

The signs of barley being fit for malting, a very important point as far as value is concerned, is the shrivelled skin across the middle line. The difference of price in England used to be very great between malting and grinding barley; but now the duty is levied on the beer instead of on the malt, it is not so great. The *swell*, as it was technically termed, amounted sometimes to as much as 15 0/0, i. e. the bulk of the malt exceeded the bulk of the barley by that amount. Barley was never sold by weight, as malting barley weighing 52 lbs. a bushel was often worth £2.50 a quarter more than grinding barley weighing 54 lbs. Here, unfortunately for the careful growers, there is very little difference in price between the two kinds, and it is not invariably the maltster fault, for I remember well that, when I had a brewery, if I gave one farmer an extra price for a fine sample, the next that came with a lot to sell insisted upon getting as much as his predecessor in spite of a possible inferiority in his grain. Of course he did not get it; but it created a dissatisfied feeling, which frequently led the disappointed man to refuse to deal any more.

A good crop of barley is a splendid sight. I once saw, in Cambridgeshire, England, 72 bushels an acre, standing bolt upright, and the waving ears, with their golden beards, were a glorious spectacle. The ordinary crop used to be about 48 bushels, but in the Eastern counties, 64 were not uncommonly seen. Somewhere about 1835, Dr. Chevalier, a Suffolk physician, found a *stool* of barley, the beauty of which induced him to preserve the ears and propagate the seed with great care; hence, the celebrated Chevalier barley; the finest malting barley ever seen. This was not its only peculiarity, for whereas, before its discovery, no barley fit for the brewer would grow on the clay soils above the chalk, the Chevalier was found to answer famously there; and the consequence was, that instead of growing six or seven quarters of oats to the acre, the farmers of heavy land in the Eastern district succeeded in producing seven to eight quarters of the finest malting samples. In the long run, the landlords of course raised the rent, but it was a profitable discovery to the tenants all the same; the Chevalier barley entirely changed the whole system of farming in that part of the country, and a slovenly district was converted into one of the best farmed parts of England. In this case, barley at first was sown on a summer fallow, whereby the land lay without a crop from August, when the wheat was cut, till the following February twelvemonth, when the barley and grass-seeds were sown. A long time, to be sure, but as the average yield per acre was 60 bushels, and the price 5 s. sterling, the gross return equalled £15, or £7.10 a year, the time between crop and crop being of course two years. Later, rape was sown on the fallows in June or July with bone-dust, guano, or dissolved bones, fed off with sheep, to each being given a pound of linseed cake, or  $\frac{1}{2}$  a pound of cake and  $\frac{1}{2}$  a pint of beans or lentils. With this, or with heavy dressings of dung ploughed in during the autumn, and the barley sown on the stale furrow—the strong point of heavy land farming in the Eastern counties—the crop was enormous; a farm I rented for a few years having averaged 64 bushels an acre for 14 years. The course of cropping was as follows: fallow or rape, barley, seeds (red clover), wheat; and the acre-yield: 64 bushels of barley,  $3\frac{1}{2}$  tons of clover, cut twice, and 40 bushels of wheat. In process of time, it was found that red clover would not bear the frequent repetition, and it was replaced in the second round by beans, and in the third round by hop-clover, commonly called trefoil (*trifolium procumbens*). In the two last rounds of the twelve years, the wheat was found to fall off in yield, but it was no use going on sowing red clover, and the loss had to be borne. I mention this because I must keep on dinning it into people's ears that our most

valuable friend red clover cannot be played tricks with. It has its fancies, and if those fancies are not indulged, evil will come of it. The writers in the American papers talk of sowing red clover for manuring purposes as if it was a plant which, like wheat, would, if the land was kept in good heart, come every year. It is not so, as our East Anglian brothers found out long ago, and if we persist in neglecting to profit by their experience, we shall inevitably find that red clover will refuse to grow altogether.

Good Chevalier barley weighs from 52 lbs. to 56 lbs. a bushel. In Worcestershire, on the New Red Sandstone formation, it has been known to go as high as 60 lbs. I have found some samples in Chambly, on the Longueuil road, weighing 57 lbs., but the ordinary barley of the province does not exceed 52 lbs.

*Malting.*—The conversion of barley into malt is conducted as follows: The grain is steeped in water for from 48 to 72 hours, according to its quality—in mild weather, the water is changed the second day—it is then, after draining, turned out of the steep into a frame, called the couch, where it lies for about 24 hours—depth of couch, about 20 inches.—The grain now begins to heat, becoming about 10° hotter than the surrounding air, and it is turned over, and gradually thinned down to 5 or 6 inches. The roots begin to show; the stem or *acrosire* springs from the same end, and turning back, runs along the grain under the husk. To bring this acrosire far enough up and not too far, is the great point in malting. In England, the quality of the barley is so superior that three-fourths is found sufficient, but, here, it is better to let the germ almost protrude. In proportion to the progress of the acrosire, the starch of the barley undergoes a change: barley usually contains 8 0/0 or 9 0/0 of sugar and gum; after malting, it contains about 30 0/0 of these substances. In the process, some of the nitrogenous matter originally contained in the seed is lost: barley contains 3 0/0 of gluten, malt only 1 0/0. In the brewer's mash-tun, a further portion of the starch is changed into gum and sugar.

When the acrosire has proceeded far enough up, the malt is dried to prevent further growth, which, if allowed, would exhaust the whole contents of the husk. The process is a most interesting one, and in our English malt-houses is carried to perfection. Great pains are taken by the Burton people in the selection of grain; they have buyers all over the best barley districts, and price is no object, if the quality is of the best. I, myself, saw at Saffron Walden, on the borders of Cambridgeshire and Essex, 40,000 bushels of barley belonging to Messrs. Bass & Co. Burton, which had cost that firm 30s. a bushel over the ordinary market-price. The duty on malt used to be, up to about 1880, 2s. 9d. a bushel!

The rootlets or *cummins*, as they are called, when detached from the malt are very valuable cattle-food, containing as they do about 25.9 0/0 of albuminoids. The grains from the mash-tun contain only 5.9 0/0 of albuminoids, and yet at Chambly I could never get more for the one than for the other, both fetching 10s. a bushel. In reality, if the grains were worth 10s. the cummins were cheap at 30s; as may be easily seen by the subjoined analysis:

	Water.	Ash.	Albu- minoids	Fibre.	Other carby- drates.	Fa.	Value per 100 lbs.
Cummins	11.6	6.7	25.9	9.3	45.5	1.1	\$1.33
Grains ..	75.2	0.3	5.9	3.9	13.2	1.5	.36