all the New England States, over all the State of New York except its western section, through the north-east portion of Pennsylvania, and in several parts of Canada, every grain field was invaded, and most of the fields literally thronged by it." No subsequent attack of this insect has approached this in severity, nor has it since been very destructive over broad districts. But it is not at all improbable that the coming year it will become numerous in our grain fields, and the occasion of unusually severe injuries. The past summer has been very favorable to the multiplication of aphid life, as shown in the almost entire failure of the hop crop in the State of New York from the ravages of the hop aphid, *Phorodon humuli*, upon the unfolding leaves and blossoms.

Early in the month of September last myriads of minute insects, which almost filled the air in the streets of Albany, were identified by me as this grain aphid; and in a note addressed to the *Albany Evening Journal*, and contained in the issue of September ninth, the fear was expressed, based upon the remarkable abundance of the insect at this time, that the coming year might bring with it a repetition of the memorable demonstration of the summer of 1861, above referred to.

The opportunity escaped me of examining more than a few of these insects, but it is not improbable that the flight consisted very largely, if not entirely, of females — all of the summer broods, of which there are several, being produced without the presence of the male sex — and that, having just deserted the grain fields,

where they had been feeding until the matured grain could give them no further sustenance, they were now seeking or waiting the fall-sown wheat or rye upon which they could deposit eggs, and thereby provide for the new life-cycle of the coming year, the present cycle being upon the point of completion.

It is proper to state that the cause and purpose of the flights, as outlined above, is simply conjectural, based on our knowledge of other species, for the full life-history of the grain aphid is still unknown, and in several particulars it is proving quite enigmatical to us. No description of the male appears in any writings to which I have access, and in 1862 Dr. Fitch wrote as follows of it:

I have watched the grain aphid this year round so closely that I am perfectly assured that no eggs were laid and no males were produced. When and under what circumstances males occur, if they ever do occur, is yet remaining to be discovered. At present it seems as if these insects might go on forever producing young, without any intercourse of the sexes. (*Transactions N. Y. St. Agricult. Soc.*, xxii, 1862, p. 36.)

A year earlier (in 1861, in Sixth Rept. Ins. N. Y.) Dr. Fitch had stated that the eggs remain through the winter to be hatched by the warmth of the following spring. Subsequent observations failed to sustain this conjecture, as it was found that some of the insects hibernate under the ground to lay their eggs the following spring; or, that the eggs laid in the autumn hatch soon after they are deposited and that the annual round, to be continued through most of the ensuing twelve months, is then commenced. This appears from observations of Dr. Thomas, formerly State Entomologist, of Illinois, who, in 1878, published the following as additional contributions toward the life-history of the species:

When the winter wheat appears above the ground in the fall it passes [to it] from its hiding place at that time, wherever that may be. \* \* \* Here they work upon the leaves and stalks singly while the weather is not too cold; but when winter appears they move down toward the ground — some of them, at least, entering the soil and feeding upon the sap of the roots. At any rate I find the apterous ones at this time working upon the roots, but, at the same time, I find a winged individual above ground. I have also observed them heretofore at the root of the wheat late in the winter, while the snow was on the ground; and, what somewhat surprised me, I found them busy at work under the snow and the apterous females bearing well-formed larvæ. I am therefore led

to believe that in this latitude the species passes the winter in other than the egg state. This will also probably be found true wherever winter wheat is grown. (*Third Report on the Insects of Illinois*, p. 53.)

A species of aphid, so exceptional in its habits as to continue its feeding and propagation throughout the winter in northern localities, might also surprise us by depositing autumnal eggs, to hatch the same season.

This grain aphid is a very pernicious species as it feeds on wheat, rye, barley, oats and various kinds of grain and is extremely prolific. Dr. Fitch has shown that "the wingless ones come to maturity in three days. A single one producing four young daily, and these becoming equally prolific when they are three days old, her descendants in *twenty days* will number upward of *two millions* and will be increasing at the rate of a million daily."

*Preventives.* — We can do nothing of importance to save from destruction a grain crop which is badly infested with this aphid. A field of winter grain, in which its presence to any considerable extent is unmistakably ascertained, should at once be sacrificed by some method that would arrest its continued multiplication through the winter, such as heavy salting, application of gas-lime, dragging out the plants, or any other means through which the insect could be deprived of its food. A deep plowing under of the grain would hardly accomplish this. English writers have recommended dusting with lime or soot, and probably some benefit would result from such measures.

In a communication to the *Country Gentleman* of November 25, 1886 (page 893), Mr. W. A. Stewart, of Denton, Maryland, notes that in a field of rye sown September seventh, which had made a vigorous growth, he discovered many places in it that were turning yellow. Later, upon taking up for the examination of the roots some of the supposed sunburned plants, he found that the appearance "was caused by millions of parasites" feeding thereon.

The "parasite" beyond doubt is the grain aphid, and its autumnal presence may be regarded as indicating serious injury from its multiplication the coming year, in accordance with the fear expressed in the communication made by me to the *Albany Evening Journal* above referred to.

## THE HOP-VINE APHIS.

*Phorodon humuli* (Schrank).

The following notice of the above-named insect was sent to the editor of the *Waterville Times*, of Waterville, N. Y., under date of July 19, 1886, in response to a note of inquiry from him:

DEAR SIR.—Yours of the sixth instant, making inquiry of the hop aphis, accompanied with specimens of the leaves of the hop covered with “honey-dew,” was duly received. Your communication states:

I send you by this mail a box containing hop leaves, upon which you will find honey-dew, lice and black flies (said to be the English aphis and breeders of the lice). Vines all over the State are covered with this sort of vermin. Lice appeared about June fifteenth, and have increased steadily since. For the benefit of my numerous hop readers I would like to have your ideas on them, briefly or at length, as to origin, nature, life, and connection with honey-dew.

I regret that I cannot possibly, in consideration of my other engagements, give you at this time a full notice of this insect pest, such as I would like to send you. It would be too late to be of much service at the present time, but I hope to have it in readiness for my next report.

The leaves when received were found to be thickly covered with honey-dew, which had already, perhaps from inclosure in the box, commenced to assume the black appearance which, when further advanced, is known as “black blight.” This blight, as it is called, is simply a later stage of the honey-dew, when, from exposure, it has undergone decomposition.

The honey-dew was thickly sprinkled with little white bits of matter, which are the cast-off skins of the young lice at their moltings.

The lice upon the leaves were the young and older forms of the hop-louse, *Aphis humuli*, known by our later authorities as *Phorodon humuli*, which is identical with the European species, for many years very destructive in Europe, but first noticed in this country about the year 1862. Upon the leaves were also some yellowish worm-like forms, of one-quarter of an inch long or less, holding to the leaf by their hinder extremity, and reaching out their head in different directions in search of the lice upon which

they feed. They are the larval forms of one of the Syrphus flies, and as they render most excellent service in killing myriads of the lice, their presence should always be welcomed.

Another form fastened to some of the leaves, which may be the "black flies" to which you refer, is the pupa of a lady-bug, *Anaitis 15-punctata* Oliv. It is about one-tenth of an inch in diameter, almost round, fastened by its narrower end, of a dark cream color, with some paler markings on the back. The larvæ of these are slate-colored, and travel rapidly over the leaves, eagerly catching and devouring the lice. A black species, common in England, is known by the common name of "nigger." The more numerous that the lady-bugs and their larvæ occur the fewer are the lice.

As to the origin of the hop lice, the latest observations seem to indicate that in the spring the winged fly makes its appearance on the upper leaves of the plants, upon the borders of the fields, and commence bringing forth the young lice: in England this has been seen about the twenty-eighth of May. It is believed that the winged flies at this season come from plum trees. But in an instance where a free, clean hop plant was protected by a fine muslin covering from all outside attack, it was found covered thickly with the aphides (lice), which must have come up from the ground, or from crevices in the sticks or roots where they may have hibernated. (Miss Ormerod's *Report of Observations on Injurious Insects* for the Year 1883, Appendix, p. 10-11.)

The lice have been reported several inches under ground in the autumn, after the removal of the crops, as if they had retired for the winter, but the most diligent search has failed to find them in the spring. The life-history of this insect is not fully known. Thus we do not know why it is so rarely seen in June, and then why about this time it appears so suddenly in immense numbers. Its history is being more carefully studied, and when we have full knowledge of it we shall probably be able to do much toward the prevention of its ravages. [See note appended.]

The present year promises to be unusually favorable for its increase and destructiveness. Aphides have been remarkably abundant thus far as the result of atmospheric conditions. I have never known them so numerous upon apple trees, rose bushes, currants, and several other plants. Their injuries to hops might have been predicted.



With our present knowledge it seems that hops, when badly infested, can only be saved at the cost of considerable labor, by the methods frequently resorted to in England, viz. : washing them by means of a hand engine and hose with some liquid that will kill the lice. The best wash for the purpose is said to be: 100 gallons of water (if hard water, with soda added); 4 to 5 pounds of soft-soap; 6 to 8 pounds of quassia. This is to be thrown, as far as possible, on the under surface of the leaves.

The efficacy of this washing has been clearly shown. Planters using it in England grew crops of from seven to nine hundred pounds per acre, while those not using it grew nothing, or next to nothing.

It must be used as soon as the lice make their appearance, and continued until they are all removed.

It is now too late for this remedy in our New York yards. Judging from the reports made, the crop is doomed for this year, unless favorable weather and heavy rains come to its rescue. Much may be done in preventives early in the season.

As to the cause of the honey-dew coating the leaves, it was thus explained by Dr. Fitch: "Each aphid has two little horns projecting from the hind part of the back, which horns are termed the honey-tubes. From these tubes the fluid called honey-dew is ejected, in the form of minute drops, like particles of dew, which, falling upon the leaves beneath them, the upper surface of the leaves become coated over with this fluid, more or less copiously as the aphides producing it are more or less numerous."

This opinion is pretty generally accepted, as giving also the explanation of the honey-dew on our elms, which, at the present time, is blackening the sidewalks beneath these trees in many of our cities. Others believe that the leaves, from some diseased condition, give out the honeyed substance. As lending color to this opinion, we have in the report of Mr. J. B. Smith, agent of the United States Department of Agriculture, in an examination made of some hop-yards of our State, the following statement: "July twenty-first, saw honey-dew for the first time. The current belief is that this is caused by the lice, but there certainly are not lice enough now to produce all this 'honey-dew.' Mr. Eastman and Mr. Fuess think the lice have nothing to do with it. They say they have seen lice without honey-dew, and honey-dew in abundance where there were no lice."

Mr. Wm. Trelease, a botanist of note, referring to honey-dew as sometimes secreted by aphides, adds: "But in some cases this substance is an excretion from the leaves, apparently due either to the climatic conditions obtaining at the time, or to a diseased state of the plant. Small glands are found at the tips of the serrations on the leaves of many plants, and some of these produce a plentiful supply of nectar." (*Report of Cotton Insects*, 1876, p. 326.)

[NOTE. — Appended to the above, November 28, 1887. — Since the above was written, the life-history of this interesting insect has been worked out, *completely*, it is claimed, by Prof. Riley, Chief of the Entomological Division at Washington, and the assistants under his direction. The following is a brief summary: The eggs are deposited on the twigs of plum trees in the autumn (October). They hatch at the putting out of the leaves the following spring. Three generations follow on the plum, of which the last only is winged, which at once migrates to the hop-yards. The fourth and succeeding generations on the hop to the eleventh inclusive, are wingless females. The twelfth generation consists of winged males and females — the latter, agamic, and these return to plum trees in September. Here, the thirteenth generation is composed of sexual wingless females, which, after mating, deposit the eggs which are to hatch the following spring in continuation of the species. For a detailed statement of the above see a communication made by Mr. L. O. Howard, of the Division of Entomology, under instructions from Prof. Riley, in the *Country Gentleman*, for November 17, 1887, p. 875, giving also, the latest studies of Prof. Riley upon the insect, made in England during the present autumn.

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### THE APPLE-TREE APHIS.

#### *Aphis mali* Linn.

The unusual abundance of this insect the present year, as previously noticed, brought with it from many localities in the Middle and Eastern States inquiries of its character and how it best could be destroyed. To an inquiry from St. Albans, Vt., accompanied with specimens which the writer had never seen before, which an old tree-pruner could not tell what they were, and which were represented as having been at first observed on the leaf-buds but were then traveling over the trees — reply was made through the *New England Homestead*, as follows:

The insects infesting the apple trees are the common apple-tree aphis, sometimes popularly known as the apple-louse. They belong to a class of insects named aphides or plant-lice and have long been

noted for their injuries upon almost every known plant. There is scarcely a vegetable growth that is free from their attack and many of the long list of species known confine themselves to a single species or genus of plant. They belong to the order of hemipterous insects which take their food through a beak or proboscis which they insert into the tissues and feed upon the sap. They are exceedingly prolific, multiplying with marvelous rapidity, so that, as has been computed, from a single egg, 729,000,000 may be produced in seven generations, and some of the species have twenty generations in a year. It is difficult to compute such multiplication—and impossible to comprehend it. It will be readily seen that a multiplication even approaching the above would inevitably be fatal to the vegetation upon which it depends for subsistence, entirely consuming all the sap of the young and first developing leaves. But fortunately the young plant-lice are quite delicate and very susceptible to certain meteorological conditions. Cold is destructive to them, frost is fatal, as are also severe and continued rains.

The myriads of the apple-tree aphis now upon the trees are from the young which were hatched three or four weeks ago (the middle of April) from small, shining black eggs which were deposited last autumn in the crevices of the bark. When first hatched they resort to the opening buds, which they frequently injure to an extent that prevents their unfolding. Later they may be found distributed over all the leaves, the under surface of which they puncture, causing them to twist and curl and shrivel in the manner characteristic of an aphis attack. At this season of the year all the aphides are females and destitute of wings. They mature very rapidly and in ten or twelve days are capable of producing young, which are brought forth alive, about two daily, it is stated, for the period of two or three weeks, when the female dies. Her progeny continues to multiply with even greater prolificacy and rapidity as with the advancing season the temperature increases. All this occurs without the interposition of the male sex. It is not until the approach of cold weather in the autumn that the males are produced, when, uniting with the females, the eggs above noticed are deposited for the spring brood.

During the month of July winged females will be found associated with the wingless ones, both of which produce living young. The winged females have the head, antennæ (horns),

and body between the wings, black, with a grass-green body, dotted with black on the sides, and yellowish legs with black feet and knees. The wings are long, green next the body, transparent, with few veins and a single black spot near the tip.

It is probable that these aphides are not newcomers in the orchards where they are now abounding. It would be difficult anywhere to find an apple tree entirely free from them. Yet it is only occasionally that they abound to such an extent as to arrest attention at this season of the year. In 1882 they were very abundant in several portions of New York State, as in Wayne, Oswego and Monroe counties, and caused serious injury to the apple crop.

In the event that the cold and heavy rainfall, which at the date of the present writing (May eighth) we have been experiencing for the last twelve hours in Albany, with no indication of its speedy cessation, shall extend into Vermont, there is every probability that it will arrest this aphid attack and its threatened injury. If so, it will not be one of the least benefits to result from its coming at this time. Throughout a large portion of the State of New York this aphid has abounded during the past three weeks and justly alarmed our orchardists. To those who have made inquiry of me for instruction how best to destroy the pest, I have promised relief through such a rain, should we be favored with it, as that which is now visiting us. In localities which it does not reach, the trees infested should be thoroughly showered with the aid of a force pump. Water alone has been found to be efficient when not thrown as a spray but in a stream. Soap-suds could be applied in spray to admit of its more general distribution; or a still better application would be a tobacco solution, made by pouring boiling water upon tobacco, in the proportion of a gallon of water to a quarter pound of tobacco.

Experiments have been made which are reported as having been successful, of washing the bark of infested trees with a solution of sal-soda. The aphides were killed or driven away, it is believed, by the alkali having been taken into the circulation, and the sap proving poisonous or distasteful to them. Soft-soap or a very strong suds has also been used in the same manner and with good effect. As in the control of all insect depredations prevention is preferable to cure, it is very desirable that where the apple aphids' attack is continued throughout the year its recurrence the following year should be prevented by the destruction of the autumnal

deposit of eggs. Their black color will reveal their hiding places in the crevices of the bark, in the fore part of the month of November, when they may be destroyed by a thorough application of the alkaline washes mentioned above.

The earnest effort that is being made in various quarters for the protection and encouragement of our insectivorous birds may find a strong argument in its favor, in the great service rendered by several of the species in their destruction of plant-lice. A number of our smaller birds, among the warblers and finches, as the Tennessee warbler (*Helminthophaga peregrina*), the purple finch (*Carpodacus purpureus*), and others, feed quite largely upon these minute insect pests. Their presence should therefore be encouraged in apple orchards for the service they may render us.

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#### POTATO PLANTS ATTACKED BY APHIDES.

Potato leaves badly infested with plant-lice were received in the early part of the month of July, from Springfield, Mass., with the statement that some fields of potatoes in the vicinity had been almost destroyed by the insect. It attacked the leaves upon their under side, where it was difficult to reach them by spraying, although tobacco water had been thrown upon them with some effect.

Later (under date of July nineteenth) the same insect was received from Wyoming, Pa, where it was proving more destructive than in Massachusetts. It threatened to prove to the potato growers of that portion of the State a greater pest than the Colorado potato beetle. Entire fields had been ruined, and little hope was entertained of securing a remunerative crop.

No plant-louse attack on potato had previously come to my notice, nor do I find, in any of the entomological literature at my command, mention of a potato-feeding aphid. Dr. Thomas, formerly State Entomologist of Illinois, in the Eighth Illinois Report (1879), in which he records all of the North American *Aphididae* known to him, names and describes a species found by him on tomato vines, as *Megoura solani*. The potato aphid may be identical with this tomato one, but all the examples of the former that I received were in too poor a condition to admit of comparison with the description (quite brief) of the latter. Before the reception of the

Springfield examples, I had heard of an aphid attack on tomato plants in Albany, which was curling and otherwise injuring the foliage, but the specimens which were promised me were not brought. It is quite probable that the present year, in its favorable condition for an unusual multiplication of aphides, has multiplied the tomato species, and caused it to overflow on the potato, where it has found conditions still more propitious to its increase.

That the two are the same finds some support in the observations of Mr. A. W. Cheever, agricultural editor of the *New England Farmer*, who has written me, under date of July twenty-ninth, that both were occurring with him. Upon potatoes they had been very abundant for the preceding two weeks, but his chickens, which were the first to discover their presence, had been efficient in reducing their numbers. Not so many occurred on the tomato plants; these were much lighter-colored than the others, but would feed readily on the potato leaves if transferred to them, as would also those of the potato when placed on the tomato.

M. Lichstenstein, in "La Flore des Aphidiens" of the world, published in 1884, records, in addition to Dr. Thomas' species above mentioned, but four other species known to feed on *Solanum* viz.: *Aphis nerii* Kalt., *A. silybi* Pass., *A. solanina* Pass., and *Siphonophora solani* Kalt. To these may be added *Siphonophora solanifolia* Ashmead, described in the *Canadian Entomologist* (xiv, 1882, pp. 92, 93), from examples found in Florida (?) feeding on *Solanum jasminoides*, or "pepper vine"—according to Gray, a woody-stemmed house-plant from Brazil.

In localities where the potato aphid abounds, I would recommend for its destruction, as preferable to the tobacco water, the use of the hop-wash employed in England for the hop-aphid, viz.: 100 gallons of water (soft water if possible), four to five pounds of soft-soap, and six to eight pounds of quassia, well boiled to extract the strength. In applying the liquid the plants should be turned downward, so that the under side of the leaves can be reached where the insects congregate.

It is not probable that this aphid will continue, in future years, to be a serious potato pest, but it will be but a proper precaution if all the dead stalks and leaves, together with such other garden refuse as might furnish winter harborage for the eggs or the mature insect, be gathered and burned.

## APHIS ATTACK ON CARROTS AND PARSNIPS.

From Oakley Park, Massachusetts, report is made that the carrot and parsnip crops of the vicinity had been nearly destroyed by plant-lice. No particulars were furnished nor examples sent for examination.

The unusual prevalence of plant-lice the present year has caused them to attack a number of plants upon which they had rarely been noticed before and had not previously proved injurious. Thus they have been destructive to potato vines in some localities have injured tomato plants, and in the above communication are reported as having been quite harmful to carrots and parsnips. We have also noticed statements in some of our agricultural papers of injuries to these two last mentioned crops.

No mention of injury to either of these crops by plant-lice is to be found in the writings of any of our economic entomologists at hand. They do not appear to be known in this country. No mention is made of them in the reports of Miss Ormerod, from which we infer that they are not serious pests of these crops in England. Curtis, however, mentions as a species preying upon carrots in England, *Aphis dauci* (Fabr.); while in M. Lichtenstein's list of aphides seven other carrot-feeding species are recorded as known, three of which also attack the parsnip, in the same family — the parsley family, *Umbellifere*.

Dr. Thomas, in his volume on the Hemiptera, describes the European parsnip plant-louse, *Siphocoryne pastinace* (Linn.), as, with little doubt, existing in this country, but not having been detected by him. It is said to infest the underside of the leaves and the tender stems of the plant. *S. caprea* (Fabr.) and *Aphis carotæ* Koch., are also recorded as European species.

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THE BEECH-TREE BLIGHT.

*Pemphigus imbricator* (Fitch).

Mr. James T. Whitaker, of Penn Yan, N. Y., makes request through Dr. E. L. Sturtevant, of the New York Agricultural Experiment Station at Geneva, for some note of the peculiarities and capability for harm of a species of insect which he finds covering the under side of beech leaves. He states of them that they are "about

one-sixteenth of an inch long, with a tuft-like down attached to the end of the body. They are found in large numbers in the woods, but only on the beech. The limbs are so thickly covered with them that in their continual swaying motions back and forth they all keep time. Underneath, the leaves and ground are covered with a blue or drab-colored substance, undoubtedly the offal from them."

The insect is one of the aphides (*Aphididae*, commonly known as plant-lice), having the scientific appellation of *Pemphigus imbricator*. Popularly, it is known as the beech-tree blight.

It was first described by Dr. Fitch in 1851, in the *Fourth Annual Report of the New York State Cabinet of Natural History*, and as that publication is almost inaccessible, the description is here-with transcribed :

"*Eriosoma imbricator*. Black ; three last segments of the abdomen blue-pruinose ; stigma brown ; longitudinal nerve and a line on the middle of the inner margin black. Female (?) winged ; abdomen fulvous, with a black spot on the disk ; legs pallid. Larva pallid, with two fuscous dorsal stripes ; posterior half of the abdomen covered with a tuft of cotton-like down, from which proceed two longer and coarser filaments. Length, 0.22 inch. On the under side of the branches of the beech tree, covered with snow-white down. On the slightest jar of the branch, a shower of tiny drops of a water-like fluid falls from these insects."

This species has been noticed by but few of our writers. Dr. Thomas, in the *Eighth Report on the Insects of Illinois* (p. 139), refers to it, quoting from Dr. Fitch, and assigns it place in the genus *Schizoneura*. It does not, however, belong to this genus, as its third discal vein is not forked. Dr. Packard, in his *Insects Injurious to Forest and Shade Trees* (p. 131), cites it among beech insects, also designating it as a *Schizoneura*.

A peculiar feature of this insect and of its allied species, which so often draws attention to them, is the white substance in which they are enveloped, resembling threads of cotton or wool, and which has given to them the name of "woolly aphides." It appears in the form of threads or fibres, which are sometimes long and flattened, as in the beech-blight, and sometimes in the form of a fine powder. The substance is secreted by glandular organs in the abdomen and thorax, and is of a peculiar character,



being insoluble in water, alcohol, or solution of potash, and is not melted by the application of heat. The purpose which it serves in the economy of the insect is not known.

The allied species of woolly aphides above referred to are those of the apple (*Schizoneura lanigera*), of the elm (*S. Rileyi*), of the oak (*S. quercii*), of the pine (*S. strobi*), of the hickory (*S. caryæ*), of the alder (*Pemphigus tessellata*), and a few others less frequently met with. Of these the last-named species is quite common, and often occurs in great abundance, completely enveloping in its white coating the branches of the alder.

The "blue or drab-colored substance upon the leaves and ground" underneath the insects, is the powdery secretion that enveloped the various sized globules of excreta given out from the anal extremity of the aphid, which fall to the ground "in a shower of tiny drops on the slightest jar of the branch." Numbers of these little meal-coated globules may be seen within the galls of some of the gall-making *Pemphiginae*, the coating of which prevents the fluid from attaching itself to the plant-lice that move about freely among them.

A large portion of the white substance fastened to the under surface of the beech leaf received, consisted of the cast skins (*exuvia*) of the plant-lice at their different moltings, packed upon one another in a half-dozen or more layers.

Of course, all the aphides are injurious to the vegetation that they attack—the amount of their harm depending upon their numbers, and the consequent quantity of the sap that, by means of their beaks inserted into the bark or leaves, they are able to divert from the circulation.

As the peculiar coating of these woolly aphides protects them from most of the insecticides that could be applied to them in a liquid form—shedding the fluid without absorption—perhaps the best remedy for them is crushing them with a cloth, stiff brush or broom, as they occur in their conspicuous masses upon the trunks and branches.

These woolly aphides, in some localities, find a formidable enemy in the larva of one of our butterflies, *Penisea Turquinus* (Fabr.). The butterfly deposits her eggs upon the twigs of beech, alder, etc., in the midst of a colony of the aphides. The larvæ, upon hatching, shelter themselves beneath a thin web, and, feeding voraciously

upon their natural food so conveniently at hand, they mature and assume their chrysalis stage within the shortest period known for any butterfly larva — thirteen days. For the full life-history of this interesting butterfly, which has only been learned during the present year, see “The History and Preparatory Stages of *Feniseca Tarquinius* (*Fabr.*)” in the *Canadian Entomologist*, for August, 1886.

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#### THE COCKSCOMB ELM GALL

*Glyphina ulmicola* (Fitch).

Leaves taken from two elms, in Mercer county, New Jersey, were covered with the above gall. Other elms in the immediate vicinity of these were not affected. Without doubt they were of different species from the infested trees, although not so stated in the communication.

These peculiar elevations upon the leaves, which have been figured in several entomological reports, are the cockscomb elm gall. As described by Dr. Fitch, they are “an excrecence or follicle like a cock’s comb, arising abruptly from the upper surface of the leaf, usually about an inch long and a quarter of an inch high, compressed and its sides wrinkled perpendicularly, and its summit irregularly gashed and toothed, of a paler green color than the leaf and more or less red on the side exposed to the sun; opening on the under side of the leaf by a long, slit-like orifice; inside wrinkled perpendicularly into deep plaits.” The gall is located between the veins of the leaf, and usually parallel with them.

About the first of May these galls may be discovered forming on the leaves as slightly elevated ridges on their upper side. Soon after this, opposite to these, may be seen elongate openings to the interior of these ridges, upon the spreading apart of which the author of the gall may be seen within the cavity as a glossy plant-louse of an olive-brown color — the progenitor of the colony which is to people it.

During the month of June, four or five weeks after the commencement of the gall, an examination of its interior would show the “stem-mother” to have completed her reproduction and surrounded with an abundant offspring in different stages of growth. Distributed within the gall, among its occupants are many little

balls or globules, of various sizes, of a sweet liquid which have been excreted by the aphids. As the young emerge through the opening, which spreads apart for their egress, the excretion of the "honey-dew" continues, and, when the trees are badly infested, falls almost in showers to the leaves beneath and to the ground. When the elm is a shade tree upon our streets, the honey-dew may often be seen covering and blackening the pavement beneath it. All the members of this second generation are females and winged.

A third generation follows these, which do not produce galls and from which we have, later in the season, sexual individuals and the deposit of the eggs in sheltered places beneath the bark, destined to survive the winter and give forth the "stem-mother" the following spring.

The scientific name of this aphid is *Glyphina ulmicola* (Fitch). So far as known, its galls are formed only upon the white elm, *Ulmus Americana*, and upon the younger trees of the species — seldom over twenty-five feet in height. The best account of the species that we have is that of Messrs. Riley and Monell, cited below.

*Remedy.*— Nothing could be done to check the operations of this aphid during its gall stage. Later, when it deserts the gall and is distributed over the tree, its numbers may be reduced by spraying with soap-suds and quassia water, or with tobacco water. Fortunately it seldom becomes very abundant or destructive.

*Bibliography.*—As with many other of our aphides, this species has been obliged to submit to so many changes in name since its original description by Dr. Fitch, in 1859, that it would be difficult to recognize it under its various appellations without the aid of a synonymical table, such as is herewith given:

- Bryoscripta ulmicola* FITCH: Trans. N. Y. St. Agr. Soc., xviii, 1859, pp. 843-4; 5th Report Ins. N. Y., 1859, pp. 63-4, No. 347.  
*Thelaxes ulmicola*. WALSH: Proc. Ent. Soc. Phil., i, 1862, p. 304; Amer. Entomol., i, 1869, p. 108, f. 90, p. 224.  
*Pemphigus ulmicola*. PACKARD: Guide Stud. Ins., 1869, p. 524, f. 525; Ins. Inj. Forest and Shade Trees, 1881, p. 68 (Colopha).  
*Colopha ulmicola*. MONELL: Canad. Entomol., ix, 1877, p. 102.  
*Thelaxes ulmicola*. LINTNER: Count. Gent., xliii, 1878, p. 455.  
*Colopha ulmicola*. RILEY - MONELL: Bull. U. S. G. - G. Surv. Terr., v, 1879, pp. 9-13, pl. 1, f. 2.

*Glyphina ulmicola*. THOMAS: 8th Report Ins. Ill., 1879, pp. 142-144, figs. 21, 22, p. 204.

*Colopha compressa* KOCH. Estlund: G.-N. H. Surv. Minn., 1886, p. 55.

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#### AN UNRECOGNIZED INSECT ATTACK.

A peculiar insect injury to the leaf-stalk of Norway maples was sent to me by Mr. George T. Lyman, of Bellport, N. Y. It consists of an elongated (slit-like) puncture, which had healed over, on the upper side of the stem, at a point distant from the base of the leaf-stalk about three-fourths of an inch. Directly opposite the puncture the stalk breaks and the leaf bends over at an obtuse angle, splitting the stalk by the flexure at several points on its diameter for the space of perhaps a half-inch or less. The injury causes the leaves to separate from the twigs at their point of attachment and fall to the ground.

A careful microscopic examination of several of the broken stalks failed to show the presence of any egg or remains of an egg, larva or larval burrowing within the stem. It would rather appear as if the puncture had been made by some haustellate insect for the purpose of feeding on the sap. But, if so, why then the remarkable uniformity shown in the location of the wound — the range of variation not exceeding a fourth of an inch in a stalk-length of about four inches.

The attack was not recognized, nor had it been observed, by some of my entomological friends to whom examples were submitted. Specimens have been placed in the State collection.

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#### A GRASS-INFESTING MITE.

*Trombidium ? bicolor* (Herm.).

Specimens of a mite were received from Mr. William Trimble, of Concordville, Pa., under date of April twenty-eighth, which were very destructive to timothy fields in that neighborhood. The infested places looked as if they had been scalded. June grass, *Poa pratensis*, was untouched, as were also all the other grasses except timothy. They were first noticed about a year ago, and seemed to be increasing rapidly.

The Acarina, or mites, have not been made a special study in this country, and for that reason comparatively little is known of our species. Prof. Riley has described several species which are parasitic on other insects, and others have been described and illustrated by Dr. Packard in the *American Naturalist*, and elsewhere. Recently Prof. Herbert Osborn, of the Iowa Agricultural College, has taken up their study, and we hope soon to know more of these minute but interesting and often quite injurious creatures. In the *Canadian Entomologist* of the present year, Prof. Osborn, in connection with Prof. Underwood, of the Syracuse University, has given a "Preliminary List of Acarina of North America." Ninety-nine species are recorded in the list, and their literature given.

The common "red spider," which is such a serious pest to gardeners, and especially obnoxious in the green-house, is a mite, known scientifically as *Tetranychus telarius*. Many of the species of this genus are quite injurious to plants, shrubs, and trees. The "lice" that infest canary birds are also mites, known as *Dermanyssus aviium*. Other examples are the cheese mite, the itch mite, the sugar mite, the "jigger" of the South, etc.

Many of our species are identical with those of Europe, and have probably been introduced from thence.

Not being able to find any notice among our writers of a mite injurious to grass, some of the examples above referred to were sent to Dr. Hagen, of the Cambridge Museum, for such information as he might give of them, he having at his command, in the extensive entomological library of the museum nearly all the foreign literature upon the subject. The mites were dead and dried when received, and consequently in very unfit condition for study; but after undergoing maceration for two days, Dr. Hagen was able to send me the following information in regard to them:

"This species is very similar to *Trombidium bicolor* (Hermann, *Mém. Aptères*, p. 25, pl. 2, f. 2): and Koch (Fasc. 151, No. 28), from Alsace and Germany. The only related species would be *Trom. assimile* (Koch, *ibid*, No. 19), but, after all, the species seems to be *T. bicolor*, or very near to it. I do not know if these species have since been put in another genus, perhaps in *Tetranychus*; the claws agree, but the legs are six-jointed."

The body of these mites is black, and the legs red, from which we have the specific name of *bicolor*. I shall endeavor to learn more of the history of the species, as its attack, as above mentioned, is the first record of the kind that we have, and therefore quite interesting.

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#### A MITE INFESTING SMOKED MEATS.

##### *Tyroglyphus siro* (Linn.).

The well-known cheese-mite has been honored with quite a number of names, popular and scientific, as the result of the different conditions to which it has displayed a readiness to adapt itself. A correspondent from Everett, Pa., has sent a piece of meat infested with living forms which were abounding on some hams and shoulders. He had washed them off a few weeks previously with hot soap-suds, but they had become as numerous as ever. The inquiry is made—what do they come from, and would the use of the meat be hurtful?

The meat was found infested with, and to show the operations of, the common cheese-mite, *Tyroglyphus siro* (Linn.). This species is far from being confined to cheese (where it occurs more frequently and more abundantly than elsewhere), for it is also found in flour, from which it has been described as *T. farinae* and also in sugar, when the additional name was given it of *T. sacchari*.

Of late it has been quite frequently heard from as infesting smoked hams. Last year pieces of ham were sent to me by a provision broker in New York city, with the statement that the hams in store so swarmed with the mites as to resist all efforts made to arrest the attack, and rendered them unsuitable for sale. Some Western pork-packing houses had previously been found to be infested with it and with an associated species of somewhat larger size, *Tyroglyphus longior* (Gervais). It had also been recorded by a European entomologist, De Geer, as infesting smoked meats in Europe. (See the *Thirty-ninth Annual Report New York State Museum Natural History*, 1886, pp. 114–116.)

The question is asked, from what does the mite come? When it is discovered in hams purchased in market, the infestation may have originated in the packing-house from which they came, as some of the Western establishments have been known to abound with them in immense numbers. In the instance of the New York attack,

they were not observed when the consignment was received, nor until the hams had been smoked for market. It was suggested that they might have been present, but not detected from their similarity of color to the cured meat before its smoking.

In home-prepared hams the mites may have migrated from some neighboring infested cheese, or from musty flour barrels.

No harm could result from the use of the ham in which these mites are present. Most of them would be upon the surface and could be removed by washing or scraping. The others that remain would be destroyed in cooking and rendered entirely innocuous.

*Remedy.*—Washing with hot soap-suds, as above stated, fails to arrest the attack. It might destroy most of the mites, but would not kill the eggs, protected as they are by the fatty matter among which they are placed, and the peculiar mould-like powder thickly covering them when the attack has been long continued, consisting of the cast skins, egg-shells and excremental matter of the mites, fragments of meat, and spores of microscopic fungi. Nor would re-smoking afford the desired relief, as shown by experiments made with the New York meats.

Perhaps the most simple and effectual method of arresting the attack would be to remove, either by brushing or by scraping, all the loose, powdery material which accumulates upon the surface of the meat, as the result of the operations of the mites, and then dip it, for about a half minute, in a wash of one part of carbolic acid dissolved in ten of alcohol and diluted with ninety of water. The alcohol would serve to carry the carbolic acid to the eggs and the one per cent of the acid, which is of sufficient strength to kill the eggs with which it comes in contact, would at the same time not render the meat dangerous for use. It is believed that even double the quantity of the carbolic acid could be used with safety, if found necessary.

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#### A SEVERE ATTACK ON POTATOES.

*By Myriopoda, etc.*

Frequent complaints of injuries to various crops from Myriopoda, or thousand-legged worms, is made to this department, although not embraced within the range of entomological study. The injuries committed by them, however, is so similar to those result-

ing from the attack of wire-worms (larvæ of beetles of the family of *Elateridae*), that the same methods of treatment would, to a great extent, be applicable to either.

Mr. A. F. Chaffee, of Cooperstown, N. Y., has written as follows :

I send you by mail a potato, which is a fair sample of many which I have this year found in my garden. I send it as this will give you a perfect idea of the worm and its work. Last season this worm destroyed fully one-half of my potatoes. This year the worm's work is not so bad, as I have harvested fully a month earlier than last year. Still the ground is full of the pests. I am not alone anxious over this worm; many of my neighbors and some farmers around here have difficulty with the same worm. Will you favor me by first naming it; second, by giving me directions as to how I may rid my garden of them? Phosphates, lime, or ashes do not seem to effect them at all.

The specimen potato sent was in a very bad condition—perhaps one-fourth of its interior having been eaten and the cavities filled with excremental matter and soil. The injury to it had in the greater part resulted from an attack of a species of Milliped or thousand-legged worm known as *Julus cæruleocinctus* Wood.

It is, in its full growth, a little over an inch in length, smooth and polished, dark brown above and paler beneath, and with each joint marked with from forty to fifty minute striæ or lines with flattened spaces between and bearing two pairs of legs. There were, perhaps, two hundred of them burrowing in cavities in the potato—many of them being quite young, and of a pale color almost white, except a lateral row of round brown spots of one on each ring.

Most of the Julidæ feed upon decaying vegetable matter, but this species has frequently been sent to me depredating on potatoes. When injuring them but slightly upon the surface, it has been supposed to cause "the scab" in potatoes, and it is probably justly chargeable with one of the forms of scab of which there appears to be several kinds resulting from different agencies. I have also received it from Geneva, N. Y., as abounding in the soil of a nursery, where they must have been drawn by some crop previous to the introduction of the nursery stock. I have identified it from Madison, Wis., where it was found eating out the ripening kernels of corn. In the Eleventh Illinois Report (p. 44), *Julus impressus* Say, is named as "feeding upon the kernels of corn on ears which lay upon the ground."



Associated with the above species were perhaps half as many of a smaller form, being about a quarter of an inch long, whitish, pale brown above, each of the eighteen rings flattened above and extending out rectangularly on the sides and bearing three transverse rows of papillæ. I take this form to be *Polydesmus complanatus* (Linn.), but have not its description at hand for verification. This species has been reported by Miss Ormerod as quite injurious to potatoes in England, especially to the Magnum Bonum variety (*Eighth Report of Injurious Insects*, pp. 77, 78). Curtis records it as very destructive to the roots of wheat in England. Dr. Fitch mentions it in his *Tenth Report on the Insects of New York* (p. 27), as eating irregular patches in cucumbers, feeding upon the roots of onions (p. 28), and as probably causing the "club-root" in cabbage (p. 29).

Prof. L. M. Underwood, of the Syracuse University, who is at present engaged in the study of the Myriopods of North America, has kindly furnished me with the following bibliography of the two species above noticed.

*Julus cæruleo-cinctus* WOOD: In Proc. Phila. Acad. Nat. Sci., 1864, p. 14; Myriapoda of North America, p. 204 (1865).

*J. hortensis* WOOD: In Proc. Phila. Acad. Nat. Sci., 1864, p. 14; Myriapoda of North America, p. 205 (1865). Young.

*J. multistriatus* WALSH. Practical Entomologist, ii, pp. 34, 70 (1866).

*Polydesmus complanatus* LATREILLE: Hist. Nat. d. Crust., etc. vii, p. 79 (1804).

*Julus complanatus* LINN.: Syst. Nat., ed. xii, ii, p. 1065.

*P. serratus* SAY: In Journ. Phila. Acad. Nat. Sci., ii, p. 106.

*P. serratus* WOOD: Myriapoda of North America, p. 215 (1865).

*P. complanatus* GERVAIS: Apteres iv, p. 105.

*P. complanatus* LATZEL: Die Myriopoden der Oesterreich-Ungarischen Monarchie, ii. 150 (1884).

? *P. complanatus* FITCH: Tenth Report Ins. N. Y., in Trans. N. Y. St. Agricul. Soc., xxiv, for 1864, pp. 458-461 (1865).

A large number of small mites of two or three species — members of the Acarina — dark brown, smooth, shining, ovoid in form,

and hard-shelled, also occurred in the cavities with the Myriopods. One of them was *Uropoda Americana* Riley. Its presence here and mode of occurrence shows that it is not necessarily attached to other living forms, by its excremental thread. Another, present in large numbers, was apparently a species of *Gamasus*, but not the *Gamasus juloides* of Say, which has been observed upon the body of *Julus marginatus* and *Polydesmus Virginiensis* (Say's Entomology, ii, p. 18), nor can it at present be referred to any known species. If not identical with some European species, it is probably an undescribed form.

It is of a somewhat larger size than *Uropoda Americana*, more shining and of a darker brown color. While that species has its greatest breadth posteriorly, this is broader anteriorly, and it is more prolonged at each end. It has a distinct sternal plate (not occurring in the other), and also a distinct cylindrical projection near the margin, between the second and third pairs of legs. The posterior legs are placed at about the middle of the body, while in *Americana* they are placed behind the middle.

The above differential features have been pointed out by Prof. Riley, upon comparison with his types of *U. Americana*. Should the species prove to be undescribed, it may be named as *Gamasus obovatus*.

None of the above mites were observed upon the Myriopods, and they are believed to have been feeding on the potato.

A few examples of a small staphylinid beetle, which has been identified as *Oxytelus rugosus* (Fabr.), were also found associated with the above.

*Remedial Measures.*—The injuries committed by the “thousand-legged worms” to garden and field crops have long been known, without the discovery of any simple method adapted for general use for their arrest. Some of the species which visit the surface of the ground at night for feeding, may be attracted by slices of potatoes or other vegetables laid upon the ground, and collected from them in the morning and destroyed. But this method, of course, could not be available in an infested potato field.

Perhaps the only substances that could be used for destroying the worms while in the ground would be gas-lime or alkali waste from gas-works. A liberal application of either of these, when

they are procurable, applied at the latter part of winter or early spring, and plowed in, should serve to rid the soil of their presence.

There is good reason to believe that salt, if used in sufficient quantity — several hundred pounds to the acre — would act as a preventive of attack, by making the tuber distasteful for food, as does a tablespoonful of the material spread over a hill of corn after planting render the roots distasteful to the white grub. How the salt could be used so as to act the most effectively, must needs be learned by experiment. A liberal handful of it might be sprinkled over each hill after planting, to be washed in by rain, and enter into the circulation of the plant. Successive and larger applications would have to be made later in the season, and especially at about the time when the attack commences, which might be ascertained by opening a few hills. Perhaps, too, the foliage of salted plants might not be agreeable to the Colorado potato beetle, the blister beetle, the flea beetle, and other foliage eaters, and the two or three species of stalk borers. Experiments in this direction are desirable.

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#### NOTES ON VARIOUS INSECTS.

MICROGASTER PIERIDIS.—Some larvæ of *Pieris rapæ* collected at West Albany, N. Y., on the ninth of October, gave on the thirteenth of the same month clusters of the yellow cocoon of *Microgaster pieridis*, spun in each instance alongside of the larva, but detached from it.

HABITS OF WASPS.—Mr. C. R. Moore, of Johnson Town, Va., states that he has seen the common brown wasp [*Polistes fuscatus*] seize the green worms on cabbage [*Pieris rapæ*], sting them repeatedly and then carry them away.

He further states, that after a number of dead katydids [*Platyphylus concavus*] had been drawn up by the bucket from a well in his vicinity, a "mud-dauber" [probably *Pelopæus ceruleus*] was frequently seen to fly to the well with a katydid and drop it in.

GORTYNA NITELA *Guenée*.—Mr. E. G. Fowler, of the Orange County Farmer, Port Jervis, N. Y., sends, through Dr. Sturtevant, stems of tomato burrowed by a larva which I identify as that of *Gortyna nitela*. The larva is quite young, only about three-eighths inch in length, but showing plainly its characteristic

interrupted lateral stripes. Mr. F. writes that it is destroying tomato plants in that vicinity by boring a hole into the stalk about the size of a large knitting needle, eating out the center until it breaks over, and that plants half as large again as a lead pencil have been utterly destroyed.

*PARTHENOS NUBILIS* Hübn.—Miss Emily L. Morton reports finding frequently larvæ of *Parthenos nubilis* feeding on *Robinia* only at night, after nine o'clock; also, *Biston ursaria* Walker, feeding on the young shrubs of wildcherry and on several other plants.

*NEMATOCAMPA FILAMENTARIA* Guenée.—A larva of this species was found on a black walnut tree, on the tenth of June, differing in color and ornamentation from other larvæ that I have seen of the species. Its general color is dark brown. Before the anterior appendages are two transversely oval white warts, one on each side of the dorsal line, and a pair of white dots close together behind these; these and the curled appendages are apparently on the fifth segment. On the back part of the fourth are two tubercles which are nearly as broad basally as the curved appendages, and about as high as broad; each bears a hair apically.

*BUCCULATRIX* sp. ?—Mr. Shelby Reed, of Scottsville, Monroe county, N. Y., sends leaves of the yellow birch, *Betula lutea*, infested with a small caterpillar, which are very numerous (forty-eight had been counted on a single leaf) and eat the upper and lower surfaces of the leaves, leaving only the transparent inner tissue. "The trees infested with them have a brown and scorched appearance, and light comes down through the thickest foliage as through a softened skylight."

The caterpillar is 0.18 to 0.22 long, slender, deeply incised at the joints, tapering at the extremities, and subcylindrical; head pale brown, slightly bilobed, ocelli and mandibles black, mouth-parts projecting; body dull, pale green, bearing a few short hairs on the usual spots, and longer ones on the first segment; terminal pair of prolegs projecting. Walks slowly and hangs by a thread when it falls.

A few of the larvæ had spun cocoons on the surface of the leaf when received. On the following day, nearly all had made or were engaged in making their cocoons.

*TISCHERIA MALIFOLIELLA* Clem.—Prof. C. H. Peck brought from his residence at Menands, Albany county, N. Y., leaves of apple, each containing several of the mines (from three to eight) of *Tischeria malifoliella* Clem. The portion of the mine first constructed, before it enlarges and extends it in an irregular blotch, suggests in its appearance an oyster-shell with its successive imbricated transverse lines of growth, of which the crescents are white, contrasting with the brown of the intervening spaces and the orange of the blotch. The segments of the larva are much more deeply incised than shown in Mr. Brunn's figure in the Second Report, Dep't. of Entomology of Cornell University Experimental Station (pl. 6, t. 1a), being almost moniliform. The largest of the larvæ were apparently nearly full-grown when received on September thirteenth.

*TRYPETA (STRAUSSIA) LONGIPENNIS* *Wied.*—Several examples of this species were taken June twenty-first, while resting on or slowly walking over the under surface of the leaves of the sunflower. It is easily taken by putting the mouth of the cyanide bottle slowly over it, as it is not readily alarmed.

On June twenty-seventh it still continued on sunflower. Twenty examples were taken this date, and it was seen to oviposit in the stalk a few inches from the tip. The fly bends the tip of its body in a curve, extends its long ovipositor, inserts it into the stem, expands its wings at almost a right angle with the body, and continues in this position for from twenty to thirty seconds. The operation was seen to be repeated several times by the same fly. Captures of the insect were made daily to July tenth.

*ADALIA BIPUNCTATA* (*Lin.*).—This species has been quite abundant in its larval stage, upon some peach trees, rose bushes and the black currant, feeding on the aphides with which the peach, rose, and currant swarmed. About two weeks ago one of the peach trees, a small one, was having every leaf killed by the aphides, when a number of the larvæ were collected and placed upon it. To-day (June 1), hardly an aphid is to be found thereon. *A. bipunctata* is just emerging from the pupæ which have been observed for the past few days, mostly upon the upper sides of the leaves. It has abounded all June, continued into October, and during November examples of it were frequently sent for name and habits. The insect had entered dwellings in numbers and fears were entertained that it might be the carpet beetle.

*ANTHRENUS SCROPHULARIÆ* Linn.—Mr. A. W. Cheever, of the *New England Farmer*, states that he has had in his possession in confinement in a small paper box, for more than two years, a larva of *Anthrenus scrophulariæ*, and that it is still quite lively. It has moulted three times, and appears to have eaten a brother specimen meanwhile. It had also had one or two very light feedings of wool, but shows no apparent increase in size.

Prof. H. M. Seely writes that the above named insect invaded Middlebury, Vt., in 1884 and 1885, to an alarming extent. To suppress its ravages he had prepared and distributed among some of his friends an insecticide consisting of naphthaline, camphor and kerosene. This was used both as a liquid and as a solid. In the latter case it was sprinkled at the borders of the carpets with a view of destroying the insect if present, and preventing the deposit of the eggs. The result was to be observed upon raising the carpets, and reported at the next house-cleaning. As no report was received, the experiment was probably not successful.

Prof. W. F. Robinson, of Elizabeth N. J., states that he found this larva eating the cotton lace of an infant's cloak [?]. He had nearly exterminated the insect from his house by persistently fighting it. He had purchased four gallons of naphtha and poured it along the floor joinings and base boards.

*TRICHODES NUTTALI* Kirby.—This insect occurs abundantly at Centre, Albany county, N. Y., feeding on the pollen of the ox-eye daisy, *Leucanthemum vulgare*; forty eight examples were taken in ten minutes from a road-side patch. One example of *T. apivorus* Germ., was among them.

*PSENO CERUS SUPERNOTATUS* (Say).—An imago of this longicorn beetle was found within a burrow in a small stalk of *Memispermum Canadense*, among some material collected January 25, 1873, as per label, and laid aside for examination.

*DACTOLYPIUS DESTRUCTOR* Coms.—This insect was received for name from Dr. H. Knowlton. See *Entomologist's Monthly Magazine*, for December, 1886, pages 154, 155, for the recent detection of this Coccid, in England, infesting some cucumber plants in a forcing-pit.

*PTINUS QUADRIMACULATUS* Mels.—Three of the beetles were taken, February seventeenth, dead, from a box of dragon-flies (Odonata)

received the previous year from South Britain, Conn. Two dead individuals had previously been discovered in another case of insects.

The species may, therefore, be enrolled in the entomological black-list of museum pests, where it has not hitherto had place.

*ANTHONOMUS MUSCULUS* Say.—A new strawberry pest made its appearance on Staten Island, N. Y., early in June, 1884. It proved to be a small beetle belonging to the *Curculionidae* or snout-beetles, known as *Anthonomus musculus* Say. The first notice of it as a strawberry pest was in July of 1883, when its ravages were brought to the notice of Prof. A. J. Cook, of the State Agricultural College at Lansing, Mich., as having appeared in countless thousands at Phoenix, Mich., and was ruining the entire strawberry crop by puncturing the fruit. The attack is noticed and a figure given of the beetle, with its description, in the *Thirteenth Annual Report of the State Horticultural Society of Michigan*, for the year 1883 (p. 155).

Upon Staten Island, according to Prof. Riley's observations of it, the beetle attacked the buds, causing them to droop or shrivel and dry up. The "Sharpless" variety was found to have suffered the most from the attack.

*ATROPOS DIVINATORIA* (*O. Fabr.*).—Prof. E. W. Claypole, of Akron, O., referring to the notice, in the *Second Report of the New York State Entomologist*, of *Atropos divinatoria* infesting a dwelling-house (pp. 189-201), states that a similar case had been brought to his notice by one of his colleagues, where a room was found similarly infested and the like suspicion of their introduction by guests was entertained. Recommendation was made of scouring and airing the room for their extermination. The short time that had elapsed (about three months) did not suffice to show the effects of the recommendation.

Prof. Claypole also reports the presence of *Anthrenus scrophulariæ* in Akron, Ohio, for the past seven years.

## CONTRIBUTIONS.

The following contributions to the Collections have been received during the year :

Examples of *Bombus fervidus* Fall., *B. Virginianus* Oliv., *Vespa vulgaris* and *Peloponcus cæruleus*. From Mrs. Emily Smith, Coeymans, N. Y.

Cocoons and imagines of *Limneria fugitiva* Say, from *Ædemasia concinna* (Sm.-Abb.). From A. S. Fuller, Ridgewood, N. J.

Examples of a minute chalcid, *Copodosoma truncatella*, reared from a larva of *Plusia brassicæ* Riley. From Mrs. Julia P. Ballard, Easton, Pa.

Larvæ of a saw-fly, *Dolerus* sp. which cuts off the heads of wheat and feeds upon the stalks. From J. E. Wittmer, Slab, York county, Pa.

*Papilio Asterias* Linn., *Tetracis lorata* Grote, and *Mesographa stramentalis* Hübn. From Mrs. E. Smith, Coeymans, N. Y.

Larva of *Thecla Irus* Godt., burrowing in a plum. From E. Moody & Sons, Niagara Nurseries, N. Y.

*Bembidium quadrimaculatum* (Linn.), sent as injuring strawberry leaves. From J. P. Little, Columbia, Conn.

*Telea Polyphemus* (Cramer). From H. C. Hunt, Albany, N. Y.

*Actias Luna* (Linn.). From J. F. Black, Albany, N. Y.

Larva of *Cossus Centerensis* Lintner, apparently full-grown, July second, and galleries of the same in *Populus*. From Bernard Schmidt, Jr., Albany, N. Y.

Larvæ, less than half-grown, of *Gortyna nitela* Guen., burrowing in stems of tomato, June eighteenth. From E. G. Fowler, Port Jervis, N. Y.

Larvæ of *Phakellura nitidalis* Cram., from muskmelons. From H. C. Schmitz, Crozet, Va.

Larvæ and cocoons of *Bucculatrix* sp. ? on yellow birch, *Betula lutea*, September fourteenth. From Shelby Reed, Scottsville, Monroe county, N. Y.

Larvæ of *Tischeria malifoliella* Clem., mining apple tree leaves, September thirteenth, at Menands, N. Y. From Prof. Charles H. Peck, New York State Museum of Natural History.



Larvæ of *Cecidomyia betule* Winnertz, within the catkins of the white birch, *Betula alba*, March twenty-fifth. The imago obtained. From W. H. Payne, Albany, N. Y.

*Sphinx quinquemaculatus* Haworth — moth of a second brood, taken September twenty-fourth from a basket of peaches. From Dudley W. De Witt, Albany, N. Y.

*Dytiscus fusciventris* Say, drawn from a well, June seventh. From C. M. Reed, Sinclairville, N. Y.

*Dytiscus Harrisii* Kirby, from a cistern, May eighteenth. From R. H. Sabin, M. D., West Troy, N. Y.

*Euphoria melancholica* (Fabr.), from ripe peaches, October ninth. From C. H. Hedges, Charlottesville, Va.

Maple twigs newly cut off by the larva of the oak-pruner, *Elaphidion parallelum* Newm., at Pawling, Dutchess county, N. Y., July twentieth, from which the beetles were obtained late in November. From A. T. Thomas, New York city.

*Otiorynchus ovatus* (Linn.) = *O. ligneus* Lec., from beneath carpets, June second. From Miss Effa A. Elmore, Bergen, N. Y.

*Scythropus elegans* (Couper), taken at light, May twenty-fourth. From P. Barry, Rochester, N. Y.

*Pissodes strobi* Peck — the larvæ in cells in tips of white pine, June twenty-seventh. From G. A. Schmitt, Wellesley, Mass.

*Cylas formicarius* (Fabr.), in its larval, pupal and perfect stages, and the larvæ operating in a sweet potato — examples from Texas; also, borings in a branch of an apple tree of *Xyleborus obesus* Lec., received from Rhode Island. From A. S. Fuller, Ridge-wood, N. J.

*Phloeotribus liminaris* (Harris), from peach trees at Paterson, N. J. From Ellwanger & Barry, Rochester, N. Y.

*Leptoglossus oppositus* (Say), occurring in clusters on grapevines; also, examples of *Lygranthocia rivulosa* Guenée. From C. M. Hedges, Charlottesville, Va.

*Belostoma Americana* Leidy. From Charles S. Scattergood, Albany, N. Y.

Galls of *Pachypsylla celtidis-mamma* Riley, on *Celtis occidentalis*, and subsequently therefrom numerous examples of the imago. From W. H. Vandenberg, M. D., Amsterdam, N. Y.

*Melaphis rhois* (Fitch), in the *Rhois tomentos* gall on the leaves of the staghorn sumach, *Rhus typhina*. From Mrs. H. D. Crane, Schenectady, N. Y.

*Pemphigus imbricator* (Fitch), from a beech tree. From James S. Whitaker, Penn Yan, N. Y.

A large Arachnid, *Epeira* sp. ? (undescribed ?), which had descended by its thread from a limb of an elm tree, about sixty feet from the ground. From Hon. Abraham Lansing, Albany, N. Y.

*Chernes Sanborni* Hagen (of the Pedipalpi), attached to the legs of a fly, *Limnophora* sp. From E. N. Holly, Amsterdam, N. Y.

*Uropoda Americana* Riley, and *Uropoda* n. sp., from cavities in a potato associated with *Julus ceruleocinctus* Wood, *J. hortensis* Wood (is immature *J. ceruleocinctus*), *Polydesmus complanatus* Linn, and a Staphylinid beetle *Oxytelus rugosus* Grav. From Mr. Chaffee, Cooperstown, N. Y.

*Cermatia forceps* Rafinesque (of the Myriapoda). From John C. Russell, Albany, N. Y.; W. H. Moore, Pittsburg, Pa.; D. L. Boardman, Troy, N. Y.; Miss Church, Albany, N. Y.

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#### PUBLICATIONS.

The following publications have been made by the Entomologist during the year. It will be observed that several of them have been introduced in the present report.

The Spring Canker-Worm — *Anisopteryx vernata* (Peck). (The Country Gentleman for April 1, 1886, li, p. 249, c. 2-3 — 34 cm.)

Defoliation of trees for two years past in Dutchess county, is recognized as a canker-worm attack. Importance of preventing its spread is urged. Reference is made to remedies and preventives, in the C. G. for May, 1882, and July 10, 1884. Pupæ may be killed by working the ground beneath the tree at this season. Mention of the different kinds of bands used as preventives; of poisoning by Paris green and London purple, and a method for doing so economically, and of a spraying apparatus where the power is furnished by the revolution of the wagon wheels, transporting the material.

The Cause of Gapes. (The Country Gentleman for April 8, 1886, li, p. 260, c. 1-3 — 63 cm.)

The windpipe of a chicken killed by gapes, submitted, shows no indication of the false membrane believed to have caused its death,

but the presence of one mature specimen of the gapes parasite *Syngamus trachealis*. Reference is made to a prize treatise on the Gapes by M. Megnin, a French investigator (published in 1882 ?), an abstract of which is embodied in this and the following paper. In this is briefly sketched the history of the disease in Europe and description of the parasite given. M. Megnin's detailed description conforms nearly to that given by Prof. Verrill, in a paper published in 1870, which is here quoted and its accompanying illustration of the parasite copied.

Cause and Treatment of Gapes. (The Country Gentleman for April 15, 1886, li, p. 289, c. 2-4 — 61 cm.)

In treating of the life-history of the parasite, it is stated that the eggs are only liberated by the death of the female and destruction of its body. For their development, moisture and a temperature of 68° Fahr. is required, and a period of about thirty days. The disease is communicated by poultry consuming the expelled syngame, and by taking up the embryos in their drink. The nymphal stage is passed in the air sacs and pulmonary bronchi. As remedies for the disease, urine in the drinking water has been found useful; removal of the worms by a feather or looped horse-hair, and mixing garlic and asafoetida with a prepared food is given, and disinfection in infested localities.

Birch-seed Insect. (The Country Gentleman for April 15, 1886 li, p. 287, c. 2 — 8 cm.)

A small, footless, orange-red larva found within the seeds of the white birch, submitted, from Albany for name, is not recognized. No insect is known with this habitat, and it will probably prove to be new to science. Some of the infested seeds have been carefully laid aside in the hope of obtaining shortly the perfect insect from them.

Aphis mali — The Apple Plant-louse in Ontario Orchards. (The Ontario County Times for May 12, 1886, p. 3, c. 6 — 50 cm.) (Copied in the Watkins Express, N. Y., for May 20, 1886; The Palmyra Courier, N. Y., for May 28, 1886; The Sentinel, Trumansburg, N. Y., May 19, 1886.)

The insects infesting orchards in and about Canandaigua, N. Y., first noticed about the middle of April, are *Aphis mali*, hatched from eggs of last autumn. The present season is unusually favorable for their increase. Those now seen are all females. One individual may produce in seven generations 729 millions. The *A. mali* has more than seven generations — how many not known. Heavy rains at this season are destructive to them. The remedies that may be employed against them are mentioned.

A Curculio Demonstration. (The Country Gentleman for May 13, 1886, li, p. 366-367, c. 4, 1 — 10 cm.)

A beetle, torn from the bleeding tongue of a young chicken which had tried first to swallow the insect and afterward to dislodge it, sent from North Carolina, is identified as *Pachylobius picivorus* (Germ.). Fastened as it was, by its mandibles and tarsi and resisting removal, it would probably have caused the death of the chicken.

Orange Insects. (The Country Gentleman for May 13, 1886, li, p. 370, c. 3-4 — 30 cm.)

The report published by the Division of Entomology, Department of Agriculture, was ordered by Congress, four years ago. After preliminary reports, this is the final publication, based on the studies of Mr. H. G. Hubbard, in the orange plantations of Florida during 1881-1885. Nearly 100 pages are devoted to the *Coccidae* infesting the orange in Florida and California. Orange rust produced by the rust-mite, *Typhlodromus oleivorus* Ashmead, is treated of. New species of insects are described in the appendix, and experiments with insecticides given. The report is highly commended, as well as the general work of the Entomological Division.

The Apple-tree Aphis infesting our Orchards. (The New England Homestead, May 15, 1886, xx, p. 189, c. 3 — 35 cm.)

Character, abundance and prolificacy of aphides; development and habits of the apple-tree aphis; abundant in New York in 1882; the heavy rain occurring will probably arrest the attack; the best remedies are showering with water; spraying with soap-suds or tobacco water; washing the bark with sal-soda or soft-soap, and protecting insectivorous birds.

The Canker-worm and Codlin Moth described. (The New England Homestead, for May 15, 1866, xx, p. 192, c. 4 — 26 cm.)

In compliance with a request made, the caterpillar and wingless female moth of the canker-worm are described. The Codlin moth, *Carpocapsa pomonella*, the mature form of which is so little known by fruit growers, is also described, accompanied with a figure showing the transformations and operations of the insect. The Paris green remedy for the two insects is given — one pound of the green to one hundred gallons of water.

Insects and Other Pests. (New England Homestead for May 22, 1886, xx, p. 189, c. 5 — 20 cm.)

Notice of a method for restricting the ravages of the currant saw-fly *Nematus ventricosus*, in picking off the lower leaves of

the bushes as soon as they show the small holes eaten into them by the young larvæ; also, a correction of the substitution of figures of the raspberry root-borer, *Bembecia marginata* (Harris), in a preceding number of the paper, for the currant saw-flies — figures of both sexes of each species accompanying.

Horizontal Borings in Tree-Trunks. (The Country Gentleman for May 27, 1886, li, p. 409, c. 1-2 — 32 cm.)

To inquiry of the insect that bores round holes in a circle around tree trunks, reply is made that it is not an insect attack, but of the yellow-bellied woodpecker, *Sphyrapicus varius* (Linn.). Of the explanations given of the purpose of these holes by different writers — feeding on the inner bark and feeding on the sap — the latter is regarded as the true one. Mr. King's observations, quoted, show this conclusively. Borings made in a horizontal line gives a better sap supply than if made perpendicularly.

The Elm-leaf Beetle. (The Country Gentleman for May 27, 1886, li, p. 409, c. 2-3 — 27 cm.)

Insects occurring by thousands in a house in Whitestone, N. J., are *Galeruca canthomelana*, which have hibernated, as is their habit, in the upper rooms of the house, and are now resorting to the windows to make their exit and attain the elm trees for oviposition. The benefit of killing the beetles before they escape for oviposition is urged. Reference is made to the principal publications upon the insect which is proving injurious in Pennsylvania, New Jersey and south-eastern New York.

A Plea for Entomological Study. (The Glens Falls [N. Y.] Republican for June 1, 1886.)

Extracts from an address before the Agassiz Association of Glens Falls, in which are noticed the facilities offered for entomological study, and the importance of economic entomology, in consideration of the large number of insect pests and the extent of their ravages.

The Apple-tree Aphis. (The Country Gentleman for June 3, 1886, li, p. 429, c. 1-2 — 26 cm.)

*Aphis mali* Linn., from Mossville, Ill., May 16 (some of which were winged), identified. Unusual abundance of aphides this season of various species, *Aphis ribis*? having been observed to have nearly killed some black currant bushes. Arsenical applications not available for destroying them. Tobacco smoke is fatal, but not available for trees. Soap-suds or tobacco solu-

tion will kill the young aphids. Sal-soda solution applied is the bark said to cause the aphids to abandon the tree, but it is questionable if it would be taken in the circulation by this means. It might be done through spraying the leaves or applied to the roots.

The Asparagus Beetle. (The Country Gentleman for June 3, 1886, li, p. 429, c. 2 — 22 cm.)

The insect injuring seed-beds of asparagus in Chestertown, Md., identified and figured in its several stages, with notice of its introduction at Astoria, on Long Island, thirty years ago. For full account of it, reference is made to the *Country Gentleman* of April 14, 1881. The best remedy for it is freshly slacked lime as tested and vouched for by Mr. A. S. Fuller. The lime is also a valuable fertilizer. Poultry are serviceable for destroying the beetle.

A New Strawberry Insect. (The New England Homestead for June 5, 1886, xx, p. 216, c. 5 — 11 cm.)

Beetles occurring in large numbers in Columbia, Conn., on strawberry plants, very badly eaten, are found to be *Bembidium quadrimaculatum* (Linn.). Dr. Fitch, in his remarks upon this common garden insect, states that its habits are carnivorous. Some of the *Carabidae*, however, are known to be herbivorous; and the circumstances under which this species occurred as detailed, render it probable that it was the depredator upon the strawberry plant.

The Grapevine Scale Insect. (The New England Homestead for June, 12, 1886, xx, p. 221, c. 6 — 14 cm.)

Scales on a grapevine from Springfield, Mass. (described), are identified with some doubt, as *Pulvinaria vitis* of Linnæus. The eggs were hatched at the time received, June 4, without any cottony excretion visible. As remedies, crushing the scales, which are quite tender, by rubbing the vine with a cloth wet with a carbolic acid solution, or scraping them into a vessel of water and kerosene, are recommended.

Apple-Tree Bark-Louse. (The Country Gentleman for June 17, 1886, li, p. 469, c. 4 — 29 cm.)

Apple twigs sent from Virginia are covered with the scales of *Mytilaspis pomicorticis*. Trees completely infested, should be burned. From young and but partially infested trees the scales should be scraped in the autumn by some instrument that will at the same time crush the eggs beneath them, to be followed by an alkaline wash.

The best remedy is to scour the infested portions in the spring, when the insects have just hatched, with a solution of soft soap and carbolic acid. According to Dr. Le Baron, greasing the tree with lard or linseed oil has proved an effectual remedy. His experiments with these substances are stated.

The Forest Tent Caterpillar. (The New England Homestead for June 19, 1886, xx, p. 229, c. 4-5 — 30 cm.)

Caterpillars described, collecting in masses on apple and cherry trees in St. Albans, Vt., are the *Utsiocrampa sylvatica* Harris; its differing habits from *C. Americana*; its common name unfortunate as it is not limited to the forest, nor is it a tent occupier; the peculiar masses in which it collects on apple, plum, cherry, and maple described. Remedies are removing the egg-belts, jarring the larvæ from the trees, and destroying the masses of the larvæ in mornings or evenings.

The Squash Bug. (The New England Homestead for June 19, 1886, xx, p. 229, c. 5 — 21 cm.)

Insects imperfectly described, and represented as girdling the stalks of melon vines, are probably *Anasa tristis*, a species not often injurious to the melon, but at times so, as appears from Miss Murtfeldt's observation of eggs upon it.

Remedies for it: Search in the hiding places by day for the hibernated bugs during their period for oviposition in June and July; later, destroy the egg-patches on the under side of the leaves; trap the bugs with pieces of board near the hills, or wilted melon leaves spread on the ground. Place ashes and salt around the root stalks to prevent the injury of the bug to it.

A New Attack on Wheat. (The Country Gentleman for June 24 1886, li, p. 487, c. 2-3 — 30 cm.)

A green larva an inch long, with brown head and twenty feet, which has attacked wheat in Salem, N. Y., and in York, Pa., is recognized as a saw-fly larva. The species is not identified, for no known species has this habit of cutting off the heads that it may feed downward on the stalk. *Cephus pygmaeus*, of Europe, burrows into the stem. Curtis describes a saw-fly larva which appeared suddenly on the heads of wheat, the description of which nearly accords to this species. The habits of the larva are given.

An Unknown Grass Insect. (The Country Gentleman for July 1, 1886, li, p. 503, c. 1-2 — 27 cm.)

An injury of thirty per cent of the stalks of June grass, reported from Emmett, Ohio, in which the tops turn white and the stalks, readily pulled from the sheath, eaten at the end —

is a common attack of wide distribution and long observed. No insect is found in the examples sent, but it is believed to be produced by a small fly, one of the *Oscinidae*, having habits similar to the wheat-stem maggot. A notice of the same attack in Ohio in 1845 is quoted. Of eggs found within a sheath of grass sent some seem to be Hemipterous, and others, which have hatched and are feeding, are of some species of moth.

[*Gortyna nitela* destroying Tomato-plants.] (The Orange County Farmer for July 1, 1886, p. 4, c. 7—21 cm.)

A larva sent as boring downward into the stems of tomato-plants, in Port Jervis, N. Y., and destroying numbers of them, is the "stalk-borer," *Gortyna nitela* Guenée. Its food-plants and habits and the appearance of the moth are stated. Cutting out the larva with a knife is the best remedy. For further information reference is made to the First Report of the New York State Entomologist, pages 110-116.

Hop Vine Insects—Origin of Honey Dew. (The Waterville Times [N. Y.] for July 16, 1886, p. 2, c. 2-3—73 cm.)

In reply to inquiries of the hop aphid, "black-fly," and honey-dew, answer is made that the aphid, *Phorodon humuli*, identical with the European species, was first noticed in this country in 1862. The "black-fly" may be the larva of the lady-bug. The life-history of the aphid is not completed; it is not known how it hibernates; is believed to come from the ground in the early spring, but has not been found in the ground at that time. The hop crop of this year is doomed to destruction. The formula for the wash used in England is given. Honey-dew is generally supposed to be secreted by the aphides, but there are reasons (given) for believing that it is also secreted by the leaves. Prof. Trelease is quoted on honey-dews.

Honey Dew of the Hop Vine. (The Country Gentleman for July 22, 1886, li, p. 553, c. 4—20 cm.)

To inquiries made from Waterville, N. Y., of honey-dew and character of the "nigger" that preys upon the hop aphids, answer is made that the honey-dew is secreted by the aphids, and is given out by the two honey-tubes. In its occurrence upon some plants, it is regarded by some botanists as a true nectar. The "nigger" or "devil" is the larva of *Adalia bipunctata* (Linn.), which abounds this year upon various plants and is very active in destroying plant-lice.

A New Attack on the Potato. (The New England Homestead for July 24, 1886, xx, p. 273, c. 1—15 cm.)

Potato plants in some gardens in Springfield, Mass., have been almost destroyed by an aphid attack— not before, so far as



known, recorded in this country. No mention of it is found in any of our entomological reports. The specimens sent were not in condition for study. The aphid may prove to be the *Megoura solani* of Thomas, recorded as feeding on tomato. The wash used in England for the hop-aphid — 100 gallons water, five pounds soft soap, eight pounds of quassia, might be used for this aphid. The dead stalks and leaves, and other garden rubbish which might afford hibernating shelter, should be burned.

Potato-Stalk Weevil — *Trichobaris trinotata* (Say). (The American Rural Home for July 24, 1886, xvi, No. 30, p. 8, c. 4-5 — 22 cm.)

Beetles sent from Maricopa county, Texas, as having almost destroyed the potato crop in that section, by boring the stems, are recognized as *Trichobaris trinotata*, of which a description is given. It occurs in the Middle States, but is seldom very injurious except in the Southern States. As the transformation to the perfect stage takes place in the stalks, a preventive of future attack is found in pulling up the plants as they commence to wither and burning them. No other food-plant is known for it.

A Plant-Louse on the Potato. (The Country Gentleman for July 29, 1886, li, p. 569, c. 1-2 — 23 cm.)

A plant-louse received from Wyoming, Pa., where it is destroying entire fields of potatoes, is identical with examples received from Springfield, Mass., two weeks previous. They were in too poor condition, when received, for study or identification. No potato-feeding species is recorded. They may be the same as reported from Albany as infesting tomatoes the present year, and possibly the *Megoura solani* of Thomas. The English hop-wash of water, soft-soap and quassia, is recommended for their destruction. As a preventive, stalks and all garden refuse should be burned.

[Notice of Dr. Walker's communication on "Experiments in Gapes."] (The Country Gentleman for July 29, 1886, li, p. 576, c. 1-6 cm.)

No evidence adduced of identity of the parasite in earthworms with the *Syngamus*. Earthworms not the only media by which the gapes can be communicated — the media serve no purpose for development. The experiments cannot set aside those of Dr. Megnin.

The Stalk Borer. (The New England Homestead for July 31, 1886, xx, p. 277, c. 1-20 cm.)

A borer damaging corn in Hampden county, Mass., by burrowing in the stalk from the blossom downward, is *Gortyna nitela*

Guen. The caterpillar is described, and its injuries in Wisconsin, its habits, the transformation of the insect, and the general features of the moth, stated. As the best remedy for the attack, cutting out the borer is recommended, and as a preventive, not permitting the insect to mature within the withered stalks.

A Maple-Tree Pruner — *Elaphidion* sp. (The Country Gentleman for September 9, 1886, li, p. 677, c. 2-4 — 76 cm.)

Twigs of maple cut off in a transverse section by an internal borer, at Pawling, Dutchess county, N. Y., are sent with the statement that some ornamental maples are being seriously disfigured by the attack. The borer, from its operations, is recognized as an *Elaphidion*, and probably *villosum* or *parallebum*. The former, the "oak pruner," usually attacks oaks. *Elaphidion* attack on maples is mentioned only by Dr. Le Baron. The method of burrowing of the larva is stated and reference is made to Dr. Fitch's account and to figures. Speculations on the object for excising the twigs. Destruction of the larvæ by its enemies. The burrowed twigs received, described. Transformations of the insect. Remedy for attack — collecting and burning fallen twigs with their contained insects. [Proves to be *Elaphidion parallebum* Newm.]

[Myriads of Minute Insects in the Air.] (The Albany Evening Journal for September 9, 1886, p. 4, c. 1 — 10 cm.)

The insects were not observed in flight by the writer, although they attracted so much attention, but from examples received they are identified as *Aphis granaria*, the species so destructive to grain crops in New York and New England in 1861. Their present appearance may be explained by the unusual prevalence of plant-lice, this year, in New York. The hop crop has been destroyed, the apple crop reduced three-fourths, potato fields attacked, and other crops not previously infested have been injured by them.

Apple-Tree Pest and Parasite. (The Country Gentleman for September 16, 1886, li, p. 695, c. 1 — 18 cm.)

Caterpillars submitted from Annapolis, Md., are the red-humped apple-tree caterpillar, *Aedemasia concinna* (Sm.—Abb.). All the larvæ received are infested with a parasite, *Limneria fugitiva* (Say), which uses the outer skin of the caterpillar for its cocoon, changing it to a white color, and otherwise presenting a very strange appearance. The same parasitic cocoon was also received from Virginia. This parasite displays a fondness for the *Bombycidae* larvæ — seven other species of Bombycids are mentioned which it infests.

Carrot and Parsnip Aphides. (The Country Gentleman for September 16, 1886, li, p. 695, c. 1-2 — 22 cm.)

The unusual prevalence of plant-lice this year has caused attack of crops which had before escaped, as the potato, tomato, and now the above mentioned. No mention of injury to these is recorded by our writers; is probably unusual in England. Curtis mentions *Aphis dauci* (Fabr.) on carrots, and Lichtenstein records seven other species. Dr. Thomas describes *Siphocoryne pastinace* as likely to occur on parsnips in this country, but not yet detected; two other European carrot-feeding species known. Some remarks are made upon the cherry aphid, *Myzus cerasi*, reported with the above, as limited to one row of trees in the garden. Winds may not have been favorable to its general distribution.

A Ham-infesting Mite. (The Country Gentleman for September 16, 1886, li, p. 695, c. 2-3 — 28 cm.)

A piece of smoked ham, from Bedford county, Pa., is infested with a mite, recognized as the cheese-mite, *Tyroglyphus siro* (Linn.), identical with *T. farinæ* and *T. sacchari*, from flour and sugar. The same mite recently infested hams in a New York City provision store, received from a western packing house. De Geer has recorded it as infesting smoked meats in Europe. The mite, unless very abundant, would become innocuous in cooking the ham. The attack fails to be arrested through washing with hot soap-suds or by re-smoking. A remedy would be a wash of one part carbolic acid dissolved in ten of alcohol, diluted with ninety of water.

The Cockscomb Elm Gall. (The Country Gentleman for September 23, 1886, li, p. 713, c. 3-4 — 35 cm.)

The galls, received from Mercer county, N. J., are described, and their growth, with the life-history of their occupant, *Glyphina ulmicola* (Fitch), given. The honey-dew that the galls contain is noticed. The gall is believed to be confined to young trees of the white elm, *Ulmus Americana*. The aphid is only vulnerable after leaving the gall, when it may be sprayed with soap-suds and quassia or tobacco water. The synonymy and bibliography of the species is given, under *Bryoscripta*, *Thelaxes*, *Pemphigus*, *Colopha* and *Glyphina*.

U. S. Entomological Report. (The Country Gentleman for September 23, 1886, p. 715, c. 2-3 — 20 cm.)

Notice of Prof. C. V. Riley's Annual Report to the Department of Agriculture for 1885, mentioning articles on silk culture, silk-worm diseases, the periodical Cicada and several other insect pests, and reports on various subjects by special agents of the Entomological Division.

A New and Destructive Borer to be Conquered. (The New England Homestead for September 25, 1886, xx, p. 341, c. 4—16 cm.) (Copied in the Country Gentleman for November 11, 1886, li, p. 853.)

A borer stated to have killed cherry, peach, and plum trees, at Philadelphia, Pa., of which the appearance and habits are given, is probably (no examples are sent) *Scolytus rugulosus* (Ratz.). Its history in this country is detailed. Trees attacked in force by it cannot be saved. They should be cut down and burned. A soap and carbolic acid wash would act as a preventive of attack. *Phloeotribus liminaris* (Harr.) may also concur in the above attack.

Honey-Dew on Maple Leaves. (The New England Homestead for September 25, 1886, xx, p. 344, c. 2—18 cm.)

Maple leaves are sent covered with honey-dew, which bees were collecting. Its value to bees is asked. The leaves show no indication of plant-lice. They are not always present. The honey-dew may be conveyed a short distance by wind and deposited on uninfested leaves, as in an instance related. It is not usually desirable for honey purposes, but this on the maple is doubtless wholesome. Bees are known to collect from *Pemphigus imbricator* (Fitch), on beech, and *Lachnus dentatus* (Le Baron), on willow. An occurrence of abundant honey-dew, on willows in California, is quoted.

The Gapes in Fowls. (The Country Gentleman for September 30, 1886, li, p. 731, c. 4—31 cm.)

In comments upon a letter from Dr. Walker, the author of a paper under the above title, it is shown by quotations from the paper that the parasites found in the earth-worm have not been shown to be syngami. The paper does not invalidate the studies and published observations of Dr. Megnin, as it is claimed by its author to do, and attempted to be shown through imperfect quotations. Dr. Walker's investigations of the gapes, have resulted in little of scientific value, and some of the conclusions drawn therefrom are clearly erroneous.

The Muskmelon Worm. (The Country Gentleman for September 30, 1886, li, p. 733, c. 3-4—50 cm.)

Larvæ received, with good descriptions and habits, from Albemarle county, Va., are identified as *Phakellura nitidalis* (Cramer), with reference to C. G. of July 23, 1885, for description of the young caterpillar, the moth, and for the best remedies. It is becoming a great pest of muskmelons and extending its ravages. It is not known in New York. Its transformations

noticed — those received are preparing (Sept. 13), for pupation. Said to feed also on squash and potato. Its literature given. The reported presence of the carnivorous *Chauliognathus marginatus* in the infested melon patch indicates its preying on the muskmelon larvæ. The Coleoptera sent for name are *Hippodamia convergens*.

Silk-Culture. (The Country Gentleman for September 30, 1886, li, p. 735 — 12 cm.)

Notices "The Mulberry Silk-Worm — a Manual of Instructions in Silk-Culture," by C. V. Riley, as issued by the Division of Entomology of the United States Department of Agriculture, in a pamphlet of sixty-two pages and two plates. The subjects of the several chapters are named, and the manual commended as a full treatise upon the silk-worm and silk-culture and indispensable to all engaged or about to engage in the industry.

A Queer Bug and Other Insects. The Country (Gentleman for October 7, 1886, li, p. 753, c. 4 — 18 cm.)

*Leptoglossus oppositus* (Say), occurring in large clusters in Charlottesville, Va., upon the grape and corn, is characterized with remarks upon its supposed carnivorous habits, like those of *L. phyllopus*, while *Metapodius femoratus* (Fabr.) is reported as injurious to cherries. Observations on its food-habits are desired. Other insects from the same locality, viz.: *Euschistes* sp., *Arctia Phylira* (Drury) and *Lygranthæcia marginata*, are remarked upon, in their features and distribution.

A Severe Attack on the Potato. (The Country Gentleman for October 14, 1886, li, p. 773, c. 3—4 — 46 cm.)

A potato sent from Cooperstown, N. Y., as a specimen of a half-destroyed crop, harbored within large cavities eaten into it, *Julus coruleocinctus* Wood (perhaps 200 in number), a species of *Polydesmus*, probably *complanatus* Linn., in large number, many minute mites of *Gamasus* sp. and probably undescribed, and a few Staphylinid beetles of an undetermined species. As remedies, gas-lime or alkali waste would destroy the myriopods. Salt, applied as suggested, might prevent attack and also repel leaf-eating insects of the potato plant.

The Beech-Tree Blight. (The Husbandman [Elmira, N. Y.] for October 27, 1886, xiii, No. 636, p. 1, c. 1—2 — 38 cm.)

Plant-lice, covered with flocculent matter, occurring on beech-trees in woods, and covering the ground beneath with a blue or drab-colored substance, are *Pemphigus imbricator* (Fitch). Its original description by Dr. Fitch is given, with notice of reference to it by other writers. The flocculent matter upon the insect is

noticed, also its allied species. The substance observed upon the ground beneath them is the remains of their excreta, dropped in meal-coated globules. Their exuvia occur thickly on the leaves. Injuries of aphides noticed. The best remedy for the woolly aphids may be found in crushing them as they occur massed on the branches.

The Grain Aphis in Maryland. (The Country Gentleman for November 25, 1886, li, p. 893, c. 2-4 — 44 cm.)

“Millions of parasites” reported in rye-fields in Maryland, causing the young grain to appear as if sunburned, are probably the grain aphis, *Siphonophora avenæ* (Fabr.). The insect was very destructive in the United States in 1861, but not seriously so since that time. The abundance of aphids the present year and an extensive aphis flight, observed in Albany early in September last, identified as this species, indicate that it may occasion serious injury the coming year. Portions of its life-history are not yet known. Extracts from Drs. Fitch and Thomas upon it are given. Its food-plants and rapid increase are referred to. The best preventive of its increase would be to destroy infested crops in the autumn.

Annual Address of the President of the Entomological Club of the A. A. A. S., at the Buffalo meeting, August 17, 1886. (Entomologica Americana for October and November, 1886, ii, pp. 143-160.)

Gives the evidences of the progress in entomology during the year, as shown in publications made in the several orders, of which a list is given — in the rapidly increasing lists of North American insects (about 25,000 species at present described) — and in some of the entomological events of the year.

A Sweet-potato Pest. (The Albany Express for December 8, 1886.)

Abstract of remarks made before the Albany Institute at its meeting on the seventh of December, on the sweet-potato weevil, *Cylas formicarius* (Fabr.), examples of which, in its larval, pupal and perfect stages, together with an infested potato, were exhibited. The insect threatens to prove in Texas a more serious pest than the Colorado potato beetle.



