cess is too expensive for a tenant. With respect to the longitudinal drains, they ought, as already stated, to be at least three feet or two and a half deep, and from three to six inches wide at the bottom. If upon dry-field ground, where stones can easily and cheaply be procured, they are then filled to the height of from nine to twelve inches, with the stones broken so small as to pass through a ring of two and a half inches in diameter. They are then covered with sod having the grassy side under, or, when sod cannot be pro­cured, with damaged hay or straw, old thatch, ferns, or even roots of quickens (triticum repens), saved for the purpose in cleaning the same and other fields of the farm. Over these looser materials, care must be taken to spread a layer of soil of a few inches in depth, which must be trodden down and well compacted together, that it may serve as a permanent close cover to the looser materials below, to prevent the crumbling and loose soil from dropping in among the small stones, and thus preventing the run of the water. Simple as this mode of covering is, it has hitherto been found to answer the purpose effectually ; as some drains at Dean- ston constructed in this manner fifteen years ago are still as efficient as at first. These various preparations must not be raised higher than half the depth of the cut, as the super-incumbent soil, to meliorate which all this labour has been undertaken, has now to be thrown in ; and it must have an average depth of eighteen inches, in order that the subsoil-plough, in traversing the field, may not by any possibility injure the drain.

The expense of this mode of draining is very considera­ble, and has in most cases been deemed beyond the means of ordinary farmers, without some stipulated aid from their landlords. This we believe to be fiιr the best way of manag­ing so expensive an improvement ; because the practical farmer, when the operations are entirely left to himself, will devise expedients for lessening expense, in direct outlay at least, of which expedients the landlord could not be sup­posed to avail himself. In some cases the drains must be dis­tant from each other only ten feet. This is the most expen­sive system that has hitherto been thought necessary, even upon the wettest land or the most tenacious bottom. The other extreme is at the distance of forty feet, which is deemed sufficiently wide for any land that requires draining; and there is little in Scotland, except what is incumbent upon pure sand or fine gravel, which draining may not improve. It is thus evident that the expense of draining each acre must depend upon circumstances. We shall give Mr Smith’s calculations, which we believe not to be overrated where every thing has to be paid for in money. It is unnecessary to give the whole table : it will be sufficient to state the ex­pense at ten, twenty, thirty, and forty feet distance between the cuts. At ten feet between the cuttings, where the sub­soil is an obdurate till, almost if not altogether impervious to water, the cost will amount to L.12 ; at twenty feet, which implies sandy clay partially pervious to w ater, L.6 ; at thirty feet, which implies a free open stony bottom, L.4 ; at forty feet, which implies the most open bottom or subsoil requir­ing draining, L.3. These sums, especially the first two, are large, but not larger than the work can actually be done for in money value ; nor are they too great for the benefit to be derived from such judicious outlay ; for if the work be properly executed, experience has not yet taught the real benefit which may be derived from such efficient drainage, nor how long it will endure in an effective state.

The actual outlay to a practical farmer, who calculates nothing but the cutting of the drains, breaking the stones, and putting them into the drains, his own people gathering the stones which are found in the field, carting them, and filling up the remaining part of the cuts, so as to bring the field to its proper level, for which he estimates no charge, the labour being performed by the force upon the farm, amount­ed to L.2. 14s. the acre. This was only eightpence more upon the acre than the sum stated in Mr Smith’s table for the distance of thirty feet between the drains, which was the scheme executed by the farmer referred to upon a field of thirteen acres since last autumn, and which field afterwards produced an excellent green crop of potatoes and turnips. Here then is an admirable example of what may be accom­plished by an active and enterprising farmer, wholly at his own expense, and without losing either the whole or any part of a crop. This was accomplished upon the farm of Bearside, near Stirling, the property of William Murray, Esq. of Touchadam and Polmaise, and possessed by Mr James Gray, whose active and enlightened induslry is ra­pidly converting a piece of moorland, which some years ago bore only an unprofitable crop of tall furze, affording shel­ter to some scores of rabbits, into one of the most valuable farms upon the Polmaise estates. He has been busily en­gaged upon the same laborious task for the last six years, and two or three more will complete the object which he has in view. He may then with confidence rely upon his expense and toil being rewarded.@@1 When stones have to be quar­ried and carted a greater distance, the expense will be somewhat greater.

When stones cannot be procured in sufficient quantity, or at moderate expense, recourse is had to tiles made for the purpose. The accompanying figure represents a sec­tion of the tile. They are about five inches deep and four across, and generally fourteen inches long ; and in most cases flat tiles are placed in the bottom of the drain, and the arched ones placed over them ; but where the subsoil is very stiff, the extra expense of sole tiles is dispensed with. As draining with tile is the cheapest mode in clayey land, such as the Carses in Stirlingshire, and with stones as de­scribed above in dry-field, and as the filling-in process in both is the same, it is needless to repeat the description already given. With respect to the comparative merits of the two modes, the most competent judges prefer the small stone-drains, when at all practicable, to those formed with tile, both as concern durability and practical utility. Cer­tain it is, they possess one decided advantage over tile, as they present a perfect barrier to the admission of vermin, as moles rats &c. and therefore the chances of being choked by the ravages of these noxious animals are greatly diminished, and the durability increased. It may be useful to add, that “ the frequent drain system” is another appel­lation by which it is pretty generally known.

Not satisfied, however, with this expensive system of draining, Mr Smith of Deanston has had recourse to a system of ploughing invented by himself, and denominated, aptly enough, “ subsoil-ploughing.” The implement by which the work is accomplished, is just like any other old Scotish plough, without a mould, but larger, heavier, and stronger. It is never wrought with fewer than three, most commonly with four, and not unfrequently with six horses, according to the nature of the soil in which it has to ope­rate. Where it is desirable to bring up any of the subsoil, this is performed by another large plough, called a “ trench-plough,” which has a mould attached to it like an ordi­nary plough, and is generally drawn by three horses. The mode of procedure consists in an ordinary plough with two horses going before it, with the usual depth of furrow, the subsoil-plough following with a depth of at least ten or even twelve inches more, and forcing to the surface, besides

@@@1 To some it may appear invidious to select the names of individuals, when so many are at least equally active in improving. It will serve as our apology, that some names were absolutely necessary to verify our statements ; and Mr Murray took the lead as a landlord in introducng these improvements, while among the tenantry Mr Gray has not been the least active.