

Entomology.

The Joint Worm.

In the last number of the "Practical Entomologist" (published by the Entomological Society of Philadelphia), there is a long article—much too long for insertion in its entirety in our columns—commenting on our observations respecting the Joint-Worm, (*vide* CANADA FARMER, Vol. II, No. 19, p. 297.) The following extracts will enable our readers to judge of the importance which is attached by Entomologists to the smallest particulars respecting our insect enemies; and to perceive how much valuable assistance they can render us and the community at large, by carefully watching the depredations of such insects as come in their way, and sending us the results of their observations.

"The above paragraph from THE CANADA FARMER, throws some considerable light upon a subject of great practical importance to the Agriculturist, which has never yet been fully elucidated. For many years back it has been known that whole fields of wheat, rye, and barley have been destroyed in the States bordering on the Atlantic, by a minute insect popularly called the "Joint Worm." All accounts agree in stating that this so-called "worm" is found in considerable numbers, imbedded in a small, gall-like swelling in or immediately above the second joint of the straw, or at all events some joint not far from the ground; and that, in consequence of its operations, the portion of straw above the gall-like swelling withers and comes to nothing. This "worm" of course must, in all probability, be the larva of some insect; but to what Species, to what Genus, and even to what Family and Order it belongs, is at present wrapt in obscurity.

Both Dr. Fitch and Dr. Harris were originally of opinion that the Joint-Worm was the larva of a *Cecidomyia* or Gall-gnat, the same genus of insects to which appertain the common Hessian Fly and the Wheat-midge. Subsequently, however, because from a large quantity of the diseased straw they never bred anything but *Chalcis* flies, they both of them came to the conclusion that it must be the *Chalcis* flies that were the cause of the disease. And yet it is notorious that the *Chalcis* family—to which appertain the genus *Eurytoma* mentioned in the extract from THE CANADA FARMER—are generally parasitic upon other insects; and that, although hundreds of species of them are known to entomologists, in no one instance has it yet been satisfactorily proved, that any one of them is other than parasitic in its habits.

We have referred this subject to Mr. Benj. D. Walsh, of Rock Island, Illinois, who has paid special attention to the Natural History of Galls,* and has published Papers in our Proceedings, on the Galls of the Willow and Oak."

The article then gives Mr. Walsh's opinion on the subject. He first states his reasons for believing that the "Joint-worm" is the larva of some Gall-gnat, and not of a *Chalcis* fly, and then proceeds as follows:—

"Let us recur now to the extract from THE CANADA FARMER, in the light of the above suggestions, which I offer, not by any means as a complete solution of the question, but as mere opinions formed from the very incomplete evidence which has as yet been published. Three things are tolerably plain from this extract—1. That the 'two small sections of wheat-straw, in which are imbedded pupæ' and which are located generally 'on the second joint of the straw,' are true Joint-worm galls. For if the pupæ had been those of the Hessian fly, it would not have been necessary to make a 'section' of the straw in order to exhibit them, as the pupæ of the Hessian fly always lies, not *inside* the straw, but between the straw and the shank of the leaf that envelops the straw above every joint. 2. That the 'tiny little flies' bred from the pupæ found in the wheat-straw from Canada are *Chalcis* flies, probably belonging, not to the *Eurytoma* group, but to the *Pteromalus* group. 3. That they 'ate their way out of the sides of a certain pupa' found in these 'Joint-worm' straws, and consequently that they must be, not gall-makers, but parasites like all other *Chalcis* flies whose natural history is accurately known. Whether that pupa is the pupa of a Gall-gnat, or of a Gall-moth, or of a Saw-fly, or of a Gall-fly, can be readily and certainly determined from the simple inspection of a

single good specimen either dead or alive. But the particular genus and species to which the insect belongs, can only be found out by actually breeding the living pupa to the perfect state. For these two purposes I most earnestly solicit the gentleman in Cobourg, or the Editor of THE CANADA FARMER, to mail me immediately a few specimens of the pupæ spoken of in the above extract and the flies bred from them, packed in any small, stout, paste-board box in cotton wool, so that they may not rattle about and get broken on the road; and so soon as Spring opens and the supposed Joint-worm galls have nearly got their growth, to mail me every three or four weeks, enclosed in oiled silk to prevent their drying up, a fresh supply of them, roots and all if practicable—say a good large handful at a time—until I notify him to stop, which I engage to do as soon as ever I have attained my object. This may seem unnecessary trouble and expense; but it is absolutely necessary for the end which we all of us have in view. In order to breed Gall-gnats with success, it is essential to have fresh galls from time to time; for by no method known to me—and I have tried dozens of different methods—can these delicate insects be kept alive any length of time in the Breeding-vase."

Should our Cobourg correspondent be willing to accede to Mr. Walsh's request—as we trust he will—he can send specimens of the diseased wheat by mail at a very trifling expense. The following is the Post Office regulation for such matter:—"Packages of seeds, cuttings, &c., may be posted in Canada for delivery within the Province, or to an address within the United States on prepayment by postage stamp of a rate of one cent per ounce." No communication, whether written or printed, must be enclosed in them; but the nature of the contents must be marked on the outside, in order that the package may go at the reduced rate.

—In a matter of such importance, affecting such vast interests both in this country and in the United States, it is surely the duty of every one who has the opportunity, to do all in his power to increase our knowledge respecting these tiny foes, and thus render assistance towards the discovery of efficacious remedies. We know of no one better qualified than Mr. Walsh to make use of information contributed from various quarters, and to deduce from it results of practical value. We trust that any of our readers, who have observed their wheat attacked in a similar manner to that described by our Cobourg Correspondent, will also favour Mr. Walsh with specimens of it.

ERRATA.—No. 19, page 279—article, "Walking-stick Insect," for "*Bacumentus*" read "*Bacunculus*." *Ibid.*—Article, "Wheat-Joint Fly," for "*Eureptoma*" read "*Eurytoma*."

No. 20, page 311—article, "The Turnip Caterpillar," for "specimens of an (*Ophion*, etc.)," read "specimens of an *Ichneumon* (*Ophion*, etc.)"

Poultry Yard.

Fattening Table Fowl.

At the approach of Christmas we usually receive many queries respecting the best method of fattening fowls for the table. In reply, we cannot do better than quote the following very practical directions from Mr. W. B. Tegetmeier:

The place in which poultry are fattened should not be close, but should be free from drafts of cold air, and kept at a moderately warm and uniform temperature; the roof, therefore, if of tiles, should be thickly lined with straw. Quietness being so especially desirable, it should be so situated as not to be accessible to those fowls at liberty; and should be partially darkened, if possible. It is also important in the highest degree that it should be perfectly dry, as it is scarcely necessary to add that a fowl suffering from cold and inflammation is not likely to fatten, and it must be kept scrupulously clean. The fattening coops should be two feet six or eight inches high in front, and about two feet deep, with a boarded roof sloping backwards, the back and ends should be closed, and the bottom made of flat bars with rounded edges, two inches wide at the top and narrower beneath, so as to prevent the dung sticking to the sides. It is very important that the bars should run from end to end of the coop (not from back to front), as the fowls cannot stand towards the front when they are in the

latter position, and they should be two inches apart on the upper sides. The front of the coop should consist of rounded bars, three inches apart; two rods connected together by a loose cross-piece below, and sliding through holds made in the roof, will be found more secure than a door, as it cannot be left open by a careless feeder. Before the front should run a ledge to support the feeding-troughs, which are best made by joining two pieces of wood at a right angle, and securing the ends by letting them into grooves in stout end pieces.

The coops should be raised on legs so far from the ground that the droppings underneath can be scraped up every day; the most scrupulous cleanliness must be observed, otherwise disease will be produced. The coops, therefore, should be frequently lime-washed with freshly slaked lime and water, and then thoroughly dried, before a fresh batch of fowls are introduced. In cold weather, the front should be covered up with matting, or some other warm material, at night. The length of the coop must depend on the number of fowls that it is required to contain; but it is not advisable to place more than ten or a dozen together; and if strange fowls are put up, care must be taken that they agree well together, as otherwise the constant excitement would prevent their fattening. It occasionally happens that fowls are infested with lice to such a degree that they become irritable, and refuse to fatten; in these cases a little flour of brimstone dusted under the feather before cooping them, immediately expels the vermin. The age at which fowls should be put up to fatten is a very important consideration. When a pullet has once laid, she cannot make a first-rate fowl for the table. She should, therefore, be cooped before she shows symptoms of laying. The young cocks should be put up when the curved sickle-feathers of the tail begin to show beyond the straight feathers, or, as the country women say, when the tails begin to turn. If these ages are exceeded, the birds do not fatten so readily, and the flesh is not equal in tenderness and delicacy to that of younger birds. The best food for fattening poultry is sweet, fresh oatmeal or barley-meal, mixed either with scalding milk or water. Cooped fowls should be supplied with fresh food three times a day—namely: at daybreak, or as soon after as possible; at mid-day, and again at roosting time. As much as they can eat should be given on each occasion, but no more than can be devoured before the next meal; should any be left, it should be removed and given to the other fowls; as, if kept it is apt to become sour, when the birds will not eat it freely. The troughs for the soft meat should be scalded out daily, which can only be done conveniently by having a supply of spare ones. In addition to soft food, a supply of fresh, clean water must be constantly present, and a little gravel must be given daily, otherwise the grinding action of the gizzard, which is necessary to the due digestion of the food, does not go on satisfactorily. The supply of a little green food will be found very advantageous to health; a little sliced cabbage, or some turnip-tops, or a green turf to peck occasionally, being all that is required. A variation in the diet will be found very conducive to an increased appetite, and therefore the occasional substitution of a feed of boiled barley for the slaked oatmeal is desirable. Some feeders have a division in their troughs, or, still better, a small extra trough, which always contains some grains for the fowls to peck at.

Should the birds be required very fat, some mutton suet or trimmings of the loins may be chopped up and scalded with the meal, or they may be boiled in the milk or water preparatory to its being poured over the food, and the fat of fowls so fattened will be found exceedingly firm. In the course of about a fortnight to three weeks, at the utmost, a fowl will have attained, under this system of feeding, the highest degree of fatness of which it is capable; and it must then be killed; for if the attempt be made to keep it any longer in that state, it becomes diseased, from an inflammatory action being established, which renders the flesh hard and even unwholesome. When the fowls have arrived at a state fit for killing, they should be kept for twelve or fifteen hours without food or water, in order that the intestines may be as empty as possible, otherwise the bird turns green and useless in a short time. An objection to this mode of fattening will probably be made—namely, that it is expensive, owing to the cost of oatmeal. Barley-meal may be substituted, but it is not equally efficacious, and we strongly doubt whether it is any cheaper in the long run, as we believe that a fowl may be fattened at the same, or even less, cost on oatmeal than on barley-meal. In situations where good, sweet Indian corn meal can be obtained at a low rate, it will be found to answer quite as well as oatmeal; it contains a very large amount of oil, and it is invariably used in the States of America as a food for all animals put up to fatten. Wheat-meal is too expensive, but some small tail wheat is far superior to barley to place in the trough, as whole grain for the fowls to pick at.—*The Field.*

*It may be incidentally remarked here, that all unnatural or diseased growths upon plants, no matter what their shape or colour, which are caused by insects, are technically termed "Galls," by Naturalists.