

in many situations in this country. In England it is becoming more and more adopted, and we can see no reason why its use should not be attended with equal benefits here. The cut at the head of this article, illustrates the manner in which this operation is performed. A team drawing the subsoil plough, follows in the furrow made by a common plough. It is proper to observe, that for subsoil ploughing to produce the greatest benefits on wet, tenacious soils, they should be first under-drained.

The Journal of the Transactions of the Highland Agricultural Society of Scotland, for January, 1847, contains an account of some very valuable experiments in regard to subsoil ploughing, furnished by Mr. J. Wilson. It is stated that the farm on which these experiments were made, had been under cultivation for a long period; that it consists of various kinds of soil—from a gravelly earth to a tenacious clay. The usual depth of ploughing for many years had been from five to six inches, and a hard crust had been formed at that depth.

The field first experimented on, contained thirteen acres, most of the soil being heavy, inclining to clay, on a clay subsoil, and the rest light soil, on a gravelly subsoil. It was under-drained in 1843, with tile, at the distance of fifteen feet between the drains. Previous to draining it had been very wet, and the crops it bore were generally poor. It was subsoiled in the Fall of 1844, the plough going across the drains. A common two-horse plough was first used, taking a depth of six to seven inches, and a subsoil plough with two horses followed, taking an additional depth of seven to eight inches. Eleven acres were ploughed in this manner, and two acres were left, which were only ploughed to the ordinary depth of six and a half inches. The whole field was manured alike—the manure being from yard dung and guano—and it was sowed to yellow turnips in the fore part of June. No difference was discernible in the crop till about the first of August, when the subsoiled portion showed a decided superiority, which became more and more apparent till the crop was taken up the last of October. The subsoiled portion gave 26 tons 7 cwt. per acre, and the part not subsoiled, 20 tons 7 cwt. per acre—making a difference in favour of subsoiling of 6 tons 7 cwt., or a value of £3 18s. per acre.

The next experiment was upon a field which had been furrow-drained with tiles in the autumn of 1844; the soil rather inclined to sand on a subsoil of sandy clay. Two acres were subsoil ploughed to the depth of fifteen inches in December, 1845, and 2 acres were only ploughed to the depth of six or seven inches. Two ridges of the field were trench-ploughed to the depth of thirteen inches. [Trench ploughing is performed by running a plough of the common construction in the furrow of another of the same kind. Its operation and effects are dif-

ferent from those of the subsoil plough, as the surface soil is covered by the earth taken up from below by the second plough.] The field was manured alike with manure from the farm-yard, and planted to potatoes. The trench ploughed part gave 7 tons, 1 cwt., 2 quarters, per acre; the subsoiled, 7 tons, 9 cwt., 2 quarters; and the part only ploughed, 6 tons, 14 cwt., 1 quarter, per acre—making a difference of 15 cwt., 1 quarter per acre, in favour of subsoiling, over the part ploughed only in the ordinary way; and a difference of 8 cwt. over trench ploughing.

The next experiment was made on a field which had been partially drained several years since. The soil, "an earthy loam incumbent on clay." A portion of the field was subsoiled, and the remainder ploughed to the ordinary depth. The field was sown to barley in 1845. The appearance of the crop was most favourable on the subsoiled portion during the time it was growing, and when threshed, gave the following results:—The subsoiled portion yielded 8 quarters, 3 bushels, per acre, with 36½ cwt. of straw; the part not subsoiled, yielded 7 quarters, 4 bushels, 3 pecks, per acre, with 28 cwt. of straw—making a difference in favour of subsoiling of 6 bushels, 1 peck of grain, and 8½ cwt. of straw per acre.

From the Scottish Farmer.

GUANO.

DIRECTIONS FOR USE.—HINTS TO COTTAGERS.

In the application of this valuable manure, it is necessary to keep in view its powerful properties, and to exercise great care to prevent its coming into immediate contact with the newly-sown seed or the foliage of plants and flowers. It should never be placed in contact with seeds; for all seeds in the process of germination give off a greater or less quantity of carbonic acid and vinegar; and these acids, having strong affinities for the ammoniacal portion of the guano, are apt to attract it so powerfully, as to check and even destroy vegetation.

PREPARATION.—To secure its safe application, it has been found most effectual to mix it with about four times its own bulk of finely sifted mould, ashes, or charcoal, or even with sand, if the soil be of a cold clayey nature; and that the mixture may be complete, the guano should, before mixing, be carefully passed through a fine sieve. That portion of the guano, such as the undecomposed bones, beaks, or claws of birds, which cannot be passed through the sieve, will nevertheless be found strongly impregnated with ammoniacal salts, and by steeping in water, will readily yield a rich liquid manure. An intelligent farmer in Dumfriesshire, in reference to the necessity of mixing the guano before applying it to the soil, says, the objects of mixing guano, are, 1, To partly disinfect it by absorbing its volatile products and diminishing its smell. 2, To separate its active parti-

cles, and thereby diminish their action on each other. 3, To present it to warm soils in a form in which its action will be less violent at first, but more protracted and steady than when given in an unmixed state. Of course, the colder the soil, and the earlier the season when sown, the less quantity of mixture is needed, and conversely. But, as a general rule, it should be mixed as equally as possible, with four times its bulk of finely sifted, moderately dry, black or brown coloured earth, or peaty matter, sawdust, slightly burnt clay, charred turf, coal or peat ashes, whichever of these substances can be most conveniently had. Perhaps newly-burnt charcoal used as soon as cold, is the best matter that can be had for mixing; but as it can seldom be had at the Farmer's command, any of the above matters will answer in its stead. Where a considerable quantity of useless wood can be had, it might be piled up, surrounded, and nearly covered with clayey or spatty turf, and burnt with little admission of air. When cold, the charcoal, clay, and charred turfy matter, if well broken with a spade, mixed, and put through a sieve, will make an excellent mixture for guano, especially for light warm soils. Some have mixed guano with sand, and when for a cold clayey soil, this mixture seems very suitable; only sand need not be given in more than double its bulk, and should be put in the soil soon after mixing, whereas any of the other mixtures may, with advantage, stand, heat up, under cover for a week or more, according to the weather, character of the soil, and distance at which it is to be put below the seed, and also in proportion to the quantity of guano given to the acre. The colder and heavier the soil, and the colder the weather, the more slightly the manure ought to be covered, and conversely. No rules can supersede experience in this. When either dung or bones are given as part of the manure, and when the soil is moderately moist, or disposed to clay or peat, the guano should be put near the seed. Again, where the ground has just been limed, the guano ought both to be given in a large quantity of mixture, and covered rather deeper than in ground not limed for a year or more. On light soils, lime should, if possible, be mixed some weeks before guano is given.

It would appear that grass crops, of all others, most appreciate the guano manure, and shew the most wholesome and productive results, under applications varying from 3 cwt. to 20 cwt. per imperial acre; and considering that by far the larger portion of the soil of Great Britain consists of pasture and meadow-land, it is of paramount importance that the grazier should be enabled to set a proper value on this unexceptionable manure. The increase of weight and bulk thus obtained does not arise from the greater abundance of coarse rank grass, as some persons have insinuated, but from the general luxuriance of the crop; and parti-