

they require a great quantity of white bedding. Secondly, a great quantity is wanted for food, being mixed with green leaves of the root crop and smashed Turnips. Thirdly, a ton per acre is used in Clover and Vetches, into imperfectly dried hay, with a due admixture of salt to arrest fermentation. These uses fully take up all the straw which I grow. I think the methods employed in preparing the manure from the "boarded" cattle deserve mention.

First the liquid manure flows into large tanks; below them is another, which I call the mixing tank, for in it the manure is diluted with water to any degree which the state of the weather may require, the rule being that, in proportion to the increase of temperature must be the increase of dilution; i. e. the hotter the weather, the weaker should be the manure applied. In order to avoid the expensive and often injurious water-cart, I have laid down over the highest part of my farm a main of green Elm pipe, of 2 inches diameter, bored in the solid wood; at every 100 yards distance is an upright post, bored in the same manner, with a nozzle. A forcing pump fixed at the mixing tank discharges along these pipes, buried two feet in the ground, the fluid with a pressure of 40 feet; of course it rushes up these pierced columns, and will discharge itself with great velocity thro' the nozzle; to this I attach first of all 40 yards of hose, and therewith water all the grass which it can reach. To the end of this hose another forty yards of hose are attached, and a still larger portion of the surface is irrigated. At the first upright, the nozzle is plugged, and the fluid is discharged at the 100 yards distanced column, and so on. For this application of the hose I am entirely indebted to that most able man, Mr. Edwin Chadwick; the green-elm pipe is my own contrivance. The cost of the prepared canvas hose, which was obtained from Mr. Holland, of Manchester, was 1s. per yard; the wooden pipes cost me only 1s., and being underground, they will be most enduring. By an outlay of £30, I can thus irrigate forty acres of land; and see how inexpensive, compared with the water-cart and horse, the application! A lad of fifteen works the forcing-pump; the attaching the hose and its management require a man and a boy. With these, then, equivalent to two men, I can easily water two acres a day, at the rate of forty hogsheads per acre, of the best manure in the world; I say best, because all chemists will assure you that the liquid contains the principal nitrogenous and soluble salts, and therefore is far more valuable than the dung, and it is plain enough to every man, though he be no chemist, that plants can only take up the manure in a liquid form. The principal use which I make of the hose is to water the clover, and, above all, the noble, but this day much-decried, Italian rye-grass. How hard Mr. Woodward was upon its soft weed herbage! Yet

his own excellent principle, that you must carry back to the land an equivalent for what is taken away, may be successful, alleged in defence of this most productive and nutritious of all grasses. It is certainly true that, if you cut and carry away Italian rye-grass, and do not also carry back the manure made in eating it, you will not be able to grow wheat after it. But from my own observation, I know that, if after each cutting the hose immediately follows, you may cut it without wrong to the land as often as you like, and an amount of fodder will be obtained which no other plant can approach. It comes the earliest, and grows the longest of all the grasses; and I feel confident that with such appliances as I have mentioned, you may secure fifty tons per annum of this milk-giving, fat-producing, muscle-making grass. I can refer to Mr. Dickenson of Curzon-street, as an authority for growing, at least, this weight of green food, and I believe far more. That you can cut it, by the help of liquid manure, six times a-year admits of no doubt. I must now advert to the treatment of the dung made by the cattle and pigs. That on the boards is hourly swept down, and wheeled away to a long covered shed; contiguous to this is another shed, containing a large store of burnt earth and other ashes. The dung is worked up with the ashes, and therewith is mixed the other manures, dissolved bones, soot, powdered chalk, &c. This, about eight or ten cart-loads per acre, is carted to the field ready for turnip sowing. The manure is drilled in by one of those that deliver most manure, and thus eight acres can be got over in a day drilled on the flat. If the field is very poor, the drill goes over four acres in the morning without seed; in the afternoon the same quantity is again deposited in the same ruts, and the seed upon this double discharge. The advantage of this is, that the dung is never exposed to the drying of the sun or air; that the seed being deposited over a moist bed, germinates immediately in the driest season, and cares not for the fly. The pig manure I consider the best of all, because one-half of the corn I feed them on is in the shape of beans, which contains the best mineral ingredient for growing Swedes, as I have endeavoured to set forth in my "Lecture on Manures."—These, gentlemen, then, are the principal points of the practice which has brought me into that pleasing embarrassment of which I spoke before, and which I wish may befall you all—more manure than you can safely put on your arable land.

(To be continued.)

From the Farmers' Gazette.

## CHEMICO-AGRICULTURAL SOCIETY OF ULSTER.

COUNCIL MEETING.

*The Turnip Crop.*—Several exceedingly interesting communications were read to the meeting, by Dr. Hodges, respecting the turnip crop, and the depredations

which had, during the past months, been committed by various kinds of insects. He exhibited specimens of the larva of a moth, which had been forwarded to him by Mr. Cope, steward to the Marquis of Downshire, at Hillsborough-park. Mr. Cope's communication mentioned, that frequently 25 or 30 of these caterpillars were found on the soil surrounding the turnip. The turnips were grown on guano and farm-yard manure, and were 21 inches apart. Dr. Hodges also read a letter from Dr. Clarke, of Templepatrick, on the ravages committed in that neighbourhood, by insects. It stated, that these insects had attacked both cabbages and Swedes simultaneously, about six weeks ago; but none of them had been observed on the rough-leaved turnips.—In reference to this communication, Dr. Hodges stated, that he had submitted specimens to Mr. Patterson, vice-president of the Natural History Society, who had kindly forwarded them to Mr. Spence, president of the Entomological Society, and that he had been allowed to communicate to the meeting the interesting reply of that distinguished naturalist. The following is an extract from Mr. Spence's letter:—

"I have written to Mr. Clarke, Templepatrick, in reply to his letter, with specimens of the aphides infesting their Swedish turnips, which are, to all appearance, *Aphis brassicae*, known to be often very injurious to this crop, though I have not heard of its doing much mischief in England this year. In Suffolk, they are suffering from the attacks of the larva of a moth (*Agrostis segetum*). The caterpillar which Mr. Clarke sent, was evidently the larva of one of the aphidivorous flies; and is, therefore, one of the farmer's friends, and to be encouraged, not destroyed, as are the little flies Mr. Clarke refers to, which are, doubtless, species of some of the eight or ten genera of minute parasitic hymenoptera which lay their eggs in the bodies of the aphides. I am quite persuaded, that if farmers were entomologists, as we wish to make them, they might effectually exterminate these pests of aphides on the hop, bean, and turnips at the outset, by setting boys and women to crush the first females, each of which give birth, including the eight or ten generations of their descendants, to ravages which the sagacious agriculturists call a blight, and regard as a fatality that must be submitted to without an effort. I found, however, in looking a little closely into the history of aphides, previously to our last meeting of the Entomological Society, how much we have yet to learn as to their economy, before we can pretend to give instructions to the farmer. Where, for example, are the eggs deposited by the females of the last brood of aphides, feeding on annual plants, like beans and turnips, placed? Not, of course, on the plants themselves, as the eggs are laid in autumn. I can find nothing on this important point in books; but the difficulty will be, in a