

and he publishes the following in support of his recommendations—"Professor Linter, entomologist of the State of New York, in a recent letter says that in his opinion fruit growers who do not use Paris green as a remedy against caterpillars infesting fruit trees are guilty of culpable negligence."

Mr. Jabez Hogg goes out to intimate that "fruit growers may save themselves all the trouble and expense of springing by the preservation of our feathered friend" and if they neglect this, "retribution" will surely come, when

"Hosts of devouring insects crawled and found
No foe to check their march, till they had made
The land a desert, without leave or shade."

These lines admirably represent what has already come in districts where birds are cherished and preserved, therefore not as a "retribution." A "foe" is obviously needed to, we will say, assist the birds to "check the march" of the devouring pests which crawl and eat till not a leaf was left.

A great lover of fruit and birds found he could not have both on his bushes together, because the birds eat all the bush in spring, and in summer devoured his strawberries. "Oh! net the beds and bushes," say the bird preserver. But is precluding birds from food "preserving." Is it not more like starving them? The gentleman in question did, however, not from birds, and very thoroughly. He had the trees and bushes in a large square in his garden, which he enclosed in a huge wire cage, with doors for ingress and egress. The fruit cage is tall enough for a tall man with a tall hat to promenade amongst the trees and bushes, and there is plenty of fruit on them.

Now, please note, with the object of learning whether he could have fruits without birds, he determined to exclude them at all times. Here is the curious result before the enclosure his gooseberry bushes were defoliated with caterpillars, but now they are free from the pest. He confesses he cannot account for the change, but has been driven to the conclusion that "there is a good deal of sentiment in the feathered friends' fraternity," and intends keeping his fruit cage closed throughout the year. It is not quite safe to dogmatise on these things.

Mr. Campbell of Glewston and his gardener have done good service to fruit growers in the discovery they made of the favourite nesting places of the insects, the consequence being the destruction of millions of eggs.

It is better not to disguise the fact that Paris green is dangerous. An entomologist writes in a letter before me that, owing to the insolubility of the substance, "grains of it are sure to lodge in the angles of twigs and branches, within buds, &c. and the probability is that afterwards, as the drying process is completed, these may be wafted through the air to the injury of persons approaching the trees operated upon. Again, there is to be considered the effect of this patent article upon the trees; first, in its being applied to branches and foliage; secondly, by its descending to the roots, for in the spraying process some of the liquid must fall on the soil below. Chemists and fruit-growers whom I have consulted are unanimous against its use, and there is really no difficulty in finding washes, which though less poisonous, are quite efficient in caterpillar killing."

Hertfordshire and Gloucestershire fruit growers will be very delighted to know what the washes alluded to are. Hellebore, petroleum, alum, quassia, and, as far as I know every thing else that has been recommended have been tried, and while several preparations destroyed the gooseberry caterpillar, they have had no such effect on the larvæ of the winter moth. The tenacity of life of these caterpillars seems remarkable. Immersion in strong solution of hellebore (8ozs. to the gallon) did not kill them. They crawled about in petroleum and water stronger than could be applied to trees. Mr. Wise of Toddington says they "enjoy alum." Mr. L. Castle has had

them alive in Paris green water for twenty minutes. Nothing appears to kill them by contact except perhaps, quassia, and soft soap, and this has not been found efficacious at Glewston. The last recorded formula from there is 10 lbs. quassia chips and 7 lbs. of carbolic soap boiled together and mixed with 5 ozs. of Paris green with 100 gallons of water. That has answered so well both against the caterpillar and insects that it will probably be the concoction in the future.—From a paper by Mr. J. Wright, in the *Journal of Horticulture*.

DE OMNIBUS REBUS.

Practice with science.—I fancy many people connected with the experiment-stations in the States are in danger of making the mistake of placing science before practice in matters concerning farming. It would be well for the readers of the numerous bulletins that proceed from these establishments to remember that practice, in almost every case, has been in advance of science in the application and use of manures and of the different foods given to the stock of the farm. For instance: *bones* were used as a manure for roots nearly a hundred years before science explained that their efficacy was due to the phosphoric acid they contained; we did not need the investigations of the stations to teach us that pease and other leguminous plants increased the proportion of lean meat in our fattening animals, for English farmers had always used gray-pease for their bacon-hogs, and lambs had white-pease in troughs given them when being prepared for market, while older sheep had beans, and bullocks, beans, lentils and oilcake, long before science taught us that the increase of muscle was due to the nitrogen contained in these foods.

Did science find out the value of linseed-cake for feeding cattle? By no means: a poor man's cow was observed to frequent a spot in the rear of an oil-mill, at Hull, Eng., where the refuse of the crushed linseed was daily thrown. The cow got so fat that the butchers were soon after her, and when slaughtered, she was so full of suet that her reputation was spread abroad throughout the district. Enquiries were instituted as to the source of this accumulation of adipose, and the cow's footsteps were soon tracked to the mill and the cause of her thriving exposed. From Hull, the use of cake soon ramified throughout England, but science could take no credit for its application.

And the same with rape-cake: When Lord Leicester, in the early part of the 19th century, set about improving the then almost barren sands of his Holkham estate in Norfolk, which then let for 5s. an acre; seeing that linseed cake fattened cattle and sheep, it struck him that it would also fatten land, but finding it too expensive to be used as a manure, Lord Leicester bethought him that the refuse of another oil-plant, *rape*, would probably have the same effect as the more costly material. Rape-cake was tried, and succeeded beyond expectation: thus, with bones for the root-crop, fed off *in situ* by sheep eating linseed-cake, rape-cake for the wheat crop, and the farm-yard manure mixed with manure for the clover, the celebrated Norfolk, or four-course cropping system, was instituted, and the land raised in value from 5s to 35s an acre, which latter rent was customary on the estate when I left England 33 years ago. But science had nothing to do with it: the use of the materials of improvement was purely empirical, that is, experimental.

When Lawes, too, showed by his experiments at Rothamsted that Liebig's theory: The crops on a field diminish or increase in exact proportion to the diminution or increase of the mineral substances conveyed to it in manure: was abso-