

tendence 10 and 12 years ago, at depths varying from 17 to 36 inches deep, are now being taken up and relaid from 42 to 48 inches deep, in consequence of its having been found that they had been raised, through such subsidence, to within 20 and 30 inches of the surface. The subsidence of soils will of course vary; as, for instance, on soils of a peaty or spongy nature, it will be greater than on clays; and the drains ought to be laid deeper in proportion to its probable extent; shallow drains, or drains stoned too near the surface, are objectionable, as they carry off the substance of manures, as well as the ammonia contained in the rain water, and proved by analyses of water discharged by such drains, and which water has been frequently found to contain a considerable quantity of nutritive matter; whereas the water discharged from deep drains is perfectly pure, having left all its good properties behind it.

Deep drains, likewise, remove stagnant water from below which shallow drains do not, and they are more secure from being injured by the roots of trees, sediment, fungi, &c., and also less liable to be burst by severe frosts or other causes.

The first case which I shall adduce is a fair average of the others.—It is a *thirteen* acre field of stiff brown loam, resting on tenacious blue clay and marl, and had been let at 17s. 6d. per acre; it was drained early in 1842, with 2½ inch tiles and soles, laid 3 feet deep and 22 feet apart; it cost—

Labour.....	£24	1	4
23,000 tiles and soles	40	10	0

£64 11 4, or nearly £5 per acre.

It had previously been cropped as follows, without manure:—In 1838, wheat; 1839, oats; 1840, bare fallow; and 1841, wheat. After drainage it was deeply ploughed and worked by Fimiason's grubber, and sown with Swedish turnips, manured with 160 cubic yards of good well-rotted cow-dung, 3 cwt. of guano, and two tons boiled bones. The produce averaged 30 tons per acre, and some of the bulbs weighed 17½ lbs. They were all pulled and consumed by cattle in the house. The next crop was wheat, sown on the 7th March, producing 290 bushels, equal to *twenty-three* bushels per acre. It was so on down with permanent grass seeds, and let for grazing with ewes and lambs at £30, or 46s. per acre. The party who paid this rent, having sold all his stock and made a fair profit, obtained permission to sublet the field from 6th October to 6th December, and obtained for these ten months, a rent of £10, which was nearly to the previous tenant's annual rent. In this case, the rent to the landlord was nearly three times its former amount, and the tenant's profits probably greater at that rent than his predecessor's at 17s. 6d. per acre. The original annual value of the field—

Being..... £12
Its new value. 30

The difference. £18, or upwards of 25 per cent. per annum on the outlay of £64 11s. 4d.

The next field was of the same value, was drained in the same way, broken up from grass, and the first year produced oats worth £1 5s. per acre; 2nd year, potatoes, sold at £20 10s.; 3rd year, wheat, valued for tithes at 30 bushels per acre, worth, according to the then value, £10 10s. The cost of drainage was £4 15s. per acre, and the field was valued the third year by a land surveyor at £2 10s. per acre, thus yielding 20 per cent. on the outlay for drainage. In both these cases the crops repaid the manure, labour, and current expenses, and the land was not, therefore, liable to be charged with anything beyond the outlay for drainage.

The CHAIRMAN reviewed, in a clear and dispassionate manner, what had been stated, and summed up very ably; and the following resolution was then agreed to:—

“That in the opinion of this meeting a good system of draining, liberally carried out, would be highly beneficial to this neighbourhood; that the variety of soil in the district precludes the possibility of adopting any general principle—pipe, stone, and turf drains having the advantage according to circumstances. That the most permanent system of draining known at present is when done with PIPES, at not less than *three* feet, and distances to suit the soils. That in open or porous subsoils, collars should be put on the pipes; and in clay soils, six inches of stones broken to pass through a *three-inch* ring, should be laid over the pipes, and the clay returned on them.”

PHILOSOPHICAL ESSAYS.

BY JACOB THOMPSON DUNNE.

Hail usually precedes rain, often accompanies it, but seldom follows it. The hail-shower continues generally only for a few minutes, seldom longer than a quarter of an hour. The quantity of ice that falls in so short a time is prodigious, the ground being often covered several inches in depth. The clouds that produce hail are of peculiar gray, or reddish colour, often of a deep, black blue; their lower surfaces present enormous protuberances, while the edges exhibit deep and enormous indentations. How the cold is produced which causes the congelation of the watery particles, and how a hailstone, after acquiring a sufficient size to fall through the atmosphere by its own weight, remains suspended a sufficient time to acquire a volume of twelve or fifteen inches in circumference, are questions which have not as yet been satisfactorily explained; in fact, “the theory of hail is still involved in great obscurity.” Some countries are more subject to hail than