on all other crops. But being smaller and more delicate, the seeds of the grasses ought to receive greater care than those of larger and sturdier crops. The gardener sows his finer seeds with special care, mellowing the land as much as possible, and even dusting the tiny seeds with soil passed through a sieve, so as to give them the best possible chance of germination. So should the farmer bestow extra attention upon his smaller seeds. Thorough preparation of the land for a timothy meadow will pay, and and a stubble field re-ploughed, harrowed, and seeded down in the fall, will yield a far better crop of grass the following year, in nine cases out of ten, than the same field would have done with the timothy sown along with the grain. Not only should the soil be well mellowed for a fall seeding of Timothy, but the now general use of mowing machines renders it necessary that the ground should be free from stones, grubs, and stumps; also that the surface be made as level and smooth as possible. The success and profit of the crop will also be enhanced by this course. From the beginning of September to the middle of October, timothy may be sown with good chance of its doing well. The earlier it is got in, provided the ground is moist enough and the weather favourable, the better the plants will become rooted before winter and the more able they will be to withstand the effects of the late fall and early spring frosts. A bushel of seed will sow six acres. Some sow less than this. A gallon per acre is considered sufficient by many. It is better, however, to sow grass seed with a liberal hand, and make sure of putting on enough.

Memoranda on Land Drainage.

MR. John C. Morton, one of the most practical and accomplished English writers on agriculture, contributes the following directions on the subject of underdraining, to the London *Agricultural Gazette*. They will be of material service to farmers in this country; for while, in the matter of depth, there is some difference of opinion among those who have had the most experience in this country—and in the matter of cost, Mr. Morton's figures do not apply,—in his "memoranda" of previous considerations to be regarded, and calculations of distances apart and lengths of drains, he speaks from extensive practice and wide observation:

1. In the first place, arrange the whole plan for the whole estate before commencing a single field. Do not fritter away your means in laying one field after another dry on plans proper enough for each, but not well fitted to one another. This is especially good advice where a whole estate, comprising several farms, is taken in hand for improvement. The selection of an outfall, and the fitting it for its purpose, the removal of spring water, the order in which the work shall be done, which is determined by two considerations, viz., 1st, the necessity of working from the final outfall upwards; and 2d, the possibility that water removed from one part may lay dry another; to that here, as opposed to the other consideration, the necessity may arise, or rather the propriety may be indicated, of draining a higher field first of that water which is thus hindered from re-appearing below—all these are, to use the words of the politician, not local, but imperial questions, needing attention in the first place. The arrangement of the plan for the whole estate should, in fact, be attended to before any of the work is commenced.

2. Next, get a permanent and sufficiently deep outfall, to allow, if possible, an easy fall from four feet below the lowest part of the land.

3. Remove all spring-water—tap all porous and water logged beds—and in general provide, in the first place, for the removal of all the water which comes upon the land, or on any part of it, otherwise than directly from the clouds. To this end straighten all water-courses, leaving, however, as few open ditches as possible.

4. Lay drains in all habitual water-courses; humour and attend to the habits which the water of the estate has acquired, if you mean to obtain an immediate result. Let this, in the case of grass lands with deep ridges and deep intervening furrows, go the length of inducing you to put drains in the furrows, however they may run, you, rather than up and down the slope in straight and parallel lines, with uniform intervals, disregarding the old ridge and furrow arrangement.

5. When all this has been done, then begin the drainage of the estate—field by field—the lowest first and proceeding from the lowest part of each to the upper part. Dig a main drain with sufficient fall along the foot of the lower field first, about 8 yards or thereabouts from the hedge, and 4 feet 6 inches deep or thereabout, *i. e.*, somewhat deeper than the drains which run into it, and wide enough in the bottom to take a 3 or 4 inch pipe—one large enough, at any rate, to take all the water which is likely to run in it.

6. Dig trial holes here and there across the face of the slope, 4 feet deep, and try the effect of a single narrow drain, 4 feet deep, taken right up the slope in their midst; and learn from the distance at which this minor drain will empty these holes the intervals between your drains, which in each field you will adopt.

7. Your minor drains should be 4 feet deep, both for the sake of their permanence and efficiency, and for the sake of the greater quantity of earth per acre which will thus be fertilized for the use of plants. They must take a two-inch pipe up to near the top of each; a one-inch pipe will suffice at the upper end, where less water runs. They will be from 7 to 8 yards apart, in homogenous clays—10 to 12 yards apart in freer and more open soils; and any greater distance in rocky or gravelly subsoils, which are unable to discharge their water naturally, but which a single deep drain will often lay dry for acres, by the artificial outlet thus provided.

8. As to the way in which, when the method which any field requires has been determined on, the work is actually set out, it may suffice to mention that the place of each drain right down the slope should be pegged out, and (especially in the case of grass lands) the line itself may then be opened up by the plough, which will, with horse labour, thus take out to its full width the first six or eight inches of the depth. A working man of ordinary size can easily stand and work in a drain 3 feet deep if it be a foot to 14 inches wide at top. He stands in such a drain, and takes out the remaining foot in depth, making a 4 foot drain without difficulty. In the case of a drainage match held some years ago before the Hertfordshire Agricultural Society, there were 17 sets of men at work, and the prizes went for drains 12 inches and 11½ inches wide at the top respectively. One drain was opened 4 feet deep, with only a 9-inch opening at top.

9. As to the cost of the work, earth capable of being lifted in masses by the grafting tool can be put into barrows for 2d. per cubic yard; and the difficulty of working in a narrow drain adds only this much to the cost, that the labour of cutting and lifting earth in making drains varies from only 2½d. to 2¾d. per cubic yard. A 4 foot drain thus costs from 6d. to 8d. per rod for cutting it.

10. Let us here enumerate the items of cost per acre. If drains be 5½ yards apart, 880 yards are needed per acre; if 8 yards apart, 605 yards per acre are needed; if 11 yards apart, 440 yards per acre will be required. If the mere cutting be 6d., the cost of opening the drains will be £4, £2 15s., and £2 per acre; if it be 8d. per rod, the cost will be £5 6s. 8d., £3 13s. 4d., and £2 13s. 4d., per acre respectively. If the tiles used be 2-inch pipes, at 20s. per 1000, they will cost 50s., 36s., and 25s. per acre in these several cases. If collars be needed to connect the tiles, you must add one-half more on their account. Add some 5s. an acre for superintendence, and 1d. per perch for filling in the earth after laying the pipes; and you have as the cost of drainage £10 to £8 per acre, according to the quality of the work, in near drainage, and £4 10s., to £6 per acre, according to the character of the work, in the wider drainage. The average cost under ordinary circumstances, including the extra cost of mains and outfalls, may be put at £5 per imperial acre. There cannot be a doubt that, thus adding from 8 to 10 per cent. to the cost of the estate, they often result in an increase of 30 to 50 per cent. of its value.

HIGH CULTIVATION.—The *Maine Farmer*, alluding to the subject of "high cultivation" so much talked of and written about, says that there is much more talk than improvement. A man looks over his farm, of many acres, and finds the whole needs aid, but not being able, at once, to render it to all portions, makes no particular effort to improve any part. The right way—right because alone practicable—is to commence with a few acres at a time. Get these in good heart the first year and the increased product from them will aid in experimenting on another section the succeeding year. In this way the farm will soon become renovated, and properly cared for, will not run down again as "long as grass grows and water runs."

A Splendid Cranberry Yard.

WE had the pleasure of inspecting the cranberry plantation of S. N. Gifford, Esq., of Duxbury, the popular Clerk of the Senate. It consists of something less than two acres, lying about three miles from the sea shore, and well protected by surrounding woods and uplands. It was reclaimed from a low brush swamp, full of high blueberry and other shrubs and trees, the surface having been first pared off at great expense of time and labour, and sand applied to the depth of an inch or two, when the vines were set about a foot and a-half apart in drills. This is the fourth year of growth, and the bed is completely and beautifully covered with the closely-matted vines. We have seldom seen a yard so clean and well cared for. The yield last year, which was the third, of a considerable part of the piece, was large and satisfactory, and the prospect of the present year is remarkably good, the blossom being already very full and beautiful.

Mr. Gifford and his partner in the operation, Mr. Loring, are continuing the work of subduing the balance of the wild swamp, and if anybody wants to see a specimen of enterprise and pluck, let him take a look at the enormous amount of labour required to get it ready to receive the vines. By the time the plantation is ready to bear, which can hardly be in less than three years, the cost per acre cannot be less than four or five hundred dollars; but the result of the part already in bearing has proved the thing to be a most capital investment, and fully justified the calculations of the enterprising owners.

This yard is flowed in winter, but not by a running brook. The rains fill it and cover the meadow to the depth of a foot or more, while the ditches, which are, perhaps, twenty feet apart, take off the water only slowly in spring. There are no means of flowing rapidly at any season of the year, but then they are less required near the coast than they would be farther inland, on account of greater freedom from late spring and fall frosts. However uncertain this crop may be in places very liable to frosts, and where the cultivator has not full control of water for flowage, there is little trouble on this score along the seashore. There the greatest risk to be apprehended is from the "fire fly" and the cranberry worm.

It is but a few days since we visited the noted plantation of Dr. E. D. Miller of Dorchester. He has about twenty acres in his different yards, situated in the town of Franklin, most of which was reclaimed from a swamp at even greater labour and expense than Mr. Gifford's, but he has full control of water in ample reservoirs, which are caple of flooding the lots in an hour and a-half; while the ditches will free them in about the same length of time. Dr. Miller picked a thousand barrels from his plantation in one year, and we believe the yield last year was from a thousand to twelve huudred bushels. He is still going on with expensive improvements, and extending the area of his yard. Some other lots of cultivated cranberries that we have recently visited, will be alluded to hereafter.—*Mass. Ploughman.*

Beet Sugar.

A CORRESPONDENT of *The Nation*, writing from Germany, thus describes the condition of the peasantry on the great sugar beet plantations, and also the manner of making beet sugar:

After an hour or two I began to come into the midst of the great sugar-beet plantations for which this part of Germany is celebrated. The fields in which the root is planted here are often of vast extent, sometimes two or three hundred acres, reminding me of the prairies of the great West or the plantations of the South. I was inclined to continue the comparison last made much farther after seeing the manner in which they are cultivated. The beets are drilled in rows about fifteen inches apart, and the whole labour of tilling them, from first to last, is performed with the hoe. Never before had I seen so complete a reproduction of some of the scenes I have witnessed in the Southern States on the cotton plantations. Here were at work, men and women together, from fifteen to eighteen in one gang, hacking stolidly over the ground with the same mechanical stroke that marked the slaves. In one row I counted eighty-one, and they were principally women. When their labour is ended, however, and at the nooning, they display the same buoyancy and often playfulness that are characteristic of the blacks. When the village bell in the distance or the winding horn calls them to their simple fare, they often caper and chase across the fields in a rough buffoonery that shows the German elasticity of temperament is still unimpaired.

The clothing of these peasants is of course of the simplest and cheapest; a short, thick dress of woollen, and a close hood of the same for the women, and