

ever, that this grass should form a part of the farm under the convertible system, not as permanent pasture." Mr. Browne of Markle states, that on a farm of five hundred acres, sixty acres in pasture grass is found to answer very well. This extent of perennial pasture is broken up by the plough in four years, to the great benefit of the rest of the farm, yielding then abundant crops of corn, and requiring little manure for several years. This alternation of pasture and tillage keeps the soil in a perpetual state of healthy vigour, which the most liberal course of arable culture could never produce.

Many farmers, on purpose to prolong the rotations, and prevent the too frequent repetitions of the clover crop, substitute a crop of peas or tares after the barley, sowing the clover after the wheat or barley in the next rotation, which makes the time between the two clover crops to be seven, instead of four years. The crop of peas they consider as by no means remunerative, yet, from the additional crop of clover reaped in the second rotation, they find themselves compensated for the deficiency in the peas. The opinion of Sir John Sinclair is in confirmation of this practice: he says, "Mr. Andrew of Tillilumb, near Perth, finds that if clover is cultivated only once in eight years, the produce is not only about double, but the succeeding crop of oats is better by two bolls per acre." From this it seems, that the falling off in the clover crop arises either from the soil being too porous, occasioned by over exertion and tillage, from too frequent repetitions of green crops, from an antipathy existing between turnips and clover, or from clover being too often grown on the same soil. From the facts given above, it is quite obvious that all the causes admit of a positive remedy. The over-porosity of the soil, and the pernicious effects of the turnip are cured by sheep eating the turnips on the soil. In the other instances, whether a crop of peas is substituted for a crop of turnips or a crop of clover, in every alternate rotation, it appears that a good crop of clover will be obtained. The advisable mode to be followed by farmers in regard to the subject of rotations, cannot be better given than in the language of Sir John Sinclair.

"Every farmer must be aware, in fixing on his rotations, that it is necessary for him to ascertain not only the various articles for the production of which his farm is suitable, and which are likely to yield him the greatest profit, but also the succession in which those articles ought to be raised, so as not to diminish the fertility of the soil."

We might here take notice of a plant amongst which clover invariably succeeds, not only in its seedling stage, but also in the following year's crop, namely, lint or flax. No person can dispute this fact, although the cause of it is not easily ascertained. It is a circumstance both curious and interesting, how a plant will grow luxuriantly in company with one species, and cannot be made to grow, on any account, with another. Plants, like animals, derive nourishment from the decay of each other; and it is an interesting research to examine minutely the relation which one plant bears to another, and to the soil they are destined to live on. We shall now point a few more remedies for the falling off in the clover crop, when the ground is kept in constant tillage; and these are, deep ploughing, summer fallowing, and surface applications.

In the present improved mode of tillage, deep ploughing is seldom given, although, when the soil is of considerable depth, it is attended with the most valuable consequences to the clover crops. Sir John Sinclair remarks, "that deep ploughing, by bringing up a new mould, is peculiarly favourable to clover, turnips, beans and potatoes, and without that advantage, these crops must diminish in quantity, quality, and value. Sensible of the benefits to be derived from deep ploughing to these crops, many of the tenantry of the Lothians are going over the whole of their farms in a course of trench ploughing. Some of them have a number of men working behind the ploughs, digging up the under mould and throwing it upon the top of the ploughed furrow, by which means the trenching is effectual in turning up a new and fresh mould, and the hardness below the ordinary furrow depth, occasioned by the repeated trampling of the horses and friction of the plough, is completely removed, giving a free scope for the roots of the plants to extend themselves, the effects of which have proved most valuable to the clover, and indeed to all the crops. It may be, in a great measure from the effects of turning up the virgin soil, as well as from the destruction of the slugs, that a naked summer fallow is always found to produce a much better crop of clover than the same quality of land will do after turnips. In proof of this, Sir John Sinclair remarks, "that clover and rye-grass is always a sure crop, when the

land has been previously prepared with a well-managed summer fallow." He again remarks: "Mr Wood of Milrigg, from many years' experience, has found that there is little or no danger of clover succeeding every fourth or fifth year, providing a complete summer fallow intervenes between the clover crops. But if green crops are to serve as substitute for the fallow, he has found in that case, on the same field, the clover give way, when it succeeded on the fallow part of the ground, the green crop roots taking away that nourishment which is necessary for the support of the clover plants. He could clearly see that it was for the farmer's interest to make any sacrifice to ensure red clover. It is probably the new earth, turned up by the operation of following, which renders the clover plant so successful." Sir Humphrey Davy says, "In rich clay soils the furrow can scarcely be too deep, and even on sands, unless the subsoil contains some substance noxious to vegetables." As it would be useless to cite any more evidence to show the value of deep ploughing, or a naked summer fallow, as a remedy for the falling off in the clover crops, when the land is to be kept in a state of constant tillage, we shall now proceed to point out the benefits of surface applications to produce the same effects.

Surface applications are now administered on an extensive scale all around Edinburgh, for the sole purpose of procuring an abundant crop of clover and rye-grass. Soot is one of the ingredients which is applied to the greatest extent, and it has uniformly the effect of strengthening and forwarding the crop. Liquid manures are also extensively used, and the urine of the cows is collected with great care, for the purpose of being applied to the soil. The effects of liquid manures upon clover grass have been already pointed out in the section Manures, and little need be said upon them here. Liquid manures are much more lasting in their effect, and, from our own experience of their application, they seem better adapted for clover than soot. Saltpetre is likewise much used, and forms an excellent top-dressing for seedling grasses. It is by such means as these that the Agriculturists of the Netherlands have been able to keep up the fertility of their lands, in the cultivation of clover, through time immemorial; and those, therefore, who neglect such measures, have themselves to blame when their clover crops fail. The whole of the Agriculture of the Netherlands rests upon the cultivation of clover, which is sown with every kind of grain, but as in this country, it grows most luxuriantly when sown with flax. The clover too unfrequently yields a heavy crop the first year, and even three abundant crops the second, and if allowed to stand another year will yield a good crop, and afterwards be excellent pasture for cattle, till ploughed up to receive wheat seed, which usually follows it. It may be supposed that the land of Flanders is naturally so rich as to be adapted for the growth of clover; but this is not the case; the soil of that country, when left to itself, produces only heath and fir, and its fertilization has been brought about by a series of expensive and labourous operations. How is it that, with all our boasted improvement in Agriculture, although the clover is but of comparatively recent introduction into this country, the amount of its produce, even on our best soils, should be so inferior to theirs? Let us follow their system, and, in all probability, we will be as successful in its cultivation as they are. The top-dressings applied to their clover consist of liquid manure and pent ashes, the effects of which are highly spoken of by all who have witnessed Belgian husbandry.—*Jackson's Treatise on Agriculture.*

RELIEF OF CHOKED CATTLE.—Believing the fact is not generally understood, that ruta bagas seldom need cutting or slicing, I would state that for three years past, I have in no case cut them for anything having good teeth. Sheep eat them decidedly better when fed whole, and cattle never choke on them. When I practiced cutting, scores of cattle were sometimes choked in a season; and here permit me to remark, that when such an accident occurs, I use a flexible rod about four feet long, three-fourths of an inch in diameter; wind a wad of tow, the size of a hen's egg, around the butt end; tie a rag tightly over it, grease it and push gently down the throat. To keep the mouth open take a piece of hard wood, one foot long, four inches wide, one inch thick, bring the ends to a point, bore a hole one and a half inches diameter through the center, push through the mouth, turn on the edge and pass the rod through the hole. I have never failed in any instance in thus giving effectual and permanent relief. With such an apparatus in hand, five minutes is sufficient to relieve the worst cases. S. W.

Whalen's Store, Nov. 15, 1841.