

University of the State of New York

9 1/2<sup>th</sup> REPORT

OF THE

STATE ENTOMOLOGIST

TO THE

Regents of the University of the State of New York

FOR THE YEAR 1893

[From the Forty-seventh Report on the New York State Museum]

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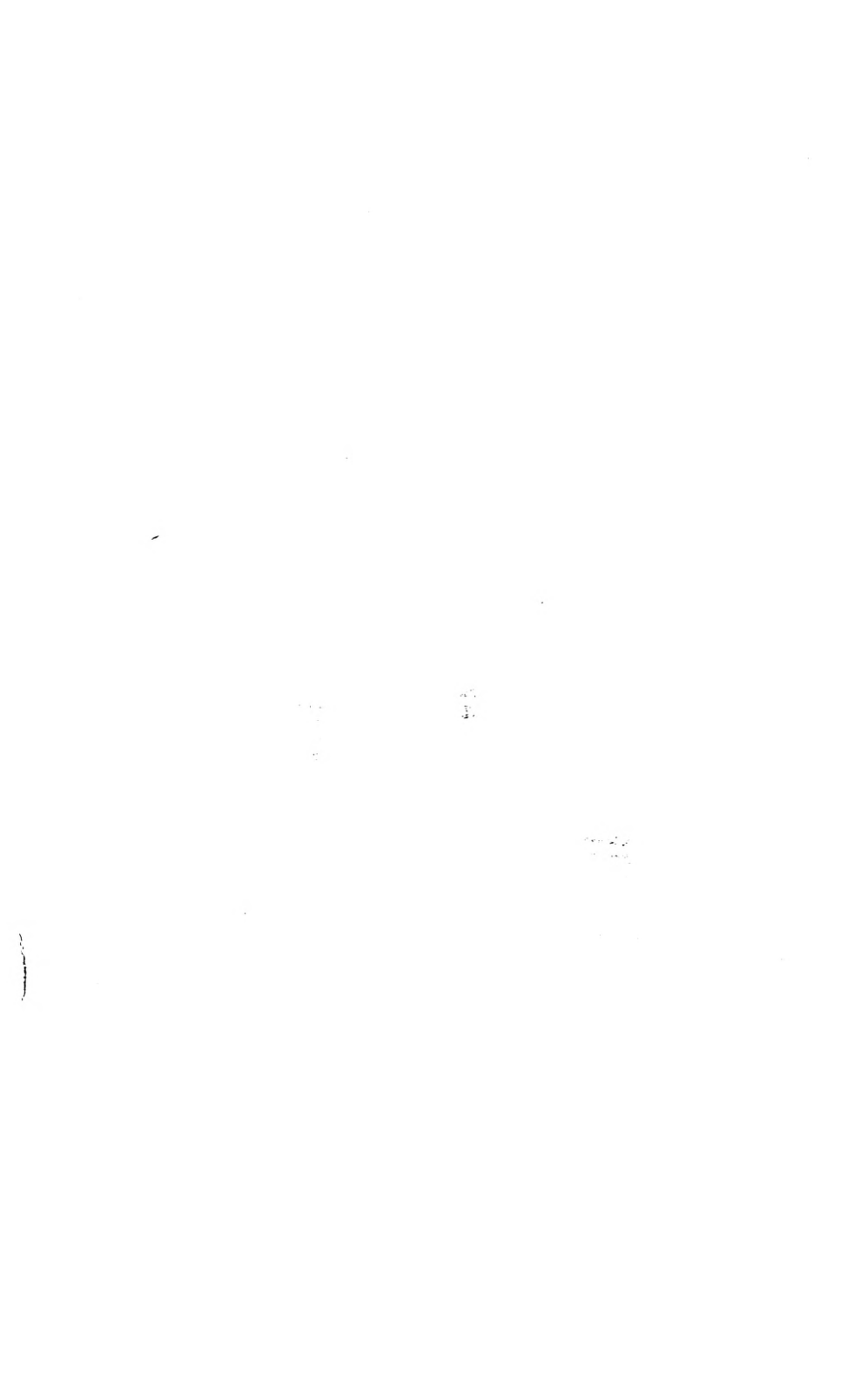
BY J. A. LINTNER, PH. D.

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ALBANY

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1894



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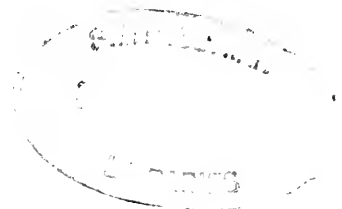
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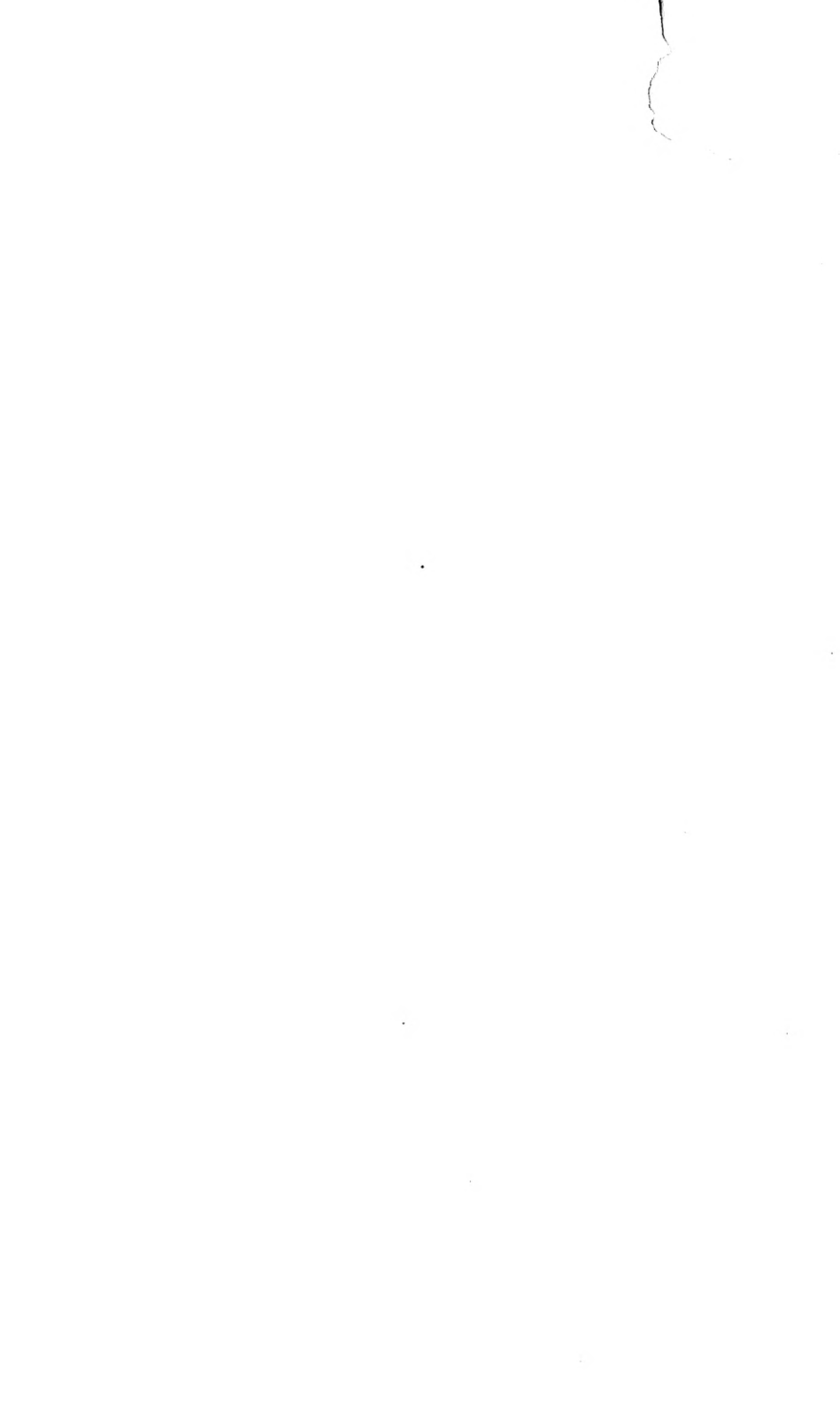
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ALBANY  
UNIVERSITY OF THE STATE OF NEW YORK  
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# STATE OF NEW YORK.

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No. 90.

## IN SENATE,

JANUARY, 1894.

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## REPORT

OF THE

State Entomologist to the Regents of the University  
of the State of New York.

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OFFICE OF THE STATE ENTOMOLOGIST, }  
ALBANY, *January*, 1894. }

*To the Legislature of the State of New York:*

I have the honor to present to the Legislature my Report on the Insects of the State of New York for the year 1893, which is also presented to the Regents of the University, as required by law.

Very respectfully,

J. A. LINTNER.



# REPORT.

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OFFICE OF THE STATE ENTOMOLOGIST, }  
ALBANY, August 28, 1893. }

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

GENTLEMEN.—The recent change made by the resolution of your board in the time for the presentation of the annual reports of the Scientific Staff of the State Museum, viz., that they be presented in readiness for printing by the first of July of each year, instead of the first of November as heretofore, has prevented the preparation of the usual report of the State Entomologist, containing the studies of the insects to which his attention has been given during the year.

The purpose of this change is understood to be, the printing of the reports during the summer or autumn of the year of their presentation and before the legislative printing shall engage the entire time and resources of the State Printer.

The early publication of scientific studies and investigations is unquestionably very desirable: without it, much of their interest and value is lost, or the credit due them accrues to later studies having prompt and earlier publication.

Your Entomologist, however, fears that under the new arrangement the earlier publication of his studies will not be attained. The entire occupancy of his time during the spring and early summer in investigating the many insect attacks that belong to this part of the year, and in the correspondence connected therewith, and attendant field studies, can leave barely the opportunity for making the notes which are to be worked up into proper form during the autumn and winter. A report presented in July, to be printed probably during the November following, could contain but little beyond the results of the preceding year. If it were possible so to arrange that

the reports of the several members of the State Museum Scientific Staff, covering the entire year's operations, could be printed during the spring following thereafter, it would, I am confident, leave nothing further in time of publication to be desired. The present system has been found to be unsatisfactory and vexatious, as may appear from the delay attending the printing of the State Museum Reports for the years 1891 and 1892—the reports of the Geologist, Botanist, and Entomologist contained therein being still in MS. The reports for 1891 narrowly escaped destruction in the burning of the State Printing House, in September, 1892.

#### INCREASING INTEREST IN THE WORK OF THE DEPARTMENT.

The work of my Department continues to increase in proportion to the greater interest that is being taken in it, as the result of annually increasing insect ravages, the necessity of resisting them if serious losses shall not be sustained, and a conviction that experience has given our agriculturists that it is within their power to lessen these losses very materially through a faithful use of the means that the economic Entomologist has pointed out.

Applications for aid in meeting insect attacks have been numerous, and in nearly every instance it has been possible to return information that could not fail of being of service to the inquirer. The correspondence of the office is steadily growing. Much of the information sent from it has been in communications made to leading agricultural papers, and to the local press when some new form of attack is apparently confined to a limited portion of the State. In replies to inquiries, which are often limited to the name of the depredator and remedies or protection, it has been the aim to add such details of life-history and habits, especially if not previously published, as may tend to give them permanent value and serve as additions to the steadily increasing stock of economic entomological literature.

#### PUBLICATIONS OF THE ENTOMOLOGIST.

Including a few papers printed in scientific journals, more than fifty publications have been made by the Entomologist during January–August of the present year. The usual list, giving titles, place of publication and summaries of contents, will be communicated for the next report.



ADDITIONS TO THE STATE COLLECTION.

The aggregate of the additions to the State collection through the Entomologist from January to August inclusive, as already reported to your board, is 1775 specimens, which, with a few exceptions, have been ticketed with locality and date of collection. Of these, 1399 have been mounted and 388 have been labeled with their scientific name.

Contributions to the collection have been made, during the same time, by 52 contributors, consisting of about 160 examples.

COLLECTIONS MADE IN THE ADIRONDACK MOUNTAINS.

The additions made to the State collection have been mainly, as in preceding years, in the Adirondack region of the State. The collections made in Keene valley, Essex county, this season, during portions of the months of July and August, were larger than usual. Lepidoptera attracted to light were unusually abundant. Over six hundred examples, mostly belonging to the *Noctuidæ*, were taken by this means. Two species of *Plusia*—a genus containing perhaps the most beautiful of our Noctuids—*P. u-aureum* and *P. mortuorum*, which in former years have been comparatively rare in the Adirondacks, although belonging to high altitudes, were this year really common—more common, indeed, than any other species. The first *Plusia purpurigera* ever taken by me was captured on August 6th. As the *Plusias* have place among the rarer of our Noctuidæ, and are always regarded as desirable additions to collections, the several species taken at Keene valley this season, with the number of each, is herewith given:

<i>Plusia</i> (Deva) <i>purpurigera</i> Walker, 1	<i>Plusia</i> <i>precatationis</i> Guenée, 10
<i>P.</i> <i>ærea</i> Hübner, 1	<i>P.</i> <i>u-aureum</i> Grote, 84
<i>P.</i> <i>æroides</i> Grote, 9	<i>P.</i> <i>mortuorum</i> Guenée, 58
<i>P.</i> <i>balluca</i> Geyer, 8	<i>P.</i> <i>simplex</i> Guenée, 8
<i>P.</i> <i>bimaculata</i> Stephens, 4	

The total number of *Plusias*—all taken within doors—was 183, not including many worn and rejected examples appearing in August.

Comparing the above with the collections reported by Mr. W. W. Hill, in the western portion of the Adirondacks (Lewis county) during the four years, 1875–1879.\* we find that nearly

\*In *Seventh Report on the Survey of the Adirondack Region of New York*, 1880, p. 387.

twice as many examples of *P. u-aureum* and *P. mortuorum* were taken this year as in the four years cited — or 142 as against 82. Of species contained in the Hill List, and not seen at Keene valley this season, are the following: *Plusia Putnami* Grote, *P. thyatiroides* Guenée, *P. formosa* Grote, *P. mappa* Gr.-Rob., *P. viridisignata* Grote, *P. epigæa* Grote, and *P. ampla* Walker. These, however, are among the rarer species, and only thirteen examples are reported in the List.

The following of the *Noctuidæ* were among the most common that came to light, and of each from ten to thirty examples were obtained :

Adelphagrotis prasina ( <i>Fabr.</i> )	Agrotis redimicula <i>Morr.</i>
Noctua baja <i>Fabr.</i>	Mamestra purpurissata <i>Grote</i>
Noctua Normaniana ( <i>Grote</i> )	Mamestra meditata <i>Grote</i>
Noctua bicarnea <i>Guenée</i>	Mamestra olivacea <i>Morrison</i>
Agrotis ( <i>Feltia</i> ) subgothica <i>Steph.</i>	Xylophasia dubitans ( <i>Walker</i> )
Agrotis ( <i>Feltia</i> ) tricola <i>Lintn.</i>	Tricholita signata <i>Walker</i>

In contrast with the abundance of *Noctuidæ*, there was almost an entire absence of some other insects which in other seasons have been observed in large numbers. Thus, of the attractive and conspicuous family of the “hover-flies” or *Syrphidæ*, scarcely any were seen except the small form of *Sphaerophoria cylindrica*, which seems almost inseparably associated with the golden-rods of August. The *Bombylidæ* were much less abundant on the damp spots in roadways than usual. Scarcely any of the “Dragon-flies,” or Odonata, were seen; and indeed but few Neuroptera, except three species of *Phryganidæ*, which shared with the moths in attraction in the evening to lighted rooms. Coleoptera were not common. In a locality—a dried roadway ditch—where in 1892 hundreds of *Cicindela repanda* could be taken by simply swinging the net from side to side as one walked rapidly along, hardly any were met with.

#### OPERATIONS AGAINST THE GYPSY MOTH IN MASSACHUSETTS.

In preceding reports I have written of the accidental introduction into the State of Massachusetts, in the year 1869, of the destructive European Bombycid, “the gypsy moth,” *Ocneria dispar*—of the probability of its entering New York and spreading over adjoining States—and of the efforts being made, under

the direction of the Massachusetts State Board of Agriculture, for its extermination while within the limited locality of the northeastern part of the State, where it is at present confined.

This is the fourth year of active operations against this insect under annual appropriations by the State Legislature, which have now amounted in the aggregate to \$275,000.

In June last an invitation was extended to me by the committee of the State Board of Agriculture to visit the infested district in company with the State Entomologists of adjoining States, for the purpose of inspecting the work of the committee, and to offer such suggestions or criticisms as it might be thought proper to make.

Every facility was afforded for thorough examination, such as witnessing the field operations of spraying, kerosening and burning rocky and waste places; banding and liming trees for preventing the ascent of the caterpillars; personal inspection of the present condition in most of the twenty towns in which the insect has occurred; the experimental work being conducted at the Insectary at Amherst, in testing the susceptibility of the larvæ to various insecticides, and the study of the life-history of the insect and its habits; the method of recording by the office staff the field observations made by the force of nearly two hundred employes; the various instruments and appliances used in the field-work, with the manner of their use, etc., etc.

The inspection was very satisfactory and gratifying and at the same time instructive, as showing what may be done in arresting insect depredations when the task would seem almost a hopeless one. I had not expected to find that such progress had been made toward the extermination of the myriads of the notorious gypsy moth. It was a surprise to me that in the brief space of three years, the fearful ravages of the insect, as described to me and as pictured in photographs, could have been reduced to such a degree of comparative harmlessness, that to the ordinary observer no indication of its presence was visible; and in a ride of an entire day though several of "the worst infested towns," including a visit to localities which had been frightfully scourged, not a single example of the larva could be found by me, although diligent search for it was made.

How a work of such magnitude — extending over two hundred square miles, with the insect so abundant that in one locality the entire side of a house was so closely covered with the caterpillars that the point of a pencil could not be thrust among them without touching them — could have been accomplished, was an enigma to me until the means by which it was done had been shown and explained to me.

The only suggestions that occurred to me to offer to the committee in response to their request, were these two: Now that the mechanical details of field-work were rapidly diminishing with the steady reduction of the insect, there was both the greater need and the opportunity of such scientific work as might serve to complete the labors of the committee and present the result in form that would render it available for future use whenever the necessity might arise for a resort to similar methods in other insect invasions hereafter. A volume or two, which should treat exhaustively of the gypsy moth and the methods employed for its extermination, might be another contribution to natural science which would rank with those which Massachusetts had already made.

It was also recommended that at this stage of the committee's work, the cultivation of the parasites of the gypsy-moth (of which about a score of native ones are already known) be entered upon and conducted with all the knowledge and skill that could be brought to bear upon it.

A plan for the artificial rearing proposed was suggested, embracing in brief these points: The entire collection of the pupæ for this year, which might amount to twenty thousand, should be preserved, placed in suitable cases, and kept, through cold storage, from giving out their parasites until caterpillars of suitable age and reared from eggs gathered for the purpose, could be inclosed with them to receive the entire parasitic oviposition. The parasitized caterpillars should be properly guarded until their pupation, when the parasites that they would disclose within the cases should have a caterpillar supply in readiness for them. This round could be repeated as long as there seemed to be the necessity for it and the parasites could be obtained.

By the above method, or by some modification of it, it would seem that an actual extermination of the insect can be effected, and possibly in no other way.

In view of what has already been accomplished, there is abundant reason for a continuance of the appropriations by the Legislature of Massachusetts until the desired extermination is secured, or until the insect shall have been reduced to entire harmlessness and in position never again to develop in injurious numbers or to invade other States. Knowing as we do, the frightful ravages of the gypsy moth in the past, and the certainty that, if left to itself, its natural multiplication would soon carry it over the entire State, it would unquestionably be a wise economy if its extermination could be attained through the expenditure of a million of dollars. It may be recalled in this connection that the wheat-midge inflicted upon the wheat crop of the State of New York in one year — 1854 — an estimated loss of fifteen millions of dollars.

#### THE DESTRUCTIVE WHEAT-MIDGE IN WESTERN NEW YORK.

This last-named insect, *Diplosis tritici*, has been noticeably injurious in Western New York this present season. Attention was drawn to its operations in the wheat fields of Orleans, Genesee, Monroe and other neighboring counties during the last of June. A correspondent, from Monroe county, of the Country Gentleman, under date of August 28th, wrote as follows of it: "The wheat-midge has done much damage to the old variety of wheat — the Clawson — most commonly grown here. It is estimated that one-fourth of the crop has been destroyed by it, and farmers are alarmed about the future prospect of wheat-growing in this section. The insect has approached us in about the same manner as in 1853-54; lightly at first but increasing until the entire destruction of the crop in 1856, and continued until 1860, when it began to decrease as gradually as it came, until it disappeared. The best safeguard against the midge is an early variety of grain." The writer commends an early variety of red wheat grown in Michigan, which is also very productive, yielding him forty bushels to the acre while the Clawson seldom exceeds twenty bushels.

#### REMARKABLE ABUNDANCE OF APHIDES OR PLANT-LICE.

Without entering into detail, at the present, of the insect operations of the spring and summer of 1893, brief reference will be made to some of them.

The early spring did not bring to notice, either through personal observation or that of my correspondents, the usual number of injurious insects. The earliest to claim attention, were the aphides, or plant-lice—more or less abundant every year, but in some seasons becoming very numerous and correspondingly destructive.

The opening of the apple-tree buds in early May was attended with such an unusual abundance of the apple-tree aphis, *Aphis mali* Fabr., as to excite apprehension of their effect upon the coming fruit crop. Many letters were sent to me in relation to them. The necessity of preventing their increase by spraying was urged on my correspondents, unless a heavy and continued rain should occur before they would be sheltered by the leaves—say within ten days or a fortnight after their hatching. Mr. C. C. Risley, Chairman of the Executive Committee of the Hop Growers Association, of New York, writing under date of May 9th, stated that hop growers were reporting large numbers of plant-lice on the buds and blossoms of fruit trees and on rose-bushes, recalling the conditions existing in the spring of 1886, in which year the hop crop of the State of New York was almost wholly destroyed by the hop-vine aphis. This year the fruit trees seemed even more infested than they were at that time. He especially wished to know what significance, if any, this might have with respect to hop injuries the present year.

Answer was made that the past winter had apparently been very favorable for the protection and preservation of aphis eggs, and unless the young, recently hatched or now hatching could be speedily destroyed by a heavy rain fall, which, at this stage of their existence, is so fatal to them, we would, in all probability, find the present year characterized by an abundance of aphides equal to that of 1886. It was therefore recommended that, if natural causes did not intervene to prevent this multiplication, the hop growers, on the first appearance of the insect in their yards, should proceed to kill them by proper spraying before they could produce new generations and extend over the entire yards. Directions for spraying with kerosene emulsion—perhaps the best insecticide for use against this insect—and how to make the emulsion, accompanied the letter.

In response to a request from the editor of the *American Farmer*, for information for the benefit of its readers in regard to the multiplication of plant-lice as reported from New York, the following communication was made and published in the issue of that journal for June 1, 1893 :

“The remarkable abundance of these destructive little pests on the opening buds and tender leaves of fruit trees in the State of New York this spring is exciting a great deal of interest and considerable apprehension among fruit growers. The apple tree has been particularly infested, the insect occurring on it, the *Aphis mali*, being one that multiplies under favoring conditions in excessive numbers, entirely covering twigs and standing one on another, and sucking out all the sap until the parts attacked are blighted.

“From some portions of the State reports have reached me of the opening buds of apple trees being literally covered with these plant lice, or aphides as they are scientifically known. As the reports have come from eastern, central, and northern counties, it would appear as if the condition was general throughout the State. Whether it also extends into adjoining and other States is as yet unknown to me.

“To inquiries made of the probable effect of this attack on the coming fruit crops, I have replied that it was unusually severe, and apparently exceeded anything that we had experienced since the year 1886, when the superabundance of plant lice of different species inflicted serious losses, and the hop aphid almost destroyed the hop crop of the State of New York. It was therefore desirable that fruit growers should spray their trees at once with kerosene emulsion, strong soap suds, or tobacco water, and not wait until the aphides have greatly multiplied and found shelter within the curled leaves where the insecticide could not reach them. A long, cold rain following in a week or ten days the appearance of the insect, would probably be quite as beneficial as the spraying recommended, if we could judge from observations in preceding years, but, of course, this providential aid could not be counted upon.

“Since then we have had throughout the State heavy rains, continuing with more or less intermission, amounting to from two to three inches of fall. It was not a cold rain, however, and judging from a few reports since received (I have not been able to make personal observations) it failed to prove very efficient in the desired direction, for the apple aphid is said to be about as abundant as before.

“Our hop growers also are feeling considerable anxiety, for the same conditions that favor an unusual number of the apple aphid

would naturally tend to the multiplication of the hop aphid, as was so markedly illustrated in 1886.

“The hop growers have therefore been advised to keep close watch for the first appearance of the hop aphid on the upper leaves of the outer rows of their hop yards. They will probably be seen there about the last of May or the first of June as full-grown, winged females, which have just flown from neighboring plum trees, where the winter had been passed in the egg and the early spring as wingless females.

“If these, the mothers and progenitors of a number of successive broods through the summer, are killed at this time by proper spraying with suitable insecticides — in the proportion that they are destroyed will subsequent injury to the crop be prevented.

“It is said that in England the hop growers do not attempt to grow a hop crop without their regular ‘hop washings,’ which we call spraying.”

Reports of unusual abundance of aphides on fruit trees came from the following counties, indicating that they were not confined to any particular part of the State: Westchester (on apple and cherry in June), Dutchess, Scholharie (buds literally covered in June), Schenectady, Chenango (on apples and pears in May), Oneida and Onondaga in May, Madison, Oswego, and Chautauqua.

Of the hop vine aphid, *Phorodon humuli*, the most severe injury seems to have been caused in the southern part of Dutchess county, where hop yards were entirely stripped, save here and there a blackened, perforated leaf of a new shoot. Nothing was done to stop the ravages of the insect; so quickly did it do its work that it was almost done before it was discovered. The crop is an entire failure (*New York State Weather Crop Bulletin*, July 8th, 1893). In Madison county the destruction of the crop was threatened in early July, but a more favorable condition was reported later. Spraying was resorted to in several of the counties — in Franklin and others — with gratifying results.

#### A GRASSHOPPER PLAGUE IN WESTERN NEW YORK.

It has been a remarkable year for grasshoppers. Their abundance in the western part of the State, where dry weather has prevailed to the extent of severe drouth, has made them a veritable plague. It is very unusual that occasion arises for complaints of injuries from them to crops in the State of New York. About the middle of July they were reported as numerous in the



western portion of the State, since which time, up to the last of August, their number and their destructiveness have been on the increase. After the heavy rainfall of the 25th-29th August, amounting to over six inches in some localities, a marked diminution in number was observed. They appear to have been particularly injurious in the more western counties. Mr. J. A. McCullom, of Niagara county, writing toward the latter part of August, states that most of their crops have been destroyed entirely by the ravenous insects or so damaged as to be worthless. From Erie county it is reported: "Grashoppers have settled down upon this section of Western New York and eaten every green thing in sight. The loss will be very large. Acres on acres which a short time ago were fresh and green with ripening crops are now barren wastes of leafless stalks and branches. At first but little attention was paid to the flying and hopping pests, but as they increased in number hourly, the farmers became alarmed and steps were taken to drive them away. A strong mixture of salt and water was used, but had little effect." (*Associated Press*.) In Chautauqua county fields of oats were stripped of their grain early in August, and "garden truck" wholly destroyed, while in Cattaraugus and Allegany counties they were very numerous at the same time. In Wyoming county, after consuming the corn, they began to eat the leaves of the fruit-trees. In Genesee county, they were reported as "eating every green thing." In Orleans county "they had never been seen in such numbers before." Along the southern range of counties they were quite destructive in Steuben (much oats were cut prematurely for fodder in order to save it), Chemung, and Tioga. In Central New York they inflicted much damage in Madison county, and northwardly toward the lake shore in Oswego county, where the cabbage crop suffered severely. In the northern part of the State, as in Franklin county, they were less destructive, but pastures and meadows were reported as suffering from them.

As usual in the State of New York, a large proportion of the injuries committed this season, as above reported, is chargeable upon our two most common species of grasshoppers, viz., the red-legged locust (commonly called grasshopper), *Melanoplus femurrubrum* (De Geer), and the lesser migratory locust (as designated by Riley), *Melanoplus atlantis* (Riley). In their destructive work,

however, they were largely aided by other members of their family, which were also unusually abundant, among which may be named: *Melanoplus femoratus*, *Circotettix verruculosa*, *Camnula pellucida*, *Dissosteira Carolina*, and *Chortophaga viridifasciata*.

#### INSECT DEFOLIATORS OF SHADE AND FRUIT TREES.

The elm-leaf beetle, *Galerucella xanthomelena* (Schr.) \* has been very injurious in Dutchess county. During the month of July the elms were covered with the beetles and lost most of their foliage. The season has probably favored their multiplication. Prof. J. B. Smith reports that trees in New Brunswick, N. J., suffered more than ever from them, and in some cases not a leaf remained upon them by the middle of July. In many places the ground was covered with the fallen leaves as in autumn (*Entomological News*, iv, 1893, p. 229).

The tussock caterpillar of the vaporer moth, *Orgyia leucostigma* (Sm.-Abb.) proved a veritable plague in Albany during the month of July. Fruit trees in gardens were badly eaten by it, while of many of the elms and horse-chestnuts the foliage was entirely destroyed. From present appearances a number of the trees that suffered the most will die from the effect of their defoliation. The attack was somewhat local: at times, a single isolated tree in a row of elms would be attacked, and again, nearly all the trees ranging on one side of a block. The explanation of this may be, that in such instances, no care had been taken to remove the egg-clusters the preceding year from the trunks and main limbs of the trees or from beneath fence and wall copings and sills of the houses — the importance of which, as the chief protection against the ravages of this insect, has been repeatedly urged upon our citizens. The application of bands of loose cotton to the trunks of trees subject to its attack has been largely resorted to, but it should be borne in mind that this will only serve as a preventive when there are no egg-clusters or caterpillars on the tree or when the tree is not exposed to the dropping of hungry caterpillars from overhanging infested branches. To trees already infested, either by the eggs or the

\* *Galeruca xanthomelena* of former reports.

larvæ, the bands can only be detrimental, in interfering with descent from the tree for pupation and thereby inducing the spinning of the cocoons upon it.

The apple tree tent caterpillar of *Clisiocampa Americana* Harris, was observed in large numbers in Westchester county at the time of the appearance of the blossoms, May thirteenth. It was also reported as abundant in Dutchess county the latter part of May, and in Cortland county in early June. It is fortunate that the apple orchards of New York, however, so far as known to me, have not been subjected to visitations of this notorious orchard pest at all comparable to those experienced in Massachusetts — particularly in its northeastern portion — during the past few years. In riding through several of the towns surrounding Boston, in the month of June, the almost entire defoliation of orchards that arrested the attention was a sad and painful picture of destruction, as the thought arose of how easily it might have been averted. It fully justified the comparison often made of other insect devastations — “appearing as if a fire had swept over the trees.” There was evidence that a considerable portion of the defoliation had been caused by the canker-worm, *Anisopteryx vernata* (Peck), but the unsightly presence of numerous large web nests in the forks of the branches bore ample testimony to the operations of the pestiferous tent caterpillar.

Regretting the necessity that compels the presentation to your board of so imperfect and brief a report as the above,

Respectfully submitted.

J. A. LINTNER.



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APPENDIX.

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# INDEX TO REPORT FOR 1886.

[The few separates printed of the "Report of the State Entomologist to the Regents of the University of the State of New York, for the Year 1886," have been distributed as the "Third Report of the State Entomologist." (See list given with vii, viii and ix.) As it contained no index, it may aid in reference to its pages if the index herewith given be removed and transferred to it.]

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