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The Practical Entomologist.

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PHILADELPHIA, SEPTEMBER 29, 1866.

We take pleasure in announcing that, although the desired number of subscribers is not yet made up, we shall continue the publication of the *Practical Entomologist* another year, because we believe that, through the continued exertions of our friends, we shall have 5000 names by the issue of the October number. Therefore, those who have sent in their names as subscribers for the second year, may, if they feel so disposed, send us their subscription money *now*, or, on the receipt of the October number. In remitting the money, please do not send us mutilated or defaced currency.

☞ We shall always be happy to furnish any one, who may wish to assist us by getting up a club of subscribers, with specimen copies of the paper, and also copies of our Prospectus.

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THIS NUMBER

is occupied chiefly by a long, valuable and interesting article by Mr. Walsh on the Natural History of the Sawfly of the Gooseberry and Currant. As this Insect Pest promises to do an immense amount of damage, it would be well for every one who cultivates the fruit to read the article over carefully. Several interesting communications and answers to correspondents have been crowded out, but these will appear in the next number.

IMPORTED INSECTS;—The Gooseberry Sawfly.

BY BENJ. D. WALSH, M. A.

It is a remarkable fact, that fully one-half of our worst Insect Foes are not native American citizens, but have been introduced here from Europe. The Hessian Fly (*Cecidomyia destructor* Say) was imported almost ninety years ago—the Wheat Midge (*Diplosis tritici* Kirby) about half as long ago—the Bee Moth (*Galleria cereana* Fabr.) at the beginning of the present Century—the Codling Moth (*Carpocapsa pomonella* Linn.), the Currant Borer (*Trochilium tipuliforme* Linn.), the Bark-louse of the Apple tree (*Aspidiotus conchiformis* Gmel.), the Cheese-maggot (*Piophila casei* Linn.), the Meal-worm (*Tenebrio molitor* Linn.), the Grain-weevil (*Sitophilus granarius* Linn.), the House-fly (*Musca domestica* Linn.), the Leaf-Beetle of the Elm (*Galeruca calmariensis* Fabr.), the Cockroach (*Blatta orientalis* Fisch.), and the different Carpet, Clothes and Fur Moths, at periods which cannot be definitely fixed. And even within the last few years the Asparagus Beetle (*Crioceris asparagi* Linn.) has made a lodgement in the State of New York, and will no doubt gradually spread westward from that point through the whole United States. I now have to record the appearance among us from across the Atlantic of a bitter enemy to the Gooseberry and Currant—the Gooseberry Sawfly.

One would suppose at first sight, since there are about as many voyages made from America to Europe as from Europe to America, that we should have reciprocated to our transatlantic brethren the favors which they have conferred upon us, in the way of Noxious Insects. It is no such thing. Neither the Chinch Bug (*Micropus leucopterus* Say), nor the Curculio (*Conotrachelus nenuphar* Herbst), nor either one of our two principal Apple-tree borers (*Saperda bivittata* Say and *Chrysobothris femorata* Fabricius), nor the Cankerworm (*Anisopteryx vernata* Peck), nor the Apple-tree web-worm (*Clisiocampa americana* Harris), nor the Peach-tree borer (*Trochilium exitiosum* Say), nor any other of our Native American Insect Foes has ever, so far as I am aware, emigrated from this

country to Europe and effected an extensive and permanent settlement there. For although on one or two different occasions single specimens of our Army-worm Moth (*Leucania unipuncta* Haworth) have been captured in England, yet it has never hitherto spread and became ruinously common there, as it continually does in America. Our destructive pea-bug or rather pea-beetle (*Bruchus pisi* Linn.) has also found its way to Europe; but although it is met with in England, Kirby and Spence expressly state that it does not occur there "to any very injurious extent." (*Introd.* letter 6.) Again, the only species of White Ant that exists within the limits of the United States, (*Termes frontalis* Köllar,) has been known for a long time to be a guest in the Plant-houses of Schönbrunn in Germany; but it is not recorded to have ever as yet spread into the surrounding country. A very minute yellow ant, however, (*Myrmica molesta* Say,) which often infests houses throughout the United States, has, according to Frederick Smith, "become generally distributed and naturalized" in houses in England; (Stainton's *Entom. Ann.* 1862, p. 70 and 1863, pp. 59—62;) and Kirby and Spence state more specifically that "it has become a great pest in many houses in Brighton, London and Liverpool; in some cases to so great an extent as to cause the occupants to leave them." (*Introd.* Letter 8.) As to the Woolly Aphis of the Apple-tree, (*Eriosoma lanigera* Hausmann,) which was formerly misnamed in Europe "the American Blight," it was proved long ago, that instead of having been imported from America into Europe, it was in reality imported from Europe into America. (Harris *Inj. Ins.* p. 242)* The same law seems to prevail in the Vegetable Kingdom also. For while we have imported from the Old World a whole host of noxious weeds, but very few native American plants have established themselves on the other side of the Atlantic.

"But," the curious reader will ask, "what can be the reason for such a strange anomaly?" The reason is that, although this is popularly known as the New World, it is in reality a much older world than that which we are accustomed to call the Old World. Our plants and our animals mostly belong to an old-fashioned antediluvian creation, not so highly improved and developed as the more modernized creation which exists in Europe. Consequently they can no more stand their ground against European competitors imported from abroad, than the Red Indian has been able to stand his ground against the White Caucasian race. On the other hand, if by chance an American plant or an American animal finds its way to Europe, it can, as a general rule, no more stand its ground there against its European competitors, than a colony of Red Indians could stand their ground in England, even if you gave them a whole county of land and a hundred shiploads of stock, tools and provisions to begin with. I refer here, of course, only to what is called the naturalization of a plant or an animal, i. e. its becoming able permanently to maintain itself in a state of nature in any particular country. For there are plenty of American plants and animals, which are artificially domesticated in Europe, the Potato and the Turkey for example. But who ever heard of Potatoes and Turkeys running wild in Europe, as the European Horse has run wild in Mexico, and the European Cow in Buenos Ayres, or as the European purslane has spread over every garden and field in the United States?

Let not "Young America," however, be discouraged and disgusted at hearing, that our Animal and Vegetable Creation is more old-fashioned than that of what is commonly known as the Old World. There is a large Continent, which is as much more old-fashioned than America in its plants and animals, as America is more old-fashioned than the so-called Ancient Continents. In America we have but a single mammal—the opossum—that brings forth its young before they are fully developed, and carries them about with it in a pouch, till they are ready to be born again in a complete state of development. In the Old World they have none at all. In Australia almost all their mammals possess this remarkable peculiarity, which characterizes the first and earliest mammals that are known to have existed in ancient geological times; and in addition they actually have a mammal—the Ornithorhyncus—that has a bill like a duck and lays eggs like a duck, thus forming a degraded type connecting the Mammals with the Birds. If Europe crows over us, we can crow over Australia. If the American creation is old-fogyish, that of Australia is more old-fogyish still.

When accounts arrived in Europe, towards the close of the last Century, of the frightful manner in which the Hessian Fly was destroying the Wheat crop in the United States, the British Government was so greatly alarmed at the idea of its being imported from America into England, that they actually called a special Meeting of the Privy Council, to deliberate on the best and most advisable means of excluding the little pest. They need not have alarmed themselves at all about the matter. It is now clearly proved, that the Hessian Fly has existed time immemorial in Europe, but in such limited

*A species of Cockroach (*Blatta americana* Burm.) has also, as the name indicates, been supposed by some to have been imported from America, not only into the seabord of England, but also into the Mauritius and the Isle of Bourbon. It exists undoubtedly at the present day on the seabord of the United States, but I suspect that it was originally introduced there from Eastern Asia. Westwood mentions having seen it "swarming in a vessel recently arrived [in England] from the East Indies." (*Introd.* I, p. 417.) America has so little commercial intercourse with the Mauritius and the Isle of Bourbon, that it seems improbable that a noxious insect should pass from one country to the other. On the other hand these two islands are in frequent communication with Hindostan and China, and import at the present day many Coolies therefrom. Brullé also considers the American nativity of this insect as very problematical. (*Hist. Nat. Ins.* IX. p. 33.) I have never met with it in Illinois and do not believe that it exists there. Our common Cockroaches, which do not however occur in houses but only in the woodlands, are *Platamodes pennsylvanica* DeG. and *Pl. unicolor* Scudd., which last species has been erroneously described by Mr. Scudder as only one half of its actual size. Both of these occur also in similar situations on the seabord of the Eastern States, and in the houses there the imported *Blatta orientalis* Fisch., which is such a pest in European houses.

numbers as never, except in a very few localities, to have attracted the attention of the European farmer. Why then, when it reached America, should it have increased and multiplied at such a prodigious rate, destroying the wheat like a devouring fire as it gradually advanced through the country? The answer is simple. Here it had only three or four parasites to check its increase, and these were of the old-fashioned American type, not so highly improved and developed as the European parasites, that had for ages untold preyed upon it in its native home, and prevented it from increasing there to any alarming extent. The case was pretty much as if Louis Napoleon were to land an army of a hundred thousand Frenchmen, of the highly improved Caucasian race, in the United States, and we had nothing to oppose to that army but a crowd of Red Indians of the old-fashioned indigenous North American type. But in some cases the foreign invader has scarcely had even an indigenous old-fogyish foe to contend against. To this day it is not known, that any indigenous North American parasite has attacked the Wheat Midge, since it landed upon our shores some forty years ago; and unless it be true, as I believe, that the *Thrips* of entomologists—not the *Thrips* of the vine-growers, for that is a plant-feeding insect—preys largely upon the Wheat midge in its larva state in certain locations in the United States, it is not even known that any indigenous North American cannibal insect preys upon it within the limits of the United States, although undoubtedly our American Goldfinch does so to a considerable extent. Can we wonder, under such circumstances, that the foreign invader sweeps the whole country? Can we wonder that in one single year, as has been proved by official documents transmitted to the Secretary of the New York State Agricultural Society, the Wheat-midge inflicted upon the single State of New York damages to the enormous amount of fifteen millions of dollars? During the Revolutionary War the British forces, as is well known, did us large pecuniary damage. They also accidentally, in the course of the war, imported among us the Hessian Fly, in some straw that their Hessian mercenaries brought with them. Let any one compute the whole amount of pecuniary damage, purposely and directly inflicted upon us during that war by the British Army and Navy, and then go to work and compute the pecuniary damage, that has since that time been indirectly and unwittingly inflicted upon us by the British Army, through the instrumentality of the Hessian Fly; and he will find that the latter amount is a thousand fold as large as the former.

The plain common-sense remedy for such a state of things is, by artificial means to import the European parasites, that in their own country prey upon the Wheat Midge, the Hessian Fly and the other imported insects that afflict the North American farmer. Accident has furnished us with the bane; science must furnish us with the remedy. It is no use trying to fight White Frenchmen with Red Indians. The highly improved race may perhaps be slightly checked and harrassed by the primitive indigenous foe, but in the end it will be certain to come out victorious. Naturalists differ widely, as to what was the origin of the different sets of animals and plants that now exist in different countries, and that have, ages and ages ago, existed in the different geological epochs, that preceded the advent of Man upon the earth. But no naturalist at the present day disputes the fact, that the plants and animals of North America, for example, are, as a general rule, distinct from the plants and animals of Europe, and that, as a whole, they are of an inferior and less highly developed type. If it were not so, how could we possibly account for the very singular facts enumerated above? But the scientific mind is always ahead of the popular mind. Vaccination, Gas, the Steam-engine, the Steam-boat, the Rail-road, the Electric Telegraph, have all been successively the laughing-stock of the vulgar, and have all by slow degrees fought their way into general adoption. So will it be with the artificial importation of parasitic insects. Our grand-children will perhaps be the first to reap the benefit of a plan, which we ourselves might, just as well as not, adopt at the present day. The simplicity and comparative cheapness of the remedy, but more than anything else the ridicule which attaches, in the popular mind, to the very names of "Bugs" and "Bug-hunters," are the principle obstacles to its adoption. Let a man profess to have discovered some new Patent Powder Pimperlimpimp, a single pinch of which being thrown into each corner of a field will kill every bug throughout its whole extent, and people will listen to him with attention and respect. But tell them of any simple common-sense plan, based upon correct scientific principles, to check and keep within reasonable bounds the insect foes of the Farmer, and they will laugh you to scorn. Probably about nine-tenths of the Members of Congress and of our different State Legislatures are lawyers, busying themselves principally with Law and Politics; and the remaining one-tenth are Physicians, Merchants and Manufacturers, with a *very* small sprinkling of Farmers. Is it to be expected that a crowd of men, whose heads are mostly full of such important things as Cognovits and Assumpsits and Demurrers and Torts and Caucuses and Conventions, should condescend to think about "Bugs?" What do they know about Farmers, except that they have got votes? Or about Farmers' pockets, except that most of the taxes come out of them? What do they know or care about Entomology, fancying, as most of them do, that Entomologists busy themselves exclusively in collecting the greatest possible number of beautiful butterflies? Talk to them of science, and they smile in your face. They are so perpetually teased and tormented by scientific charlatans—wolves in sheeps' clothing—lobbying for legislative assistance for all kinds of ridiculous impossibilities, that they have come to believe firmly, that Science is only another word for Humbug and Imposture.

I am confident that if one-hundredth part of the pecuniary damage, that is annually inflicted by

Noxious Insects upon the farmers, were inflicted, instead, upon the Merchants or upon the Manufacturers, thousands of dollars would have been long ago voted by Congress to discover some remedy or some palliation of the evil. Why? Because the Merchants, as a class, act in one solid body; the Manufacturers, as a class, act in one solid body; while the Farmers of the United States are nothing but a mere rope of sand. It is the old Greek fable of the bundle of sticks, practically translated into modern English for the benefit of "whom it may concern."

THE IMPORTED GOOSEBERRY SAWFLY.

Unlike the Wheat-midge, the Gooseberry Sawfly, whose Natural History I am now about to elucidate, has already been attacked by an indigenous North American parasite—the *Brachypterus* [*cryptus*] *micropterus* of Say. But this parasite is of extreme rarity, as, exclusive of a single specimen bred by myself from the cocoons of this Sawfly, I have only met with two poor solitary specimens in the course of eight years' steady collecting. It is not probable, therefore, that it will effect much towards checking the rapid increase of this insect, though it is certainly possible that other parasites, which I have not as yet detected, may already be in arms against the invader.

The imported Gooseberry Sawfly (*Nematus ventricosus*, Klug) comes out of the ground soon after the leaves of the gooseberry and currant bushes, upon which it feeds, put forth in the spring. My specimens, reared from cocoons obligingly furnished to me by Dr. Wm. Manlius Smith, of Onondaga County, New York, came out April 21—27. The sexes then couple, as usual, and the female proceeds to lay her eggs "along the stems on the under side of the leaf," according to Mr. Bigelow, of N. Y. From these eggs shortly afterwards hatch out minute green larvæ or worms, which at first have many black dots on their backs, but after moulting their skins for the last time are often entirely of a grass green color, except the large dark eye-spot on each side of the head found in all larvæ belonging to this genus. By this time they are about ¾ of an inch long, and, from their greatly increased size, make their presence readily known by the sudden disappearance of the leaves from the infested bushes. Shortly afterwards, having attained a length of fully three quarters of an inch, they burrow underground, generally beneath the infested bushes, and spin there a thin oval cocoon of silk, within which they assume the pupa state. About the last week in June or the first part of July, or occasionally not until the beginning of August, the winged insect bursts forth from the cocoon and emerges to the light of day; when the same process of coupling and laying eggs is repeated. The larvæ hatch out from this second laying of eggs as before, feed on the leaves as before, and go underground as before; but the perfect fly from this second brood does not come out of the ground till the following spring, when the same old series of phenomena is repeated. My specimens of the summer brood of flies, reared from cocoons received from Dr. Smith, of N. Y., came out June 26—August 13, and most of them by July 11. Of course there will be some little variation in the time according to the season and the latitude.

Larva. A pale green worm ¾ inch long, with three rows of black dots placed crossways on the joints of the body and a black head; after the last moult often losing all the black dots, and the head changing from black to green.

Nearly mature. Length ¾ inch. Pale green, verging on yellow towards the tail. Head black, polished, with numerous short hairs proceeding from minute tubercles. Mouth, except the mandibles, pale green. Joints of the body above with rows of small shining black tubercles placed crossways, and each bearing a hair in the less mature specimens, but in the largest and most mature ones bearing no hairs at all, except the larger tubercles on the sides. First joint behind the head with a single row of dorsal tubercles; joints 2 and 3 each with a double row, the anterior one curved forwards in the middle in a semicircle; joints 4—12 with a treble row; the anal plate black, polished, and prolonged at each posterior angle in a slender acute thorn, and having, besides the triple row of tubercles before it, a group of six or eight tubercles on each side of and partly before it. A longitudinal row of larger lateral black tubercles on joints 2—12, one on each joint, beneath which there is a geminate black tubercle above each proleg, all these tubercles bearing many hairs. Legs black, the sutures pale green. Prolegs fourteen, pale green, all but the two anal ones with a few minute black dots towards their tip in front. Joints 4 and 11 without prolegs.

When mature, the larva, according to Mr. Bigelow, is said to "change its skin to a pale green," as the European larva does, according to many authors; but I have not seen any specimens in this state. I suspect that in many individuals this change does not take place, and that in these the black tubercles remain throughout in the mature larva, while the hairs proceeding from them disappear, as in the largest specimens described above, which were almost an inch long, and still retained the black hairy head found in the smaller specimens, and the black anal plate. Described from thirty or forty specimens of various sizes, well preserved in Mr. Verrill's brine-mixture by Dr. Smith, of New York.

As is very generally the case in the genus *Nematus*, the males and females of this Sawfly differ so widely, that they would scarcely be taken by the inexperienced Entomologist for the same species. I subjoin a full description of each, based upon very numerous specimens, all bred by myself.

Female Fly. A four-winged fly rather larger than a common house-fly, with glassy wings and the body mostly yellow.

Body bright honey-yellow. *Head* black, with all the parts between and below the origin of the antennæ, except the tip of the mandibles, dull honey-yellow. Antennæ brown-black, often tinged with rufous above except towards the base, and beneath entirely dull rufous except the two basal joints; four-fifths as long as the body, joint 3 when viewed laterally, four times as long as wide, joints 3—5 equal in length, 6—9 very slowly shorter and shorter. In two females the antennæ are 10-jointed, joint 10 slender and ¾ as long as 9. *Thorax* with the anterior lobe above, a wide stripe on the disk of each lateral lobe which is very rarely reduced to a mere dot, or very rarely the whole of each lateral lobe, a spot at the base and at the tip of the scutel, the two spots sometimes confluent and very rarely subobsolete, a small spot at the outer end of each cenchrus and a geminate small spot transversely arranged between the cenchri, the tip of the metathoracic scutel, the front and hind edge above of what seems the 1st abdominal joint but is in reality the hind part of the metathorax, or very rarely its whole surface above, and also the whole lower surface of the breast between the front and middle legs, or very rarely two large spots arranged crossways on that surface, all black. Cenchri whitish. *Abdomen* with joints 1 and 2 very rarely edged at tip with black. Sheaths of the ovipositor tipped more or less with black, the surrounding parts sometimes more or less tinged with dusky. The triangular membrane at the base of the abdomen above, whitish. *Legs* bright honey-yellow; all the coxæ and trochanters whitish; the extreme tip of the hind shanks and the whole of the hind tarsi brown-black. *Wings* glassy; veins and stigma brown-black, the latter as well as the costa obscurely marked with dull honey-yellow. In a single female all three submarginal cross-veins are absent in one wing, and only the basal one is present in the other wing. In another all three are indistinctly present in one wing, and in the other only the basal one and a rudiment of the terminal one. In a single wing of two others the terminal submarginal cross-vein is absent. And in a single female there are but three submarginal cells in either wing, precisely as in the genus *Euura*. Length ♀ .22—.28 inch. Front wing ♀ .27—.33 inch. Expanse of wings ♀ .53—.64 inch, (wings depressed.)

Male Fly. A four-winged fly, the size of a common house-fly, with glassy wings and the body mostly black.

Body black. *Head* with the clypeus and the entire mouth, except the tip of the mandibles, dull honey-yellow. Antennæ brown-black, often more or less tinged with rufous beneath except towards the base, as long as the body, the joints proportioned as in the female, but the whole antenna, as usual in this sex, vertically much more dilated, so that joint 3 is only 2½ times as long as wide when viewed in profile. *Thorax* with the wing-scales and the entire collare honey-yellow. Cenchri whitish. *Abdomen* with more or less of its sides, the extreme tip above, and its entire inferior surface, honey-yellow. *Legs* as in the female. *Wings* as in the female. In two males the middle submarginal cross-vein is absent in both wings, so that if captured at large they would naturally be referred to the genus *Euura*. In two others this is the case in one wing only. Another has but the basal submarginal cross-vein remaining in each wing. And in two others the terminal submarginal cross-vein is absent in one wing. Length ♂ .20—.22 inch. Front wing ♂ .23—.25 inch. Expanse of wings ♂ .44—.51 inch, (wings depressed.)

Described from twenty-two males and thirteen females, three males and one female of the spring brood. As this solitary female happened to be one of the two with 10-jointed antennæ, I erroneously stated, in answer to a correspondent, that this was a peculiarity of the species. It is evident now that it is merely a variation, but a variation of a kind of which no other example in the whole Family of Sawflies is known to me, or, so far as I am aware, is recorded by others. For the satisfaction of the incredulous, I have donated one of these abnormal females to the Collection of the Society at Philadelphia.

I believe, on carefully comparing Stephens's description of the English *Nematus ribesii*, which is said by him to "feed on the common red currant," that our American insect is the same species, although he describes the legs as having no dark markings, and although he had the incredible carelessness not to state which sex he was describing. Otherwise his description agrees very well with our female, after making the necessary allowances for so slipslop a describer. But long before Stephens wrote, our insect was described by the German entomologist Klug, under the name of *Nematus* [*tenthredo*] *ventricosus;* and this species, it is distinctly stated, feeds both upon gooseberry and currant. Our insect, also, as is expressly stated by Mr. Otis Bigelow of N. Y., feeds both upon the currant and upon the gooseberry; (*American Agriculturist*, May, 1865, p. 141;) but it appears that certain European authors, finding this same insect upon two distinct plants, the gooseberry and the currant, jumped to the conclusion that the insects themselves were also necessarily distinct.* Two female specimens that I have received from England from a rather unreliable source, through the kindness of Mr. Norton, labelled as the true *Nematus ribesii* of Stephens, differ altogether from Stephens's description and must have been so labelled by mistake. Neither is it possible, from the laws of sexual coloration in this genus, that Stephens described the male and not as I suppose the female of his species, and that these are the true females belonging to his *ribesii*. For instead of the body being lighter colored than he describes it, as it ought to be if these were the females of his males, it is very much darker colored. At any rate these females are quite distinct from the females of our species. Those who desire fuller information on this subject, are referred to the Appendix to this Article.

Now for the American evidence, that this Gooseberry Sawfly found in the East, is not an indigenous, but an imported species. No notice whatever of any such insect is to be found in the writings either of Dr. Fitch or of Dr. Harris, whence we may reasonably infer that, at the time when they wrote, no such insect was known to infest the Garden in the Eastern States. Mr. Bigelow says that it was first noticed in Onondaga County, N. Y., about A. D. 1862. (*Ibid.*) In 1864 Prof. Winchell, not at all suspecting that it was an imported species, named and described it as occurring at Ann Arbor, Michigan, in a newspaper Article which was reprinted in *Silliman's Journal*, (Sept. 1864, p. 291,) under the specific name of *ribis;* but by an oversight, very pardonable in one who was not a professed entomologist, referred it to the wrong genus, *Selandria*. Unless my memory fails me, Mr. Brackett of Maine has also described this same insect, but under another specific name, as occurring in the State of Maine. Finally I hear from Dr. W. M. Smith of N. Y. that "Mr. F. W. Collins, of Rochester, N. Y. thinks that the Gooseberry Sawfly was undoubtedly introduced at Rochester, N. Y., by nurserymen in importations of bushes from Europe," and that he "knows that it has gradually spread from Rochester, as a centre, in gradually widening circles." And I learn from other sources, that in that part of the State of New York it has now become an awful pest. Hence, putting all the facts together, we may conclude that this Sawfly was imported from Europe within the last five or six years, perhaps in more than one place at once, and that it is now slowly overspreading the whole country. It was only the other day that I heard from a correspondent in Wisconsin, that his currant bushes had been attacked by a new kind of worm, that none of the neighbors had ever seen or heard of before. I may add here that Onondaga County, where both Dr. Smith and Mr. Bigelow reside, lies some 70 or 80 miles to the east of Rochester, and that Rochester is celebrated all over

*Kirby and Spence speak of "the Sawfly of the currant and gooseberry" as one and the same species. (Kby. and Sp. *Introd.* Letter 6.)

the United States for its very excellent and extensive nurseries.

I find in the *New York Tribune*, (July 27, 1866) the following statement which is apparently copied from the *Pittsburg Gazette*. It evidently refers to this same insect, and confirms the conclusion arrived at above. As to these worms ever "desisting and disappearing," that is very problematical. They may, and probably will, be worse some years than others; but wherever they have established themselves, there they will remain, in all probability, for ages and ages. The currants of infested bushes are likely enough unwholesome, but they can scarcely be "poisonous."

In the northeastern counties [of Pennsylvania] a worm has destroyed the currants, by rendering them poisonous; in multiplied instances killing the bushes. This pest was imported from England four years ago, by Barry and Ellwanger of Rochester, N. Y., on a lot of gooseberry bushes. It is about three-quarters of an inch long. It multiplies its progeny almost incredibly. These worms attack the leaves, which they entirely devour. By reason of the destruction of the foliage the fruit becomes unfit for use. These worms travel more than a hundred miles a year, and will probably plague the country before they desist and disappear.

The mode in which this insect has been transmitted, first from the European nursery to the American nursery, and afterwards all over the the country, may be easily explained. As has been already stated, it passes the autumn and winter in the ground under the bushes where it has fed, housed in a little oval cocoon from ¼ to ½ inch long. Hence if, as often happens, bushes are taken up in the autumn or early in the spring with a little dirt adhering to their roots, that dirt will likely enough enclose a cocoon or two. A single pair of cocoons, if they happen to contain individuals of opposite sexes, will be sufficient to start a new colony. The first and probably the second year the larvæ will not be noticed; but increasing, as almost all insects do, unless checked from some extraneous source, in a fearfully rapid geometric progression, by the third or fourth year they will swarm, strip the bushes completely bare of their leaves, and ruin the prospect for a good crop of fruit. Of course, like other winged insects, they can fly from garden to garden in search of a suitable spot whereon to deposit their eggs; so that any point where they have been once imported becomes, in a few years, a new centre of distribution for the immediate neighborhood.

Nurserymen and all others, importing Gooseberry and Currant bushes from a distance, should be particularly careful, before they plant them, *to wash t'e roots thoroughly in a tub of water, and burn or scald whatever comes off them.* By attending to this precaution the dessemination of this mischievous little pest, throughout the United States, may be greatly retarded for many years to come. For those who are already cursed with it, I cannot do better than to copy the very sensible directions of Mr. Bigelow:—

REMEDY.—Dig up all the bushes that cannot be personally attended, and trim the remainder so as to leave them open and accessible. Visit them at least once every day. Look for leaves with little holes in them. The little holes indicate the presence of the newly hatched worms, which are not seen unless the leaf is turned up, as they always begin on the under side. By destroying four or five leaves on each bush per day the whole may be saved, as only a few leaves are selected by the fly to deposit her eggs. The worms never touch the fruit, and the stripping of the leaves does not prevent a new growth the same season, but these will no sooner appear than they are destroyed."

In the annexed figure, which has been drawn from specimens kindly furnished to me by Dr. Smith of New York, the portion of the currant leaf marked (1) shows how the eggs are laid by the mother-fly on the under surface of the leaf along the principal veins. That marked (2) shows the "little holes" spoken of by Mr. Bigelow as bored by the very young worms; and that marked (3) the holes bored by larger larvæ. It is evident that such holes may be readily recognized, and the leaf, along with the minute larvæ upon it, carried far away from any currant or gooseberry bushes and left to wither there, or---to make assurance doubly sure---thrown into the fire. If, however, the young larvæ are removed a few rods away from any plant belonging to the botanical genus *Ribes*, (Currant and Gooseberry,) they will be sure to die of starvation. For they cannot feed on anything else, any more than a Locust-borer can live in an Apple-tree.

There is a very similar worm, which has long been known to infest Currant and Gooseberry bushes in the East, and which is not an imported, but a Native American insect. But it may be distinguished at a glance from the larva of the Gooseberry Sawfly by its being what is popularly called a "Span-worm" or "Measuring-worm" or "Looper," having only ten legs, whereas our larva has twenty legs, and never "loops" as it walks. Like all other "loopers," this worm produces, not a four-winged fly, belonging to the Order Hymenoptera, but a moth or miller, belonging to the Order Lepidoptera, which has been called by Dr. Fitch, who first described it, "The American Currant-moth (*Abraxas? ribearia*)."

THE NATIVE AMERICAN GOOSEBERRY SAWFLY.

But besides this imported Sawfly I have recently discovered that there is an indigenous species in the Valley of the Mississippi which feeds on the Gooseberry and Currant, but which differs from the other one in the following respects:—1*st*. It belongs to a different genus—*Pristiphora* instead of *Nematus*. The genus *Pristiphora* is chiefly distinguished from *Nematus* by always lacking what is technically termed the 1st submarginal cross-vein in the front wings of the perfect insect, so that, instead of *four* submarginal cells there are only *three*, the first very large. In the genus *Euura*, which is likewise closely allied to *Nematus*, there are also only three submarginal cells, but there it is the *second*, not the *first*, submarginal cross-vein that is lacking, so that the first submarginal cell, as in *Nematus*, is quite small. 2*nd*. The body of the larva is always green, and never bears the numerous black spots which, except after the last larval moult, always characterize the larva of the imported species. 3*rd*. The larva never goes underground to spin its cocoon, but constructs that cocoon among the twigs and leaves of the plant on which it feeds. 4*th*. The winged insect of the second brood comes out the same season, instead of lying underground all the winter in the pupa state, so that it cannot of course lay its eggs upon the leaves, but must necessarily lay them upon the twigs of the infested plant. Otherwise, if it laid them upon the leaves in September, which is the month in which the fly of the second brood appears, the eggs would be scattered to the four quarters of the compass, along with the leaves, far away from the infested bushes, at the fall of the leaf, and the young larvæ would starve when they hatched out next spring, and the species soon become extinct. Hence, in the case of this species we cannot apply the method of counterworking the other one recommended by Mr. Bigelow. For I particularly observed that the very young larvæ were not gathered in numbers upon one particular leaf—as in the imported species—but were distributed pretty evenly over the whole bush. Neither did they bore the similar holes through the leaf, which render the other species so easy of detection when young. 5*th*. The insect is but ⅔ the size of the other in all its states.

The first brood of this species I found had swarmed in prodigious numbers on some gooseberry and currant bushes, in Davenport, Iowa, about the end of June and beginning of July, 1866, so as to strip them almost completely bare. The owner of the bushes stoutly maintained that all the damage had been done *in three hours' time;* but that of course was a mistake, for the larvæ must have been feeding there, as I afterwards ascertained, for at least two weeks. His gardener, shortly before I visited him, had syringed the bushes thoroughly with a wash composed of whale-oil soap; and as the larvæ had all disappeared, with the exception of one or two individuals, he was strongly of opinion that they were all killed, horse, foot and dragoons. I told him that in all probability they had merely retired to spin up, and that he would have a second brood of them to afflict his bushes, shortly after the winged flies had appeared and laid their eggs for the second brood. In the middle of August I again visited these bushes, and just as I had anticipated, found a very plentiful supply of very young larvæ on them—enough, I should say, to strip them a second time of their leaves. From these larvæ I succeeded in breeding large numbers of the perfect insect, the description of which, as well as of the larva, is here subjoined.

PRISTIPHORA GROSSULARIÆ, new species. A black, four-winged fly, about the size of a common house-fly, the males and females not perceptibly different at first sight.

Female. Body shining black, with fine, rather sparse punctures. *Head* with the entire mouth, except the anterior edge of the labrum and the tip of the mandibles, dull luteous. Labrum transverse and very pilose. Clypeus short, squarely truncate, immaculate. Antennæ ⅔ as long as the body, joint 3 three and a half times as long as wide, joint 4 fully ¼ shorter than joint 3, 5—9 very slowly shorter and shorter; brown-black above, beneath dull luteous, except joints 1 and 2, which are black, tipped below with luteous. *Thorax* with the wing-scales honey-yellow and the cenchri whitish. *Abdomen* with the basal membrane whitish; ovipositor honey-yellow, its sheaths black. *Legs* honey-yellow, or sometimes pale luteous, with the six tarsal tips, and in the hind legs sometimes the extreme tips of the tibiæ and of the tarsal joints 1—4, pale dusky. *Wings* subhyaline, tinged with dusky; veins black; costa honey-yellow; stigma dusky, edged all round with honey-yellow, especially below. In a single wing of two females only out of forty-nine, the first submarginal cross-vein, which in this genus is normally absent, is quite distinct; and in a single wing of five other females, traces of it are visible on holding the wing up to the light. Length ♀ .17—.21 inch. Front wing ♀ .19—.23 inch. Expanse ♀ .41—.45 inch, (wings depressed.)

The *male* differs from the female only as follows:—1*st*. The antennæ are a trifle longer, and as usual vertically more dilated, joint 3 being only 2½ (not 3½) times as long as wide. 2*nd*. The coxæ, except their tips, and the basal half of the femora, are black; and in the hind legs the extreme tip of the tibiæ, and all but the extreme base of the tarsus, are dusky. Anal forceps honey-yellow. Length ♂ .17—.18 inch. Front wing ♂ .17.—19 inch. Expanse ♂ .35—.38 inch, (wings depressed.)

Described from four males and forty-nine females, bred September 2—12 from larvæ found on the cultivated gooseberry. I have also a single female in my collection which was captured at large in the woods; whence I infer that this insect feeds also on the wild gooseberry and currant. In this captured female the last submarginal cross-vein is only partly developed, and, as is in one or two of my bred females, the hind middle cell of the hind wing is absent. This is the first species of the genus *Pristiphora* hitherto described as North American. Stephens mentions eight species as found in England, none of which are said to feed on gooseberry or currant.

Larva. A pale grass-green worm, about ½ inch long, without any black dots on its body, and with a black head; after the last moult the head becoming principally green.

Immature larva. Length not quite reaching ½ inch. Body pale green, with a rather darker dorsal line, and a lateral yellowish line above the spiracles, the space below which line is paler than the back. Anal plate and prolegs immaculate. Head black, not hairy. Legs brown, except the sutures.

The mature larva measures ½ inch in length, and differs in the head being pale green, with a lateral brown-black stripe commencing at the eye-spot and more or less distinctly confluent with the other one on the top of the head, where it is also more or less confluent with a large central brown-black spot on the face. The legs are also green, with a small dark spot at the exterior base of each, and a similar spot or dot before the base of the front legs.

Described from forty larvæ of various sizes, four of which spun up August 26, and the others within

the next week. These larvæ were taken off the bushes August 12, at which date they were mostly about ½ inch long. I have little doubt that it is to this same insect that Mr. Huron Burt of Missouri refers, when he says that the gooseberries and currants in his neighborhood were all destroyed in 1865 by a "green worm." (See PRACTICAL ENTOMOLOGIST No. 11, p. 114.) If it had been the imported species, he would surely have spoken of the black dots or spots, which catch the eye at once in that larva. With the above two exceptions, and possibly the case in Wisconsin referred to above, it does not appear to be on record, that this indigenous species has ever occurred on anybody's bushes in such numbers as to attract attention. Yet that it has existed in the Valley of the Mississippi, and possibly in the Eastern States, for time immemorial, there can be no manner of doubt. For there is no species of the genus *Pristiphora* known to infect Gooseberry and Currant bushes in Europe; and consequently it could not have been imported therefrom into the United States.

Having procured all the above larvæ when they were so very small and young, that they could scarcely have been as yet attacked by parasitical insects, I am unable to say anything as to what particular species of parasites may check and control the undue multiplication of this species. But from the fact that this sawfly is so seldom noticed as a noxious insect, I should infer that there must be at least one indigenous Parasite that makes effective war upon it. In the case of Mr. Huron Burt's species—which I suppose to be the same as this—the insect seems to have been almost entirely extirpated, from some cause or other, for at least two successive broods.

On the one hand, then, we find a native-born American Sawfly, feeding on gooseberry and currant bushes, which has existed in the United States ever since the country was first settled up by the white man, yet was never noticed by any one, so far as I can find out, as a noxious insect till the year 1865, and then merely in a few scattered localities. On the other hand we have a European Sawfly, feeding on gooseberry and currant bushes, which has only been introduced into the United States five or six years, and then merely in small numbers, and yet has already almost put a stop to the cultivation of these plants in a large district of country in the State of New York, and is slowly but surely spreading in all directions—ruining the gooseberry and currant bushes wherever it goes, unless the greatest pains be taken to counterwork it. What is the cause of such a remarkable difference? Why, of two Sawflies feeding on the very same plants, and belonging to two closely allied genera, should one be comparatively innocuous and the other be a pest of the most destructive character? It is because the first belongs to the old-fashioned and less highly improved American Creation, and the last to the new-fashioned and highly developed Creation of the Old World. In every department of Organic Life the same law holds good. The White Man slowly but surely is sweeping the Red Man from off the face of the earth. The European Horse and the European Horned Cattle now roam in vast herds over large districts of America, where the more puny denizens of the soil were formerly the undisturbed sovereigns. Various species of European insects are slowly but surely following in the train of the White man, and occupying those places in the Scheme of the Creation which were formerly occupied by indigenous American species of weaker and less energetic constitutions. And even in the vegetable Kingdom, the robustly constituted plants of the Old World are slowly but surely overspreading America; and the daisy, the toad-flax, the purslane, the Jamestown weed, (Gympson weed), the pig-weed, and a host of others are gradually seizing hold of roadside and ploughed land and pasture fields with silent but irresistible force.

Dr. Fitch has observed that no American plant-feeding insect attacks the toad-flax (Linaria vulgaris), a European weed, which, as it appears, terribly infests many pasture-fields in the State of New York; and has speculated on the propriety of importing some of the European insects that are known to feed on it in its native country. He has also advised the importation of some or all of the three parasitic insects that check and control the excessive multiplication of the Wheat Midge in Europe. But we should not stop here. The principle is of general application; and wherever a Noxious European Insect becomes accidentally domiciled among us, we should at once import the parasites and Cannibals that prey upon it at home. Nobody can doubt that if the Lion and Tiger and Leopard of the Old World were imported into South America and allowed to increase and multiply there, they would greatly check the multiplication of the Horned Cattle and Horses that now range wild over the vast Pampas of that country, although our more puny American *Felidæ*, the Puma and Jaguar and Couguar, are unable to do this. And on the same principle, if we wish to fight effectually against those noxious insects which have been introduced among us from Europe, we must fight them by the instrumentality of the strong and energetic foes that make war upon them in their own country. To attempt to fight them with the poor old-fashioned indigenous Cannibals and Parasites of America, is like sending out a fleet of old-fashioned wooden ships to oppose a fleet of ironclads.

APPENDIX.

After an attentive study of a valuable Paper by M. Léon Dufour of France on the Sawflies of the Gooseberry and Currant, (*Annal. Soc. Ent. France*, 2nd ser. V. pp. 571—581,) I incline to the conclusion that there are but *two* species infesting these plants in Europe—and not *three* as is maintained by M. Dufour—and that it is the second of these which has been introduced among us. Here follows their synonymy, with my reasons for the conclusions arrived at. It will be observed that the two insects belong to distinct genera, and that our species, having been first described in the year 1819 by Klug, must, according to the law of priority, retain his specific name and be designated as *Nematus ventricosus*, Klug.

I. **Tenthredo ribis** Schrank. Quoted by Dahlbom *Clav. hymen. system* p. 36. Said by Dufour (p. 576) to belong to the genus *Coryna* of St. Fargeau, which is a pre-occupied synonym of the subgenus *Tenthredo* of Hartig. (See Brullé *Hymen.* p. 664.) Larva unknown to Dahlbom.

The larva of what is apparently the same insect, though Dahlbom refers it to his *Nematus grossulariæ*, is figured by Reaumur (V. p. 94 and Plate 10) as *La fausse chénille du groseillier* (the false caterpillar of the currant and gooseberry), and is described as 22-footed, (like the larvæ of most *Tenthredo*,) and as having no hairs proceeding from the black tubercles always found on the body before the last larval moult. See Dufour, p. 576.

II. **Nematus** [*tenthredo*] **ventricosus** Klug, *Berlin Magazin*, A. D. 1819. The perfect insect only described? Quoted by Snellen von Vollenhoven *Zijdscrift Entom.* 1859, as the authentic name of the species, the larva of which was in 1834 described by Bouché. Overlooked by Dufour.

Nematus [*tenthredo*] *affinis* St. Farg. ♂ and *Nematus* [*tenthredo*] *3-maculatus* St. Farg. ♀, *Monogr. Tenthr.* p. 69, A. D. 1823. Evidently described from the perfect insect only. Quoted by Dufour as identical with his species.

Nematus [*tenthredo*] *ventricosus* Klug. The larva is described by Bouché *Naturg. Inseckt.* p. 140, A. D. 1834, as bristly and with black tubercles, the dorsal ones "mostly on each segment in three transverse rows." His description evidently applies only to the larva before its last larval moult, after which it always, or at all events often, loses the tubercles and hairs and becomes entirely green; for he gives the length of the larva as only seven lines. It is said to swarm upon both Currant and Gooseberry bushes. Entirely overlooked by Dufour.

Nematus grossulariæ Dahlbom. (l. c.) A. D. 1835. Larva said to be 20-footed, and with hairs proceeding from the dark tubercles always found on the body before the final moult. Also said to change to green after the last moult. On Gooseberry. Quoted by Dufour.

Nematus grossulariatus Dahl. (*Ibid.*) Also on Gooseberry. Supposed by Dahlbom to be a distinct species, although he says himself that the perfect insects are as like as one egg to another, merely because the larva spins its cocoon on the leaves of the infested plant, instead of going underground to do so. M. Dufour found some of his larvæ to do the very same thing, although they all produced the same imago. (pp. 572—3.) Hence he very justly infers that *grossulariatus* is a mere synonym. We might as well make two species of the Wheat-midge (*Diplosis tritici* Kby.), because some few of the larvæ construct their cocoons in the ear of the wheat, instead of going underground for that purpose.

Nematus ribesii Stephens, *Ill. Brit. Ent. Mand.* VII, p. 32. A. D. 1835. Description very imperfect, the larva not being described, and nothing being said as to which sex of the perfect insect is described. On Red Currant. Entirely overlooked by Dufour.

Nematus ventricosus Klug. Hartig Aderfl. Deutsch. I, p. 196, A. D. 1837.

Nematus ribis Leduc, *Mem. Soc. Sc. Natur. Seine-et-Oise* II, Plate 1, fig. 5, Plate 2, figs. 1—2. A. D. 1846? On White and Red Currants. Quoted by Dufour.

Nematus ribis Leduc apud Dufour, l. c. A. D. 1846. On Red Currant. M. Dufour describes the larva before its last larval moult so as to agree exactly with Bouché's description, except that Bouché says nothing of the anal plate being black. In particular he says that "each segment has *three* rows of black tubercles transversely arranged;" (p. 574;) which, by the way, is not strictly true of the three thoracic segments in our New York species.

M. Dufour assigns the following reasons (p. 577) for believing his *Nematus ribis* to be distinct from Dahlbom's *N. grossulariæ:* 1*st*. He says that his larva lacks the two anal prolegs and is 18-footed, not 20-footed. But he allows (p. 574), that there is a bilobate projection on the anal segment, which is used by his larva to walk with, and this is about all the anal proleg that I have seen on any *Nematus* larva. 2*nd*. He finds in his larva, before its last larval moult, a dark plate with pointed angles on the dorsum of the last segment, which Dahlbom says nothing about. As this plate is expressly said to disappear afterwards, it might likely enough have escaped Dahlbom's notice. It is very obvious in our American New York larva. 3*rd*. Dahlbom describes the tubercles on his immature larva as piceous-black, and Dufour says they are coal-black in his. This is splitting hairs with a vengeance. 4*th*. Dufour finds no trace in his larvæ of a dorsal green line described as existing in Dahlbom's larvæ. The ground-color of the larvæ being pale green, and "the middle tubercles on the back forming two rows," as Bouché correctly states in his description, this is scarcely worth talking about. 5*th*. Dufour says that there is a notable difference in the distance between the eyes of the two larvæ, (*une différence notable de taille entre les yeux*.) This is probably based upon Dahlbom's figures, which may be not perfectly correct. 6*th*. Dahlbom's larva fed on the Gooseberry and Dufour's on the Currant. But our American insect, as has been shown above, feeds indiscriminately upon both plants; and Bouché expressly states that *ventricosus* Klug occurs "in two generations in May and then again in July and August, *on Gooseberry and Currant bushes*, which they often eat up almost entirely." 7*th*. Dahlbom describes the cocoon of his species as having an external envelop of thin network. Dufour can see in his cocoon only "filaments which seem to cross one another on its flanks to fix it to its place." (p. 579.) This is a distinction almost without a difference. As regards the perfect insects, it is not stated that there is any difference whatever.

M. Dufour contends that descriptions must be rigorously interpreted, without making any allowance for variations, whether geographical, phytophagic or otherwise, or for possible oversights or inaccuracies in the describer. But that even M. Dufour himself is sometimes inaccurate, may be inferred from the following facts:—1*st*. He describes the wing-scales of his insect as "black" and the ground-color as "luteous or luteo-rufous;" (p. 579;) whereas it is contrary to the general law of coloration in *Tenthredinidæ*, that the wing-scale should ever be black except where the body is almost entirely black. In our American insect it is luteous in both sexes always. 2*nd*. He says that in his larva the abdominal prolegs "occupy the six segments which follow those of the thorax;" (p. 574;) whereas in all Tenthredinidous larvæ, even in those which are 22-footed, the segment immediately behind the thorax is always destitute of prolegs.

Nematus [*Selandria*] *ribis* Winchell. *Am. Jour. Sc. Arts*, Sep., 1864, p. 291. Like Bouché, this author in his description has entirely overlooked the normal or occasional change in the larva, after the last moult, from green dotted with black to pure green, and like Dufour and Stephens, he states that it feeds on the Red Currant, without being aware that it also feeds on the Gooseberry.

[FROM A LETTER FROM ISAAC HICKS, N. Y.]

We want your Paper to go ahead, so as to expel all such errors as boring into trees and putting in sulphur. In 1860, having heard of this sulphur humbug, and thinking it would be but little trouble to try the experiment, I bored about six half-inch auger holes into my peach trees. Well, they lived a few years, bore a few peaches, and the effects of the Curl and Yellows soon sent them to the woodpile. One day my man called me in great earnestness to come there quick to the woodpile; he had something wonderful to show me. And sure enough he had been cutting up the trunks of my unfortunate peach-trees, and had come across the auger-holes made four or five years previously and filled with sulphur. It was perfectly incomprehensible to him, how that yellow stuff ever got there. Now, as these trees lived several years after they had been bored and the holes filled with sulphur, and as the sulphur was still there when they were cut up for fuel, it is plain that the sap cannot take up the sulphur and carry it away, out of the auger-holes in which it was originally placed, into the branches, twigs and leaves; which is assumed to be the case by the believers in the "Sulphur-cure."