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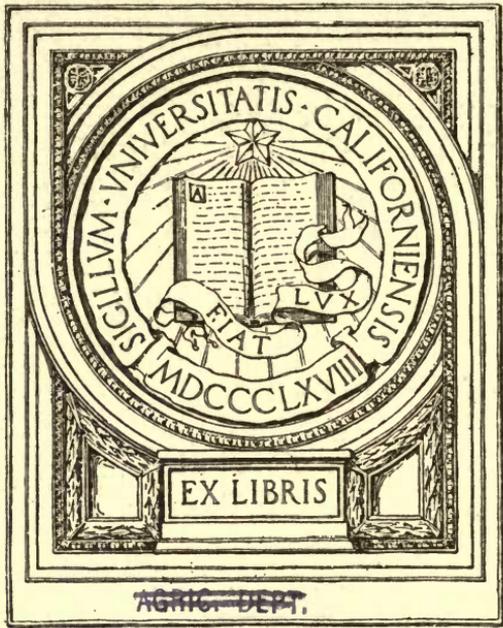
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INJURIOUS INSECTS 1878

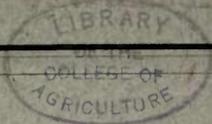
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REPORT

E. J. Wickson.

OF SOME

INJURIOUS INSECTS

OF THE YEAR 1878.

By J. A. LINTNER.

[Reprinted from the Thirty-eighth Annual Report of the New York State
Agricultural Society, 1878.]

ALBANY:
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SOME INJURIOUS INSECTS OF THE YEAR 1878.

BY J. A. LINTNER.

It should not be necessary, and I trust it is not, that extended remarks should be offered to the members of the New York State Agricultural Society upon the importance of the study of insects in their economic relations. You are all prepared to bear ready witness to the truth that the difficulties which you have to encounter, are not so much with an unproductive soil as with over-productive insects: the field, the orchard and the garden, bear one unvarying testimony to this truth. You have all felt the tax imposed upon your labor and its expected product, through insect injuries, but few of you are prepared to realize the regular recurrence of this tax and its magnitude, from the insidious secrecy with which it is levied and enforced. A moment's reflection will convince you that a half-crop, as the direct result of the depredations of the wheat-midge, the Hessian-fly, the grain-aphis, the army-worm—or a score of other pests which might be enumerated can have but this interpretation—a levy of fifty per cent upon the aggregate value of the crop—usually submitted to without an effort being made to resist its recurrence another year. Were the State to make this assessment—not to spread it through myriads of ravenous stomachs as excrementa upon the ground, but to mold and pile up the enduring granite of yonder noble structure, in which succeeding generations may feel an honest pride—would it be as quietly submitted to? That crop is an exceptional one which the insect does not tithe, often without our knowledge. The poverty and starvation which the Rocky Mountain locust has borne with it through our Western States and Territories, tells of destruction of entire crops as complete as if swept by a fire.

To present these losses in a somewhat comprehensible form, it may be stated, that a careful estimate of losses through insect ravages within the United States, based upon the census returns of the value of the agricultural products of the country, and estimates of injuries inflicted by certain insects within certain States, gives, as the aggregate of annual losses, two hundred millions of dollars (\$200,000,000). The loss occasioned by the chinch-bug alone, in Illinois, in a single year, was computed at seventy-three millions of dollars (\$73,000,000).

Without dwelling longer upon these considerations, permit me to pass directly to a brief notice of a few injurious insects which have come within my notice during the past year—a year, it may be incidentally remarked, so signalized by a scarcity of insects, that the work of collecting for the cabinet, and for scientific study, was almost abandoned. The report made at the meeting of the American Association for the Advancement of Science, at St. Louis, in August last, from entomologists representing the various portions of the United States, was unanimous, that of the Noctuidæ (a family of the moths comprising the cut-worms and a large proportion of the species most detrimental to the agriculturist), not one individual was to be found, where a hundred were to be met with the preceding year.

Your attention will first be invited to an insect which now for the first time claims local habitation and a name in our list of insect foes. It may be called

THE CLOVER-SEED FLY—*Cecidomyia trifolii* n. sp.

Early in the month of June, 1877, some heads of red clover (*Trifolium pratense*) were brought to me by Mr. T. L. Harison, Secretary of the New York State Agricultural Society, and my attention was called to some small, worm-like creatures contained within the heads, and apparently feeding upon the seeds. From their acutely elliptical form and vermiform movements when taken from the clover and placed upon a table, they seemed to be the larvæ of some species of dipterous insect. All the writers upon economic entomology at my command, American and European, were searched for a notice of the insect, but no mention of it was found.

During the same month, examination of heads of clover collected at West Albany, at West Troy, and it is believed at one or two other localities in the State, was made by Mr. Charles H. Peck, State Botanist, whose attention had been called to the insect, and the larvæ were discovered within them.

On the 19th of the same month, during a field meeting of the Troy Scientific Association held at Schroon Lake, Warren county, N. Y., the larvæ, in small numbers, were found by me in some heads plucked in the village of Schroon. Subsequently my engagements were of such a nature, that I made no further observations on the "clover-seed worm" during the season.

In the fore part of August, 1878, heads of red clover were handed to me by Mr. Harison, which were said to have been taken from an infested field, but I failed to detect the presence of larvæ. On the 19th of the same month, six heads were sent from the President of your Society, Mr. George W. Hoffman, of Elmira, N. Y. They contained very few seeds, but the examination was not sufficiently thorough to enable me to say whether the seeds had not been formed, or if their substance had been devoured by the larvæ—the latter was thought at the time to be the explanation of their paucity. Within some of the pods larvæ were found very nearly filling their interior.

Upon picking the flowers apart and strewing them upon a black surface, the larvæ readily left their concealment and commenced traveling over the table. The flowers were shaken several times during a half-hour, until no more larvæ emerged from them. A number of the pods were then opened, but all were found deserted by the occupants which they may have contained. It is probable that the larger number of the larvæ had matured and left the heads before they were received by me.

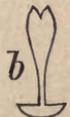
Fifty larvæ were obtained from the six clover heads. Of these, ten were deposited in alcohol for more careful study than could be given them at the time; the remainder were placed in a small pot containing damp sand, in which they all buried themselves within an hour thereafter—some entering it as quickly as the operation could be performed, and others after a longer or shorter preliminary travel.

Their appearance at this time was as follows: The head, small and acute; the body, elliptical, moderately constricted at the joints, flattened on the sides, rather rounded behind, without feet, of a pinkish color approaching orange; length eight-hundredths of an inch.

A later microscopic examination of the larvæ which had been preserved in alcohol, disclosed characters which led me to refer them, with very little doubt, to the Cecidomyidæ, and probably to *Cecidomyia*—the genus to which belong, among many others, two species, the names of which are only too familiar to our agriculturists—the Hessian-fly and the wheat-midge (*Cecidomyia destructor* and *Diplosis tritici* of entomological literature). Dr. Hagen, of Cambridge, to whom I submitted my alcoholic specimens, also recognized them as belonging to *Cecidomyia*. He has, in addition, kindly examined the European authorities in economical entomology contained in the extensive library at Cambridge, and has informed me that he finds no record therein of any *Cecidomyia* or allied form preying upon the seeds of clover. As by far the larger number of this family are monophagous—*i. e.*, living on a single species of plant or closely allied species, there is every probability that from the secrecy with which this minute insect has been prosecuting its work, and possibly from its not yet having multiplied to a formidable extent, it has remained, until within the past two years, undetected, and that the present is its first introduction to public notice.

Baron Osten-Sacken, in his excellent paper *On the North American Cecidomyidæ*, pp. 173–205 of the *Monograph of the Diptera of North America*, by H. Lowe, Part 1, groups the N. A. species in three categories, viz.: *a*, those of which the perfect insect is described but its habits unknown; *b*, gall or larva known but perfect insect unknown; *c*, perfect insect described and its habits known. Under *b*, the category in which our new species falls, thirty-two species are arranged, whence it may be seen that there is ample authority for not awaiting the knowledge of the perfect insect before the bestowment of the scientific name.

The alcoholic specimens of the larvæ, as seen under a low magnifying power, presented the following features: Head (outline with following segment represented at *a*) subacute, subtriangular, slightly rounded laterally on its posterior half, giving that portion a subquadrangular form; a short cylindrical, horny process at its tip, and two longer antennal processes, cylindrical, tapering apically. Body delicately chagreened; laterally at about the middle of each segment, a short, fleshy papilliform process, with two short bristles of unequal length, near the posterior of the segment; posterior segment bilobed, each lobe armed with two short fleshy processes of which the outer is the longer; “breast bone” of a pale, yellowish color, the portion exposed appearing as represented at *b*—its projecting end divided into two rather blunt, laterally rounded points. A dorsal row of processes similar to the lateral ones is suspected, but was not definitely made out.



In placing the larvæ under a one-fifth objective, for their more critical examination, they were unfortunately so badly crushed as to be un-serviceable for further description.

The Cecidomyidæ, in their larval and pupal stages, are known to possess remarkable vitality, and there is, therefore, good reason to believe that the perfect fly will soon be obtained from some, at least, of the thirty larvæ which buried themselves last August in the sand which I gave them, as before stated, and that its description may then be secured. Dr. Fitch, in his account of the wheat-midge (*Sixth Report Insects of New York*, p. 57) writes: "When a larva is but half-grown, we have seen that although deprived of food it does not die, and though kept from moisture for many months it does not dry up so as to perish. Thus no extremity of hunger or of thirst seems to have power to kill them."

The above statement gives encouragement that the possibly premature burial of my larvæ, and their having been meanwhile kept for the greater part of the time in a warm room without moisture, may not have proved fatal to them, but that they are safely hybernating within their minute globular cocoons, which there would be but the slightest chance of detecting for the purpose of examination, even if a very close search were made for them. We will hope that these cocoons, within the ensuing two months, from the warm temperature to which they have been subjected hastening their development, will open by a smoothly cut hemispherical lid, and disclose the delicate, tiny fly, in all probability new to science, and with which, it is apprehended, we may hereafter become too well acquainted.

The extent of injury which the clover-seed fly may have already inflicted, or is destined in the future to inflict, can at the present be only conjectured. It is possible that, for many years past, this little creature, so insignificant in size, has been secretly levying a heavy tax upon the clover-seed culture of our State, seriously diminishing the annual yield, while its operations have been charged to unfavorable climatic conditions, or to imperfect fertilization of the blossoms through a scarcity of that important if not indispensable agent in the work of fertilization—the humble-bee. Or it may have but entered on a career, which if unchecked by parasitic agency, will result in the entire destruction of the seed in infested districts, compelling, as did its congener *Diplosis tritici* with the wheat, its importation from localities where the pest may not abound.

The range of this insect will be an interesting subject of inquiry for the coming season. Does it occur throughout the State of New York, and is it to be found in other of the States? Will it be detected in Europe, from which its food-plant was introduced, now that its lurking-place is known? Is its attack confined to the *Trifolium pratense*, or does it extend to the *T. hybridum* (the Alsike clover) and other species?

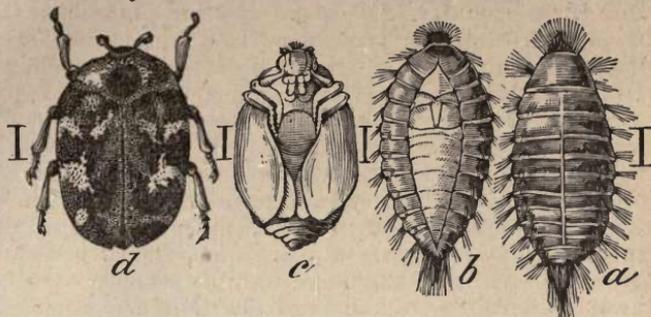
To the extent that my engagements permit, it will be my pleasure to investigate the history of this interesting insect the coming season, promising, as it does, a considerable degree of economic importance.

THE CARPET-BUG—*Anthrenus scrophulariæ* (Linn.).

In my communication presented to this Society two years ago (*Trans. N. Y. State Agric. Soc.*, vol. xxxii, p. 240), I gave a brief account of this new insect pest which was exciting much alarm in several portions of our country, from the serious depredations which it was making upon carpets, and the great difficulty that had been experienced in the attempts made to check its ravages. A more extended notice of the insect, giving descriptions of the different stages, together with illustrations of the same, has since been prepared by me and contributed to the *Thirtieth Annual Report of the State Museum of Natural History*, advance

sheets of which have been printed and a copy placed in the library of the State Agricultural Society. The illustrations of the transformations are herewith

presented. At *a* the larva, popularly known as "the bug," is represented—the form in which it is usually found in its hiding place beneath the borders of carpets during



the period of its ravages. At *b*, a cast skin of the larva is shown, several of which are thrown off during its growth, and numbers of which may be found in the crevices of the floors of infested houses. Fig. *c* represents the pupa, which is retained within the skin of the larva, and may be seen during this stage, through the fissure on the back shown in *b*. When fully matured, the pupa-case also splits open on the back, disclosing the wing-covers of the beetle, beautifully marked in white, black and red. At *d* the beetle is represented. The figures are enlarged—the accompanying lines indicating the natural size.

Some additional information respecting the insect has been obtained since the publication of the account above referred to, which is herewith, in part, presented.

The apprehension was then expressed that when the threatened multiplication of this beetle reached the extent that it would be found feeding upon flowers after the habit of its congener, the museum-pest, the *Anthrenus varius*, the comfort of carpeted floors would hardly be allowed us. Already we have learned that it is no longer confined within doors, where an occasional specimen may be captured upon window-panes or articles of clothing, for under date of September 14, 1878, Mr. A. S. Fuller, of the Rural New-Yorker, has communicated to me the following information: "I have taken the *A. scrophularia* in goodly numbers this season, feeding on *Spiræa aruncus*—on the pollen, not on the honey or leaves. It will undoubtedly visit other species of the *Spiræa* blooming in summer." Mr. Fuller suggests that these flowers will serve as an excellent bait by means of which the beetles can be collected and destroyed.

Public attention was first drawn to the ravages of this insect, through newspaper notice, in the State of New York, in the year 1874. It has been recently announced that it had been observed in the city of Boston two years earlier—in 1872. Since that time—perhaps the year of its introduction—it has multiplied to so great an extent as to have occasioned serious alarm. In a late communication upon the subject to the Boston Society of Natural History, Dr. Hagen, of the Museum of Comparative Zoölogy at Cambridge, stated that its increase the past summer (of 1878) was so great as to be entirely contrary to the laws of probability. It was evident that it had propagated and spread in an alarming manner, and in illustration thereof, he presents the following statement: "A gentleman had the entire outfit of his recently married daughter destroyed; another had furnished a new house, and had to begin the same task over again; a lady found all her winter clothing

damaged, and before she was aware of the presence of the depredator, her carpets were entirely destroyed." These, and many similar cases were investigated, and it was discovered that about three-fourths of the infested carpets had been purchased at a certain carpet store, the proprietor of which had bought a large stock, which he was disposing of at reduced rates.

In consideration of the grave results of introducing an infested carpet in one's home, it was recommended to the Bostonians that every new carpet or rug should be considered as dangerous, and first exposed in strong sunshine in the open air and strongly beaten, before laying it on the floor. The common custom of ordering new carpets from the stores to be laid down at once, was pronounced as attended with great danger. Dr. Hagen also recommended, as a means of preventing the entrance of the insects, that the joinings of the floors (their favorite habitat) should be filled with the softest common tallow, and that tallowed paper should be placed underneath the carpets, extending in strips of a foot or two around the room adjoining the walls.

In addition to the reason assigned for the above recommendation, viz. : that the tallow is avoided by the larvæ of the carpet-beetle, as it would readily attach itself to them and close their spiracles or breathing-pores, it may be stated, that the odor of tallow is disagreeable and repellent to a large number of insects, and that it has long been the custom to protect woolen goods from the clothes-moth, during the summer months, by placing among them a tallow candle wrapped in paper.) For some time past, I have employed the same protective means for the preservation of my entomological collection from the attack of the *Dermestes lardarius* and the *Anthrenus varius*, by placing tallow candles among my cases, and small pieces of the same within the cases. Some interesting experiments recently made with a colony of *Dermestes*, probably the familiar larder-beetle (see *Canadian Entomologist*, vol. x, p. 141, 1878), gave the following results: They were confined in a glass jar, and a piece of camphor placed therein. At first they manifested some uneasiness, but in a minute or two commenced traveling about and over the camphor with entire unconcern. Upon a small piece of tallow being dropped in the jar, the effect was instantaneous and ludicrous—a regular stampede ensued. The beetles fled precipitately to the side of the jar, and after endeavoring to effect their escape, they huddled together in a mass, where they remained so long as observed. The jar was set aside, and upon looking at it again a fortnight thereafter, only one *dead* beetle was found of the large family. It is presumable that they died soon after their exposure to the tallow, and had eaten up the dead bodies of one another.

In one of my early communications on this insect, it was stated that I had found no mention of its preying upon carpets or other woolens in Europe, where it had been long known, and the suggestion was advanced that it may have developed a new taste with its introduction in this country. Since that statement was made, mention has been brought to my notice of its feeding upon clothing in Europe. It is written of it: "It is common in houses, where it can become very obnoxious by the destruction of furs, clothes, animal collections, and even leather and dried plants. The obnoxious larva is common in closets and rooms in the attic, where it finds dead flies, and from whence it enters other rooms." It is usually met with in Europe on flowers, such as roses and tulips, and often on fruit trees. A popular name for it, in some parts of the continent, is

the flower-beetle. The fact of its not having been known as a carpet pest in Europe, is doubtless owing to the very few carpets that are used in that country—their use there being almost wholly confined to the winter season, while during the summer months, the period in which the larvæ commit their ravages, they are withdrawn from the floors and carefully stored and protected from harm.

It is a very common insect in Europe. In a catalogue of the Coleoptera of Norway, by H. Tiebke, published in 1875 (*Catalogum Coleopterum Insectorum Norvegicorum*), it is recorded as “of frequent occurrence in various localities in Norway [thirteen cited], principally upon umbelliferous flowers, during the months of June, July and August.”

Judging from the rate of increase and distribution of other insect pests introduced from the Eastern world, and from the history thus far of the species under consideration, there is every reason to believe that before many years have elapsed, this most unwelcome guest of our homes will become as abundant among us as it is, at present, in Europe. When that time arrives, a carpeted floor, now regarded as a necessity in almost the humblest home, will then be the exception, unless more effectual measures against the new enemy shall have been discovered. But with the rest which we predict for the looms of our carpet manufacturers, we foresee a wonderfully increased importation of Persian rugs. The pleas which will come up from the length and breadth of our land for the coveted rug will be too powerful to resist, when urged by coaxing lips with such arguments as—“so much more cleanly, and then, you know, so much cheaper than a carpet; for, not reaching to the walls, under which the horrid carpet-bug hides, we shall not have to buy a new one every year.”

THE FLEA—*Pulex irritans* (Linn.).

From a neighboring city and an adjoining State (Boston, Massachusetts), comes notes of alarm, occasioned by the sudden increase during the year 1877, and an invasion, in 1878, of the common flea. Dr. Hagen states, that eleven years ago, while this well-known insect was satisfactorily common in New York and Canada, it was so rare in New England that he did not believe that it existed there at all. It was a long time before he could procure a human flea for an examination which he desired to make—all which were brought to him were dog or cat-fleas. Simultaneous with the above invasion, the cat-flea became exceedingly abundant. In many of the streets of the suburbs of Boston, cats might be seen having their body nearly covered with the Persian insect powder. From Medford, in Massachusetts, a phial of flea eggs was received, which a lady had taken from a spot on her sofa which a pet cat had appropriated for her resting place; and similar instances of the propagation of the cat-flea were elsewhere observed.

Many residences in the city of Boston and in its suburbs, have become infested by the human flea, in such number as seriously to detract from the comfort of carpeted floors. To those suffering from this remarkable invasion of their homes by a most annoying pest, of wonderful powers of increase, the diminutive size and agility of which renders its capture by hand almost an impossibility, Dr. Hagen has been able to suggest a very simple method of capture and destruction, which has long been practiced in Poland, that “paradise of fleas,” and which it may be well for us to bear in mind against a time of need, should the Massachusetts invasion extend to New York. It is simply to place on the floor of the

infested room at night, a wash-bowl filled with water, and in the middle of it a lighted candle. Like many other insects, the fleas are attracted to the light, and leaping toward it, are caught in the water and drowned. Persons who had experimented with the above trap, reported it as most effectual, and as giving promise of a speedy release from the affliction. In some instances the water of the bowl was stated to have been "black with fleas" caught during the night.

A NEW CORN DEPREDATOR—*Euryomia Inda* (Linn.).

From various sections of the State of New York and of New England, complaints have been made of an insect which was proving very injurious to standing corn, by burrowing beneath the husks and feeding upon the kernels. All the accounts stated that it had never before been known to prey upon corn. The following notice of it is extracted from a New Haven, Conn., paper of September 7th, 1878:

The Corn-Bug.—The corn-fields of the interior of the State are suffering from a brown-colored, six-legged bug, having a broad body and a small head, which starts at the tips of the ears and works through to the butt, devouring the kernels. Meriden and Burlington report the ravages of the pest. A correspondent from the latter place says: 'Fields of corn are ruined almost in a single day.' A gentleman, of Woodbridge, picked twenty of the bugs off two ears of corn, August 30th. The general impression among farmers is, that this pest will prove more disastrous than even the potato bug."

From examples received, it proved to be no new insect, but one that had long been known to science, and familiar to all entomologists as *Cetonia Inda*. The Cetonians are preëminently flower-beetles, their mouth organs being provided with a brush of hairs with which to collect the pollen of the flowers which they frequent, as those of the golden-rod, *et cetera*. They are diurnal in their habits, flying actively about, with a loud, humming noise like that of bees, in the warm and bright sunshine. There are eighteen species of the Cetonidæ known to North America, of which the *C. Inda*, or as it has been designated since the subdivision of the old genus of *Cetonia*—the *Euryomia Inda*, is our most common species. It is a thick-bodied beetle, measuring about six-tenths of an inch in length. Harris describes it as having a broad body, very obtuse behind, with a triangular thorax, and a little wedge-shaped piece on each side between the hinder angles of the thorax and shoulders of the wing-covers; the latter, taken together, form an oblong square, but are somewhat notched or widely scalloped on the middle of the outer edges. The head and thorax are dark copper-brown or almost black, and thickly covered with short greenish-yellow hairs; the wing-cases are light yellowish-brown, but changeable with pearly and metallic tints, and spattered with numerous, irregular, black spots; the underside of the body, which is very hairy, is of a black color, with the edges of the rings and the legs dull red.

That one of the flower-beetles should present itself to our notice as a corn pest, has excited no little surprise even among entomologists. Its habit of frequenting sap trees in the spring to partake of the sap, has long been known, and it has also been chargeable with burrowing into ripe peaches to feast upon the sweet and luscious pulp. An entomological correspondent of the New Haven paper from which we have quoted above, Mr. H. F. Bassett, questions the statements made that this insect is the author of the injuries credited to it, and says: "It would be just

like it to prowl around and in ears of corn that some bird or beast had meddled with, but to strip the husks off and gnaw the cobs, would be quite beyond the power of any flower-eating beetle known to me, their mouth not being fitted for hard or difficult work."

The above-mentioned writer also states that he had looked over a large portion of our economic, entomological literature consisting of the New York reports of Dr. Fitch and the Missouri reports of Riley, the reports of the Canadian Entomological Society, and the volumes of the *American Entomologist*, without finding any reference to this species as particularly destructive to anything but sweet, juicy fruits. Upon further search, I find that he had overlooked a statement made by Dr. Le Baron, formerly State Entomologist of Illinois, in his Fourth Annual Report (1874), where, in a very brief reference to *E. Inda*, he says of it: "It is sometimes troublesome by burrowing into ripe fruit, and also by feeding upon sweet corn in the milk."

The idea advanced by Mr. Bassett, above quoted, that this insect is not alone chargeable with the injury to the corn, finds support in a communication to the *Country Gentleman* of January 16, 1879, from a correspondent at Flushing, N. Y., which at the same time adds another count to the formidable bill of indictment against that unmitigated nuisance—the English sparrow. The correspondent writes: "I had fifty or sixty hills of corn planted in my garden, which came up and thrived wonderfully, and we found it deliciously sweet; so did the English sparrows. For a considerable time we found, after it was fully ripe, many ears were eaten for five or six inches from the top, and upon examining the places closely, I found one or two bugs in each one about the size of the Colorado bug, with a mottled back, something like in color to a tortoise shell, with considerable hair on the under-side and legs, which I picked off and destroyed. This I followed up for three or four days, but one morning, going to the corn earlier than usual, I saw on one ear seven of the sparrows making a new opening where there was none before. Of course, here was the solution. After I had put a coat, pantaloons and hat on some sticks nailed together and stood it up in the middle of the corn, I had no more trouble with them. I had supposed that the bugs did the mischief, but they had only entered where the birds had made an opening."

It is quite probable that the past year was one in which the species occurred in unusual abundance, and its ordinary food not being met with in sufficient quantity to supply the wants of such a host, it was led to resort to the juices of the tender corn, as an exceptional article of food. Its large numbers, the past season, give no assurance, fortunately, of an increased or even an equal number the present year, for it is well known to entomologists, that a year noted for the invasion of some particular species of insect, may be followed by one when the same insect may be rarely met with.

Dr. Harris' statement that this insect has its second brood about the middle of September, in Massachusetts, may need some modification. Examples of this brood were found as early as the middle of August, near Bridgeport, Conn. Mr. Bassett records its having been seen by him feeding on the sap which flows from certain woody galls on oak trees. The intense bitterness or acidity of most galls would seem to be very unlike the sweets for which it manifests so great partiality.

Another species of this genus, the *Euryomia melancholica* Gory, of which a figure is given in the *American Entomologist*, vol. ii, p. 61, fig.

39, is frequently found in Illinois, boring into apples, and according to Prof. Riley, is fond of eating into the flowers and fruits of a variety of plants.

THE PEACH-TWIG MOTH—*Anarsia lineatella* (Zeller).

In June last, some examples were sent to me for determination, which proved to be the above insect. They were accompanied by the following note: "The enclosed insects are very injurious to the terminal branches of the peach-tree. They deposit their eggs, either very early in the spring, just as the buds are swelling, or the fall previous. The terminal buds of all the higher and outer branches are so stung, and although these buds develop into seemingly fine branches, in a few weeks they wither and drop off. The centers of the twigs are first destroyed by these insects while in the larva state. I placed several of the twigs in a large bottle, and secured the inclosed specimens from them. One of the pupæ seems to be destroyed by some parasite, as it looks as if it was filled with eggs."

From the above statement of the habits of the insect, and the effect of its operations upon the twigs, the specimens of the moth received, although in too poor condition, if sent alone, for identification, were readily referable to the insect popularly known as the peach-twig moth. From its small size and structural characters, it is numbered among the Microlepidoptera of the family of the Tineida.

In 1860, Dr. Clemens bred this insect from larvæ which he found, on the 16th of June, infesting plum trees, and described it under the specific name of *pruinella*, doubtfully referring it to the genus *Anarsia* (*Proceedings Academy Natural Sciences of Philadelphia*, 1860, page 169). Subsequently he identified it with the European species, *Anarsia lineatella* of Europe, thereby adding it to the long list of insect pests which Europe has given us. Prof. Riley obtained specimens of the same moth from peach twigs, and on submitting examples to Prof. Zeller, they were pronounced identical with the European insect.

The first published notice of the operations of this insect in this country which we have met with, appears in the report of the Entomologist (Mr. Glover) of the Department of Agriculture at Washington, published in the Annual Report of the Department for 1872. Mr. Glover says of it:

"In examining peach orchards in the neighborhood of the Maryland Agricultural College, about the first week in May, almost all the young twigs of the trees were observed to be killed at the extreme end for a distance of from one to two and a half inches, and the terminal buds entirely destroyed. On cutting open these dying twigs, the injury was found to be caused by a very minute caterpillar, which, entering the twig near a bud, had entirely eaten the pith and the interior, leaving only its 'frass' and the exuding gum to mark the spot where it had entered. When confined in a glass case, after about a couple of weeks, several of the larvæ left the injured twigs and formed very loose cocoons on the sides of the box or among the rubbish and old leaves lying scattered on the earth, and in about six to ten days, the perfect moth appeared [last of May]. * * * * * The tail of the pupa is attached to a little button of silk, in an exceedingly slight cocoon. There was scarcely a single young tree in the peach orchard examined that was not more or less injured by this little pest, and at least as many as from twenty to fifty injured twigs were found on some very young

trees. After the insect leaves the twig, the injured part dries up and breaks off. This insect was also seen, though in much smaller numbers, last season, in Maryland and Virginia. Apple trees are also similarly injured in a similar manner in Maryland, and it is probable that the damage is done by the same worm."

"The larvæ are about 0.25 inch in length; head black; body dark reddish-brown, with lighter rings—the third ring being more conspicuous and whitish. The moth is quite small, and measures from 0.40 to 0.60 of an inch in expanse of wings, and is of a pale grey color, with a few blackish spots on the upper wings."

From a recent communication of Professor Comstock, of Cornell University, Ithaca, N. Y., made to the Western New York Horticultural Society, we have information of the ravages of this insect in several portions of the State of New York. The statement of the habits of the caterpillar made by Professor Comstock, differs in some particulars from that of Mr. Glover, above quoted. According to his observations, "it destroys the terminal leaf-bud, and sometimes the lateral buds, in the following manner: The young caterpillar begins its work in the spring at the time, or soon after, the shoots begin to grow. These, when from one-half to one inch in length, are punctured at the base and eaten completely off. The leaves of the bud unfold and then wither. The twig, although severed, does not drop off, but is held in place by a gummy substance. All the twigs on some trees are destroyed, especially on two-year old trees. Mr. Green, of Clifton, N. Y., had 100 trees infested. The larvæ became full-grown during the latter part of May or early in June. Specimens, collected June 10th, were found to have changed to pupæ June 14th." The period of their emerging as moths was not observed, as they were found dead in their breeding-cage some time during the summer.

In addition to this insect's occurrence at Ithaca, it was also observed at Rochester, Lockport, and at Jordan Station, Ontario. Its operations have not come under my personal notice, but its presence in the eastern portion of our State is very probable, from statements made to me two years ago, of an affection of some peach trees in Schenectady and Albany.

In the Annual Report of the Entomological Society of Ontario for the year 1872, published in 1873, we learn that the ravages of this insect are not confined to the peach, plum, and perhaps the apple, but that it also occurs under very different conditions and affecting a very different food-plant. In this report, Mr. Wm. Saunders, the editor of the Canadian Entomologist, describes the insect under the name of the *strawberry root or crown-borer*. During the years 1868 and 1869, it was very destructive in certain grounds at St. Thomas, Ontario, the caterpillar eating irregular channels in various directions through the crown and larger roots of the strawberry plants, causing them to wither and die. Mr. Saunders gives a minute description of the caterpillar, narrates its history, states that it probably has two annual broods, and quotes the description of the moth given by Dr. Clemens, under the name of *pruinella*, as before stated. For convenience of reference, we copy the description:

"Head and face pale grey; thorax, dark grey. Labial palpi, dark fuscous externally, and pale grey at the end; terminal joint grey, dusted with dark fuscous. Antennæ greyish, annulated with dark brown. Fore wings grey, dusted with blackish-brown, with a few blackish-brown

spots along the costa, the largest in the middle, and short blackish-brown streaks on the median nervure, subcostal, in the fold, and one or two at the tip of the wing; cilia fuscous grey. Hind wings fuscous grey; cilia grey, tinted with yellowish."

Specimens of the larvæ obtained late in the season were found alive within their thin silken cocoons on the 12th of January, rendering it probable that this brood hibernates in the larval state, and transform to pupæ in the spring, a short time before their appearance in their perfect state.

The above *strawberry root or crown-borer* of Saunders should not be confounded with the *strawberry crown-borer* of Riley—an insect belonging not to the order of Lepidoptera, but to the Coleoptera, of the family commonly known as snout-beetles or weevils. This latter insect has been described and figured in its larval and perfect stages by Prof. Riley (*Third Report on the Insects of Missouri*, p. 42, fig. 14, 1871) as *Analcis fragrarix*. So far as known, it is confined to the Mississippi valley, and has not, to our knowledge, been reported from the Eastern States. Its habit of boring down through the crown of the strawberry plant into the pith and eating through the more woody portions, is very similar to that recorded of the *Anarsia lineatella*, and the ravages of the two insects in localities where they conjointly occur, are liable to be confounded. The general use of common names for our insects, birds, fishes, mammals, etc., very often results in serious confusion, when with little difficulty the scientific name, which always indicates the object referred to, could be acquired.

It is gratifying to know, that in all probability, this destructive pest has already been attacked by a parasite which promises to perform an effective part in checking its ravages. The "pupa apparently filled with parasitic eggs," referred to in the communication accompanying the examples sent to me, is the dead body of a caterpillar, distended to its utmost capacity by the presence of no less than fifty-one pupa-cases of apparently some hymenopterous insect. They had been crushed in their transit through the mail, preventing the perfect insect being obtained from them, or even an approximate reference of their relationship. Prof. Riley has also received examples of the caterpillars infested with parasites.

Should the increase of this insect not be prevented by parasitic agency, then the most effectual means of arresting it will be the cutting off of the infested terminal twigs of the trees upon which it occurs—readily to be distinguished by the drying up of the leaves—and burning them with their contained borers. This must be done during the month of May or early in June, before the larvæ have attained their maturity, after which they leave their burrows to seek some sheltered place beneath the loose bark of the trunk, leaves upon the ground, or elsewhere, where they may construct their cocoons and undergo their final transformation. Strawberry plants giving indication of their presence, should be promptly uprooted and burned.

NEW YORK STATE MUSEUM OF NATURAL HISTORY, }
 January 22, 1879. }





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