

roots lie near the surface, only a few penetrating the undrained soil.

The advantages of deep drainage are, first, a greater amount of soil is made available to crops, and fewer ill effects are felt from drought; second, there is room for more water in the soil in times of heavy rainfall, so that water may rise considerably above the drains for a short time without seriously affecting the crops. The soil becomes drained no deeper than the floor of the tile. In time of heavy rain the water can not pass off as fast it falls, and of course saturates the earth much above the drains, and often to the surface. In this case the tiles must be much larger, so as to carry off the water nearly as fast as it falls, if we wish to keep depth enough of drained soil so that no injury for the time being may be done to the crops. This will many times account for the cry often made, "My tiles are too small." The same tile placed deeper, thereby giving a larger reservoir in which to collect drainage water in times of heavy rains, would often remove the difficulty.

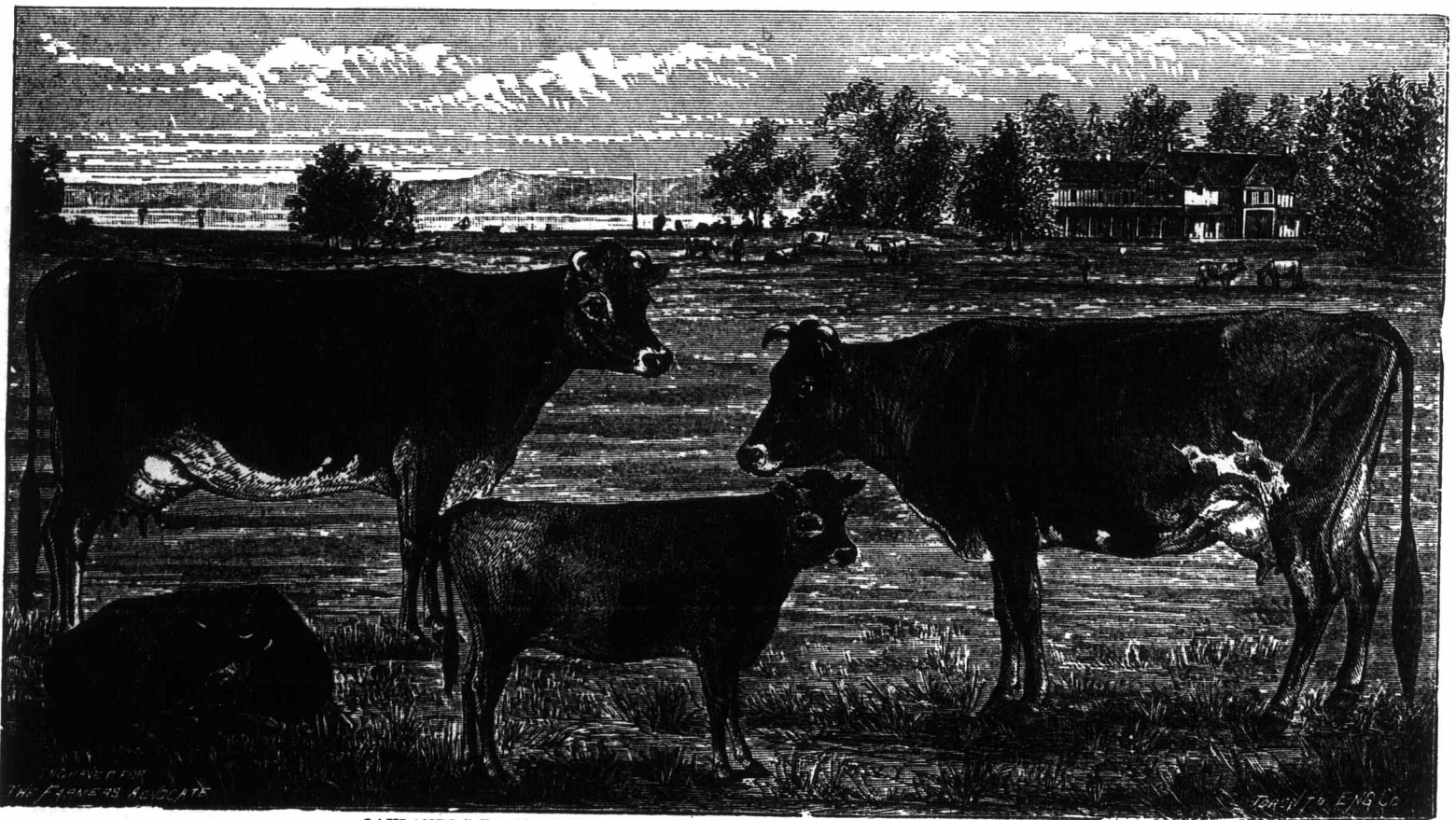
We have thus far been general in the discussion of depth. The question will be asked, "What

The Parent of Wheat.

The origin of wheat is traced in the following article, in *Macmillan's Magazine*:

The nearest form to true wheat now found wild in the British Isles is the creeping couch-grass, a perennial closely agreeing in all essential particulars of structure with our cultivated annual wheats. But in the south European regions we find in abundance a large series of common wild annual grasses, forming the genus *Egilops* of technical botany, and exactly resembling true wheat in every point except the size of the grain. One variety of this species, *Egilops ovata*, a small, hard, wiry annual, is now pretty generally recognized among botanists as the parent of our cultivated wheat. There was a good reason, indeed, why primitive man, when he first began to select and rudely till a few seeds for his own use, should have specially affected the grass tribe. No other family of plants has seeds richer in starches and glutens, as, indeed, might naturally be expected from the extreme diminution in the number of seeds to each flower. On the other hand, the flowers on each

VALUE OF LEACHED ASHES.—There is much difference of opinion as to the value of leached ashes as a fertilizer. There is none about that of unleached ashes, and the difference doubtless arises from the known effect of the potash in the unleached ashes. Potash is always useful, whether the soil abounds in potash or not, because the potash in the ashes exerts a decomposing action on the vegetable matter of the soil and produces available nitrogenous compounds. Of course, this does not happen with leached ashes; but where the soil is deficient in potash and lime the leached ashes are useful, hence the differences of opinion in regard to this matter. The potash and lime of ashes being of organic origin, are more active than those of mineral origin, and 50 bushels of ashes per acre containing 60 or 100 pounds of potash and several hundred pounds of lime are, of course, very beneficial on soils needing these elements. It is very rare that unleached ashes fail to be valuable, and there is little risk in using them at any time. If there is a doubt about the effectiveness of ashes,



OAKLANDS, FARM OF MR. VALANCEY FULLER NEAR HAMILTON, ONTARIO.

particular depth is most preferable, all things considered?" If we are careful to lay out grades to the best advantage, our depth will vary much with the inequalities of the surface. From the experience of many, it has been found that a depth of from 3 to 3½ feet in prairie soil is most desirable. It will be found that some portions will be laid four feet deep and others only three feet, or even less, if we aim at a general depth of 3½ feet. The expense of digging the ditches for four-foot drains is much greater than for three-foot drains, so that for general purposes of farm drainage the above instructions may be regarded as the best that can be given. It is not always possible, however, to obtain the desired depth, because of the shallow outlets which farmers are sometimes obliged to use.

Distances Apart.—According to the principles already noticed, drains in a retentive clay soil must be placed nearer together than in ordinary vegetable loam, if we wish to drain all the land between them. Even then the water-table will not recede so near to the floor of the drain as when the water percolates more freely and rapidly through the soil. In our experience, drains placed 100 feet apart in our loamy soil, and 3½ feet deep, will thoroughly drain the land where the surface is ordinarily flat. It has been found that so easily and rapidly does our soil drain, there is no necessity for such close proximity of drains as is used in the East.

If, however, the soil is very retentive, especially near the surface, a distance of from 50 to 75 feet may be required to give thorough drainage.

plant are particularly numerous; so that we get the combined advantages of many seeds, and rich seeds, so seldom to be found elsewhere, except among the pulse family. The experiment conducted by the Agricultural Society in their college garden at Cirencester has also shown that careful selection will produce large and rich seeds from *Egilops ovata*, considerably resembling true wheat, after only a few years' cultivation.

"Oaklands."

(See "On the Wing," p. 70.)

The cow standing on the right of our engraving is "Oakland's Faith." She took first prize at Toronto and Hamilton; also the sweepstakes at both places. Her milk record was 21½ quarts, and her butter record for 7 days was 15 lbs. 2 oz.

The animal represented on the left of the picture is "Swansdown," daughter of "Farmer's Glory." Her yield of milk as a two-year old, 15 quarts.

The heifer calf which is standing is out of "Faith," and took first prize at both Toronto and Hamilton.

We could not better employ spare time than by filling up the waste places of our farms with timber for future growth.

and nitrogen is needed, it would be safe to use the artificial complete manures which contain potash, lime, soda, magnesia, phosphoric acid and nitrogen.

The introduction of barbed wire will restore into use as a hedge plant the buckthorn, *Rhamnus catharticus*. When growing in good soil and trimmed annually—a very easy process with it—there is no deciduous plant so dense and so beautiful in shade of foliage. It excels the privet in this respect and is eminently a plant for home hedging of fruit yards or of paddocks, as the English call the small areas of pasture for fowls or calves or ailing animals that are so conveniently close to the stables. It requires a richer soil than the barberry to develop its luxuriant beauty. Plants are very easily raised from the berries that are abundantly yielded by untrimmed bushes.—[Quis-Quis.]

The Milwaukee, Wis., Pickle Company raised, by proxy, last year, 25,000 bushels of cucumbers on 300 acres; the average price paid, *The Western Farmer* says, "was a cent a pound."

An authority declares that ticks and lice will never be found troublesome where sheep are fat and in good condition, the pests only attacking poorly kept animals. The "moral" is obvious.