

This would not be, like drainage grants and 'Land Improvement Companies,' a mere temporary remedy, involving fresh liabilities; since by a wholesome prospective operation it would discourage, and in fact prevent the ruinous transmission of stereotyped encumbrance which parental pride and hope ever miscalculate, and of which inheritors entering upon life and nominal property, in debt, carry to the end a lengthening chain.

But how would this 'facilitate' the transfer of land? Precisely in the way in which alone it can be done: as an elephant trots through a jungle of 'wait-a-bits;' as a frolicking heifer tears up a rabbit-net and runs off with it on her horn; as a hungry bat fresh-awakened from a winter's sleep, dashes out-o'-window through the cobwebs, and astonishes the spiders. Marry, how? By impetus, and speed, and pressure, that can't stop long to "argue the question."

FOREIGN AND NATIVE WEEDS.

[THE following remarks have been forwarded to Mr. Darwin on the subject to which he refers at page 779, 1857, and are now published with his permission.] In reference to the observation at page 762, 1857, "There is too much reason to believe that foreign seed of an indigenous species is often more prolific than that grown at home," I would here observe that these remarks were meant more particularly to apply to weeds accompanying cultivation, *i. e.*, agrarian weeds. These long observation and experience have taught me obey the same law as varieties of cultivated plants which become the more prolific and grow better the oftener their change from one soil or situation to another, and I cannot but think that the farmer the better keeps up a vigorous weed growth by those that he sows with seed from various distant places, than from those that he lets seed upon the land. It would be as difficult to trace the origin of many of our agrarian weeds, but I incline to the belief that many of the weed forms are as much the result of cultivation as the crop itself, for like the crop they are nowhere found truly wild, but are introduced with culture wherever that pertains. If this be so, it is as necessary for the wellbeing of the weed that its seed should be changed as it is for the better growth of a crop, the same seed wearing out in one case as in another. The constant introduction of new varieties of crop plants, as well as the perpetual change of seed, are so many changes of circumstances by which they were originally produced—and just so is it with the agrarian weeds by which the crop is accompanied. In reference to this I would quote my experiments with *Avena fatua*. From this I have procured the cultivated types; the *A. fatua* may thus be viewed as the initiative of *A. sativa*, but can we view the *A. fatua* as the primary plant? It is never found except as an agrarian, which I hold as an evidence that it, too, is a derivative. In cultivating all wild plants the first step augments their size on account of the change—seed transported from one district to another continues this change in an augmented form in proportion to the distance, and so all those that are capable of gaining a footing and supporting it do so at an accelerated rate. My own observations in America confirm me in these opinions; there every homestead is full of English weeds, and had I been of Mr. Babington's opinion, I must have looked upon many of them as distinct species from those at home, for not only were many of them more prolific, but they wanted that sturdy character which they possess at home, hence *Sinapis nigra* on the alluvial banks of the Ohio is as much as 6 feet in height. I find in my notes, written on board an Ohio steamer, "June 23: Stuck fast on a sand-bar for the whole day. Went on an island in the evening; good crop of Wheat and Indian Corn. Plants (wild) were European, twice the size of British specimens. *Bromus secalinus* abundant in the corn" (and I remember the enormous size and height of this Grass). The *Chrysanthemum leucanthemum*, commonly called Daisy in America, is as much as a yard high in the meadows, or rather where it occurs—an apology therefor. In fact I quite came to the conclusion that even the plants as well as the men became attenuated in the States, and yet with this it may be a question whether both are not more prolific. I have no means of knowing from observation whether imported seed of an aboriginal species in America prevails over the native, but I noticed that in the States agrarian cultivation was affected by the same weeds, with but few exceptions, as our own, and these certainly appeared to me to lose nothing from growth in a new country, but, on the contrary, were larger and more prolific.

As regards the questions about the *Sinapis nigra* on the farm described, I would beg to state that it was somewhere about seven years since the introduction of this in quantity in some foreign Flax seed. Previously to this it was an occasional plant on the farm (as on what farm is it absent?), but the *Sinapis arvensis* was, for years before, the chief pest; this latter has been much got under, not only as a result of better farming, but as I take it fairly driven out of the field before the foreign invader, and in the Flax field, where it was originally sown, it constantly comes up in quantity, while the *S. arvensis* is here the exception, though time was when it was the law. "Weed introduced from other land" is constantly driving out the natives. Coltsfoot establishes itself perhaps from seeds from a distant farm or dirty road-

side; let it alone or cultivate it as farmers do by ploughing and scattering the divided rhizomes over the field, and the result will soon be that it will gain more or less perfect possession. Leave in a poor meadow clusters of *Brachypodium pennatum* without ameliorating the soil, and it will soon occupy its greater part. Manure it, and in two years this weed Grass will scarcely be seen. Again, let drainage be defective in part of a meadow for a few years, the whereabouts will be indicated by large bunches of *Aira cespitosa*. Remove the cause, and in less than two years most of this weed will die out and be seen on its heels on the sward. In Wiltshire, to recur to Mustards, the *Sinapis arvensis* has been driven out in some districts by the *Sinapis alba*, the latter having got possession of the soil from the cultivation of Mustard for sheep. Lots of instances of the like may be adduced had I time, and indeed so certain is the law of extermination of one form by the introduction of another that I am not sure that the best way to get rid of some more objectionable weeds would not be the cultivation of those less so. *J. B.*

Home Correspondence.

*Masters and Men.*—There appeared in the *Gazette* a short time ago an article giving some details respecting the agricultural population in the south of Scotland; and certainly if the account given there is anything like an accurate statement of what generally prevails in all those counties enumerated in the article to which I refer there is to those unacquainted with such a system no very desirable feature to recommend it. Nevertheless it shows with what tenacity the people in some districts cling to old feudal customs, especially in those districts purely agricultural. Although such a system may still generally linger in the south of Scotland, it is only by keeping it before the public that farm labourers in other districts have the opportunity of comparing and reviewing such descriptions in their own minds, and thus become, it may be, a little better acquainted with the position and manner of engagement of persons in their own circumstances residing in other districts. In order that people may not think such a description is applicable to all and every portion of Scotland, I will briefly state a few facts which are in general applicable to a large portion of Scotland, especially to the large districts north of the Grampian mountains, a system which has its peculiar features, and has for ages worked well, and when well and faithfully carried out having many beneficial features. In the district to which I have referred farms are not generally so large as what they are in the south of Scotland and in some other districts, but this has greater moral and influential bearing on the wellbeing of those employed on them than where farms are very large; and when any person has seen the difference, bearing in mind the position and social wellbeing of the sturdy and hard-wrought sons of toil, as much as the gains of the farmer, I question very much if they will not give their verdict in favour of the more northern system. Bothies are still too common in some parts of the country. I have seen a good deal of them, and experienced a little of the system. I confess there is something about many of them which forcibly reminds one of "Uncle Tom's Cabin"—not much comfort about them, even in a material point of view, leaving out of sight higher considerations. As I have stated, the farms in Kincardine, Aberdeen, Banff, and Moray are not generally so extensive as what they are in many other districts. In some of these counties the farms will be of all sizes—from 400 acres down to 50. Of late years some proprietors are making fewer farms on their estates, turning out some of the smaller tenants, and thus joining two or more of them into one. In these counties all the farm men and women are generally engaged by the half year, and the terms of engagement end in May and November, and generally speaking both women and men are boarded and lodged. With the former there are generally two women servants employed in the farm house; in some places, more especially when they take a part in any of the work on the farm, or about the barn, &c., all the men and boys have their meals in the farmer's kitchen, and there they sit of a winter's evening; and many of them employ their time by reading, and otherwise improving their time and stock of general knowledge; and many of these farm men are very intelligent, considering their position in society, and the opportunity which they have had. The men and boys generally have a sleeping apartment near to the stable, if not over it, as is generally the case; and in this there are many very great advantages to the farmer; as first, he has persons near his horses and cattle all night as well as by day, and should any of the horses make the least unusual noise during the night, some of the men or boys will be sure to hear it, and render assistance if required; and, besides, they are generally all about the premises all the evening, which gives a feeling of security to the farmer and his family far beyond what can be enjoyed by those where the practice is that all the men leave, and it may be go to their own cottages at some distance; and those who attend on the cattle can look into every byre to see they are all right at any time during the evening. This article is becoming much longer than I anticipated. I intended to have stated several other things, but must reserve them for another occasion. However, I will just state, formerly before railroads penetrated into the far north, foremen and good ploughmen's wages averaged per half year from 6*l.* to 7*l.*, and in some few instances they were more; second-rate hands from 5*l.* to 6*l.*;

boys from 3*l.* to 4*l.*; women from 2*l.* 10*s.* to 3*l.*; but since the railways have been in making in those districts, and emigration too going on to such an extensive scale, agricultural men and women's wages have advanced very much. *G. Dawson, Fulham.*

Farmers' Clubs.

LONDON.—At the last monthly meeting of this Club a lecture on Land Drainage, the substance of which was given in our last Number, was delivered by Mr. Nesbit. The following is an abridgement of the discussion which ensued:—

Mr. Mechi said—It was now 16 years since he first began to drain—

He had at first made his drains 12 feet apart and 2 feet 8 inches deep. That was on a very tenacious plastic yellow clay, with no lime. Subsequently he had drained other lands to a considerable extent 4 and 5 feet deep, at intervals varying from 23 to 50 feet, still on the same kind of clay. After 10 years' practical experience on that land, his labourers told him that they could always plough easier and work with one or two harrowings less on land drained 12 feet apart and 2 feet 8 inches deep, than on land drained 4 and 5 feet deep, at wider distances. Owing to the ventilation of that soil, or to some circumstance which he could not perfectly explain, there was an equality in the crops, and an evenness in the yield, both on the furrows and the other parts of the land, that afforded unmistakable evidence of thorough drainage. He drained deeper on other soils, 4 or 5 feet down in the strong clays, at intervals of 30, 40, and 50 feet apart; that drainage had turned out to be very profitable, and the crops were very good, though he readily admitted that the land was not in so satisfactory a condition as the land which he had treated on the other method of 12 feet apart, and 2 feet 8 inches deep.

Mr. R. Baker said there seemed always to be a great diversity of opinion on this subject.

Some persons lived in districts where there was a retentive soil on the surface and a porous soil below, whilst others resided in districts where the porous soil was above and the retentive soil below. Of course, therefore, the process of drainage in these localities must be extremely dissimilar. He had had experience chiefly upon land where the retentive subsoil was near the surface, and he made his drains 6 yards apart and 30 inches deep. He had made a drain 3 feet deep, and cut a parallel drain exactly 1 yard from it, but leaving the parallel without any opening except what it possessed through percolation. It was filled on Friday night, and on Monday it had only sunk 1 foot, and the water was percolating from the ditch in a manner which convinced him that it had never entered the pores of the soil. He then proceeded to drain the remaining portion of this field. The largest part was drained 3 feet deep, with pipes, and filled up in the ordinary way. Another portion was drained 4 feet deep; a third portion in that execrable mode which had been so much condemned in Essex, of using wood and straw; and a fourth with a common mole plough. There was the field to this day, and he defied any person to tell where one system was used, and where another.

Mr. B. Denton said he should like Mr. Mechi to inform him whether draining 4 or 5 feet deep, at intervals of 12 or 18 feet, would not have ameliorated the soil to an equal extent with the less depth and the nearer intervals.

He was sure he should not be charged with any discourtesy if he said that there were several assumed facts in Mr. Nesbit's lecture to which he could not give his assent. He observed that that gentleman had adopted the old illusion, that there was no water level in clays; and had also alluded to the case of a well. Mr. Nesbit said that water would not accumulate in a well. Now the simple answer to this was, that a well was a hole pierced in the soil, and could only have an effect upon the space immediately around it. What was the object of draining? The perfect aeration of the soil. When the soil had been aerated from one drain to another, the water descended, for this reason, that it was just 817 times heavier than the air which was displaced by it. That was one of the principal points in drainage, and it disposed at once of the illusion that a well was any criterion of a water level.

Mr. Thomas (Lidlington) said the discussion tended to two practical conclusions. One was, that no depth could compensate in the case of homogeneous clays for too great a distance between the drains. The other, that in the case of friable and springy soils they could hardly go too deep.

He himself occupied a good deal of land on wet and precipitous hills, and he was satisfied by experiment that the system would not answer there. With regard to the overdrainage of Grass land, he had seen it done often, on many hundreds of acres. What they wanted was that the land should be sufficiently dry for the cattle, and at the same time sufficiently moist for the production of Grasses, and that object was not always kept clearly in view.

Mr. B. Webster said:

He had always taken a decided part in opposition to draining below 36 or 40 inches deep on strong and retentive subsoils. He believed that the practice of going deep in strong clay subsoils was only a waste of money.

Mr. Hatfield, of Euston House, Stamford, said he had had some experience in draining upon retentive clay soils:—

Before commencing the drains he dug a few trial holes of about 5 feet in depth; he covered them carefully, and watched when the rains fell for the purpose of ascertaining at what depth the waters entered, as a guide how he ought to drain his land. Now he found that whenever there was a continuous heavy fall of rain, it would enter the pits at 1 foot, but in a moderate fall of rain it would enter the pits at a depth of 2 feet. He concluded, therefore, that it was necessary to go sufficiently deep below the 2 feet, in order to arrive at a method that would be applicable to all the circumstances of the soil. Adopting that system as a standard for his drain, he went down 30 inches, and afterwards increased the depth to 36 inches; and for 10 years he had found that 36 inches would drain the land most effectually.

Mr. W. Bennett (Cambridge) said:—

Upon strong clays it was useless to go tremendous depths, involving an expenditure that could never be repaid the farmer; and drains varying from 5 to 7 yards apart, with a moderate depth so as to secure them from damage, say from 2½ to 3 feet, were most desirable upon retentive soils. He had farmed some of the strongest land in England for a considerable portion of his life, and these observations were the result of his experience.

Mr. Trethewey (of Silsoe, Beds) did not himself advocate either deep draining or shallow draining as a system, but he might infer that the shallow drainers were those who went 3 feet deep and less, and the deep drainers those who went further below the surface.

His idea of draining was not only to get rid of the water, but also to act upon the surface and the substance of the soil as