

In trying to throw light upon an obscure explanation in our text-book, my brain took fire, I plunged with quickened zeal into a subject which I had for years abandoned, and found food for thoughts which have engaged my attention for a considerable time past, and will probably occupy all my powers of contemplation advantageously for several months to come.

OUR INSECT FOES

AN important conference was held at the Society of Arts on Tuesday afternoon on the subject of insects injurious to agriculture and methods of stamping them out. Its origin was a proposition by Mr. Andrew Murray (who has had the arrangement of the collection of economic entomology made by the Science and Art Department), which he laid before the Lord President of the Council. The proposition was printed by order of the president, and copies were sent to the agricultural societies and chambers of agriculture of the country. After the proposition had been before them for two months and there was no indication of any notice being taken of it, it was arranged that a conference of delegates of agricultural societies should be held at the Society of Arts. The Duke of Buccleuch, K.G., took the chair, and there were present representatives of the Scottish, Cheshire, Warwick, Hampshire, and Banbury Chambers of Agriculture; the Farmers' Club, Dr. Maxwell Masters, representing the president of the Royal Society, Prof. Voelcker (chemist to the Royal Agricultural Society), Mr. Sewell Reed, M.P., &c. The conference was opened by a paper read by Mr. Murray.

The paper commenced by assuming as an axiom that, besides the occasional great injury done by insects, by which whole districts are ravaged, a continual drain is constantly kept up by them, which constitutes a very perceptible percentage of deduction from the cultivators' profits; and, further, that where this loss can be prevented at less cost than the loss it occasions, it should be prevented.

It next maintained that, if we wish to rid a district or a country of an injurious insect, to be effective, any attempt to do so must be simultaneous and combined, for to what purpose would it be if one man cleared his farm if his neighbour did not clear his; or if the one cleared his one year, and the other cleared his another? A central authority, therefore, is needed to secure united action.

It next considered the various ways in which the insects injurious to agriculture might be extirpated. The first, the simplest, the most powerful, and the most efficient of these is county or district rotation of cropping. Farmers know well enough the advantage of a rotation of cropping (or its equivalent) on their own farms. By long-continued growth of the same crop on the same land the soil becomes exhausted of some of the elements necessary for the proper development of that kind of crop, and a change of crop brings other elements into use, and relaxes the demand upon those that have been too much drawn upon.

Exactly the converse of this takes place with regard to certain insects. The great majority of vegetable-feeding insects do not feed on all kinds of plants indiscriminately; most of them are restricted to one kind of plant, and if by cultivation of that plant its numbers are enormously increased, so will naturally be the number of the insects that feed upon it; while, if we should cease to grow that plant, the number of the insects would correspondingly diminish. Thus, for instance, if a district is almost entirely in pasture, there will be very few wheat-feeding insects in it, but if it is turned into a wheat country they will be myriads. If these numbers reach such a pitch as to deteriorate the crops the remedy is plain. Change the rotation, and grow some other crop instead of wheat.

Most of the wheat insects are only annuals. If they could be banished for one year they would be banished entirely, or until re-introduced. Now, if there were a controlling authority, what would be easier than to say to the farmers, "Gentlemen, in the common interest you will substitute barley for wheat in your next year's rotation." The insect, deprived of its proper nidus, must then either lay its eggs in an unsuitable place where they will perish, or have recourse to the pasture fields for *Triticum repens*, or other suitable grasses. By this, of course, the fly would not be exterminated, but its numbers would be so reduced as to render it comparatively harmless, at all events for a time, when, if it again reappeared in force, the same means of defence would be resorted to. Nay, it might be so arranged that two or more counties might brigade themselves together, so as to establish a permanent see-saw by which they should play into each other's hands. But no single man can carry out such a rotation. He may try it upon his own fields, but they will be replenished continually from the fields of his neighbours, unless they at the same time are compelled to follow the same rotation.

Mr. Murray then went over the various other means of extirpation—picking and burning infested plants, the collecting caterpillars, poisons, and local remedies, in relation to which he drew attention to the destruction of what are called ticks and lice upon sheep. Everyone knows how readily such vermin can be communicated by contact or even proximity, and it does seem a very hard case that a man, who has kept his flock clean by taking proper precautions, should be liable to have them infested by a neighbouring neglected flock, by stray sheep, or even by sheep passing along the road. It is said that, *ceteris paribus*, the difference in value between a sheep that has been kept clean for the season and one that has been worried by vermin will be 20s. If that is so it is a wonder that sheep farmers have not long since clamoured for some supervision.

At the conclusion of the paper the following resolution was put from the chair and carried:—"That thanks are due to the President and Lords of the Council for having brought the subject of insect damage under the consideration of the agricultural bodies of the kingdom."

Dr. Maxwell Masters moved the next resolution, and in doing so said he was charged to express the regret of the President of the Royal Society that he was unable to be present. He spoke of the great ignorance throughout the country on the subject of insect damage, and as an indication of the amount of damage done, said that half the time of the Scientific Committee of the Royal Horticultural Society was occupied with answering inquiries from all parts as to how to deal with insect foes. The resolution he moved was,—“That much of the loss occasioned by insects is preventable, and ought to be prevented.” This was seconded by Mr. Maclagan, and carried.

Mr. Mechi then moved—"That it properly belongs to Government to provide the necessary means for protecting cultivators from this loss, as it is only by combined and simultaneous action over considerable districts that it can be effectually done, and Government alone possesses or can obtain the requisite means of enforcing such action."

Both Mr. Mechi in moving it and Prof. Voelcker in seconding it, spoke of the want of knowledge throughout the country on the subject. Mr. Sewell Reed urged it was not a question for government but for agricultural societies. The resolution was declared carried, though many hands were held up against it.

The last resolution was—"That the President and Lords of the Council and the Agricultural Societies of the United Kingdom be informed of the opinion of this Conference, and urged to take the subject at once into their consideration, with a view of providing a remedy," which, after a long discussion, was carried.