

the first manufacturers, from the absence of criticism and competition, from the limited extent of custom, and from the want of artisans skilled in working in iron, were, however excellent in idea, but clumsy and costly. The choicest specimens which existed in 1840 have been so altered in execution by cheaper materials and improved workmanship that they can scarcely be recognized."

With the aid of root crops and that of machinery in our labour, it is not difficult to anticipate the time when our farmers shall labour less, but yet prosper more. The success of the steam plough on the beautiful and fertile prairies of the West, almost makes real the expression in the fine lines of Mr. Thackeray on the Great Exhibition in England in 1851.

Look yonder where the engines tow,
The Nation's arms of conquest are,
The trophies of her bloodless war ;
Brave weapons these.

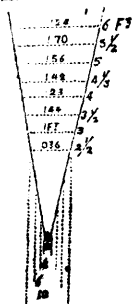
Victorious over wave and soil,
With these she sails, she weaves, she tills,
Pierces the everlasting hills
And spans the seas.

New-England Farmer.

UNDERDRAINING.

In executing a system of thorough drainage, as in all other work, it is necessary to make the original cost as slight as possible, in order to realize the greatest return in proportion to the outlay. That this may be done, it is necessary for the person having charge of the work to be familiar with all its details, both scientific and practical, and to know the most effective use of labor, that he may attain the desired object by the shortest and simplest process. Very much work, however, must be done where the services of such a person cannot be readily obtained ; it then becomes necessary for the proprietor to do his work as economically as possible, with such knowledge as can be obtained from those more familiar with the work. To such, I propose to make a few suggestions on a single practical point, which may be useful to them.

The only object for which trenches are cut in underdraining is that the pipe may be placed in its proper position, and as the amount of earth thrown out materially affects the cost of the work, it is of great importance that no more earth should be disturbed than is necessary to give the workmen room for a free use of their tools. The width at which trenches can be most economically cut is much less than is generally supposed, and the dimensions that are given below, though they may seem small, are the result of some experience and may be relied on, except in peculiar circumstances. The accompanying diagram shows the lines that may be followed in forming the cross section of a trench from two and one-half to six feet deep, and to admit a pipe from one to eight inches inside bore.



The full lines represent the side of the trench, the horizontal dotted lines are at certain distances from the bottom, as represented by the figures opposite each at the side. The figures above each represent the width of opening at the surface for a trench of that depth, the widths are given in feet and hundredths, to reduce the decimal to inches, divide by eight, the result will be inches nearly. The vertical dotted lines show what earth must be removed in order to increase the width at bottom to receive the larger sizes. Suppose a trench is to be dug four and one-half feet deep, the number opposite $4\frac{1}{2}$ is 1.42 or one foot five inches, which is the width of opening at surface.