

correct index of the fall being properly kept. When this simple guide is not present, a common bricklayer's level, about twelve feet long, will be the most available gauge of the perfection of the work; and the whole amount of fall in the field having been first ascertained, a false bottom can be adjusted to the level, which will give the proper slope to each section of the entire drain. In all cases I would recommend the land to be well ploughed, leaving deep open furrows at regular intervals where the drain is to be laid. If this is done, and the furrow filled with long stable litter in the autumn, this work can be proceeded with as easily during the winter on clay lands as during any other season. The next step will be to remove the loose earth from the furrow, and take out the first spit with a common spade, opening the trench to the width of from twelve to fifteen inches at the top, and gradually contracting in its descent; the remainder of the trench can then be taken out at two draws, with what is called the grafting tool, a round-backed spade, the blade of which should be about seventeen inches long, and five wide at the point, being wider above; the handle should be straight and strong, and almost in a line with the blade. Many suppose that different-sized tools are necessary to contract gradually the trench, so as only to receive the tile at the bottom, but a skilful workman with the above tool will narrow down the opening to any size required. After the last draw is taken out, the crumbs are removed and the bottom levelled, and shaped exactly to receive the tile with a long narrow-bladed scoop, drawn towards the workman. The tile is then laid in either by a man down in the trench, standing on each last-placed tile with his face looking up the drain, or standing on the surface of the ground and reaching down the tiles with a long-handled hook, which is inserted into each pipe. This latter is the better plan, especially in wet weather. For sandy lands some modifications will sometimes be necessary. If there is a stratum of clay within any reasonable distance of the surface, and the depth of the outfall will admit, the drain should be sunk down to it, as the clay not only forms the best bed for the tile, but furnishes the best covering for it also. In this case, from the greater depth of the drains, they can be placed much farther apart. If, however, such a stratum is not at hand, I think the following is the only safe and at the same time economical way of proceeding:—The bottom of the drain should be formed so as to admit a strip of board about an inch wider than the tile, which is to be laid upon it. Clay should then be sought and carted in from other places, and the tile covered to the depth of three or four inches with it. There are few situations where clay is not to be found near at hand, and I think it the only reliable means of isolating the tile from the sand, which otherwise is sure to find its way through the joints of the tiles, unless we have recourse to the expensive plans adopted in England in difficult cases of this kind, which is to put tile collars on the joints of the pipes, and even sometimes entirely encase small pipes in others of larger size; and even this I do not think so safe a plan as the board with the clay covering, and generally it will of course prove vastly more expensive. This method I found necessary to adopt after several failures in attempting to lay pipes through a wet, boggy piece of land, which is now perfectly dry and planted with winter wheat last spring, after it was drained, being the first time it ever was ploughed. In draining land of this description, the work should be kept close together, and the tiles laid well up to the workmen and covered in as quickly as the trench is dug, and no more of the trench opened than is to be finished at once, for, as soon as the ground is opened, the water begins to gather, the soil becomes weakened, and the sides will soon fall in, thereby producing a great increase of labor, trouble, and consequently expense.

As to the cost of the work, I am, I think, able to show conclusively that this work is within our reach, and perfectly applicable to our condition in an economic point of view. Within the last twelve months I have laid over 40,000 tiles, averaging four feet deep, at a rate of expenditure for which the in-

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