

THE MALTSTER.



LOFTUS, LONDON.

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THE MALTSTER,

By W. R. LOFTUS.



# THE MALTSTER:

A COMPENDIOUS

*TREATISE ON THE ART OF MALTING  
IN ALL ITS BRANCHES.*

INCLUDING A DESCRIPTION OF THE VARIOUS SYSTEMS  
NOW PRACTISED; THE CONSTRUCTION OF  
MALTHOUSES; AN ACCOUNT OF THE EXCISE  
REGULATIONS.

AND AN

ABSTRACT OF THE WHOLE OF THE MALT LAWS.

*NEW AND REVISED EDITION.*

By W. R. LOFTUS.

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## P R E F A C E.

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THE "Maltster" was first published in 1860, a second and revised edition was issued in 1871, and this being now out of print, and the demand for the work still continuing, the publisher has had the matter again carefully re-arranged and revised by competent hands in the Revenue and the Trade, so that the present edition may be relied upon as including all recent changes in the Laws or Regulations, as well as an account of every improvement of importance that has been introduced into the process of Malting since this work first appeared.

The chapter of "Practical Hints," now first given, is derived from actual observation and experience, and will be of value to all consulting the work with a view to conducting their business profitably.

LONDON, *August*, 1876.



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# MALTING IN GENERAL.

BY W. R. LOFTUS.

## CHAPTER I.

INTRODUCTORY OBSERVATIONS.—HISTORY OF THE ART, ETC.

MALT is the name given to the product obtained when barley or other grain has been steeped in water, allowed to grow or germinate artificially, and then dried at a certain point to stop further germination and exhaustion of the seed. The object of treating grain in this manner is to develop its sugar-producing qualities so as to obtain a suitable material for the use of brewers of beer, distillers, and others. Any description of corn or grain (cereals) such as oats, barley, rye, wheat, maize, &c., may be converted into malt; as may also the seeds of leguminous plants, such as beans or peas. But that which is generally used for the purpose, as yielding the best results, is barley, either the ordinary two-rowed kind or the inferior six-rowed variety, known as bere or bigg. The reasons for the preference given to barley will be fully explained in the next section.

The word "malt" is supposed to be of Anglo-Saxon origin, meaning something malled or beaten with a wooden hammer, now called a mallet.

The art of malting and preparing malt liquors is of very high antiquity. The invention of malt to be used for the purpose of preparing intoxicating liquor by the process of fermentation, is ascribed by the Greek writers to the Egyptians, to whom is also attributed the first cultivation of barley under the guidance of Osiris or Bacchus. Herodotus tells us that "owing to the want of wine the Egyptians drank a liquor fermented from barley." The Grecian poet Archilocus, who lived about 700 B.C., called it wine of barley. Diodorus of Sicily, in the time of Julius Cæsar, mentions beer in his history. Pliny, about the middle of the 1st century, speaks of this beverage in many parts of his natural history. He says, "All the nations who inhabit the west of Europe have a liquor with which they intoxicate themselves. The manner of making it is somewhat different in Gaul, Spain, and other countries, and called by various names. In Spain it is called *celia* and *ceria*, and in Gaul and other provinces of the Roman empire, *cerevisia*, but its natures and properties are everywhere the same. The people of Spain in particular," he goes on to say, "brew this liquor so well that it will keep good a long time. So exquisite is the cunning of mankind in gratifying their vicious appetites, that they have thus invented a method to make water itself to intoxicate."

Egyptians, as the first promoters of agriculture, are said to have invented beer, and to have prepared a kind at Pelusium, which was called by the name of that city, and was much celebrated. We are ignorant how far the beer of the ancients resembled what is now drunk under that

name ; it was no doubt prepared from barley, and in order to fit the barley for brewing it must have been converted into malt, but in what way the operation was performed we have no well-authenticated record. It is presumed, however, that it was upon the whole but little different from that pursued at the present time, as the causes which produce certain chemical changes are the same in all ages. The mode employed by the ancient Britons in preparing their beer is thus described by Isidorus, who wrote about the year A.D. 410 :—“ The grain is steeped in water and made to germinate, by which its spirits are excited and set at liberty ; it is then dried and ground, after which it is infused in a certain quantity of water, which, being fermented becomes a pleasant, warming, strengthening, and intoxicating liquor.” Wheat, oats, and millet were the grains most commonly used in preparing this beer.

It is supposed that the art of malting was introduced into this country by the soldiers under Julius Cæsar. Vinegar and beer were the ordinary beverages of the Roman soldiers. The former was made very strong, and drunk diluted with water, when on the march. Amongst the numerous features of civilization brought into this country by that energetic and martial people, none appear to have been so thoroughly appreciated as the introduction of a new and easily prepared intoxicating drink. Previous to this the ordinary beverages of the ancient Britons were water, milk, and an intoxicating liquor made from honey, now known as metheglin or mead. Mead was a scarce article owing to the scanty supply of honey ; but the

Britons being an agricultural people and having plenty of corn, the method introduced by their conquerors was gladly welcomed, as the materials for making the new drink were at hand at all seasons, whereas the honey was only to be obtained during the summer months. Beer then began to be a common and favourite beverage with the natives. After the Romans had been compelled to give up possession of Britain, A.D. 426, the Saxons, under the brothers Hengist and Horsa, reduced the natives under their rule, who received the method of making the drink from the Britons, which was better than their own rude method. This addition to the luxuries of their festal board was, no doubt, highly appreciated by a people already addicted to extreme drunkenness. William de Mahmesbury informs us that in the reign of Henry II., in the twelfth century, "the English were addicted to drunkenness almost universally; they caroused over their bowls day and night, keeping free house, and spending their incomes in these revels, eating and drinking to unheard of excess." The monasteries even were not free from these excesses, they were remarkable for the strength and purity of their ales, which were brewed from malt made by the monks with great skill and care.

The manufacture of malt in the olden time was so much cared for, that by an old Act of Parliament any maker of malt, who knowingly sold malt not properly separated from the roots and dross, was punished with fine and the pillory. The oldest Act of Parliament regulating the sale of malt is dated as far back as 1325, when by the 18 Edward II. cap. 9, it was enacted that the

“standard for bushels and ells shall be in the custody of the mayor and bailiff, and that no manner of grain shall be sold by the heap or cautle, except it be oats, malt, and meal.” In early times ale was much cheaper than at the present day, in proportion to the value of other commodities, there being then no restriction upon the manufacture of malt in the shape of an Excise Tax. Hollinshead informs us that about the year 1204, ale could be purchased for eightpence per gallon. The ale sold at this price was flavoured with various sweet herbs and spices; cloves were much used for this purpose, as they not only imparted a fine taste, but also preserved the beverage. Beer was also preserved by the addition of wormwood, chamomile flowers, &c.

When and where the hop was first used for flavouring and preserving beer are questions more easily asked than answered. The plant was cultivated as early as the ninth century, for in 822 the millers of Corbey were freed by the abbot from all labour relating to hops; and hop gardens are mentioned by Ludovicus Germanicus a few years later. They were used in the breweries of the Netherlands in the beginning of the fourteenth century, but do not seem to have been introduced into England until the reign of Henry IV., about A.D. 1400. The introduction of hops as a preservative was the cause of so much discontent that Parliament was petitioned against the use of them. In 1530 Henry VIII. enjoined brewers not to put hops into their ale; but little attention was evidently paid to this order, for in 1552 hop plantations had begun to be formed. The addition of hops not only

renders ale more palatable, but fits it for being kept much longer without injury.

Malt is one of the commodities which has long held a very prominent position in the manufactures of this realm ; it has accordingly for many centuries past been the object of legislative interference ; not always, however, for revenue purposes, but also to insure the purchaser a well-manufactured article, and to protect him from fraud. Many Acts to this end have from time to time been passed, but the most important was the 2 and 3 Edward VI. cap. 10, passed in the year 1548, and entitled, "The Bill for true making of malt." This Act, as its name implied, regulated the whole of the maltsters' operations. At the present day an Act prescribing, as this did, arbitrarily, the time of working on floor, or requiring the operations of malting to be conducted according to an unalterable law, would be looked upon as an invasion of the liberty of the subject, and would be much more keenly resented than any restriction which might be imposed simply with a view to secure the duty. A law such as this would not allow the maltster to work as he might think proper or find convenient, or to exercise his judgment either in the selection of barley or the market he would work for. As malt is an article of daily consumption, and contributes so much to the revenue, it is of course necessary to regulate the manufacture by certain laws, which have for their object the protection of the revenue and the fair trader, at the same time interfering with the operations of the maltster as little as possible. It may, however, be safely asserted, that the restrictions

imposed by the Excise laws are but little felt, as they have been framed from time to time upon suggestions from maltsters themselves, so as to secure the revenue effectually, and at the same time restrict the maltster as little as possible. Indeed, were the duty upon malt repealed, the probability is that ninety-nine maltsters out of a hundred would continue to work as at the present time.

The trade of malting was formerly, as is now the case, carried on to so great an extent in the towns of Ware, Norwich, and Bury St. Edmunds, that it gave rise to another tax upon the public in the shape of tollgates, or turnpikes, which were established in 1663 by the Act 15 Charles II., cap. 1, intituled, "An Act for repairing the highways within the counties of Hertford, Cambridge, and Huntingdon." The preamble of the Act recites that "The ancient highway and post road, leading from London to York, and so into Scotland, and likewise from London into Lincolnshire, lieth for many miles into the counties of Hertford, Cambridge, and Huntingdon, in many of which places the road, by reason of the many and great loads which are weekly drawn in waggons through the said places, as well by reason of the great trade of barley and malt that cometh to Ware, and so is conveyed by water to the city of London, as other carriages both from the north parts, as also from the city of Norwich, St. Edmundsbury, and the town of Cambridge, to London, is very ruinous and almost impassable, insomuch that it is become very dangerous." Turnpikes were erected in accordance with this Act at Wadesmill in Hertfordshire ;

Caxton, in Cambridgeshire, and Stilton, in Huntingdonshire.

The national beverage of the English being ale or beer, the art of malting is carried on in England more extensively and with greater perfection than in any other country in Europe, or, indeed, on the surface of the globe, not even excepting the Anglo-Americans of the United States. Next to the English, the Danes and Bavarians may be considered as beer drinking people. The latter have a proverb to the effect that "a Bavarian in the morning is a beer barrel, but at night a barrel of beer." The malt made in the Duchy of Schleswig-Holstein, and in the vicinity of Munich, is very good, but hardly to be compared with English malt. By the "Customs Consolidation Act, 1853," the importation of foreign malt into the United Kingdom was prohibited, but this prohibition has since been repealed by the "Customs Duties Consolidation Act, 1860" (23 & 24 Vict., cap. 110), and malt may now be imported into Great Britain or Ireland upon payment of the importation duty of 24s. per quarter, but the importation of all extracts or essences of malt, or other concentrations of the same, which are, or may be, applicable to the same purposes, is still strictly prohibited. In fixing the import duty at 24s. per quarter, it is considered that as the foreigner can store his malt in bond, after importation, until it is wanted for use, while the British maltster is required to pay the duty shortly after the malt is made, or to give bond and to pay interest if payment of duty be deferred, home duty ought to be increased by the amount of the interest locked up, which represents about a shilling

per quarter. The cost of Excise restriction is estimated, on a liberal computation, at about 1s. 3½d. per quarter, making a total of 2s. 3½d., which represents the difference between the duty on a quarter of British-made malt and the duty on that quantity when imported. The Act allowing the importation of foreign malt came into operation on the 28th August, 1860, yet up to the close of the financial year (31st March, 1861), not a single bushel of malt had been imported into any part of the United Kingdom, notwithstanding the fact that the price of labour in Denmark and Prussia, and also in Holland, is only about half that in England, and the price of grain considerably less. This fact speaks much in favour of good English-made malt.

It has been already observed that malt can be made from any kind of grain, cereal or leguminous, such as barley, bere or bigg, wheat, oats, maize, rye, rice, beans, peas, tares, &c. The grain chiefly used in England and Ireland is barley, and in Scotland bere or bigg. When wheat is cheap in England, or not sufficiently good for grinding into flour, it is sometimes used for malting with about half its bulk of sound barley. The beer, however, is not of so fine a flavour as that prepared wholly from barley malt, nor will it keep so long, as it is apt to pass quickly from the alcoholic state to the acetous. Beer brewed entirely from wheat is called "mum." This beverage is highly esteemed in Germany and Denmark. Attempts have at different times been made to malt Australian wheat, but the result has not been found satisfactory either in a commercial point of view as regards the importation, or for the brewer's purposes.

## CHAPTER II.

BARLEY FOR MALTING PURPOSES.—ITS VARIETIES AND QUALITIES.—  
TIME OF SOWING AND REAPING.—KILN-DRYING.—EFFECT OF  
STEEPING, ETC.

As barley is the grain chiefly used for malting, too great care cannot be bestowed by the grower in the choice of good seed and qualities, and in the cultivation of the grain in suitable soil. Great care is also requisite in the cutting of the grain and in securing it in stack and barn, as by an improper treatment in either particular the utmost precaution on the part of the farmer may be frustrated. Much judgment must be exercised by the barley buyer; experience, indeed, will alone lead him to determine the kind suitable for malting, as sometimes barley may be so doctored by kiln-bleaching that it is almost worthless for malting, and only fit for grinding or feeding purposes.

Barley (in Latin, *hordeum*) is a grain which has been known like most other kinds of grain, from time immemorial. It is a cereal, and, next to wheat, is one of the most important of that class now cultivated in England. It has a thick spike; the calyx, husk, and flower are like those of wheat or rye, but the awns are rough; the seed swells in the middle, and, for the most part, ends in a sharp point, to which the husks are closely united. The

species are common spring barley (*hordeum vulgare*); winter, or square barley (*hordeum hexastichon*), by some called bere or bigg; long-eared or two-rowed barley (*hordeum distichum*); and sprat, or battledore barley (*hordeum zeocriton*). The kind principally used for malting purposes is the two-rowed, or Chevalier barley. Bere or bigg is hardier than the other sorts, and is chiefly cultivated in the more ungenial parts of Scotland. <sup>Ireland</sup> Barley, as it requires comparatively little moisture, is well adapted for countries where the summer is short and moisture scanty. In Lapland it has been known to come to perfection in six weeks after the seed is put into the ground. A wet season is unfavourable to the growth of barley, as are also very heavy dews. The stalk not being so strong as wheat, bends and breaks under the load of its heavy head, which, falling to the earth, causes the grains to commence sprouting in the ear in a few days; four days' continued warm rain is sufficient to spoil barley for malting purposes if the ears lie upon the field.

Barley is better adapted for malting purposes than wheat, as it contains more starch, far less gluten, and about seven per cent. of ready-formed grape sugar.\* Wheat does not contain any appreciable saccharine matter until it has been malted. On the other hand, barley is not so well adapted for bread-making, as it is deficient in

\* By the term *grape sugar* is to be understood sugar similar in kind or character to that present in ripe grapes. Thus, the juices of fruits, honey, &c., contain grape sugar as distinguished from cane or beetroot sugar. Starch sugar is also of the same character as grape sugar.

gluten as compared with wheat ; it contains only three per cent. of gluten, whereas wheat contains from twelve to fourteen per cent. Again, both wheat and rye being destitute of husk, do not afford that protection to the germ or vital portion of the grain which is found in barley and oats. Hence the germ is easily injured, and the grain in consequence soon becomes mouldy, and undergoes decomposition. Oats, on account of their thick husk, small kernel, and slowness in germinating are unprofitable. It is very difficult also to malt Indian corn or maize successfully in this country, as numerous trials have proved.

The weight of a bushel of good sound barley is from 53 lbs. to 56 lbs., but this depends on many local circumstances, such as climate, soil, and harvest. Chevalier barley will sometimes weigh  $56\frac{1}{2}$  lbs. per bushel, whilst bere or bigg weighs only from 47 lbs. to 51 lbs.

We now pass on to consider briefly the peculiarities of each kind of barley, with a view to the selection of the best kind for the purpose of malting. Spring barley, before the introduction of its successful competitor, Chevalier barley, was the kind principally grown in England ; and in some counties, where an early harvest is a matter of importance, as in Cumberland, Yorkshire, and Durham, is the kind principally grown at the present day. There are two varieties of this sort, technically termed *the common* and *the rathpipe*. The latter seems to be the result of a peculiarity in the soil. Long cultivation in warm gravelly soil is said to produce this variety. During the first year of changing rathpipe from warm gravelly

to strong, cold, clayey soil, this kind does remarkably well, and is fit for mowing nearly sixteen days sooner than seed taken from the same kind grown on a cold soil. In the second year, however, the difference is but little, and in the third sowing the time for harvesting is the same. It has been known to be sown as late as the middle of May, and to be fit for mowing by the first week in August. This kind has nine or ten, and sometimes thirteen grains on each side of the ear. There is another kind of this barley termed Siberian, imported from Siberia, but as the yield is inferior to the rathpipe, there are no great inducements to continue the growth of it.

Winter, or square barley, is, as its Latin name (*hexastichon*) implies, six-sided. In Scotland, where it is extensively grown, it is termed bere or bigg; it is much coarser than barley and not so good for malting purposes. It is considered so much inferior, that a lower rate of duty is charged upon it. This indulgence has existed for many years. It appears to have been granted for the purpose of encouraging farmers holding poor land in Scotland and Ireland, which would answer for the cultivation of bere or bigg, but not the better kinds of barley, requiring a warmer and richer soil. It will grow on poor stony land, and is, therefore, of the utmost importance to small Scotch farmers. In the northern counties of Scotland and on the Orkney Islands, where almost every small farmer makes his own malt, this kind of grain is almost the only description used for the purpose of malting. The grains are short and plump,

the husk thick and coarse. Each ear contains from thirty-six to forty grains. They are disposed in six rows, two of these are on each of two sides, and the other two on each of the other sides.

Long-eared, or two-rowed barley, is the best kind cultivated in England, or any other country. The grains are arranged on the stalk in such manner that the foot stalks of one row are opposite the middle of the grains in the other row. The ear resembles an ear of buck or spring wheat, and contains from fourteen to eighteen grains in a row. It is flat, rather more than half an inch broad, and a quarter of an inch thick. Its husk is very thin, and for malting purposes, for regular growth, and for saccharine yield, unsurpassed by any other, with the exception of Chevalier. The number of ears from a single seed is greater than in the other varieties. Although this variety is so excellently adapted for malting purposes, there are serious drawbacks to its cultivation. It would seem that the greater part of the growth of the plant is expended in the perfecting of its ultimate organ, the seed. Such being the case, the stem is deficient in strength, and when the ear is nearly perfected, and loaded with moisture from rain or heavy dew, the weak stem is apt to break, and the ear fall to the ground, in which case, should much wet, warm weather succeed, it will germinate prematurely in the ear and spoil.

Chevalier barley is the finest kind cultivated. It is merely two-rowed barley of a very fine description, and raised to an extraordinary size and weight by cultivation. It was introduced about 45 years since by the Rev. F.

Chevalier, Rector of Stonham, Suffolk. It is well known that vegetables and flowers may be completely changed by careful cultivation. The plan generally pursued is to choose the largest and soundest seeds, and then raising them in beds of rich compost, supplying them during their growth with as much liquid manure as they may require, from time to time cutting away all superfluous leaves and shoots, and leaving only one or two ears to come to maturity. Careful treatment and selection of only the best seeds being pursued for five or six years, the character of the seed becomes completely changed, and it is no longer to be recognized as belonging to the original stock. It was upon this principle that Mr. Chevalier treated the barley, afterwards called by his name, and being eminently successful, in the course of a few years Chevalier barley was sought for far and near, and sold for remarkably high prices. It is now almost the only kind used for malting in England.

*Sprat, or battledore barley*, is shorter and broader in the ear than either of the preceding varieties. It is sometimes cultivated on light chalky soils, but is not much used for malting purposes.

The usual time for sowing barley is from the beginning of March till the latter end of April, but this varies in different parts of the country. The principal barley growing counties in England are Norfolk, Suffolk, and Essex. In choosing the seed the farmer should select the very best he can purchase. It should be free from stains, heavy, and full-bodied. In dry weather the grain is better for being steeped for two days ; this gives

all the seed an equal chance, as some may be buried deeper in the earth by the drill than others, in which case the grains on the surface do not start so soon as those sunk deep. This cereal should not be sown on the same land on which it was grown; if sown on the same land more than twice, it rapidly degenerates, therefore the seed barley should be changed at every crop.

The best soil for barley is a sharp, friable, gravelly, and dry soil. Sandy soils are very well if well manured; cold clayey land is not adapted unless it has been well drained. The barley crops should not succeed oats, wheat, beans, or peas, but rather turnips, upon which sheep have been fed during January and February, or after potatoes. The land is prepared by a light ploughing, and well loosened by cross ploughing, harrowing, or still better, the scarifier. After the seed is sown it is essentially necessary to roll the ground, particularly loose soils. Care should be taken to keep the land as free from weeds as possible. The barley is fit for mowing when the straw is quite yellow; if cut down before, the husks will not be properly filled, and a poor, shrivelled grain will be the result. If the weather be fine and the straw not encumbered with weeds, it will be dry enough for carting in a few hours. While the grain is lying on the field is an anxious time for farmers. Should the weather prove fine the malting qualities will be well secured, but should warm rains unfortunately set in, it will be stained, and its malting qualities seriously injured. It requires judgment to know when it is fit for carrying, because if not sufficiently dry it will heat in the stack or barn, and either

spoil the grain or ignite the straw. If the spontaneous heat in the stack rises above 130 degrees, the power of germination in the grain is completely ruined, and it is, therefore, quite unfit for malting purposes. Sometimes after being threshed, barley contracts damp, in which case it will not germinate properly unless it has been kiln-dried, neither will it, if it has been much sweated in the stack.

The operation of drying barley requires care, and should not be performed at a higher temperature than 120 degrees Fahr. The barley should not remain on the kiln longer than absolutely necessary, for if the kiln-drying be carried to excess, the barley is apt to become very hard and steely, when it requires to remain under water in the cistern longer than usual, owing to the slow absorption of the water. As the barley by being kiln-dried loses moisture and diminishes in bulk, it swells more than usual when placed in steep. There is, however, a great difference with reference to the swell when in steep and the working of kiln-dried barley, according to the soil upon which it is grown, and the method of drying it. These remarks must be understood to apply to barley grown on cold, stiff, clay soils, and dried thoroughly at a temperature of about 120 degrees Fahr. A very different result attends the kiln-drying of light-soil barley at a low temperature. Barley dried in this manner, having a great affinity for water, rapidly absorbs it when in steep, and swells very fast, the maximum being reached in about 40 hours. The bulk sometimes increases to the extent of 32 per cent., or even more, in the cistern. This great swell is, no doubt, chiefly due to the bulk having been reduced below that

of the grain when in its ordinary state by the partial expulsion of the 12 per cent. of water which the grain naturally contains. This great expansion of barley is also noticed in good dry seasons, when it has been well dried in the field, and harvested without rain falling, under a hot burning sun, and afterwards well sweated in the stack. Barley does not, as a rule, vegetate properly when it has been damped in the store or much sweated in the stack. It is difficult to account for this: some suppose that it holds, in combination with the starch, a certain amount of water which has not been dissipated by the heat generated during spontaneous fermentation when heaped up in the straw in the stack; others think that, if allowed to become damp in store, when threshed, the moisture draws in with it or develops an essential oil contained in the husk which is unfavourable to germination.

Kiln-dried barley should be steeped and worked by itself, for if mixed with grain which has not been so dried, the growth or germination on the working floor will not be equal and regular. Foreign barley is particularly liable to contract dampness in the hold of the vessel. In selecting malting barley, care should be taken to keep and work separately samples which are grown on different soils, or the growth on the floor will be irregular. For instance, barley grown on light soils will germinate more freely than that grown on cold, clay or stiff land, and therefore requires different manipulation. If sufficient care is not bestowed on the selection of the samples, and growths of various soils are malted together indiscriminately, the result will be that some of the grains

will be only half malted, while the rest will be thoroughly malted ; a serious drawback to the sale of the malt.

Before proceeding to explain in detail the process of the conversion of barley or other grain into malt, it will be necessary to notice the structure of the seed, and the economy of each part. In a seed, we have before us a plant in its smallest possible form. It is composed of several parts ; an inner and outer husk, the cotyledon, the plumule or future stem (called acrospire by maltsters), the corcle, rostell, investing membrane, and the scar or eye, through which the seed is nourished during germination. The white hard part of a grain of barley is botanically termed *albumen*. This part is the cotyledon comprising the chief part of the seed. Some seeds, such as barley, contain only one cotyledon, and are termed monocotyledons, others contain two, and are called dicotyledons, such as the pea or bean. It may appear singular to the uninitiated, but it is nevertheless a fact, that, for the first few days of its existence the plant actually feeds upon itself. Within an hour after being put into water, the germ commences its existence. At this time, the delicate germ requires food, but as the roots are not in a condition to afford that food until they have penetrated into the ground, the germ would die if it had no nourishment within the husk of the grain. This the cotyledon supplies. The exact mode in which the plant springs into life is not well understood, but it is supposed that at the base of the germ there are the materials of the substance termed *diastase*, which, being acted upon by the steep-water, commences the vitality, by converting the albuminous cotyledon, or

starch of the grain, into dextrine, or gum, which, by the continued action of the diastase, becomes sugar. Although it has been usual to say that it is the *starch* of the grain which becomes acted on by the diastase and converted into sugar, recent investigations tend to show that it is chiefly the *cellulose* or woody fibre of the grain which undergoes this change, and that most of the starch remains unaffected.

To produce as much saccharine matter as possible with as little loss of substance is the sole aim of the maltster in his process of artificial vegetation. Diastase has the peculiar power of converting starch or cellulose into sugar, and in such quantities as the plant may require for its sustenance, changing it first into dextrine, and then into grape sugar.

It has been commonly supposed that the contents of a grain of barley are converted into sugar, only so far as the plumule or acrospire advances, which, in the case of barley, overlies the cotyledon, and grows up under the husk. This opinion, however, would not seem correct, as the microscope shows that the flour, whether taken from the part close to the embryo, or from the unmalted portions of the seed, differs in no respect from ordinary barley starch, except in the somewhat greater size of the granules. In all plants starch granules, wherever found, are invariably enclosed in cells composed of the vegetable tissue called cellulose, which in chemical composition is identical with starch. In malt, so far as the plumule or acrospire has grown, this tissue is found to have almost wholly disappeared, and it is not unreasonable to conclude that it

is chiefly to the transformation of the cellulose into sugar that the sweetness and friability of malt are due.

The next part of the seed to be noticed is the corcle or germ, which is the embryo of the future plant. This germ, which feeds upon the sugar produced by the action of the diastase upon the starch of the cotyledon, lengthens upwards and downwards, forming what are termed respectively the ascending and descending axis. The part which ascends is called the plumule or acrospire, the future stem of the plant, which in barley grows under the husk, and, as a matter of course, emerges at the end opposite the root. The diastase, which has considerably increased by the process of malting, is found in the plumule. The descending part of the germ is called the radicle, or future root. This part is formed before the plumule; in barley it may be seen, if the weather is favourable on the third day after steeping, in the form of a white protuberance, termed the chick. The sugar is carried down from the cotyledons to the rootlets, and then forced up into the plumule by the action of the root. The root, therefore, supplies the germ with nourishment not only before it emerges from the husk, but also after the plumule has burst the husk and appears above ground in the stem of the plant. Steeping in water is necessary for the germination of the seed both in a chemical and in a mechanical point of view. When the seed is harvested or dried the albumen is very compact and hard; the husk is so firmly bound to the cotyledon that it would be impossible for the tender germ to make its way in the least. The steep-water, therefore, by softening the husk, allows

the germ to start into life and to make its way beneath. Although if seeds are kept dry their vital principle may be preserved for years, yet barley which is more than one year old should not be used for malting purposes, for if kept longer than this a great number of the seeds will fail to germinate. In order to keep barley when threshed sound, dry, and in good condition, it should be sometimes turned in the store, the exposure to the atmosphere preventing damp or mould. New barley, on the other hand, is apt to "miss," especially if not well harvested. At least a month or more should elapse from the time of harvesting barley until it is steeped for the purpose of malting, so as to allow the grain to sweat in the stack and the damp of the stack to evaporate. If, therefore, a maltster wishes to commence malting in August or September, he would do well to use barley of the previous years' growth.

## CHAPTER III.

### GENERAL DESCRIPTION OF THE PROCESS OF MALTING.

To persons practically unacquainted with the art, the operation of making grain into malt no doubt seems a process requiring but little skill. Skill, however, is required, and is only to be obtained by experience. No set of rules can be laid down by which the maltster can be entirely governed, as he has so many peculiarities and obstacles to contend with—such as the quality of the malt to be made, the nature of the grain, state of the weather, time of year, construction of the malthouse, and the properties of the water used for steeping—that if each of these was not specially considered, and the operation conducted in every instance according to circumstances, the malt might sustain considerable injury, if not be rendered almost unsaleable.

The process of malting is a chemical operation, in which art copies the order of nature as closely as possible. The great aim of the maltster is to obtain the utmost amount of saccharine matter with the smallest loss of substance and the least outlay in the shape of labour.

Almost every maltster has a different method of working; some having in view the production of malt of a superior quality; others work to produce weight; and

others, again, to produce as great a bulk as possible. Great quantities of malt are made in the midland, eastern, and northern counties, for the Liverpool market, in which case to obtain bulk is an important feature, as the malt is sold by measure. To accomplish this the grain is worked up as quickly as is consistent with the conversion of the starch, &c., into sugar. In doing so the acrospire is forced, and extends about seven-eighths of the length of the grain. This distension of the acrospire causes the grain to swell unusually, and, consequently, the malt measures more. When the malt is made with the view of producing a good quality, and to convert nearly the whole of the starch into sugar, the maltster causes the grain to vegetate slowly on the floor, and thus imitates natural germination as much as possible. As a rule, the longer the grain is in operation the more perfect is the development of saccharine matter. This kind of malt is better suited for mashing in small quantities, and is, therefore, chiefly in request by small brewers. It is to be observed that the whole of the starch of the grain is not converted into sugar by the process of malting; a portion is left to be converted into saccharine matter by the hot liquor and diastase in the mash tun. If the maltster were to work his grain upon the floor so as to convert the whole of the starch into sugar, he would suffer unnecessary loss; it would require a day or two longer to complete the process, and the germ, in the meanwhile, would feed upon the already formed sugar. But as enough of the saccharine matter has been formed in the grain in the malthouse, the remainder may be

saccharized in the mash tun. In large mash tuns, where the great bulk of the mash allows a high heat to be kept up, this operation is effected satisfactorily; but as the small brewer cannot do this in his little mash tun, the maltster must do it for him on the floor, although at the expense of the sugar which is unavoidably consumed by the rootlets in the process of vegetation.

In the warm, forced method of malting, as practised in the midland counties, the malt is made so as to bring the acrospire nearly the whole length of the grain. The roots of the malt when about five days old are very long and vigorous, growing at the expense of the starch, in which state they continue until a few hours after the germinated grain is thrown on the kiln. The malt thus made, by the process of sprinkling, and working the grain at a high temperature, does not weigh so much as malt made slowly, without sprinkling, and at a low temperature, by 3 lbs. per bushel, but the bulk is increased by the greater distension and development of the acrospire. In some parts, and particularly the manufacturing districts, the grain is malted as little as possible, which causes it to weigh much heavier. This malt is sold to persons who brew beer for their own use, and, being ignorant of the true character of good malt, will not purchase unless it weigh heavy.

*Steeping.*—The barley after having been properly screened and cleansed, so as to separate as far as possible all the thin, light corns that would not pay for malting, is placed in a vessel called the “cistern,” and kept covered therein with water for a period of not less than forty hours.

This is the smallest time the law allows, and it is found that on an average a shorter period would not suffice for the proper penetration of the husk by water and the softening of the kernel. While in steep the grain increases by the absorption of water over a fifth in bulk and nearly fifty per cent. in weight, that is, it takes up about one-half its own weight of water. The gas called carbonic acid is formed by a chemical combination between the constituents of the grain and the water. This gas dissolves in the steep-water, along with a portion of colouring matter from the husk. In warm weather a slight fermentation sometimes arises from the organic matter acquired by the steep-water acting on the decayed grains, and on this account it occasionally becomes necessary to change the water during the period of steeping. That a considerable quantity of matter has been yielded by the grain to the steep-water is rendered evident by the colour and strong smell of the latter as it runs from the cistern.

The barley is usually allowed to remain covered with water more than forty hours; it is suffered, as a rule, to continue in steep fifty hours, and in a few cases as long as sixty and eighty hours, the period being regulated according to the season, temperature, and description of grain. If a corn taken from any part of the contents of the cistern, and held lengthwise between the first finger and thumb, readily breaks down into a pulpy state when squeezed, the steeping is judged to be complete. The water is then finally drained off, and the grain thrown into a thick, compact mass of considerable depth, where it is kept for

at least twenty hours, in order that the heat necessary to the starting of germination may be developed.

*Couching and Flooring.*—The mass of steeped grain thus removed from the cistern is technically called a “couch,” and the rectangular vessel in which by the revenue laws it is required to be placed, is called a “couch-frame.”

But little apparent change takes place in the grain for from thirty to forty-eight hours after emptying from cistern. The temperature of the grain then begins to rise, oxygen is absorbed from the air, and carbonic acid gas evolved. The radicle, or as the maltster terms it, the chick or chit, may now be seen emerging from the base of each corn. In about two days afterwards, the grain becomes moist on the surface or “sweats,” and emits an agreeable odour, compared by some persons to that of apples; the fibrils of the radicle burst through the root-sheath, and at about the same time the plumule, passing the boundary of the cotyledon, makes its way in a direction opposite to that of the radicle. In order to lower the temperature and thereby moderate the germination, the grain is now spread rather thinly on the floor and frequently turned. By this means the floor is kept at an average temperature of about 60° Fahr.; germination proceeds slowly and regularly, and the starchy matter of the grain becomes white, soft, and friable. In ten or twelve days after the grain has been emptied from cistern, the frequent turnings and exposure to the air, together with the growth of the rootlets and acrospire, have dissipated the greater portion of the moisture absorbed in the steeping, and the

rootlets wither. The grain is then laid a little thicker on the floor to generate heat, liberate more moisture, and render it mellow; and by this time the acrospire ought to have grown to two-thirds or three-fourths the length of the corn.

The grain, now sufficiently malted, is dried on a kiln to arrest germination, which, if suffered to proceed beyond this point, would exhaust the seeds of their soluble contents, and also to enable the malt to be kept in store without further change.

Some maltsters work their floors on a plan somewhat different from the preceding. The floors are kept thick and germination is forced, abundance of rootlets being formed. The heat engendered in this process dissipates part of the moisture absorbed by the grain while in steep, long before the plumule has grown to a sufficient length; hence it is requisite to sprinkle the corn with water, in order to stimulate germination. In a few of the malting districts, however, sprinkling is not resorted to as a practice, it being thought unnecessary, and indeed injurious. But when a maltster works for "outcome," that is, with a view chiefly to a large increase of produce over the quantity of barley steeped, rather than with the desire to obtain malt of fine quality that will tend to the profit of the brewer, it certainly proves of advantage to water the corn on the floor, as that treatment has the effect of increasing the bulk of the finished malt. In other words, "sprinkled grain" measures well off the kiln.

When the grain is removed to the floor, the art of the maltster may be more properly said to commence. During

this stage of the operation all his judgment is brought into requisition. He must govern himself by the quality and peculiar growth of the grain, whether grown on light or heavy clayey land ; the construction of the malthouse ; kind of malt intended to be made ; time of year ; weather and temperature of the atmosphere. No fixed rule can be given to enable the maltster to work his grain on the floor ; he has all these matters to consider, and must be guided by circumstances, which experience alone can teach. The chief object to be attained is a regular germination of the grain. Very little apparent change takes place in the grain for from thirty to forty-eight hours after removal from cistern. The maltster commences operations by laying the grain to form the young floor to such a thickness that the temperature will rise to from 50 to 60 degrees, which has the effect of starting germination. The middle part of the floor being the warmest vegetates first, and after a few hours the grain is turned, or stirred, so as to bring the top and sides into a similar state of forwardness. When the grain has made a start the temperature is lowered by spreading the grain a little thinner gradually, until the middle of the process, when it is again thickened as gradually, until it is thrown on the kiln. Too great care cannot be observed in turning floors, as by treading on the grain it is more or less crushed, especially when laid out thin. To guard against this as much as possible, some maltsters will not allow the men turning the floors to wear their ordinary boots, but provide them with list slippers, while in other extensive maltings the men are compelled to perform the whole of the work barefooted,

whether when emptying the cistern, turning the grain on the floors or kiln, unloading the kiln, or screening the finished malt. In some places the workmen are so used to this that they prefer working barefooted, and can tell the state of germination better by the foot than the hand, and whether the grain requires more or less warmth on the floor. When a grain is crushed by the foot its vitality is gone. In the early stage of germination this is a matter of great importance to prevent, as the crushed grain is not only spoiled, but immediately commencing to decay and mould, communicates its bad effects to the surrounding grains. Grain when vegetating on the floor should be perfectly free from any mouldy smell, as if this odour be present it arises from some improper cause, to the deterioration of the malt.

The operation of turning the grain on floor is performed by the use of large flat wooden shovels. The precaution is very necessary, for if iron shovels were used the sharp edge would be likely to cut and injure the grain. As frequent turning of the grain is attended with considerable labour and risk of damage to the grain, it is frequently stirred by means of an instrument called a plough, which in shape resembles a very narrow shovel with a long handle. Ploughing has the effect of gently separating the roots of the grain, and exposing the underneath grains to the surface, when, coming in contact with the cold air, the germination is gently checked. The floors are ploughed or turned several times each day, according to the weather and working quality of the grain. If the grain were suffered to germinate on the

floor without turning, it would in two days become so hot that the roots would strike out to the length of an inch and a half, and completely spoil the malt. The operation of turning and ploughing, therefore, not only keeps the rootlets from a rank growth, but maintains the grain at an equable temperature, according to its age, so as to imitate natural growth as nearly as possible.

When the malt is made for the greatest quantity of saccharine matter, to suit small brewers, the rootlets should not at any time exceed three-eighths of an inch in length, and grow slowly on the floor. In some places, even during winter, where slow growth is desirable, the grain is at no time allowed to be more than an inch in depth, and is either turned or ploughed about every two hours. In such instances the grain is not thrown on the kiln until the sixteenth day after being emptied from cistern, when the acrospire extends nearly the whole length of the grain. Malt made upon this principle is the most valuable, both for richness of flavour and saccharine extract. Experienced workmen can tell so well when a floor requires to gain or lose warmth, that they have merely to thrust their hand or naked foot into the floor, without looking at the grain. If the rootlets are white and stouter than is usual for the age, the grain is spread out a little thinner; but if they appear dry, shrivelled, and yellowish, it is a sign that more heat and moisture are required, and the floor is laid a little thicker. In watching the process of germination, it should be always distinctly borne in mind that the grain should not be checked or heated suddenly; if the chemical

action has caused the grain to heat unobserved, it must not be cooled or checked suddenly ; if the maltster should attempt to do so, he will completely destroy the power of vegetation, and the rootlets within two days will shrivel and fall off. Upon the other hand, the grain, if it appear too sluggish, should not be laid too thick, so as to heat suddenly, as the root will be forced without corresponding benefit to the malt. In fact, if the maltster at all outrage the ordinary operations of nature, the malt will be sure to suffer.

Barley generally throws out five rootlets, the middle one being the strongest. If the young floor has been neglected too long, the middle root will shoot out three times the length of the others, and turn up at the end like an awl. The bulk of the grain increases gradually while on floor—nearly 5 per cent. each day until the eighth or ninth day, at which time the rootlets, having no more moisture to work upon, wither ; consequently the bulk is lessened, or as it is termed, “ goes back.” At this time, as the roots cannot deprive the grain of its saccharine matter, the floor is laid a little thicker, according to the temperature ; the chemical action, giving rise to heat, again sets in, when the temperature of the grain rises again sometimes as much as ten degrees. This has the effect of increasing the power of the diastase, which converting more of the starch into saccharine matter, gives a peculiar mellowness to the malt, without materially affecting the quantity of sugar by consuming it.

*Kiln-drying.*—When the grain has been sufficiently germinated on the floor, in order to expel the water im-

bibed while in steep, and to preserve the malt when the operation has been completed, it must be subjected to a high temperature, which is done by putting it on a kiln, heated from 80 to 210 degrees, and sometimes even more, which at once stops vegetation, and thus completes the process of malting. As a general rule, the grain, when about to be thrown on the kiln, should be of such a nature that it may be easily broken or crushed between the finger and thumb, and present the appearance of damp starch, or, when pressed and drawn along upon a board, will break up and leave a white mark. If the malt were not kiln dried it would not keep, but would have to be removed to the mash tun at once. The process of drying varies according to the purpose for which the malt is required. There are three varieties of kiln-dried malt, viz. : pale, amber, and brown ; the difference between these depending solely on the degree of heat to which each has been subjected, and the manner in which the heat has been applied. The lowest heat required to drive off the superfluous moisture and insure its keeping must not be less than about 105 degrees. The lower the temperature of the kiln the better, although the grain may require longer drying, as the saccharine matter is less liable to be converted into the chemical substance termed caramel, familiarly known as burnt sugar. If the malt be at all burnt by the improper application of heat, the sugar is more or less destroyed, and the value of the manufactured article proportionately lessened.

When the grain is thrown on the kiln it is spread evenly on the floor, the depth varying from four to sixteen inches.

The time of drying varies from one to four days, according to the depth of grain and draught of air. A good current of air is necessary in all kilns to carry off the steam. During the first six hours the heat should not exceed seventy degrees ; the more gently the fire is applied and raised the better. As the fire is continued all night as well as day, great care should be paid to prevent it becoming too fierce, which it is liable to do if not watched. To prevent this, or to keep the fire from "breaking out," as maltsters term it, during the night, it should be made up the last thing, and then covered up with a quantity of ashes which fall through the bars. This method serves to keep up a gentle fire all night, which may soon be made up in the morning by raking out the ashes and putting on more fuel. When the grain is on the kiln the fire should not be allowed to go out, as in addition to the trouble of lighting the fire afresh, the smoke from the fuel when it is getting up imparts a bad colour and flavour to the grain.

Pale malt occupies from two to three days in the drying, the temperature being slowly raised from about 90 to 120 degrees Fahr. The reason for applying the heat gently at first and increasing it gradually is, that the silicious or external part of the husk may not be "set" or rendered glassy, and the starch immediately under the husk converted into a hard substance, thereby preventing the escape of the moisture in the internal part. Pale malt dried quickly, by applying a strong fire at first, is liable to many objections. As the moisture is not fully expelled by this method of drying, it will, when heaped,

germinate afresh, and may ignite in the store by spontaneous combustion ; it is also liable to turn sour and musty, when it will contaminate any other malt which may be near it. This description of malt is seldom less than two days drying. It should not be removed from the kiln until the rootlets are capable of being easily detached, which is done by treading the malt with the feet. Under-drying should be as carefully guarded against as quick drying with a sharp fire, because the same bad qualities will attend it.

Some kilns have the bad effect of scorching and discolouring parts of the grain, giving it a black spotted appearance. This is caused by a sudden current of air passing over a fierce fire, when the excessive heat, passing up through the small holes in the tiles, scorches and discolours that part of the grain lying immediately over the whole, giving the malt an unsightly appearance. Pale malt, dried on a kiln with a tiled floor, is peculiarly liable to this. As the underneath part of the grain dries quicker than the top, it is turned or ploughed as occasion may require, so that the undried part may feel the action of the fire. Pale malt is used generally by the more extensive brewers, the very best barley being employed in its manufacture.

Ordinary malt, such as is made for the use of private persons and small brewers, is higher dried ; this is effected by the application of a brisk, clear fire, at the termination of the process, and is an operation requiring much care. Some maltsters have so good a method of finishing that they impart to the malt a very fine flavour, which is par-

anticipated in by the wort, and adds considerably to the fine flavour of certain ales. By some maltsters their method of finishing or drying off is considered a great secret, and the workmen are exceedingly careful not to impart this knowledge to other workmen. Malt kilns have their peculiarities, and require experience and study to be understood, so as to produce the different kinds of malt to advantage.

During the early part of the drying of ordinary malt the process differs but little from the method pursued in drying pale malt, but for about three hours before it is thrown off the kiln the heat is gradually raised from 150 to 180 degrees, and is then so great that the malt requires turning two or three times, and at the end of the three hours is thrown off whilst in a hot state. When the kiln is unloaded the fire is damped, and the next floor or part of a floor thrown on. During the operation of "firing off" the malt must not be left, as by a slight increase of heat beyond 180 degrees it will scorch and become too high-coloured. The operator examines the malt every two or three minutes, and by the feel alone knows when the process is finished. The hot malt at this time sends forth a peculiar sweet odour, which may be perceived at a great distance. The operation of finishing should always be done with a very clear fire, or the ale will not fine. To pale ale brewers this is an important matter.

*Amber malt* is finished in a similar manner at a temperature of about 180 degrees, which has the effect of imparting to it a higher colour. When this malt is ground it is of a rich amber colour—hence its name. The fuel

used for drying amber malt is different to that used for drying pale or ordinary malt. For the latter kinds the fire is made of anthracite coal or coke, but for the purpose of producing the amber colour and its peculiar flavour the fire is made of ordinary coal or of coke, upon which are laid a few billets of wood, generally of oak. This has the effect not only of making a sharp fire in a short time, but also imparts the peculiar flavour supposed to be derived from the pyroligneous acid thrown off during the combustion of the wood.

*Brown or porter malt*, so called from its use in the brewing of porter, is dried on the kiln in a manner quite different from that of either of the former kinds. It is an operation requiring the greatest care, as in consequence of the great heat employed the malt, if neglected for a few moments towards the completion of the process, or if the heat be increased beyond a certain point, would take fire. Indeed, with the utmost care, a sudden change of wind or an unexpected gust will sometimes cause the hot malt to ignite, when the whole is destroyed. The floors of porter malt kilns are mostly constructed of woven stout wire, about one-twentieth of an inch in diameter, or of thin perforated iron plates, as the fire must be raised and lowered in a few minutes from a heat of 100 degrees to a point nearly approaching combustion. So rapid is the process of drying porter malt that the operation does not occupy more than an hour or an hour and a half. The fuel for this purpose should be of oak, elm, beech, birch, or hard wood faggots. When the grain is placed on the kiln it is carefully levelled, and does not exceed an

inch and a half in depth. As the ordinary bars of the fire-place are too near the under part of the kiln floor they are removed, and the fire made on the ground in the fire-place. Two small faggots are fired, upon which is laid some stout wood. During the earlier part of the process it is requisite to keep the fire down a little; this is done by sprinkling on water from time to time. When the process is half finished the fire is allowed to go out, and the doors and windows of the kiln opened for ten minutes to cool it, and the malt is then carefully turned. The fire is then again made up, and the doors and windows closed. After a few minutes the heat becomes intense; the draught of air rushing over the burning faggots creates so sharp a fire that the flame is carried nearly across to the opposite side of the under part of the kiln. The workman knows by experience to what extent the fire should be allowed to proceed, and regulates it by sprinkling water on the burning wood. At this critical time, if the fire were not thus checked, the flame would increase so rapidly that it would soon communicate with the malt drying above, and set the whole in a blaze. When an accident of this kind happens, the flame shoots out from the top of the kiln several yards in height, accompanied by a humming noise, caused partly by the rush of air over the fire-place, and up through the meshes of the wire flooring of the kiln. To prevent the fire extending to other parts of the malthouse some maltsters keep iron buckets filled with water close by the kiln door, ready to be discharged upon the burning grain. A precaution like this is necessary, as when the fire first breaks

out it may soon be extinguished by a few buckets of water if close at hand.

During the latter part of the operation of drying the intense heat generates a quantity of steam in each grain, which by sudden expansion explodes, bursting the husk with a loud snap. From this the operation is termed "snapping," and the malt "snapped malt." The explosion of the husk, attended by an expansion of the starch, causes a considerable enlargement of the grain, amounting to from twenty to twenty-five per cent. above the dry barley steeped. A bushel of this kind of malt weighs about 32 lbs., and as it has a blown or distended appearance it is sometimes termed "blown malt."

The principal object to be attained in the manufacture of porter malt is the conversion of the sugar, gum, and starch into a substance resembling *caramel*, which, being a powerful colouring agent, imparts to porter its peculiar brown colour. There is another kind of porter malt made not quite so high coloured. It is not considered so well adapted for brewing porter, and is generally used as a colouring agent. The kiln is constructed somewhat similar to that used for true porter malt, but the floor instead of being square is circular. In the centre of the floor is an upright shaft, to which is attached two lateral arms, so constructed as to turn the grain when the shaft revolves. A connecting rod proceeds from the lower part of the upright shaft to the outside of the kiln. The ends of the shaft and rod communicate with each other by means of bevelled cog-wheels; the machinery is set in motion by a man turning a handle affixed to the con-

necting rod outside, so that the grain can be turned without entering the kiln. The grain, as before, is spread on the kiln floor to the depth of an inch and a half, but instead of the fire being made wholly of wood it is partly of coke. The fire is of the same intensity throughout the operation. The appearance of this kind of malt is blown, but not particularly high-coloured. The grain is turned by the machinery several times during the operation of drying.

As the external appearance of porter malt is completely changed by drying it at so high a temperature, the quality of the barley is not of so much importance as for other kinds of malt, second class grain being generally used for the purpose, nor is the operation of germination on the floor of so much importance; indeed, when the malt is in operation on the floor during the months of May and June, it is a common thing to see it so full of blue mouldy grains that the floor is quite discoloured, which would render it quite unfit for the purposes of other kinds of malt, but the high temperature of drying quite restores the look of the sample. During the drying of porter malt one great circumstance is to be attended to, which is, that the malt when ground shall be of a certain colour, according to the order from the brewer. This is rather difficult, as the floor is dried off in so many parts, varying from forty to sixty or eighty. To judge of it, the principal workman takes from the heaps of malt various samples, which are reduced to a very fine powder with a pestle and mortar. In addition to saccharine matter, the brewer often requires a certain amount of colour to suit the minds of his customers. Pale malt would impart but little

colour, therefore the desired appearance is made up by another kind of malt, known as patent or roasted malt, described on page 126.

*Storing and Screening.*—When thoroughly dry the malt is ready for removal to store, where it is kept until required for use. Some maltsters separate the rootlets and cummings from the malt before storing it, while others defer doing so until required for use, under the impression that the rootlets tend to keep and improve the flavour of the malt. In some parts of the country the cummings are not separated from the malt at all, but all goes together into the mash tun. This is particularly the case in the south-west of England. The store should be perfectly free from damp, as the malt, having a great affinity for moisture, would imbibe so much as to cause it to turn mouldy. The rootlets are detached from the grains by the workmen treading the malt, generally in list slippers, which is easily effected, the rootlets being very brittle and tender. They are finally removed by causing the malt to run down an inclined wire screen, the wires being about one-tenth of an inch apart; the rootlets fall through while the malt runs down. This operation is termed “screening.” In some parts the rootlets are separated by causing the malt to run down from a hopper into a coarse wire cylinder, placed in a sloping position, in the interior of which are several brushes revolving in such manner as to force the rootlets through the meshes of the wire-work; the malt runs down, and finds its way out through a hole at the foot of the machine. The quantity of rootlets varies

from two to three per cent. Simple as it may appear, the operation of screening is a most disagreeable one. The malt and rootlets being very dry, the dust is extremely penetrating; the workman is obliged to stand by the screen and fill the hopper as the malt runs down; sometimes as much as two or three thousand bushels have to be screened at one time, occupying several hours, and he is therefore obliged to wear a handkerchief over his mouth to prevent the fine dust entering his lungs. The cylinder screen is on this account to be recommended, as it is enclosed in a large wooden case.

Malt cummings are used for feeding sheep in the winter season, a small portion being given with chopped hay and turnips; they are said to be very warming. They are also used for the purpose of curing hams and bacon. The meat is simply put into a heap of malt cummings for a few months, and when taken out is impregnated with a peculiar sweet and somewhat smoky flavour. The very fine rootlets which fall through the holes in the kiln floor, when used with the dust which passes from the fireplace to the dungeon of the kiln, form an excellent top dressing for turnips, and when mixed with the manure of pigs is said to be but little inferior to Peruvian guano.

The longer malt is kept in store the more it swells from exposure to the atmosphere, until it gains its maximum, which it does in about three months, varying according to the dampness of the weather. Maltsters differ much respecting the increase in bulk which the malt gains whilst in the store, some affirming that it gains from one to five per cent., while others say the difference

is scarcely perceptible. The construction of the store may in some measure regulate this. While the malt is thus lying in store it is said to be mellowing.

During the process of malting dry barley loses about one-fifth of its weight, or 20 per cent. ; of this 2 per cent. is due to soluble matter carried off by the steep water ; 2 per cent. to carbonic acid, formed and given off during germination ; 4 per cent. to the rootlets ; and 12 per cent. to the original moisture in the barley, and of which malt is deprived by the process of drying. The actual loss of substance, therefore, is about 8 per cent.

Malt differs considerably in external appearance from barley ; the bright, yellowish hue and shining aspect of the husk have disappeared ; the grains of malt are generally free from wrinkles, although sometimes they have a slightly shrivelled appearance, and the husk has a lighter colour than that of barley, while, instead of the tightly-closed end which characterizes an unmalted barley-corn, an opening through which the rootlets have passed is observed at the base of each grain. As regards the internal changes, it is found that the toughness natural to barley is no longer present, and that the body of the grain has become mealy or friable, while underneath the husk the acrospire is seen to have grown nearly three-fourths of the length of the grain.

*Tests of Malt.*—It is, however, when ground or crushed, and mixed with water, and kept for an hour or two at a temperature ranging from 150 degrees to 180 degrees Fahr., that the alteration produced in barley by the process of malting is most strikingly exemplified. Under

such circumstances, the white and turbid solution of the remaining starch is observed to be converted into a sweet, transparent, liquid—the starch, in fact, being almost wholly changed into sugar, a necessary step to its being yet further transformed into spirit by the process of fermentation, and hence the importance of malt to the brewer and distiller. The characteristics of good malt are,—that it should float for a short time if put into water; be of a sweet smell, and perfectly free from mould or must; the husk of the grain thin, plump, clean, and unshrivelled in appearance; with no hard or ricy ends; friable, so that when held between the finger and thumb, and pressed with the nail, it will break easily, and disclose a full, floury kernel, which, when drawn across a board, will leave a chalky-looking trace; and of a sweet, agreeable flavour, when broken between the teeth. In properly malted barley the acrospire may be seen to extend up the back of the grain, beneath the skin, to three-fourths or even seven-eighths of the length of the grain. If *uniformly* as far as seven-eighths so much the better, but the least protrusion beyond the top of the seed indicates an exhausted and worthless condition within. The grains of each sample of malt should all be nearly equal in size, and have attained the same amount of growth. Irregularity in the degree of vegetation is, by most brewers, strongly objected to. In purchasing malt, a good judge will look carefully amongst the sample for dead corns, “idlers,” or “sleepers,” as they are termed, and count the number; in ordinary seasons there should not be at the outside more than 5 per cent. of steely grains; that is,

grains that are hard and unyielding. This steeliness in malt, or the hard, flinty condition of the kernel is owing to various circumstances, such as the use of barley which has been mow-burnt, or over-heated in the stack, or over-dried on the kiln before wetting, or the use of grain grown on different kinds of soil, and which has not germinated evenly on the floor.

As malt is specifically lighter than water, a common and convenient test of quality, and one that may be advantageously practised by persons who do not understand the method of examination by the extent of germination, is to take, say, 100 grains indiscriminately from a heap of malt, throw them into a glass of cold water, and stir them up. The thoroughly malted corns will float lengthwise on the surface ; those only partly malted will dip from the surface at various angles, with one end pointing downwards, the obliquity of the angle showing the extent of the conversion of the starch into sugar in such grains, those which are almost perpendicular being but little malted, while those suspended more horizontally are more perfected ; the wholly unmalted corns will sink to the bottom. By noting the number of grains which behave in each of these ways respectively, an accurate opinion may be formed as to the character of the malt. It is necessary that the experiment should be made quickly, as after a time even the malted corns will become saturated, and sink to the bottom.

In some parts of the country it is customary for maltsters to send the malt to the purchasers, when desired, crushed ready for the mash tun, and they should therefore per-

fectly understand that in order to prevent brewers from using unmalted grain—a practice which would lessen the revenue derived from malt—the law requires that all malt used by brewers must only be bruised or crushed by smooth metal rollers, and not ground by millstones. This restriction has been imposed with the object of facilitating the microscopical examination of the meal prepared for brewing. The action of plain rollers set close together is sufficient to flatten or bruise the grains of malt, without reducing them to powder, or entirely breaking up their structure. But raw grain when so treated, although it becomes flattened with difficulty, retains so much of its natural cohesion, that it is possible to distinguish it in that state from corn which has undergone germination; whereas, when ground between millstones, or cut or torn in a steel mill, all power of tracing its identity is lost. Besides, the restriction in question is not at all prejudicial to the success of the brewer's operations, since it is found that malt ground between millstones is more apt to "set" in the mash tun, and does not allow the mash liquor to run off so freely. By the action of rollers, the substance of the grain, already made friable by malting, is completely disintegrated, while yet the parts adhere with sufficient force to prevent them from falling into fine powder or flour. The malt after being crushed is usually left in a heap for a day or two, so that it may become mellow by the absorption of moisture from the air, and thus be rendered the less liable to form into lumps when mixed with hot water.

## CHAPTER IV.

### CONSTRUCTION OF THE MALTHOUSE.

MALTHOUSES should be built in situations where there is a good supply of water, good drainage, and free ventilation. As the greater part of the room is used for the germination of the grain, there is but little internal fitting. There are only three utensils, as they are technically called, viz:—the cistern, couch-frame, and kiln.

*Cistern and Store-room.*—In order to secure the requisite amount of floor-room, malthouses are built according to local circumstances, some having one floor only, while others have several. The cistern is generally on the ground floor, and the grain after couching is either thrown to the upper floors, or drawn up in baskets by means of a windlass. The latter method is preferable, as the work is not only easier, but the grain is less liable to injury than when thrown up from floor to floor with the shovel. The dry barley and malt store rooms should be so constructed as to be entirely free from damp. In planning a malthouse, the store room should be so situated as to occasion as little labour as possible; the malt stores should be so that the malt may be easily thrown into them from the kiln. The dry barley rooms should be over the cistern, and at the end of the house nearest the road, to afford greater facility for unloading the waggons bringing the barley. When the barley is let down into the cistern, it is advisable to let it pass down a wire screen, having a bag beneath, so as to free it from dust and dirt. The

strength of the walls of the store rooms is a matter of the greatest importance. Sometimes the whole of the malt made during the season is stored until required, when the rooms are completely filled. So great a bulk of grain severely tests the solidity of the brickwork, and the weight of the malt is not the only thing to be considered, but also the expansion arising from hygrometrical causes. (State of the weather.) The covering of the roof is of no less importance. The material for this purpose should be of such a nature that it will not attract the heat and raise the temperature of the working floor too high. Many houses are constructed with a garret floor, the temperature of which is often seriously affected, and sometimes, particularly when the house has a slate covering, to such an extent that it has to be disused. Plain or pan tiles are the best material for the purpose.

The cisterns should be constructed at the end of the house, near the entrance; if the entrance is lower down toward the space occupied by the working floor, the grain on the floor is unavoidably trampled upon, and more or less injured. The cistern is usually built in such manner that the walls of the building form part of it, sometimes one, two, or three sides. As the pressure of the grain when imbibing water in steep is very great, owing to the gradual expansion, the walls should be strong enough to resist the pressure or else they will burst. The inner sides of the cistern should either be cemented or lined with sheet-lead; but cement is preferable. To facilitate draining a slight slope or inclination must be given to the bottom: this, by law, must not exceed half an inch for each foot of length.

*Couch-frame.*—The next utensil of which we have to speak is the couch-frame; the regular construction of which, as well as of the cistern, is by law expressly provided for. It must be made with the sides and bottom straight, and at right angles to each other. Three of the sides must be permanent, but the fourth may be formed of moveable boards, two inches at least in thickness. The frame must be supported on the outside in every part, so that the sides may not bend or curve, or fail to preserve when filled with grain the same dimensions as when empty. It must be constructed and placed in such a position that the Excise officer may be able easily and conveniently to gauge the grain in every part of it. Couch-frames in use prior to 2nd July, 1827 (although not legally constructed), may be continued in use so long as they remain unaltered, provided the authority of the Hon. Board for their use has been obtained. Maltsters in Scotland, who do not steep more than eight bushels of corn at one time, may use couch-frames constructed of moveable planks. A maltster must give to the Supervisor of the district four days' notice in writing, before making any alteration in the dimensions, size, or capacity of any couch-frame, under a penalty of £100 for any neglect.

It often happens that a quantity of water is thrown out of the cistern with the grain into the couch-frame when the grain has not thoroughly drained in the cistern, and in such case the water will frequently run under the couch boards and wet the grain on the young floor. Now, as grain on the floor can only be wetted, or sprinkled

under certain restrictions, a complaint may be made against the maltster for illegally wetting the grain on the floor. To avoid this, a grating may be constructed in one corner, and a small channel cut to it, in the floor, or a ledge about an inch and a half high may be raised across the floor, thus shutting off the drainage. For the same reason, the pump for supplying the cistern with water should be so placed that the water may not be brought by means of troughs over the working floors, as in case of accident the grain may be illegally wetted, thereby subjecting the maltster to a penalty. The couch-frame should be so constructed that it will be of the same length as the cistern, and immediately in front of it. Both utensils should be nearly across the width of the house, as when so constructed the grain is thrown into the frame and levelled with much greater facility than when the couch-frame is built in a corner.

*Floor Room.*—One of the most important points to be observed in the construction of a malthouse is to provide sufficient floor room, so that the grain may have ample space to germinate when laid out thin in warm weather.

*A malthouse with a cistern capable of wetting forty quarters of barley should have, at least, eight thousand square feet of floor room, or about twenty square yards of flooring for every quarter of dry barley steeped.*

The floors should be quite level and laid down with a material that will withstand the wear of frequent turnings. They are constructed of various materials, such as slate, stone slabs, composition of lime and sand, compo or Roman cement, chalk, bricks, pammments, asphalte, &c.,

but nothing answers better than asphalte, or lime and sand. There should be a clear space of at least 6 ft. 6 in. between the working floors, for head room. The width of the malthouse and working floors should not be too great in proportion to the length. It has been found by experience that for the regular germination of grain on the floor, malthouses having floors not more than 500 or 600 inches wide, are better than those where the width is greater. In very wide houses, such as will carry 100 quarters or more at one steeping, the temperature of the grain in the middle of the floor is from two to three degrees warmer than at the sides, consequently germination in the middle will be more forward. The growth of the grain is, therefore, so irregular, that when the middle is fit for the kiln, the sides are at least two days behind. If the sides, on the other hand, be worked so as to bring the acrospire three-fourths up—supposing this to be the required length—the middle part will lose much of its starch unnecessarily by the forward growth of rootlet. Very wide malthouses in confined situations are peculiarly liable to produce this irregularity of growth to such an extent that the grain at the sides has to be turned into the middle, and the middle to the sides, at the risk of injuring the grain by trampling and loss of labour, so as to regulate the growth.

In very cold weather it is of the utmost importance to keep out the cold, but in many malthouses it is difficult to effect this highly desirable object, inasmuch, as when the men turn the floors, they are under the necessity of opening the shutters so as to admit sufficient light.

when, as the openings are not glazed, the grain is chilled by the entrance of cold air. To obviate this, malthouses should be constructed with sliding shutters, in each of which is inserted a piece of unpolished plate-glass about a foot square, which affords sufficient light to enable the men to perform any operation on the floor, but at the same time, as the glass is unpolished, does not admit sufficient light to interfere with the germination of the grain. If, however, it be found at the commencement or end of the malting season that the light is too powerful, it may be subdued by brushing the glass over with a thin coating of blue colouring, which has the effect of excluding the heat-giving and light-giving rays, which are unfavourable to the germination of grain. The best contrivance for opening and closing the shutters is upon the sliding principle. This method presents several advantages, as the shutter sliding in a groove is opened or shut with the slightest push, and to any desired extent. It is a common error to hang the shutters from the top, trap-door fashion ; it is both dangerous and cumbersome ; the shutter cannot be opened to any extent with facility, as is the case when it slides, and again, it must be propped up with pieces of stick, which are often lost.

A proper supply of light is requisite for germination, but too much light must be carefully guarded against. In some malthouses the upper working floor is lighted by means of skylights. The grain lying immediately under the skylights is all day under the influence of uninterrupted light, and if a handful of such grain be taken and compared with a handful taken from a darker part of the

same floor, the difference is at once apparent ; the sample taken from that part where it is not exposed to the full light being much more forward than that taken from under the skylight. In the construction of malthouses this is an important point. The windows should be so constructed that they can be shaded at pleasure by wooden shutters, which have the double effect of excluding the light and retaining warmth. Besides air, moisture, and a proper supply of light, warmth is essentially necessary for the germination of grain making into malt. If it were not for a proper supply of warmth the operation would be long and tedious, whereas by proper attention to the due regulation of temperature, &c., the process is completed in a period ranging from nine to twenty days, according to the method of working. To obtain the proper heat, the grain at an early stage of the operation is laid to such a thickness on the floor, that the temperature rises to at least 50 degrees Fahr. When once this heat has been generated spontaneously the grain grows rapidly, and requires to be carefully watched throughout the process. If barley were not thus forced artificially, it would be at least ten days before the rootlets appeared, when the temperature out of doors stands at 45 degrees, which is often the case during the malting season.

Cleanliness is an important point to be observed in the malthouse, as in most buildings where manufactures are carried on. The walls should be lime-whited at the termination of the malting season, which not only has the effect of destroying any noxious organic matter adhering to the walls, but also tends to destroy the sporules of the

humus or mould, which may be lodged in the interstices of the brickwork, ready to fasten upon the injured grains contained in the floors of the next season.

*Kiln.*—We now come to the consideration of the kiln, which should be situated at the end of the malthouse, farthest from the cistern. In shape, the kiln should as a rule be built so as to represent a huge funnel, with the mouth downwards, but as this plan is not applicable to very large kilns, it is not always observed. It has been found, however, that the nearer to this shape the roof or dome of the kiln can be constructed, the better are the drying qualities, as the vapour arising from the grain is more easily diffused, and does not hang in any of the corners, which is often the case in square, ill-constructed kilns. The opening at the top for the escape of the vapour should be about one-fifteenth the area of the kiln floor. It should be large enough to allow the steam to escape freely.

As great heat is often generated by the fires, there should be no wood employed in the construction of any part. The inner part of the dome in many kilns is of lath and plaster, which, in consequence of the sudden and repeated transitions from heat to cold, from vapour to dryness, soon falls down piece by piece, and continually requires repairing. Kiln ceilings are sometimes made of a composition of lime and cement, made up with half gas and half Stockholm tar. This is frequently used for pale malt kilns, when it answers very well, as the temperature of the heated air rarely exceeds 130 degrees; it resists the penetrating effects of the warm steam, and will

stand for many years, but for kilns where the temperature rises to 180 degrees, or more, it is not to be recommended, on account of its combustible nature. The opening at the top of the kiln is covered over in such manner as to prevent the rain from entering, and at the same time allow the vapour to escape freely. This is effected in various ways, such as fitting the top of the kiln with a cowl, cupola, &c. When the area of the utensil is under thirty-five bushels upon the inch, the cowl is to be preferred, as, by turning to the wind, it assists the draught of hot air over the furnace place; but when of large dimensions, or oblong, the cupola is generally used. The capacity of kilns varies; some are so small as to be only capable of drying ten bushels, whilst others are of such gigantic dimensions, as to be capable of drying sixteen hundred bushels of grain, as it comes off the floor. The very large kilns are used chiefly for drying pale malt.

Maltsters differ in their views respecting the propriety of erecting and using such large kilns. It is generally admitted, however, that by throwing the whole floor on at once, the sample of malt is more regular, as one part is not germinated more than another, which is inevitably the case when malt is dried off in portions, the remaining portion continuing to grow on the floor more or less, notwithstanding all the efforts of the maltster to prevent it. Some maltsters, rather than have such a large kiln, will erect two, or even three moderate-sized ones, in connection with one malthouse. There should be a superficies of, at least, three square yards of kiln floor for every

quarter of dry barley steeped, in which case a whole floor may be dried at once, when the germinated grain will be about eight or nine inches thick, when first put on the kiln, a very good depth for drying. The kiln floor is constructed of various materials, such as perforated sheet iron, or cast-iron plates, wire work, or perforated tiles made for the purpose, and called kiln tiles. The tiles and cast-iron plates are only used for pale or amber malt; but for porter malt, sheet iron or wire work is necessary, so as to allow of the rapid heating and cooling which is absolutely requisite. The perforations are necessary for two purposes; to allow the hot air to ascend freely, and the waste or detached rootlets to fall through. The floor is laid upon a framework of iron, supported by stout iron rods. The underneath parts of kilns are differently constructed, according to the purpose for which they are intended, whether for drying pale or porter malt. In the case of the former, where the heat seldom rises above 130 degrees, heat is not of so much importance as a continual current of hot air, which is regulated in intensity according to the time the grain has been on the kiln. To effect this object, the furnaces are placed under the floor, nearly in the central line, when the hot air accumulating rises through the perforations, heating the grain, and carrying the steam with it. The cold air, rushing through an ordinary sized doorway, continually supplies the vacuum.

For amber, high dried, or porter malt kilns, the heat is generated by the air passing over furnaces built in an opening in the wall of the dungeon, or under part of the

floor, in which case no air can enter but that which passes over the fire, as the surrounding brickwork is air-tight. By this contrivance, the air under the kiln floor can be heated to almost any extent. The part called the dunge or dungeon, under the floor, is somewhat similarly shaped to the part above ; so that the whole figure of the kiln is somewhat analogous to a double funnel, or two funnels joined together at the larger ends, the floor occupying the central line ; the opening for the escape of the steam at one point, and the hot air entering over a fire in a furnace at the other end. With this view the brickwork under the floor is contracted from about eighteen inches under the tiles, gradually down to the ground. The contracted part is generally formed by semi-arches so as to form a recess on each side of the walls, which serves as a receptacle for fuel. It will thus be seen that all the air which passes upward must pass over the fire. When the draught is quickened by a strong wind, it is sometimes necessary to check it. For this purpose some furnaces are fitted with side openings or doors, so that cold air may be admitted into the dunge without passing over the fire ; others are fitted with a door that can be opened or closed at pleasure, and the draught regulated accordingly.

As the fire toward the completion of the drying process is very fierce, the sides of the furnace are subjected to great heat, to resist which they should be composed of firebrick, or some other resisting material. Ordinary brick is too soft for this purpose, as the intense heat soon wears it away, and frequent repairs are necessary. A space varying from five to seventeen feet is left between

the under part of the kiln floor to the ground, or floor of the dunge. To prevent the fire from being too fierce for the grain immediately over it, each fireplace is provided with a sort of canopy, about four or five feet square, or more, when the heat striking against it is deflected and dispersed. This part is termed the *disperser*. It is sometimes made of sheet iron, and sometimes of thin flag stones or flat tiles, laid on a slight framework of iron. As a quantity of dust and rootlets falls through the holes in the kiln floor, and lodge on the top of the disperser, care should be observed to sweep it off when it accumulates, as from its extreme dryness it is liable to take fire. The interior of the dunge and banks, or tops of the arches, are cleaned out when the malting season has terminated. The dust from the fire and fine rootlets makes an excellent manure.

Maltsters have occasionally, from want of space for the erection of suitable kilns on their malting premises, sought permission from the Commissioners of Inland Revenue to remove their malt when fit for drying to kilns in other malthouses, at a greater or less distance from the place of manufacture; but unless the two malthouses were tolerably close together, it has been considered that too much risk to the Revenue would be incurred by a general compliance with these requests. Although the law does not actually state that a malt kiln must be on the malting premises, or, indeed, provide that malt should be dried at all, it is rendered penal to remove the malt from the place wherein it is made, until it has been taken account of and charged with duty; and as malt is liable to sur-

charge until it is fully dried and finished, and is liable to seizure if found in course of removal undried, as being goods in course of manufacture, subject to duty, and in an unentered place, the law appears sufficient to prevent use being made of a kiln at any distance from the malthouse. The Commissioners have, however, given permission to small maltsters in Scotland, who do not wet more than eight bushels of grain at one time, to remove their malt to the nearest public kiln to be dried, provided previous notice in writing be given to the Excise officer, stating the kiln to which the grain is to be removed.

The subjoined table shows the dimensions and capacities of the various utensils and working floors for the construction of a malthouse for working from twenty to sixty quarters of grain at each steeping, taken from fifteen malthouses, and constructed on the most approved principle, in some of the chief malting towns in the kingdom :—

# DIMENSIONS OF UTENSILS AND SUPERFICIES OF WORKING FLOORS.

What the Trader calculates the House	Cisterns.				Kilns.			Couch Frames.				Dimensions of Working Floors.			Dimensions of the Disperser in Feet.				
	Depth.	Length.	Breadth.	Area.	Length.	Breadth.	Area.	Depth.	Length.	Breadth.	Area.	Length.	Breadth.	Quarters able to work.	Height of the Kiln Floor from the Ground.	Distance between Five Bars and Disperser.	Space between Disperser and the Kiln Floor.	Length.	Breadth.
22	26.0	297.8	92.9	12.47	264	247	28.53	25.0	291.2	97.2	12.76	1309	385	24	12	5	3	6	6
36	33.8	342.8	83.6	12.91	221	210	20.92	25.0	383.6	89.9	15.51	1851	490	35	12	5	4	0	6
50	26.5	501.5	112.0	25.32	266	240	28.78	22.0	503.5	113.9	26.16	2250	600	51	11	4½	3	6	8
43	32.0	501.5	113.0	25.51	293	294	39.23	21.5	503.6	113.1	25.98	1960	600	41	12	6	4	0	8
22	27.0	400.8	77.8	14.05	235	240	28.67	18.0	423.8	102.0	19.43	1060	540	22	13	7	4	0	6
34	27.0	523.8	78.7	18.79	229	217	22.40	19.0	532.4	103.3	25.72	1300	660	33	12	6	4	0	8
20	30.8	368.6	73.9	12.28	253	228	23.00	17.8	394.0	98.8	17.54	1100	480	21	12	6	4	0	6
22	27.8	416.4	75.6	14.19	252	228	25.90	16.8	434.2	72.3	14.15	1100	540	23	11	5	3	6	5
41	34.0	659.5	81.8	24.32	262	218	25.74	30.0	635.5	88.0	25.19	1750	670	45	11	7	4	0	8
41	33.0	896.4	103.8	18.51	262	218	25.74	22.3	407.0	120.2	22.05	1280	413	44	10	5	8	6	8
40	35.4	281.0	108.0	13.68	242	291	38.30	25.5	395.3	115.0	20.49	1403	435	44	10	5	8	6	8
40	31.0	277.5	109.0	13.63	475	277	59.31	22.5	274.0	165.0	20.38	1960	600	41	17	9	5	6	9
60	23.5	720.7	95.5	31.02	861	336	54.68	20.0	725.6	113.7	37.19	2040	505	40	17	9	5	6	9
55	43.0	315.3	101.0	14.35	365	285	48.81	26.0	47.32	290	47.32	1150	725	30	17	9	5	6	8
30	37.5	264.0	82.0	9.75	536	209	55.21	21.5	325.3	168.9	24.75	2160	585	55	18	9	6	0	10
30	37.5	264.0	82.0	9.75	409	257	47.38	21.5	347.0	105.0	16.42	585	290	55	18	9	6	0	10
30	37.5	264.0	82.0	9.75	583	200	55.21	21.5	347.0	105.0	16.42	585	535	31	18	9	6	0	10

## CHAPTER V.

### THE MALTSTER IN HIS RELATION TO THE REVENUE.

*Entry.*—Every maltster, whether he makes for sale, or for his own private use, is required to make entry in writing with the Excise officer under a penalty in case of neglect of £100, and forfeiture of all malt found in an unentered place or utensil. Such entry must contain the name in full of the maltster, or maltsters, place of abode, every building, place, cistern, couch frame, kiln, and other vessel, or utensil intended to be used in and for the purpose of making or keeping malt, or for keeping corn or grain to be made into malt, and describing the particular purpose for which each is intended to be used. Information may be obtained of the officer as to the form and character of such entry, which must be signed by the true owner, or owners (if more than one), of the premises. Upon the erection of a new malthouse, new utensils, addition to old houses, or change of occupancy, a new entry must be made. Every entered building, place, and utensil must be distinguished and described in the entry by a particular letter, or number, and the same letter, or number, is to be painted by the trader in a large and distinct character on some conspicuous part of the vessel

or utensil, and the painting must be renewed from time to time as occasion may require, to the satisfaction of the district supervisor. The utensils, buildings, or places, must not be used for any other purpose than that described in the entry; except that corn, grain, or other seeds, may be stored in rooms entered for storing malt, and *vice versâ*, provided the malt be kept separate and apart, by proper partitions, or otherwise, from all such grain or seeds. Maltsters in Scotland or Ireland, who use bere or bigg only, must state in their entries that they intend to make malt from bere or bigg only.

No private person can legally make malt without paying duty, and subjecting his premises to Excise survey, under heavy penalties; but farmers are allowed under certain conditions to germinate grain to be used in feeding cattle.

*Licence.*—Having made entry, the next step is to procure a licence. This is required by every maltster, whether he makes malt for sale or otherwise. The licence expires 5th July, and must be renewed annually. The duty upon the licence varies according to the quantity of malt made within each year ending 5th July. The several rates, ranging from 7s. 10½d. to £4 14s. 6d. will be found on another page. A person upon first commencing business pays the sum of 7s. 10½d. for licence. One licence is sufficient for any number of malthouses used by one person, or by two or more persons in partnership, and should any person newly enter into partnership with a maltster, or any new malthouse be occupied during the currency of a licence, the name of the partner, or new

malthouse, as the case may be, must be endorsed by the Excise authorities on the back of the licence. Persons who make malt from the produce of their own land, for their own use, and do not make more than five quarters yearly, pay the sum of 2s. 7½d. for a licence. Every maltster, before commencing business, must paint, or cause to be painted and placed, or fixed, in letters publicly visible and legible, and at least one inch in length, and of proportionate breadth, over the principal or outward door or gate of his entered premises, his Christian and surname at full length, and the words "Licensed Maltster."

The maltster having complied with these preliminary requirements, and obtained from the supervisor the requisite certificate for the use of his cistern, is at liberty to commence work.

*Cistern.*—The law requires that every cistern constructed subsequently to 2nd July, 1827, if used for steeping more than eight bushels at one time, must be permanently constructed, with the sides and ends straight, and at right angles to each other, the depth must not exceed forty inches in any part; and the bottom must be even, with no more inclination for the drip, than half-an inch for every foot. The cistern must be so placed that the Excise officer gauging any corn or grain therein will have sufficient light, and there must be a clear open space of forty-eight inches, at least, above every part of it; the maltster must provide for the officer's use, means to enable him easily, safely, and conveniently to have access to the grain in every part of the cistern. Cisterns

constructed and used prior to 2nd July, 1827, so long as they remain unaltered, may, by permission of the Commissioners of Inland Revenue, be continued in use, provided they have sufficient light and head room above every part, and means be provided to enable the officer to gauge the grain in every part. If sufficient light cannot be procured from without, the maltster must engage to keep lamps or candles burning while corn is in the cistern. Some cisterns are very wide, and as they cannot be gauged from the side, wide planks must be thrown across from end to end, or from side to side, for the officer to walk upon.

Various contrivances are adopted for draining the water from the cistern without wasting the grain, but none answers better than a gutter laid from end to end, below the level of the bottom, with an inclination from each side to the gutter, the gutter being laid over with stout perforated iron plates. By this means the grain is quickly drained, and the perforated plates being movable, the gutter is easily cleaned out with a birch broom, and the plates replaced. It is a matter of the utmost importance that the cistern be water-tight, and to effectually guard against leakage, the inside should be cemented with good hard cement, or lined with lead. No cistern can be legally used before the maltster has obtained a certificate in writing from the supervisor of the district to the effect that he has surveyed and examined such cistern, and that it is constructed according to the requirements of the law. If an alteration is at any time made in any cistern, a new certificate must be obtained before it is again used. Any

maltster using a new or altered cistern without first obtaining such certificate is liable to a penalty of £100. So long as a cistern remains unaltered, after the Board's authority for its use has been obtained, no further application is necessary in case of fresh occupancy.

*Steeping, Sprinkling, &c.*—A maltster, before he can steep barley, or other grain, for making into malt, is required to give to the Excise officer a written notice of twenty-four hours, at least, of his intention to do so, specifying the day, and hour of the day, when the grain is to be wetted; the grain must be covered with water in the cistern within three hours of the time specified in the notice, otherwise the notice is null and void. A maltster may begin to wet or steep grain at any time between seven in the morning and five in the evening, but if the time specified in the notice to wet be later than three o'clock in the afternoon, the grain must be covered with water within one hour of the time specified in the notice, instead of three. The barley, properly screened and cleansed, is placed in the cistern, where it is required by law to be kept covered with water for the full space of forty hours, at least, or fifty hours, if the grain is to be sprinkled on the floor before it has been twelve days emptied from cistern. No grain must be added to the quantity steeped after the officer has taken an account of it, nor must any be taken out of the cistern until emptied into the couch-frame. While in steep the grain softens and increases by the absorption of water nearly one-fifth in bulk, and about fifty per cent. in weight. Sometimes, and more especially in warm

weather, a slight fermentation arises from the organic matter in the steep water acting on the decayed grains of corn, and hence it is occasionally necessary to change the water during the period of steeping. This may be done once during the time the grain is in steep, provided the maltster state *in his notice to wet* the time he intends to let the water off, which must be between the hours of seven a.m. and five p.m., but the grain must be again covered with water before the expiration of an hour from the time of beginning to let the water off. This operation is termed "draining." The surface of the grain should be six inches, at least, under water, as this will have the effect of keeping the whole steeping under water: even then it should be looked to from time to time, lest in swelling any portion of the grain should rise above the surface of the water.

The grain remains in steep for a period varying from forty to eighty hours, according to the view of the maltster, guided by season, temperature, or the particular kind of barley being worked. Some barley requires to be kept in steep much longer than others. Scotch barley, for instance, sometimes requires twenty-four, or even forty-eight, hours more water than English. Immediately the grain is steeped the operation of malting commences. During the time the grain is in steep it absorbs oxygen from the water, and throws out in return a quantity of carbonic acid gas; in warm weather the quantity of this gas thrown off is very considerable. A portion of the husk is also dissolved to the amount of from two to five per cent. The colouring matter imparts to the steep

water a yellowish tinge, and, being more or less charged with nitrogenous matter, gives out a most offensive smell. In warm weather this occurs to such extent that it is almost necessary, and certainly desirable, to change the water the day after steeping. The steep water at such times is of a peculiar viscid character. This is particularly the case when the water used for steeping is pumped from a pond, or canal, or, in fact, any water upon which the rays of the sun have full action, decomposing animal and vegetable matter, and giving rise to ammonia. Water obtained from such sources is, by some maltsters, preferred to pure well water, as it contains more ammonia and less earthy salts. It is said the presence of ammonia causes the grain to grow more freely and regularly, but when such water is used it should always be changed the day after steeping. Maltsters differ much respecting the time the grain should be kept under water, but, as already stated, if a corn, held lengthwise between the finger and thumb, readily breaks down into a pulpy state when squeezed, the steeping is generally judged to be complete. Forty-eight hours' steeping will generally accomplish this. The water is then drained off; this will generally occupy about half an hour, when the grain is ready for the next operation.

*Couching.*—All grain steeped in the cistern must be emptied into a couch frame. None can be legally taken out of any cistern at any other time than between the hours of seven in the morning and four in the afternoon. Maltsters using more than one cistern in a malthouse, or in two or more malthouses having any internal communi-

cation, must empty the grain from all such cisterns during legal hours on the same day, and if grain from two or more cisterns is emptied into one couch frame, the whole must be finished within three hours after the first cistern was commenced to be emptied. The grain from any two or more of such cisterns may be emptied into one couch frame, or the grain from any one cistern may be emptied into two or more couch frames in the same house. Grain cannot legally be taken out of any cistern until the expiration of ninety-six hours after grain was previously emptied therefrom, or from out of any other cistern under the same roof, or in a building having any internal communication, but the emptying may take place at any time after seven in the morning of the day on which the ninety-six hours expire. The grain is thrown directly from the cistern into the couch frame with large wooden shovels.

As the charge for duty usually arises from the gauge of the grain taken while in the couch frame, the operation of couching is regarded by the Revenue officials as most important. The grain should be thrown from the cistern into the couch frame as fairly as possible, and the law requires that it shall be laid flat and level therein by the maltster, and be so kept for the space of twenty hours, at the least; it must not be laid of a greater depth than thirty inches in the couch frame, and must not be trodden or forced together in any manner, under heavy penalties.

Grain is deemed by law to be technically in "couch," and is to be gauged and taken account of as a couch—not a "floor"—for the space of twenty-four hours after emptied from cistern, if it should not have been gauged

by the officer within that time ; this regulation holds good whether the grain still lies in the couch frame or has been removed to the floor. The reason is, that if the grain were entitled to be treated as a "floor" in the revenue sense only one-half of the gross quantity found by gauge would be chargeable with duty, whereas, as a "couch," the abatement amounts to only  $18\frac{1}{2}$  bushels in the 100.

If the officer suspects that the grain has not been thrown out of the cistern fairly, or that it has been compressed, he may direct that the grain be thrown back into the cistern and returned into the couch frame, when, if upon re-gauging it, an increase of five per cent. is found before the grain has been emptied eight hours from cistern, six per cent. if the grain has been emptied eight hours and not sixteen, or seven per cent. after sixteen hours ; it is to be deemed conclusive evidence that compression has taken place. While the grain is in couch, heat is generated and germination therefore induced ; but were the grain to remain long in couch, particularly in warm weather, germination would set in very rapidly, and the grain would be either unduly forced or turn sour. In very cold weather, when the grain is required to heat, it is sometimes allowed to remain in couch for two days. At the expiration of twenty hours the maltster is at liberty to remove the grain from the couch frame to the floor, where it must be kept level, with the edges straight, and in such form that it may be conveniently gauged.

Each stepping forms a separate "floor," and the floors must be laid in regular succession according to seniority ;

the oldest floor is always next the kiln, and the youngest nearest the couch frame, and sometimes in it.

Grain is required by law to be kept in operation on the floor 168 hours, at least, after removal from cistern. But the Commissioners of Inland Revenue allow grain in an advanced state of vegetation, such as occurs in very hot weather, to be removed to kiln before the legal time, if the grain has not been less than 144 hours out of cistern.

Although the several floors are required to be laid in order according to age, there is no objection to a maltster drying off a younger floor before an older, at any time it may suit him to do so.

The regulations as to *sprinkling* will be found in this work.

Maltsters are not allowed under heavy penalties to sprinkle or damp any malt after it has been thrown off the kiln and before delivery to the purchaser. This regulation is entirely in the interest of the consumer.

Malt stored at all damp will soon ferment, turn sour, and become quite worthless.

*Duty on Malt.*—The duty on malt forms an important item in the revenue of this kingdom. It is one of the oldest of Excise duties, having been originally established in England during the reign of Charles I. It was, however, soon after repealed, but re-established in 1697, by the Act 8 & 9 Wm. III., cap. 22, when a duty  $6\frac{1}{2}\frac{6}{11}$ d. per bushel was imposed, to enable his Majesty to carry on war against France; and was commenced 20th April in that year. In Scotland the duty was first imposed in May, 1713, at the rate of  $6\frac{1}{2}\frac{6}{11}$ d. per bushel, and in

Ireland 25th March, 1785, at the rate of 7d. per bushel. The rates of duty have several times been changed, varying between the above rates and 4s. 5 $\frac{3}{4}$ d. in England, 3s. 9 $\frac{1}{2}$ d. in Scotland, and 4s. 5d. in Ireland. The present rate of duty is as follows:—On malt made from barley, or other corn, or grain (except bere or bigg for home consumption in Scotland or Ireland), 2s. 7d. per bushel and 5 per cent., or 2s. 8 $\frac{1}{2}$  $\frac{1}{0}$ d.; the duty on malt made from bere or bigg in Scotland or Ireland for home use is 2s. per bushel and 5 per cent., or 2s. 1 $\frac{1}{3}$ d. The higher duty (2s. 8 $\frac{1}{2}$  $\frac{1}{0}$ d.) is chargeable on malt made from bere or bigg in Scotland or Ireland, when imported into England. The standard from which all measures of capacity are computed is the imperial standard gallon, which contains 277·274 cubic inches, and the bushel consists of eight such gallons, or 2218·192 cubic inches. The duty is charged by gauge, but Excise officers are authorized to take account by gauge or measure. The duty is charged on the greatest number of bushels found by gauge in any stage of the process, after making the following deductions, viz. :—18 $\frac{1}{2}$  per cent. on the quantity of grain found in the cistern or couch-frame, or one-half the quantity found on the floor or kiln. The charge for duty generally arises from the gauged quantity found in the couch-frame, but occasionally from cistern or floor gauges, though these latter charges rarely occur except in warm weather.

*Allowances for Swell of Grain.*—As the grain while in steep absorbs a great quantity of water, which causes it to swell nearly one-fifth part of its bulk, an allowance for this swell must be made. It has been found by numerous

experiments at different times, seasons, and places, that  $81\frac{1}{2}$  bushels of ordinary dry barley will, in the course of forty hours' steeping, swell to 100 bushels. An allowance, therefore, is made, as already stated, on the grain found in the cistern or couch-frame of  $18\frac{1}{2}$  per cent.

As the grain when working on the floor throws out a great quantity of coomb or rootlet, thereby increasing its bulk considerably, an allowance must be made to reduce the quantity found on the floor or kiln to the bulk of dry barley. From a great number of experiments that have been made, it has been found that in extreme cases the grain may double itself in bulk while on the floor.

For instance : if  $81\frac{1}{2}$  bushels of dry barley were put into steep, it would swell to 100 bushels in the couch-frame, and to 163 bushels on the floor ; hence the allowance of one-half the quantity found on the floor. From this it will be seen that 100 bushels charged either in the cistern or couch-frame must amount to more than 163 bushels on the floor, before a floor charge arises, which will sometimes happen, particularly in warm weather. The operation of making these deductions is termed "reducing gross bushels to net."

The gross bushels found in the cistern or couch-frame may be reduced to net by multiplying the quantity by  $\cdot 815$  ; and the gross bushels on the floor or kiln by multiplying the quantity by  $\cdot 5$ , or dividing by 2, which gives the same result. In order to ascertain whether the gauged quantity on the floor or kiln amounts to a floor charge, or to a higher charge than that on the best or highest cistern or couch gauge, the amount of the best cistern or couch gauge is multiplied by  $1\cdot 63$  ;

if the product be less than the floor gauge, the floor gauge will be the charged quantity.

The allowances upon the cistern or couch, and floor or kiln, therefore stand thus :—

	BUSHELS.
81½ bushels of dry barley put into steep,	
swell in cistern or couch to . . . .	100
On the floor, swells above cistern or couch	63
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One-half allowed for coomb or rootlet ½)	163
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The dry barley put into steep . .	81½
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These allowances are generally found quite sufficient, as when the malt is measured off the kiln, the increase over the dry barley steeped is from three to ten per cent. So that if the maltster steeps 81½ bushels of barley, the Excise charge the same quantity with duty, and he gets from 84 to 87 bushels of malt off the kiln after deducting the rootlets ; thus he not only gets an increase of from three to ten per cent., but escapes the duty on such increase, which shows the profit upon the increase when working for measure, by forcing the acrospire. It does not *always* happen that the Excise allowances will reduce the gross quantity to the dry barley measure, as the swell of the grain while in cistern is sometimes very great ; but the Excise charge, if the malt has been properly worked, very rarely comes up to the quantity measured off the kiln. In a good season—that is, when the barley has been harvested without rain and stacked in a thoroughly

dry state—the average increase of the malt when measured off the kiln, and after deducting rootlet, should be at least five per cent. over the dry barley steeped, and two and a-half per cent. over the Excise net charge, in which case the Excise charge is from two to two and a-half per cent. over the dry barley wetted. These remarks apply generally to malt made upon the “slow method,” when the acrospire is worked about three-fourths the length of the grain for weight ; but when made upon the forced system, or when the maltster works for measure or to obtain as great a bulk as possible, in a good season, the net quantity of malt produced is from five to ten per cent., or sometimes even more, above the dry barley steeped. In these cases, however, the Excise charge also increases proportionally, as the swell while the grain is in the cistern is greater, because the barley is kept fifty hours under water in order that it may be sprinkled at the expiration of ninety hours, when the Excise charge is from two and a-half to four per cent. above the barley wetted, but the quantity of malt measured off the kiln is from two and a-half to six per cent. over the charge.

*Excise Specimen.*—As soon as a steeping of grain is completely made into malt and dried off the kiln, the maltster may ascertain the quantity of malt with which he is charged with duty in respect of such steeping, by reference to a paper in the malthouse called a “Specimen,” where he will find the Excise officer has inserted immediately over the gauge of the grain taken while in the couch-frame, the net bushels that have been charged with duty, and also from what stage in the process such charge

has arisen, whether from the gauge of the grain taken while in the cistern or couch-frame, or while on the floor or kiln. A specimen is kept in every malt-house, for the safe custody of which the maltster is responsible. On this specimen the Excise record the particulars of all surveys and gauges taken by them, and no other person is allowed under heavy penalties to obliterate, alter, or deface any such entry or to make any entry thereon.

*Gauging.*—On the specimen will also be found the dimensions and area of all the cisterns, couch-frames, or kilns in the malthouse, and the maltster can therefore readily satisfy himself as to the correctness of the officer's gauges by obtaining the average depth of the grain in any stage of the process, and multiplying such depth by the area of the particular utensil to which such depth refers, as found on the specimen. The depth is found by means of a graduated rod or dipping-piece, and a wooden or metal plate, termed a float, fastened to a handle. The rod passes through a hole in the float, and as soon as it reaches the bottom of the grain the float is brought down flat upon the surface, and being retained in this position when the rod is withdrawn, marks against the edge of the latter the number of inches and tenths of an inch in each depth. Officers are instructed to insert the rod perpendicularly, to let the float come in fair and even contact with the grain, but to use no positive pressure, and to hold the float and the rod firmly together at the time of withdrawing the latter, so as to prevent the float from slipping and thus showing a wrong depth. As the surface of the grain is always more or less irregular, a sufficient

number of depths or dips is taken, and distributed throughout the surface as correctly as possible, so as to compensate for these irregularities, and give, as it were, a uniform or average depth to the whole. The number of dips taken in order to obtain the mean or average depth must of course be proportioned to the extent of surface, and to its greater or less apparent evenness. The following is an example :

A couch is 138·5 inches long, 58·9 wide, and the area is 3·67 bushels. Twelve dips are taken here as follows :—13·6, 13·4, 13·2, 13·5, 13·5, 13·4, 13·8, 13·7, 13·4, 13·1, 13·3, 13·2, these added together give a total of 161·1, which, divided by 12 (the number of dips taken), gives 13·4 inches, the average depth of the grain. This number is multiplied by 3·67 (the area of the couch-frame), and the product is 49·17, or forty-nine bushels and seventeen-hundredths of a bushel, which is the gross quantity of grain contained in the couch-frame. The gross quantity, as already stated, may be reduced to net by multiplying by ·815, thus  $49·17 \times \cdot 815 = 40·07$ , the net bushels to be charged with duty.

It has been observed that cisterns and couch-frames are required to be constructed of a rectangular shape. The view of the Legislature in restricting the maltster to this shape is, that the content may be more accurately determined, as the rectangle is the simplest figure in geometry to measure. The length and breadth are the only dimensions requisite for finding the area of the utensil, or the content upon an inch in depth. In order to obtain the dimensions, the sides and ends of the utensil

should be set out at distances opposite each other, and in the middle of every ten inches of the depth. The distances upon the sides and ends should be in proportion to the length and breadth. The cross diameters should be taken at about thirty inches from each other, but as the sides and ends are upright they vary but little. The average of the cross diameters, or distances from side to side, and from end to end, gives the true length and breadth, which, multiplied by each other, and divided by 2218·192 (the number of cubic inches in a bushel), gives the area or quantity in bushels, the utensil will hold on an inch of depth ; this area being multiplied by the gauge or average depth shows the quantity of grain in bushels in the utensil.

The following is an example of the mode of finding the area of a utensil whose mean length is forty inches, and breadth twelve inches :— $140 \times 80 = 11200$  superficial inches ; then  $11200 \div 2218\cdot192$  gives as the result 5·04, or five bushels and four-hundredths of a bushel, which is the quantity upon an inch in depth, or the area. This method will apply to either the cistern, couch frame, or kiln, if rectangular, as the area once found does not alter, but not so with grain on the floors, as there it is shifted in position, and the dimensions altered several times in a day. The length and breadth must, therefore, be found, by means of a graduated tape, each time of taking account ; and in order to ascertain the number of bushels of grain contained in the floor, the length is multiplied by the breadth, and the product multiplied by the average depth of the grain, which gives the number of

cubic inches which the grain occupies ; the inches are then reduced to bushels, by dividing the number by 2218·192 ; thus—length, 300 inches, multiplied by the breadth, 240 inches, gives 72000, which multiplied by the depth, 3·5 inches, we have 252000, divided by 2218·192 gives 113·6 bushels in the floor. This operation, which is very tedious, may be facilitated by the use of a small instrument called a “slide rule,” used by every officer.

*Overcharges.*—It sometimes happens that maltsters object to certain charges, which they deem overcharges, in which case they are at liberty to object to the same within twelve months after such charge is made, either before the Commissioners of Inland Revenue, or two Justices of the Peace, under the provisions of 4 & 5 Wm. IV., cap. 51, sec. 27. The overcharge must be satisfactorily proved in court in the usual manner, upon the oath of the claimant and witnesses.

*Payment of Duty.*—At the end of every six weeks, the officer makes a return of the duty charged upon each maltster under his survey. These periodical returns are termed “Rounds,” and are so arranged that eight occur in each financial year, commencing April 1st. Within six days after the close of each round, or at such times as the Commissioners of Inland Revenue may direct, maltsters who have not given bond, are required to pay and clear off the duty with which they are charged, according to such return. The maltster is furnished by the officer with notice in writing of the amount of duty to be paid, and the time when, and place where, the payment is to be made; and if the duty is not paid at the appointed

time and place, the maltster renders himself liable to be charged with double the amount payable. In addition to the above notice, the maltster will also find inserted on the specimen, already alluded to, a week, at least, before the payment is to be made, an entry in the following form:—"£            is to be paid for duty on            the day of            next." It will be seen by reference that by the 79th section of 7 and 8 Geo. IV., cap. 52, all malt, or corn or grain making into malt, and all vessels and utensils for making or keeping malt, in the possession of a maltster, are liable to be seized for any arrears of duty, or for any penalties or forfeitures incurred.

One great feature in the collection of the malt duty is, that upon due security being given, the maltster is allowed six weeks' credit, without any extra charge upon the amount of such duty. But before this indulgence can be granted, the maltster must enter into a bond to the Crown, with two sureties, duly approved, in a sum equal to the amount of duty chargeable upon the quantity of grain the whole of his entered cisterns are capable of steeping (assuming such quantity to be steeped every four days for a period of six weeks), with twenty-five per cent. added to the amount thus computed. If a maltster increases his business at any time, so as to render additional security necessary, he will at once be called on to give fresh bond. One maltster will not be accepted as surety for another without the special sanction of the Commissioners.

Prior to 1860, maltsters were allowed twelve weeks' credit for payment of their duty, but when this period of

credit was reduced to six weeks, it was represented to the Commissioners of Inland Revenue by some of those maltsters whose operations are on a large scale, that the limitation of credit to six weeks pressed with great severity on them in the first quarter of the financial year, at which time considerable payment of duty became due, in respect of malt made for stock, and which is not sold until the brewers recommence work after the summer. Consequently an Act was passed allowing a maltster who has given the usual bond, to defer, if he wish, payment of part of the duty charged upon him under certain conditions. He must give notice in writing to the Commissioners of Inland Revenue on or before 1st April in any year, of his wish to defer payment of such duty. In giving such notice the maltster may limit its terms to one year, or, if he specially state the fact, it may be made to apply to the then current and following years. On such notice being received, one moiety of the duty payable on the malt made between January 1st and February 15th, and one moiety of the duty payable on that made between February 16th and March 31st, and the duty payable on the whole quantity made between April 1st and May 15th, may be deferred for a further period of three months beyond the time at which the same respective amounts would otherwise become payable. The maltster will, however, be required to pay interest, at the rate of £3 5s. per cent. per annum, computed for a period of three months, on the amount of duty, payment of which is so deferred.

*Maltsters who Work by Weight.*—If a maltster desire

it, the duty on malt made by him may be charged according to the weight of the grain used, when such weight is less than 53lbs. per bushel. Maltsters who wish to have their malt thus charged with duty, must give to the Excise officer a notice in writing to that effect at least four clear days before the hour of wetting. If after giving such notice the maltster does not commence working by weight for the space of one calendar month, the notice is null and void ; and should the maltster, at any time, discontinue working by weight for the space of one calendar month, a fresh notice, as above, must be given, before he will again be entitled to have the duty charged according to weight.

Before any corn or grain is placed in the cistern under such notice, the maltster must provide a proper cover to the cistern, with fastenings, &c., fixed to the satisfaction of the District Supervisor, so that it may be secured with a Revenue lock in such a manner that the grain cannot be removed from the cistern when the cover is closed and locked, but, at the same time, so as not to interfere with the wetting or draining of the grain. The cover may be made of wood or iron, or iron grating, or of strong wire-work, but the wire must not be less than one-tenth of an inch in diameter, with meshes of not more than two inches, and firmly attached to proper framework. In the case of very long cisterns, the covers may be made in sections, but the hinges and framework must be so constructed as not to admit of any portion of the cover being removed when the fastenings are locked ; and all the fastenings must be so constructed that one

lock will be sufficient for each cistern. If more convenient to a maltster, the Excise do not object to a strong wooden screen being placed over the front wall of the cistern, and reaching up to the ceiling, instead of a flat cover. But the screen must be so fixed as to admit of a Revenue lock being applied to it.

The notice to steep grain to be charged with duty according to the weight, must in all cases be given to the officer forty-eight hours at least before steeping, and in such notice must be also specified the particular day, and hour of the day, when such grain is to be placed in the cistern, and such hour must not be later than twelve o'clock at noon, on the day preceding that on which the grain is to be steeped. If the whole of the grain to be steeped is not placed in the cistern within one hour of the time specified in the notice, or if it is not covered with water within three hours of the time specified for wetting, the notice is null and void. So soon as all the grain to be steeped is placed in the cistern, the maltster, or his chief servant, must fill up and sign a declaration, stating the true weight per bushel of such grain in pounds and ounces, and such declaration must be delivered to the officer on his first visit to the malthouse afterwards; and no other grain must be substituted for that in the cistern after it has been taken account of by the officer. The declaration must be made in a proper printed form, with which the maltster will be furnished by the officer.

The officer, when he receives the declaration, will require the maltster, or his servant, to take and weigh in his presence a sample of the grain selected from such parts of

the cistern as the officer may think fit ; and the weight of a bushel of such sample will be deemed the average weight per bushel of the whole of the grain in the cistern ; but before such sample is weighed the grain must be properly screened and cleaned. The maltster must provide correct scales and weights, and a bushel measure, to be kept at all times in the malthouse, and he must allow the officer to use them, and render any assistance that may be required. If in the weight of the sample bushel there shall be a fraction of a pound, amounting to one-half or upwards, such fraction may be reckoned as an entire pound in calculating the duty, and any fraction less than half a pound may be disregarded.

As soon as a sample of the grain has been weighed by the officer, he will lock down the cover of the cistern, and keep it locked down until the grain is covered with water, unless the weight be ascertained immediately before the hour for which notice has been given to wet, in which case he will perhaps remain and see the grain covered with water, when the cistern cover will not be locked down. In the former case the cover of the cistern will be unlocked, and left unlocked, on the first visit of the officer after the grain has been wetted. The actual weight as ascertained by the supervisor or officer is to be taken as the basis of calculation, whether it agrees with the weight stated in the maltster's declaration, or not. Should the officer be prevented from attending to test the weight of the grain, the weight expressed in the maltster's declaration will be accepted as the true weight of the grain steeped. Should the weight of

a bushel of the grain in the cistern at any time before being wetted, and after being screened and cleaned, be found to exceed by more than two pounds the weight specified in the declaration, the maltster incurs a penalty of £100. By the regulations of the Board of Inland Revenue, the sample of corn taken from the cistern may, after having been mixed on the floor, be put into an ordinary sack if the maltster so desire, and thence poured into the bushel measure, the "strike" being afterwards applied in the usual manner.

For calculating and charging the duty on malt made under these regulations, 53lbs. per bushel is taken as the standard weight of unmalted grain, and in order to ascertain the number of bushels to be charged with duty, the net bushels, calculated in the usual manner from the best gauge, are multiplied by the weight in pounds per bushel of the grain steeped, and the product divided by 53; the quotient is the quantity with which the maltster is charged with duty. Thus—

Net bushels as found by best gauge ..	127.2
Weight in pounds per bushel of the grain used .. .. .	50
	<hr/>
Assumed standard weight of unmalted grain, .. .. . 53lbs.)	6360
	<hr/>
Number of bushels to be charged with duty, .. .. .	120
	<hr/>

*Quantity of Malt* charged according to the Weight of the Grain steeped, per Act 28 & 29 Vict., c. 66.

Years ended 31 March.	Average Weight per Bushel.	Quantity Charged by Gauge.	The Charge by Weight.	Amount of Duty surrendered.
1873	lbs. $50 \frac{7}{10}$	Bush. 4,209,795	Bush. 3,981,905	£ 30,907
1874	49 $\frac{1}{10}$	3,267,663	3,065,247	27,452

The Act having reference to this mode of charging the duty will be found in this work.

The extent to which the manufacture of malt is carried on in the United Kingdom will appear from the fact that there are upwards of 5,000 licensed maltsters, 34,000 licensed brewers of beer for sale, 6,000 dealers in beer, 86,000 publicans who retail beer with spirits, and 53,000 persons who retail beer alone, making in all 184,000 traders (not mentioning the many thousands of persons employed by them) who get their living by the sale of beer. These traders pay in licence duty £751,000; as duty on the sugar used in brewing, £51,000; and as duty on the malt made, £6,900,000; or a yearly total of £7,700,000 for permission to make or sell the favourite drink of the people.

It is estimated from official returns, that in England the annual consumption of malt per head of the population is about two bushels, and of spirits half a gallon; in Scotland, seven-tenths of a bushel of malt, and one and a-half gallon of spirits; in Ireland, four-tenths of a bushel of malt, and eight-tenths of a gallon of spirits. These

figures clearly establish the preference of the English for malt liquors over spirits, and of the Scotch and Irish for spirits over malt liquors. There are no means of ascertaining the exact quantity of malt which, in the form of beer, is sent from one part of the United Kingdom for consumption in another; but it is most probable that the interchanges in this respect balance each other very closely, and thus afford a reasonable basis for the conclusions above stated.

In 1867-8 a Committee of the House of Commons took evidence from agriculturists, revenue officials, employers of labour, maltsters, brewers, and others, on a proposal to reduce or abolish the malt-tax, or levy an equivalent for it on the beer. From the evidence of the agriculturists, the malt-tax seems to interfere with the rotation of crops, by causing other cereals to be grown in the place of barley, and poor barley to be unsaleable for making into beer. If the tax were removed they assert that cottage-brewing would come into general use, that beer would be given to farm-labourers all the year round, and that farmers would make part of their barley into malt, and sell it, convert it into beer, or add it to less palatable food for cattle. On the other hand, the Excise officials, maltsters, and brewers were generally opposed to the repeal of the tax or its transfer to beer. All admitted that the revenue from the tax is yearly increasing, that it is easily and cheaply collected, and that the Revenue officials grant every facility for conducting the trade. The maltster objected to the repeal, on the ground that malting would probably be largely practised by farmers.

whilst other classes of the community would derive no advantage by the change. The corn-merchants and brewers threw doubts on the farmers' chief grievance—that the tax prevents a judicious rotation of crops, whilst other witnesses denied that malt was superior to unmalted grain for cattle food. The difficulty in taxing private brewers, the increased cost of collection, and the likelihood of inconvenient restrictions being placed on brewers, were urged by the Excise witnesses and brewers, as convincing proofs against levying the tax on beer. The fact that from the sister kingdoms only one witness—a Scotch distiller—was examined, shows the narrow field opened up by the inquiry, and the desirability of further evidence, before a tax producing nearly eight millions yearly is disturbed. Half the members of the Committee, indeed, adopted this view, and it was only by the casting vote of the chairman the Committee recommended “that the malt-tax might with justice be repealed, and a licence to brew be substituted.”

## CHAPTER VI.

### PRACTICAL HINTS.

*Cisterns; Duration of Steeping, &c.*—It is evident that the time during which any particular lot of barley should remain under water in order to prepare it for good, regular germination must vary according to the state of dryness of the corn when put into steep, the heat of the weather, and other minor circumstances, such as the hardness of the steep-water, &c.

Of course, no maltster having due regard to his pocket will prolong the time in cistern beyond what is necessary to satisfy the legal requirements, when it is in his power to supply by sprinkling on the floor any deficiency of moisture resulting from an insufficient time in cistern. It is true that mere sprinkling is not always found to produce so good an effect as an extended period of steeping, but it answers the purpose quite well enough to make it worth while to resort to it under ordinary circumstances rather than sustain the higher charge of duty attendant on prolonged steeping.

Maltsters who work only for sale and profit on their own account hardly ever steep beyond fifty hours, and trust to early sprinkling for any defect of saturation in

cistern. It is only in rare instances where no other object is sought than the production of malt that shall yield the finest wort to the brewer, or when the grain, from its condition, obviously calls for an additional time in steep, that fifty to fifty-two hours are exceeded. All must here be left to the judgment of the maltster, as no general rule can be laid down.

It may be stated, however, that new barley usually requires more water than old; that for thin or light grain, the legal period (fifty hours when sprinkling is intended) is sufficient, especially if the grain has not been harvested quite dry; that kiln-dried barley, if not heated to excess, absorbs water so rapidly in the early stages of steeping, as seldom to need more than fifty hours in cistern; and that it is not safe, in most cases, to give any grain less than fifty hours, although sprinkling may not be contemplated.

When the temperature of the steep-water exceeds  $55^{\circ}$  Fah., the corn becomes more quickly saturated, and a shorter time in steep, which on some occasions may be an object, will suffice. Even when there has been no fraudulent motive on the part of the maltster, it has sometimes been found of advantage to place the cistern near the kiln-fire for the sake of warming the steep-water. It is doubtful, however, whether healthy germination is not liable to be hindered by this practice and the keeping-quality of the malt injured. Longer steeping, at the average temperature of the air during the malting season— $50^{\circ}$  to  $55^{\circ}$  Fah.—is to be recommended.

*x That is in the popular use of the term*

The hardness of the water, if at all excessive, retards the saturation of the corn, and ought to be allowed for by careful maltsters. Water, for instance, that curdles soap so much as to prevent the formation of a good lather, ought to be suffered to remain in contact with the grain an hour or two extra, especially if the temperature be at all low.

Deep cisterns, forty inches—the greatest depth allowed by law—are, as a rule, to be preferred to cisterns of wide area, and shallow. The grain lies more compact in the deep, narrow vessels, and the pressure thus exerted causes the grain to absorb water more certainly and regularly. The skimming of the light grains can also be more easily accomplished the less extensive the surface. As before stated, cement is a better lining than lead; it is much cheaper to keep in repair, and perhaps less apt to chill the grain in frosty weather.

It need hardly be observed that the barley chamber should be immediately over the cistern, so as to admit of the grain being shot in from wooden shoots or from bags.

Great care should be taken to strengthen the flooring of the barley room by beams or other supports, that will not interfere with the head-room, which the law requires shall be provided over every cistern constructed or altered since 1827. Floors that have not been properly supported in the first instance are almost sure to sink after a time, thus reducing the cistern head-room; and if an unusually great weight of grain be at any time stored above, a serious accident may happen from neglect of this precaution.

False bottoms to cisterns are occasionally used, subject to the permission of the Excise, which would not be withheld if it were shown that the proper gauging of the grain in steep could not be affected thereby, and that no improper object was in view. It may be that false bottoms are cleaner and facilitate draining. A well-made brick flooring, with a channel down the middle, slightly but sufficiently sloping, and a good-sized discharge cock at the end, seems, however, all that is really requisite.

*Changing Water in Cistern.*—This is sometimes necessary, especially in warm weather. It cannot legally be done more than once for each steeping. Where there is an abundant supply of water, it may not be requisite to change the whole of the water during the time of steeping, as the same object can be effected by keeping the tap open and letting the water run constantly on and off; but care should be taken that the grain is kept fully covered all the time, or the law will be violated.

The water should be changed whenever it is seen to be much discoloured, or found at an early stage of the steeping to give off a disagreeable odour.

For the regulations as to draining before the completion of steeping, see the Excise laws in this work.

*Couches.*—When the level of the couch-frame is lower than that of the cistern, an advantage is of course obtained by the greater compression of the grain when thrown from cistern, and the consequent reduction of the charge of duty. This compression by simple throwing, if carried too far, may, however, involve the maltster in a penalty; and even when the legal limit is not reached, an

officer witnessing the emptying of a cistern is empowered to forbid the slightest unnecessary compression, no matter in what way effected. The maltman getting within the area of the frame, in order to throw or push the heaps of grain to the further end, is considered to be exercising some degree of compression, even when he stands on the ground without any grain under his feet, and therefore as violating the law. To avoid all chance of unpleasantness in this respect, the only safe plan is to use long-handled rakes, and to stand outside the frame wherever the greatest reach of hand can be obtained.

It is the interest of every maltster to test occasionally the fairness of the officer's gauging, but he must take care not to get upon the grain while in couch for this purpose. The dimensions of the cistern, couch-frame, and kiln, as shown on the specimen, should also be verified by the use of a tape graduated in inches; the tenth of an inch must be estimated.

The thickness of the moveable board or boards to the couch-frame, and their fixity when in place, ought to be frequently seen to, in order to prevent official objections.

By law, corn must not be laid in couch-frame of a greater depth than thirty inches (observe it is the depth of the grain and not of the utensil that is limited); but by recent directions of the Board of Inland Revenue to their officers, when the depth is occasionally found to exceed thirty inches, no notice is to be taken of the irregularity, if the excess amounts only to the fraction of an inch.

As the deeper and thicker a mass of corn lies together,

the less is its bulk, the maltster should in his own interest so construct his couch-frame as to ensure, if possible, that the grain shall fill it on each occasion to the utmost depth allowed by law—thirty inches. Wide, shallow couches invariably lead to a high charge of duty, no matter how careful and fair the officer may be in taking his gauges.

In reference to this point, it is important that the maltster or his servant should frequently watch the operation of gauging in couch by young officers, and, if necessary, insist that the rod be inserted perpendicularly in the mass of grain, and the "float" brought down well in contact with the surface. A slight obliquity in the gauging-rod, and a too "light" hand in using the float, will make a considerable difference by the end of the year.

In the matter of floor-gauging it is sometimes requisite also to exercise a check on the officer's mode of taking the dimensions, especially the average depth, where much root is developed and great growth promoted to suit a particular market. A perfectly honest trader may be subjected to floor charges, simply through want of particularity and an avoidance of trouble on the part of the officer in taking his gauges. Of course the chief risk in this respect is incurred when the floor is at its maximum growth, and about to be thrown on kiln. A careless or inexperienced officer may then, by not making some allowance for the state of the grain, and not obtaining sufficient dips to ensure a proper average, involve the maltster in vexatious overcharges.

As a general rule, however, there is but little cause for

complaint against the Excise. At the end of the season the maltster will usually find on balancing his barley and malt account, that the charge of duty leaves him a gainer to the extent of some three or four per cent., if not more.

In exceptional seasons, and with high kiln-dried grain, there will, of course, be more duty to pay.

In the extreme case of an officer determining to "throw out" a couch on the allegation of his finding it unduly compressed, the maltster should make it a point to be present at the operation, and to check all the officer's proceedings. He should see that the dips before and after the emptying from frame are taken at regular distances along the surface of the grain, that the dimensions of the frame are carefully checked, and when the officer insists—as is rarely the case—on himself using the shovel, that the corn is returned into the frame in the usual business way, not with undue lightness for the purpose of obtaining an illegal increase. It is of no use offering opposition to the Excise; the only thing that can usefully be done is to watch their proceedings civilly but closely, to give them all the assistance they require, and to be truthful in the explanation demanded.

*Working Floors.*—These are best laid with cement mixed with sharp river sand or light gravel. Such a mixture is found to assist in maintaining a regular temperature in the grain lying on it, and to keep moderately moist during the greater part of the season. Slate and asphalte are to be objected to as being conductors of heat, and thus unduly lowering the temperature of the grain in operation. Stone slabs and tiles are with difficulty made

and kept level and clean, and the mortar is apt to come out from the joints and do mischief.

*Management of Grain on Floor.*—It is in this part of the process that the skill of the practical maltster is chiefly put to the test, as almost everything depends on the formation of the proper amount of root. If the grain be laid too thick, or suffered to remain too long without turning, an excess of heat would be generated, causing the root to shoot forth rapidly instead of gradually, and thus leading to the certain impoverishment of the malt.

It is impossible to lay down any general rules of guidance that will meet all cases ; but under ordinary circumstances, when the weather is at its average temperature, the grain, after being released from couch-frame, ought not to be laid more than about eight to ten inches deep if the root has begun to show. The first turning of this may reduce the depth to six or seven inches, and the temperature of the floor at the time should not much exceed 50° Fab. It is in the power of the maltman, it should be recollected, to regulate the heat of the corn in operations at almost any stage of its growth by increasing or diminishing the degree of thickness with which it is laid on floor, and also by more or less frequent turning. On emptying from couch, the grain should in most cases be laid almost as thick as it was in couch, and no attempt made to turn or disturb it until the root or *chick* makes its first appearance. Of course in very warm weather it will be found that the root has begun to show even before the removal of the grain from frame ; and in

that case immediate turning should be practised, to prevent a too rapid germination.

In very cold weather it may not be advisable to turn the grain for two or three days after it has ceased to be in couch, so as to avoid any further lowering of the temperature, and induce keeping back of the rootlet. Indeed it is occasionally necessary to leave the grain undisturbed in the frame for some days, covered over with sacks, &c.

Supposing, then, as is usually the case, that we have the grain just emptied from cistern, and laid, say, eight or nine inches deep on floor, the weather being mild, the first turning should be in about twenty-four hours from the time of emptying, if the rootlet is showing well; if not, in about thirty hours. Any maltster who will take the trouble to observe the temperature of his floors regularly with a thermometer,\* will find it of the greatest advantage as an index to the proper time of turning or *ploughing*. By this latter term is meant simply passing the edge of the wooden shovel, or (what is better) a long stick with a flat end, half the width of an ordinary shovel, lengthwise through the grain, care being taken not to crush or injure the rootlets in the process.

It is requisite, in using the thermometer, to bury it for a quarter or half an hour successively in different parts of the floor, so that it may acquire the exact temperature of the grain before the indication is read off. But even

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\* Suitable thermometers, strongly made and correctly graduated, can be had from W. R. Loftus (*see* Price List).

roughly thrust in at any point about the middle, the thermometer will give the heat of the grain with sufficient nearness to be extremely valuable as a warning about the necessity for thinning out or heaping together. Many old practised maltmen are able to form a very good judgment on this point by the mere sensation of the hand when thrust into the middle of the floor. But in large maltings, and wherever high quality and produce are an object, the thermometer—costing only a few shillings—is indispensable.

The first turn of the “young floor” should reduce the depth to about six or seven inches, the heat after the fourth day not being suffered, if possible, to exceed 50° F.

With respect to subsequent turnings, it is a sufficient general rule that the grain should be turned twice, or once turned and once ploughed, every day, until the root becomes thoroughly developed, and the growth of the acrospire under the skin shows that the floor is nearly ready for kiln. In all cases, as soon as the root begins to shoot forth, the corn should not be left for any length of time at a greater depth, except in very cold weather, than from four to five inches.

It is important, both for the regularity of the vegetation and compliance with the Excise regulations, that the grain should be laid evenly on the floor.

For most purposes it is best to try and develop a short, bushy root, about the length of a single corn, in preference to a long root with slender, twisting filaments, which tends to exhaust the contents of the kernel, and gives a

poor, thin malt. In order to form the short thick root in question the surest method is to work slowly and coolly all through the process, avoiding sprinkling, if possible, and turning or ploughing frequently, but so as never to injure the corns. (Yes)

In no case should sprinkling be resorted to until the root is well developed; the time at which water is required is usually that at which the law first allows it to be used, viz., after the expiration of ninety hours, or about four days from the time of emptying from cistern.

When vegetation of the grain shows it to be ready for drying it is usual and judicious, as a rule, to heap it up, and let it rest a short time before loading the kiln.

*Kiln-drying.*—The following are the only remarks on this point of the maltster's process which it seems necessary to add to the directions given.

For pale malt a low gradual heat is required, going up from the ordinary temperature of the air to  $100^{\circ}$ , and thence to  $120^{\circ}$ , and finally  $135^{\circ}$ , which latter should rarely be exceeded. If a darker, higher-dried malt be wished for, the heat must of course be raised several degrees further, say to  $170^{\circ}$ , and this done suddenly after the malt has become about half or three parts dry, and shows a decided change of colour.

Pale malt need not be frequently turned on kiln. Twice or three times, where there is a good draught of air, will generally be found sufficient.

Forty-five to fifty hours may be considered the average time occupied by the drying of a floor or kiln-load of malt. Attention to the state of the grain and the

securing of an even distribution on the kiln-floor, make it possible to shorten this period by several hours. Ten inches is a fair average depth for grain to be first laid on kiln; if possible the grain should be spread at nearly an uniform depth over the drying surface; but as most kilns have unequal drying power in different parts, owing to draughts and other causes, it should be the maltman's care to place the grain thickest when the draught and the heat are found by experience to be strongest. The fuel used for ordinary malt should be well-burnt coke, or the best kind of anthracite, or stone-coal, whenever procurable. Any sulphur in the coke or coal, if not present in great excess, will only serve to bleach or whiten the malt a little, which is not a disadvantage in the small markets. Indeed, in many places sulphur (brimstone) is purposely thrown on the fire to improve the colour of the malt; but this practice is of doubtful honesty, and often causes a stoppage in the fermentation of the worts brewed from such malt. Another disadvantage of sulphur is that its fumes injure the iron bars or other iron fittings of the kiln.

Further practical remarks, however valuable, cannot be introduced consistently with the limits of this treatise.

## CHAPTER VII.

### DIFFERENT KINDS OF MALTSTERS.

THERE are four different kinds of maltsters, viz. :—General maltsters, or those who make malt for general purposes ; bye maltsters, so called for the reasons stated below ; bere or bigg maltsters ; and duty-free maltsters, or those who make malt duty-free, to be used in the distillation of spirits, or for use in feeding cattle, or for exportation. Upon the whole they are all under the same regulations as general maltsters, already described ; but as there are some slight differences in the regulations applicable to the particular purposes for which the malt is intended, we shall notice the peculiarities of each, so far as they differ from general maltsters. The laws by which each particular kind of maltster is governed will be found on page 134 and following pages. First, then, as to

#### BYE MALTSTERS.

A bye maltster is a person who makes malt for his own use from the produce of his own land, and does not make more than forty bushels annually. No maltster who makes malt for sale can be considered a bye maltster. They are generally situate in remote places, such as farm-

houses, where there are no roads or easy communication, as in the glens and mountainous parts of Wales, Scotland, or Ireland, or in the small islands on the coast of Scotland. Such persons are allowed to steep their grain, provided they steep less than eight bushels at one time, in moveable tubs, in place of permanent cisterns, but they must erect an ordinary couch-frame. Such maltsters in Scotland, who do not steep more than eight bushels of grain at one time, are allowed to remove their malt when worked to the nearest public kiln, to be dried, provided previous notice in writing to that effect be given to the Excise officer, in which notice must be specially stated the kiln to which the grain is to be removed for the purpose. A bye maltster has to pay the sum of 2s. 7½d. annually for his licence.

#### BERE OR BIGG MALTSTERS.

Bere or bigg, as has been already stated, is an inferior species of barley grown in Scotland or Ireland, in consideration of which the duty on malt made from this description of grain is less than that payable on ordinary malt; it is 2s., and 5 per cent. per bushel, or 2s. 1½d.

This kind of malt is made for consumption in Scotland or Ireland only; and if sent into England the full duty must be paid as on ordinary barley malt, and it must also be accompanied by a certificate to the effect that it has paid the full rate of duty. The general regulations under which barley malt is made are applicable to bere or bigg, except that bere or bigg maltsters must state in their

entries that they intend to make malt from bere or bigg, and from no other grain. No entry can be made of any malthouse, place, or utensil for making or keeping malt from bere or bigg, unless the premises be under a different roof, and detached from any house or place entered for making or keeping malt from barley or other grain ; nor can entry be made of premises for making or keeping barley malt, except they are in the same manner distinct and apart from premises entered for bere or bigg malt. The maltster cannot legally withdraw his entry until all the bere or bigg in his possession is accounted for and charged with duty. No person can change his entry for the purpose of making malt from bere or bigg to barley, or *vice versâ*, until all the grain of the kind from which he is working is removed, and the malt dried off. Bere or bigg is not to be brought into the possession of a maltster entered to make malt therefrom except upon notice, and accompanied by a certificate from the grower or seller, to the effect that it is actually bere or bigg, without any mixture of other grain, and also stating the place, parish, and county where, and the person by whom it was grown ; and it must be of the growth of the particular country where it is to be malted ; if grown in Scotland it must be malted in Scotland, or if grown in Ireland it must be malted in Ireland. This certificate must be delivered to the proper Excise officer ; and any person giving a certificate that is false or untrue in any particular renders himself liable to a penalty of £200. When any bere or bigg is received by a maltster it must be kept separate and apart from all other bere or bigg for

the space of twenty-four hours, at least, after being received, unless it is sooner examined by the officer ; and it must not be steeped until the officer has had an opportunity of examining it.

Barley, or malt made from barley, found in the possession of a maltster from bere or bigg, is liable to forfeiture, and the maltster incurs a penalty of £200, and all malt then in his possession, germinating on the floor, is to be charged with the full duty on barley malt. In cases of seizure of grain, when disputed, if claimed to be bere or bigg, the proof must lie on the defendant ; or if such malt be claimed as malt made from barley or other corn or grain, the claimant must prove that the full duty has been paid..

The law relating to the manufacture of malt from bere or bigg will be found in the abstract of laws.

#### DUTY-FREE MALTSTERS (FOR DISTILLERY PURPOSES).

Malt may be made duty-free to be used in distilling spirits, in malthouses approved for the purpose, by the Commissioners of Inland Revenue. This approval having been obtained, entry must be made of the malthouse, utensils, places, and rooms, for the especial purpose of making malt for distillery purposes only ; and no such entry can be withdrawn whilst any malt, or corn or grain making into malt, is in such malthouse, or in any store-room belonging to it. If the maltster is not a distiller he will be required to enter into a bond with two sureties in the amount of £1,000. As the

attendance of the Excise officer is required at the malt-house several times in a day, if such malthouse is situated at a greater distance from a market town than one mile, the maltster must provide accommodation for him, by finding a house or lodgings, at a reasonable rent, not exceeding £10 per annum; but such house or lodgings must not form part of any duty-free malthouse, maltster's dwelling-house, or distillery. Before a maltster can be allowed to commence working duty-free for distillery purposes, he must provide a proper kiln and store-rooms, secured to the satisfaction of the Excise collector or supervisor of the district, who will certify to the maltster his approval in writing. All necessary fastenings, except locks, must be provided by the trader, who is also required to provide scales and weights adapted for weighing malt in sacks, and a bushel measure, and to render to the Excise officer every assistance that may be required in measuring, weighing, and taking account of malt. The usual certificate to the effect that the cistern is legally constructed must be obtained from the supervisor before the cistern can be used. The maltster must have his name in full, and the words "Licensed maltster" over the principal entrance to his entered premises; and also, in letters three inches at least in height, and of proportionate breadth, the words "Entered to make malt to be used in distilling spirits only."

The Commissioners of Inland Revenue are empowered by the Act 23 and 24 Vict. cap. 113 to make regulations as to the time grain making into malt for distillery purposes is to be kept under water in the cistern, and

to the rate of allowance on gauges in cistern or couch-frame; and they have thereupon provided that should any duty-free maltster be desirous of malting grain of any description which would be injured by being kept in steep forty hours, or in the couch-frame twenty hours, he may be allowed to keep such grain covered with water in the cistern for a period not less than thirty hours, provided he express in his notice to wet the time he intends to keep the grain covered with water. He may also remove grain from the couch-frame to the floor after the expiration of twelve hours from being emptied from cistern. Should any such maltster steep any description of grain on which the allowance made for increase in the operation is found insufficient, the particulars will be brought before the notice of the Commissioners by the officer, with a view to some other allowance being made. Apart from this power of the Commissioners, the allowance upon duty-free malt for distilling purposes is different to that on malt for general purposes. The allowance on the grain for the swell while in cistern or couch-frame is 17 per cent., instead of  $18\frac{1}{2}$ . The gross bushels found in the cistern or couch-frame may, therefore, be reduced to net, by multiplying the quantity by  $\cdot 83$ . The allowance upon the grain while on the floor is the same as for general purposes—one-half.

In order to prevent the abstraction of grain from the kiln, the opening at the top must be secured and the floor overlaid or covered with hair-cloth, or otherwise secured, to the satisfaction of the supervisor. If hair-cloth is used, the bars of the kiln floor must be covered with wire net-

work, the meshes not to exceed one inch, and the wire must be so secured that no part of it can be displaced. The kiln is kept locked with revenue locks at all times, except when open under notice, and the key kept by the officer. No person can legally gain access to the kiln but by notice to the officer, who will attend and remain on the spot during the time the kiln is required to be kept open. A penalty of £200 is incurred for any wilful damage so as to gain access.

General maltsters are required to keep their grain in operation on the floor 168 hours at least, but maltsters for distilling purposes are allowed to dry off their grain whenever they may consider the same fit to be placed on the kiln. The maltster must give to the officer six hours' notice in writing of his intention to load the kiln, specifying the hour of loading, the date when the floor to be shifted was emptied from the cistern, and the portion of the floor, whether the whole, the first half, or the second half, to be put on the kiln. The floor for this purpose must not be divided into more than two portions. The loading must take place between the hours of five in the morning and seven in the evening, and must be completed within two hours of the time specified in the notice, or the kiln door will be again locked. The door will be secured as soon as the loading is finished, and not opened again without notice. Workmen may be admitted to turn or stir the grain on the kiln, but six hours' notice in writing must be given to the officer, and the door is not to be opened for that purpose oftener than four times a day, nor remain open more than half-an-hour each time,

and must not be opened between the hours of nine at night and five in the morning. Twelve hours' notice in writing must be given to remove the malt from the kiln, and the removal must not be earlier than five o'clock in the morning nor later than seven o'clock in the evening. The officer will attend at the time specified in the notice, when the malt is to be forthwith measured in his presence, and deposited in the secure store-room. A measure of two or more bushels may be used for measuring the malt if the maltster desire it, but it must be a correct measure, duly stamped. No less quantity than a bushel need be taken account of, unless the measured quantity falls short of that ascertained by gauge, in which case any fraction of a bushel may be reckoned as an entire bushel. If the maltster desire it, the malt may be screened before it is measured into store. No allowance is made on the quantity ascertained by measure if the malt is screened, but if stored unscreened 5 per cent. is deducted on account of the expansion of the malt by heat and growth of the rootlets.

It has been already stated that an allowance of 17 per cent. is made on the gross bushels found by gauge in the cistern or couch; therefore, for every 100 bushels found either in the cistern or couch-frame, the maltster is required to produce 83 net bushels of screened malt from the kiln. Should he fail to produce this quantity he is charged with duty on the deficiency. The maltster will be duly informed by the officer when a deficiency occurs, and he will also find the amount of such deficiency entered on the specimen (already alluded to) immediately over the

couch-gauge. He will receive due notice of the time and place where the duty on such deficiency is to be paid. If the malt is measured from kiln unscreened the duty is not required to be paid on deficiencies as they occur, but will be added together by the officer on the 30th June annually, when, if the total deficiencies at any malthouse be found to exceed the total excesses, the difference only will be charged with duty. Malt measured and deposited in the store unscreened is not allowed to be screened before it is measured for delivery from store.

In the case of malt for distillery purposes a charge does not arise from the grain while on the floor until it gauges more than 66 per cent. above the cistern or couch bushels.

Duty-free malt must be removed from the malthouse, accompanied by an Excise permit, issued by the Excise officer, and any person found removing malt from such malthouse without a permit is liable to imprisonment, and may be arrested by an Excise officer, and taken before a magistrate to be summarily dealt with.

A duty-free maltster may have his malt stock account kept either by measure or by weight, as he may elect. As all malt must be removed from the malthouse to the distillery in sacks, each containing four bushels by measure, or 168 lbs. net by weight, the maltster may, if he think fit, deposit the malt in store in sacks, each made up to that weight or measure. The maltster will be furnished by the officer with a stock book, which is to be kept at the malthouse, and in which the quantity of malt received into the store-room is to be entered as soon as it is

deposited, and also all malt sent out of stock. On the 30th June annually, or sooner, if the maltster has ceased to work for the season, the officer will see all the malt in stock weighed or measured, and will strike a balance. Should the stock be very large, or the store full at this time, the stock-taking may be deferred for convenience, but it must be taken before the trader recommences work. If the stock account when balanced shows a deficiency of more than three per cent. when kept by measure, or one per cent. when kept by weight, the maltster is charged with duty on the whole deficiency; and if an excess be found exceeding three per cent. the whole excess is forfeited, and may be seized by the officer. When the stock is kept by weight, 40 lbs. are taken as equivalent to a bushel in calculating the duty on the deficiency

The maltster must give to the officer twelve hours' notice in writing of his intention to remove malt from the store at the malthouse to a distillery, specifying the quantity to be removed, and the place from and to which the malt is to be taken. The officer, having seen the specified quantity measured or weighed, as the case may be, at the appointed time, will grant a permit to accompany the malt. The sacks in which the malt is removed must be free from patches or holes, and the folds of the seams must be inside, and the mouths securely closed with strong cord, sewed or fastened to the bagging, which, when tied, is to pass twice at least round the neck. A piece of red tape is then passed through a fold in the neck of the sack, and secured with a leaden seal by the officer.

No malt made under these regulations may be sold to any other person than a distiller, nor is any other person allowed to purchase or use such malt; but it may, under certain conditions, be exported, or, when duly mixed with linseed cake or linseed meal, be used in feeding animals.

### DUTY-FREE MALT FOR EXPORTATION.

Malt made duty-free for distilling purposes, as just stated, may be exported under the following regulations:—If a maltster licensed to make malt for distilling purposes wishes to remove any such malt for exportation, he must, in addition to his bond as a duty-free maltster, enter into another bond with two sureties in the sum of £1,000, conditioned for the due exportation of such malt. He must give to the officer twenty-four hours' notice in writing of his intention to export, specifying the time when and the place where the malt is to be packed, the quantity to be exported, the port from which it is to be shipped, and whether it is to be removed in sacks, casks, or other packages, as he is not compelled to export the malt in sacks. The malt can only be packed and removed from the malthouse between the hours of six in the morning and six in the evening. The maltster must provide a legal bushel measure, and correct scales and weights, adapted for weighing the malt, both at the malthouse and on board the vessel in which the malt is shipped. If the malt is packed and removed from the malthouse in sacks each sack must contain four bushels by measure, or 168 lbs. net, by weight, according as the

maltster may keep his stock account by measure or weight; the sacks must be free from holes or patches, and properly secured, as in the case of malt removed to a distillery. If casks, or any packages other than sacks, are used, they must be secured and sealed in such a manner as to prevent their being opened, or malt abstracted from them. If the maltster is not the actual exporter of the malt, such exporter must enter into an export bond, in double the amount of duty that would have been chargeable on the malt, if made subject to duty. This bond must be entered into quite regardless of the bond given by the maltster for the removal of such malt for exportation. A permit will be granted by the officer to accompany the malt from the malthouse, and the malt must be shipped under the regulations applicable to duty-paid malt shipped on drawback. These regulations will be found detailed in abstract of laws at end of this work.

## DUTY-FREE MALT FOR CATTLE-FEEDING PURPOSES.

Many agriculturists have supposed that when a given quantity of raw barley is converted into malt its feeding properties are increased, or it is more fattening than when in the raw state, and have in consequence been extremely clamorous for a repeal of the malt tax, so that they could use malt to feed or fatten their stock with, but were prevented, owing to the duty and consequent high price of the fattening material. This assumption,

however, has been proved by science an utter failure ; but as many farmers persisted that malt, on account of its saccharine matter, must be more fattening than raw barley, an opportunity was given them by the Legislature a few years since of fully testing the disputed point for themselves, in the Act 27 Vict. cap. 9, which will be found on page at end of this work. Had such persons taken the trouble to conduct a few experiments they would soon have found out there is not that fattening property in malt which is generally ascribed to it. For instance, 32 stones of barley produce about  $25\frac{1}{2}$  stones of good malt. The 32 stones' weight of barley contain 50 lbs. of nutritive or flesh-forming compound,  $22\frac{1}{2}$  lbs. of sugar, and 269 lbs. of starch and gum. While the  $25\frac{1}{2}$  stones of malt contain only 30 lbs. of flesh-forming matter, 53 lbs. of sugar, and 175 lbs. of starch. There is, therefore, a loss in the malting process of 24 lbs. of flesh-forming compound, and 64 lbs. of good solid fattening material. This loss of weight and substance is occasioned by the rootlets of the grain feeding upon the starch while it is germinating on the floor during the sugar-forming process. Now the value of sugar as an article of food is much the same as that of starch, and no advantage can be gained by converting one into the other. Saccharine matter is necessary to produce vinous fermentation, and the consequent alcoholic richness of the fluid is entirely dependent upon the presence of the formation of saccharine matter in some way or other. But on the other hand, saccharine matter, when taken into the stomach of animals, does not produce fat and flesh in the same way

it produces alcohol in the fermenting vessel. In estimating the feeding qualities of any substance it will be necessary to ascertain whether it contains sugar, starch, or oil; for, as these differ most materially in their fattening power, they cannot, as a matter of course, be regarded as possessing equal value. If, for instance, one pound of wheat or barley starch be worth twopence, one pound of grape sugar formed from that starch will be worth only three-halfpence.

Many persons are of opinion that sugar of itself will fatten. This is wrong; for instead of fattening, it will not even keep persons from starving, as it does not contain those ingredients which are necessary to human or animal life, such as albumen, gelatine, &c., or other nitrogenous matter. The infant, or young animal, is chiefly supported by the mother's milk, which contains a great quantity of sugar; but, in addition to this, it contains other flesh and bone-forming compounds derived from the mother's frame. This constant drain upon the frame of the mother, or dam of the animal, is shown in the attenuated form and appearance of milch cows, and often causes disease of the parent if the milk-forming material be not replaced by sound nourishing food. The starch is formed into sugar by the action of the saliva and intestinal juices in the stomach of the animal, and therefore does not require to be converted into a semi-saccharine state, by the process of malting, which not only fails to convert it into a better fattening compound, but loses part of the starch by the rootlet of the grain feeding upon it at the expense of such starch during the

vegetation or process of malting. The conversion of barley into malt, therefore, is not only attended with expense, but loss of fattening material also. The only benefit arising from the conversion of barley into malt for feeding purposes is, perhaps, that, owing to its peculiar grateful sweet flavour, the animal may be induced to eat more of it than it would of raw barley.

Experiments have also been made with a view to ascertain if a given weight of raw barley is equal to or superior to the same weight of good malt for the purpose of producing fat; but it was difficult to come to an exact conclusion upon the matter. The general results of the experiments were, however, that a given weight of malt was inferior to the same weight of raw barley. In this experiment it must be borne in mind that weight was the standard of comparison, and not measure, or bulk for bulk; therefore, as malt is lighter than raw barley in the proportion of 16 lbs. to the bushel, a bushel of malt is not of so much value to the farmer to feed his stock with as a bushel of raw barley. It is difficult to say what amount and what description of food cattle require, as it depends in a great measure upon the way in which they are kept, or the amount of exercise they are subject to. A quart of good milk is equal to three-quarters of a pound of meat for feeding purposes. A good cow will yield about one thousand gallons of milk in the course of a year. Milk to the value of 2s. 9d. will contain as much flesh-forming compound as 5s. 11d. worth of meat.

Farmers who desire it have, however, as already stated, the facilities for feeding their cattle upon duty-free malt;

for, under the Act referred to, any person may, upon giving proper security, and under certain regulations, make malt duty-free for feeding animals.

Any person wishing to avail himself of this privilege must give notice to that effect to the proper Excise officer. A licence must be taken out as in the case of malt for general purposes. The malthouse must be specially entered by the maltster, and approved by the Commissioners of Inland Revenue for this particular purpose ; and such entry cannot be withdrawn so long as any malt, or corn or grain making into malt, shall be in such malthouse, or in any store-room belonging to it. The maltster must have his Christian and surname in full, and the words, "Licensed maltster" over the principal entrance to his entered premises, and also, in letters three inches at least in height and of proportionate breadth, the words, "Entered to make malt to be used in feeding animals." He will also be required to give security by bond, with two sufficient sureties, conditioned that all corn or grain received into the malthouse shall be made into malt, and that such malt shall not be fraudulently disposed of. The amount of the security is fixed by the Commissioners, according to the probable quantity of malt to be made. If the malthouse is situated more than a mile from a market town, the maltster will be required to find a suitable house or lodgings for the Excise officer, at a rent not exceeding £10 per annum.

The usual certificate that the cistern is legally constructed must be obtained from the district supervisor before any grain is wetted. A kiln and store-room must

be provided and secured to the satisfaction of the supervisor, who will certify to the maltster his approval in writing. The maltster must provide proper scales and weights, adapted for weighing malt in sacks, and a correct bushel measure. The same restrictions and regulations are in all respects applicable as in the case of duty-free maltsters for distillery purposes, except that an allowance of  $18\frac{1}{2}$  per cent. upon the best cistern or couch gauges is made in respect of malt for feeding animals.

The maltster must give to the Excise officer twelve hours' notice in writing of his intention to remove malt from the store for grinding and mixing, specifying the quantity to be removed, and such quantity must not be less than forty bushels. The malt must be removed from the store to the grinding-room in sacks, each containing four bushels by measure, or 168 lbs. net by weight. A room for grinding and mixing the malt with the requisite quantity of meal must be provided by the maltster, into which the malt must be directly removed from the store at the time expressed in the notice, and must there at once be ground or crushed to the same degree of fineness as a standard sample in the possession of the officer, and must then be thoroughly mixed with at least one-tenth of its weight of linseed-cake or linseed-meal, ground to the same degree of fineness as the malt. The mixing-room must be provided with proper fastenings to the satisfaction of the supervisor, so that any unground or unmixed malt may be locked up in it if the grinding or mixing cannot be completed during one attendance of the officer. The mixing must take place only between the hours of six in

the morning and six in the evening. In order that the ground malt and meal may be thoroughly mixed, the maltster is required to provide a hopper, through which the mixture is to pass, and the hopper must be so constructed that 1 lb. of meal passes through with every 10 lbs. of ground malt. When the mixing has been completed, if no unmixed malt be left in the mixing-room it will be left open, and the maltster is at liberty to dispose of the mixed malt to any person, to be used for feeding animals.

Maltsters who are not distillers, and who make malt duty-free for distillery purposes, may also dispose of such malt for cattle-feeding purposes, on complying with the regulations for rendering it unfit for use in brewing.

Peas or beans may be malted duty-free for cattle-feeding purposes at malthouses or other places, without any interference from the Excise officers, or any account of the grain being taken.

Each maltster who makes malt duty-free for feeding animals will be furnished by the officer with a stock-book, in which he is to keep an account of all mixed malt sent out to be used for feeding purposes, showing the date when sent out, the name and address of the person to whom sent, and the quantity in bushels.

If any person shall attempt to separate any mixed malt and meal, or to use such mixture in distilling or brewing, he renders himself liable to a penalty of £200, and the materials become forfeited; and any person illegally removing any malt, or corn, or grain making into malt, from any such malthouse, is liable to be arrested, and to

a penalty of £100, or in default of payment to be committed to hard labour for six months.

This Act came into force on the 28th of April, 1864, and in the following year twenty-eight persons made entry of malthouses to be used for the purpose; and the quantity of malt made was 85,640 bushels; but the supply proved more than equal to the demand, for this quantity was not nearly all mixed and used as was intended, the Commissioners of Inland Revenue allowing a great deal of it to be used in brewing, upon payment of the duty. Since that year the number of malthouses and quantity of malt made for this purpose has rapidly declined, until, in the year ended 31st March, 1867, there was only one malthouse entered for the purpose, and the quantity made was 316 bushels. But this one maltster has since discontinued, and in the year ended 31st March, 1870, there was not a single bushel of malt made under the Act. But it must not be supposed that this falling-off is due to Excise restrictions—for, on the contrary, a number of gentlemen who were engaged in this manufacture have acknowledged that they had nothing whatever to complain of on that score, but simply of there being no demand in the market for the article. This result was indeed to be anticipated, from the doubtful advantage of using malt as cattle food, except in small quantities as a condiment. The Chancellor of the Exchequer, however, being anxious that every possible facility should be afforded for the use of steeped grain for feeding purposes, obtained for the farmers of Great Britain another concession in the Act of last session, the 33 & 34 Vict. cap.

32, by which this is allowed, under certain regulations, for the security of the revenue. A farmer wishing to avail himself of this indulgence must deliver to the Excise officer of the district a notice in writing, describing the particular buildings or places in which he intends to steep and germinate grain, and to keep it afterwards. The farmer will receive from the officer an acknowledgment of the receipt of such notice, and also a printed copy of the regulations under which the grain is to be steeped and germinated. The premises where the grain is steeped, germinated, or kept, must not be within a quarter of a mile of a malthouse or public kiln, and must at all times be open to the inspection of Excise officers. The Commissioners of Inland Revenue have, however, the power to sanction the use of premises for the purpose, within the prescribed distance, but their consent for the use of such premises must first be obtained through the Excise officers. The grain, after being steeped and germinated, must not be ground or crushed in any manner, but must be used in its whole state, and upon the farm where it has been germinated.

A person infringing any of the conditions contained in the Act incurs a penalty of £100, and the grain becomes forfeited. The mere steeping of grain for the immediate consumption by animals does not subject the person who carries on this practice to any of the provisions of the Act.

A full account of the conditions under which grain may be steeped and germinated for the above purpose will be found in the abstract of laws.

## ROASTED MALT.

There is another description of malt to be described, viz., roasted, patent, or black malt, as it is variously called. It is not used by itself in brewing, but for the purpose of giving to porter its rich dark brown colour and peculiar flavour, and in some districts, as in Lancashire, for the purpose also of deepening the colour of ale and beer worts. The preparation and sale of roasted malt is carried on by persons specially licensed; the trade is in the hands of very few persons, and quite distinct from that of malting. The business of a malt-roaster cannot legally be carried on upon the same premises where the malt is made, and charged with duty; neither can a maltster carry on the business of a malt-roaster or dealer in roasted malt, within one mile from his malthouse. The malt, therefore, is made and charged with duty in the usual manner, and then removed to the roasting premises to be roasted. Ordinary malt, as has already been stated, may be rendered suitable for porter brewing by raising the heat of the kilns at the end of the drying process, or by subjecting the malt to the action of a wood fire; but as a great portion of the fermentable matter is destroyed by this method recourse is generally had to the use of roasted malt, a small quantity of which imparts to the worts of pale malt all the colour and flavour that can be desired.

Before commencing business, every roaster of malt for sale and every dealer in roasted malt is required to take

out a licence, which expires 5th July annually. A malt-roaster has to pay £20 for a licence, and a dealer in roasted malt £10. The penalty for carrying on either business without licence is £100. No maltster, malt-factor, or dealer in malt can carry on the trade of a malt-roaster or dealer in roasted malt in any premises in which he makes or keeps malt, nor within a mile of the same. This regulation, however, does not affect persons who were in business prior to 1st April, 1842, and who have an indulgence from the Commissioners of Inland Revenue to continue such business within the prohibited distance. No druggist or grocer can legally be a malt-roaster or dealer in roasted malt. A malt-roaster before commencing business is required to furnish the proper Excise officer with a notice in writing of every room, store, or place, and of every furnace, cylinder, and other utensil, intended to be used in carrying on the business ; and each place, furnace, cylinder, &c., is to be distinguished in such entry by a particular letter or number, and must be marked or numbered to correspond with the entry, and such marks and numbers must be restored from time to time as occasion may require. A dealer in roasted malt is also required to make entry, in like manner, of the premises which he intends to use in carrying on his business, and to mark or number each place.

The process of roasting malt is very similar to that of roasting coffee. Malt of any colour and quality will answer for the purpose, provided it has germinated to the extent required by the law, and described on another page. The utensil used for roasting is a sheet-iron cylinder

about four feet in length and two in diameter, capable of roasting from three to six bushels at a time, and so constructed that part of the periphery, of the length of the utensil, may be drawn in and out at pleasure, that the grain may be examined during the process to see what progress it makes. When charged with malt, the cylinder is put into a brick enclosure, at the bottom of which is a strong coke or charcoal fire. A stout iron axletree passes through the cylinder lengthwise, by means of which it is suspended over the fire. To prevent the malt burning, the cylinder is gently turned by means of machinery at the rate of about twenty revolutions per minute. The operation varies, according to the heat of the fire and quantity of malt in the cylinder, from three-quarters of an hour to an hour and a half, until the malt assumes a dark chocolate colour. The temperature of the malt while roasting varies from  $360^{\circ}$  to  $410^{\circ}$  Fahr. Caramel, or burnt sugar, a blackish brown substance, exceedingly soluble in water and of a bitter, empyreumatic flavour, is thus produced, while at the same time part of the grain is unavoidably carbonized or reduced to charcoal. If the temperature exceed  $420^{\circ}$  the malt becomes almost wholly decomposed, leaving nothing but a mass of porous charcoal. Caramel, although formed from sugar, will not ferment, or afford alcohol, and in this respect it is of no use to the brewer. Its principal value consists in its high colouring properties, whilst at the same time it adds considerable density to the worts.

Malt loses in weight during the process of roasting about 10 lbs. per bushel, and increases about six per cent.

in bulk, while barley treated similarly loses about 12 lbs. per bushel, and increases in bulk from about fourteen to twenty-two per cent., and may, by peculiar management in roasting, be increased upwards of thirty per cent. This difference depends chiefly on the degree of rapidity of roasting ; and as roasted malt is generally sold by measure, there is a strong inducement for the roaster to practise the fraudulent substitution of raw barley for duty-paid malt ; although roasted barley is not nearly so well adapted as roasted malt for the colouring of beer. As the revenue from the duty on malt would be defrauded to a considerable extent if this substitution of raw barley for malt were carried on, very stringent laws have from time to time been passed for the regulation of this class of Excise traders. These laws will be found at the end. With a view to the prevention of the introduction of unmalted grain during the process of roasting, the malt-roasting premises and utensils are under the immediate surveillance of the Excise officer, who is authorized at all times, on demand, to enter and inspect the business premises of a malt-roaster or dealer in roasted malt, and examine and take account of the stock of malt, whether in cylinders or otherwise. If any prohibited grain be found, the officer is empowered to seize the whole, and the trader incurs a heavy penalty.

Every malt-roaster and dealer in roasted malt will be furnished by the officer with a malt entry book, in which the trader is to keep a debtor and creditor account of all malt he receives or sends out. The particulars of every transaction must be entered on the day on which it takes

place ; and the malt-roaster, on the day on which he roasts any malt, is to enter in such book an account of the same before nine o'clock in the evening. The malt entry-book must at all times be kept in some open part of the trader's premises, where the officer may inspect it. The malt-roaster is allowed to roast malt in the daytime only, and no malt can legally be roasted between the hours of seven in the evening and five in the morning from April 1st to August 31st, nor between seven in the evening and six in the morning from September 1st to March 31st.

No malt-roaster can legally receive any corn or grain other than unroasted malt which has been made by, and purchased of, a licensed maltster or malt-factor ; and no dealer in roasted malt can receive any corn or grain other than roasted malt, which has been roasted by a licensed malt-roaster, and accompanied by a certificate under the hand of such malt-roaster. A malt-roaster, on the next visit of the officer after the receipt of malt, must produce the invoice or delivery note, and show him the malt or so much of it as remains unroasted. The law requires that all malt received by a malt-roaster must be roasted by him on his entered premises, and unroasted malt removed from the roasting premises is liable to seizure.

A dealer, on the next visit of the officer after the receipt of roasted malt, is to deliver to him the certificate that accompanied it, and show him the malt.

Each malt-roaster and dealer in roasted malt will be furnished by the officer with an Excise certificate book ; and no roasted malt must be sent out, except in an un-

ground and unbruised state, and accompanied by a certificate, properly filled up and cut progressively from such book, signed by the trader or by some person on his behalf.

An account of the stock of malt in the possession of a malt-roaster or dealer in roasted malt is taken by the officer at uncertain times. The trader is required to level and cast his stock of loose malt into such form as will admit of its being easily and conveniently gauged ; and when any of the malt is contained in sacks, he is, if required, to declare the quantity which they contain, but the officer is at liberty to measure the malt in sacks. Each malt-roaster and dealer in roasted malt is to provide a correct bushel measure, and assist the officer in taking an account of the stock. Before the account is taken the trader may post into his entry-book the particulars of any malt received that day ; and if, at the time of taking the account, any malt is roasting, the quantity is to be included. If at any time, on taking the account, an increase be found in a malt-roaster's stock exceeding ten per cent., or in a dealer's exceeding three per cent., on the quantity of malt which such malt-roaster or dealer respectively ought to have in his possession, the excess is forfeited and a penalty incurred ; and in case of a decrease greater than ten per cent. in a malt-roaster's, or three per cent. in a dealer's stock, a penalty of £200 is incurred.

No malt-roaster or dealer in roasted malt is allowed to receive or have in his entered premises, or in any premises connected therewith, under pain of forfeiture, any raw or unmalted grain, whether the same be roasted or unroasted, mixed or unmixed with malt. With regard to

what is deemed malt, the law provides that no grain found in the possession of a malt-roaster, or dealer in roasted malt, is deemed malt, unless ninety-five per cent. of it has germinated to such a degree that the plumule, or acrospire, extends one half of the length of the grain ; and further, that all corn or grain found on the premises of a malt-roaster, which shall not have been perfectly dried upon the kiln at the malthouse where made, is to be deemed unmalted grain. It will thus be seen that it is a matter of considerable importance that malt-roasters and dealers should be able to distinguish between malted and unmalted grain, otherwise they might be imposed upon and subjected to heavy penalties and forfeitures by having grain sent to them which shall not have germinated to the extent required by law.

*Distinction between Malted and Unmalted Grain.*—The difference between malted and unmalted grain to the uninitiated, or those unacquainted with the structure of the grain in its original and malted state, may appear but little ; to the practised eye, however, the difference is very great, each presenting unmistakable peculiarities. Some persons affirm that they can distinguish the two by the mere outward appearance of the husk ; and this method may do very well in the case of well-malted barley. The chemist, however, is guided by no mere fancied difference ; for by studying the laws of nature he knows by the changes which have taken place, not only the difference between malted and unmalted grain, but also the exact amount of that change, or how far germination has proceeded. Unroasted malt may, however, be easily distinguished after a

little practice from unroasted barley. In the first place, it is of importance to know the end from which the rootlet proceeds, as this is the seat of the vital parts of the grain. It is always found at that end by which the grain was attached to the ear, and opposite to the end from which the awn or beard proceeded. In a grain of malt this end, by reason of the rootlets having protruded, remains open, and thus presents a marked distinction of appearance to the closed end of a barley-corn. If some of the suspected grains be boiled for a few minutes in water, or in a dilute solution of potash or common soda, the difference between malt and barley will be more apparent. The husk will have become somewhat transparent, so as to permit the outline of the acrospire to be discerned through it; and if germination has taken place to the smallest extent the remains of the rootlets will be seen to protrude from the opening at the base of the grain already alluded to. In the case of unroasted samples, the operation of distinguishing malted from unmalted grain is comparatively easy, but not so in roasted samples, as, by the great heat generated in the roasting cylinder, the colour is completely changed and the grain in some instances burst or otherwise distorted. Notwithstanding this difficulty, the one may be separated from the other if a little care be bestowed. The grains of roasted barley are shorter, thicker, and less liable to fall in pieces than those of roasted malt, and the wrinkled appearance of the husk of barley is not altered as in the case of malt. If the edge of a sharp knife, applied to the base of the corn when roasted, be raised with a slight jerk, the husk

will generally fly off and the embryo become exposed, and thus the extent of germination that has taken place, according to the length of the plumule, will be seen.

Roasted malt may be exported on drawback ; but only by a licensed malt-roaster, or dealer in roasted malt, and from the entered premises of such roaster or dealer. It must be packed and exported under the regulations applicable to the exportation on drawback of ordinary malt.

### EXPORTATION OF MALT ON DRAWBACK.

Duty-paid malt, whether roasted or otherwise, may be exported as merchandise, when the duty paid upon the malt will be repaid to the maltster, provided the following conditions be complied with, viz. :—

1. The malt must be made from barley, must not be ground or crushed, and the full Excise duties must have been charged thereon. Pale, crystallized, and blown malt, must be exported direct from the entered malthouse in which it has been made, and roasted malt direct from the malt-roaster's premises.

2. The malt must be thoroughly screened and cleansed from all commings and dust, and from all extraneous matter whatever.

3. The malt, after having been so screened and cleansed, must weigh not less than 36 lbs. nor more than 44 lbs. avoirdupois per bushel ; except that blown, roasted, and crystallized malt may be of less weight than 36 lbs. per bushel.

4. The maltster or malt-roaster, as the case may be, must give to the Excise officer in whose survey the malt-house or malt-roasting premises are situated twenty-four hours' notice in writing of his intention to export malt, specifying the quantity to be exported, the particular day and hour at which it is to be packed, and the name of the port from which it is to be exported.

5. The malt must be packed between the hours of six in the morning and six in the evening, in the presence of the Excise officer. It must be measured with a legal bushel measure, and packed in secure barrels, boxes, or bags, each containing not less than four bushels. If the malt is packed in bags, the bags must be properly secured with leaden seals by the officer, as in the case of the removal of duty-free malt; and if in barrels or boxes, they must be taped and sealed so as to prevent their being opened without discovery.

The exporter must give to the proper officer at the port of shipment six hours' notice in writing, specifying the number of packages, with their marks, &c., the quantity and quality of the malt, the rate and amount of duty paid thereon, the quay or place where the malt is lying and from which it is to be shipped, the time of shipment, the name of the vessel and of the master or commander, the port to which the malt is to be exported, and the place where the vessel shall then lie and may be found. He will also be required to give bond in treble the value of the malt duty to be drawn back, conditioned for the

due exportation of the malt. The Excise officer who attends to see the malt packed will carefully examine it to see that it comes strictly within the above conditions, and if not he will decline to pack it. If it be found to be mixed with raw or unmalted corn or grain, the whole will be seized. The maltster or malt-roaster must provide legal weights and scales and a bushel measure, and must assist the officer in taking account of the malt. The officer who sees the malt packed will deliver to the maltster or malt-roaster a packing certificate, which must be forwarded by him to his agent at the port of shipment. The maltster or his agent at the port of shipment will be required to make a declaration that the goods are the same as those expressed in the packing certificate. At the expiration of one month from the date of the Customs' certificate of exportation a debenture is delivered to the exporter on his declaring that he is the real owner of the goods or the agent of the owner, and that the malt has been really and *bonâ fide* exported to foreign parts, and has not been relanded. In the case of malt exported to the Channel Islands or to the Isle of Man, the debenture will not be issued without the production of the Customs' certificate that the malt has actually been landed. The debenture being obtained and duly attested, the amount of the duty on the malt is paid on demand by the proper collector of Inland Revenue.

The amount of duty to be drawn back is calculated in the following manner :—When the weight of the malt is under 40 lbs. per bushel, the quantity is calculated at the rate of one bushel for every 40 lbs. of malt exported ;

but when the malt weighs 40 lbs. per bushel or upwards, the drawback is payable on the quantity ascertained by measure ; but in both cases a deduction of  $7\frac{1}{2}$  per cent. is made in calculating the amount of drawback.

Malt exported on drawback is subject to all the provisions, penalties, and forfeitures of other exciseable commodities exported on drawback.

### MALT DAMAGED OR LOST.

*Legal Remedy.*—In the case of any malt being destroyed or damaged by fire, or by the casting away of, or by an inevitable accident to, the vessel on board of which the malt has been placed for removal from one part of the kingdom to another, an allowance equal to the whole of the duty, if the malt is totally destroyed, or part of the duty if the damaged malt be afterwards sold as salvage, is granted by the Act 7 & 8 Geo. IV., c. 52, s. 76.

Before this allowance can be granted, a notice in writing describing the nature, cause, and extent of the accident, must be delivered by the claimant, either to the Commissioners of Inland Revenue, or to the Supervisor of the district where such loss shall have taken place or have been first discovered, within fourteen days after the same shall have come to the knowledge of the claimant ; and such person, or his agent, must give notice in writing to the Collector or Supervisor of the district where the quarter sessions are to be held at which the application for relief is to be made, of his intention to apply for

relief, or to the Solicitor of Inland Revenue, when the application is to be made to the Commissioners, ten days, at least, before the beginning of the quarter sessions, or before the application to the Commissioners.

The application must be made within four calendar months after such accident shall have come to the knowledge of the applicant. It must be satisfactorily proved in court that the duty has been paid and that the damage was the result of inevitable accident ; whereupon a certificate to that effect is granted, which is presented to the Collector of Inland Revenue, and the amount is either paid, if the claimant is not a maltster, or deducted from a maltster's arrears, if duty be outstanding, should the claimant be a maltster. The above notices must be served personally, and not by post, as is sometimes done.

Full descriptions for applying for relief from malt duty, in the case of damage caused by inevitable accident, are printed on the back of every maltster's licence.

*Remission of Duty by the Board of Inland Revenue.*—As the process above described is often troublesome and expensive, it has been customary of late years for the Board of Inland Revenue, availing themselves of powers conferred on them by the Treasury, to consider claims from maltsters for repayment of duty on malt injured by fire, water, &c., and to grant remission of the duty charged, on receiving satisfactory evidence of the identity of the malt and obtaining an account of the quantity. This mode of relief, however, is not, as a rule, extended to cases in which the quantity is very large, or where there is any difficulty in ascertaining how much malt has

been injured. Under these circumstances, the trader is usually required to establish his claim at the quarter sessions, by the production of books and accounts, and of witnesses who are examined on oath. In no case will the Excise grant relief without the intervention of the legal process, where the malt has been removed in whole or part from the malthouse it was made in.

*Grain Damaged in Operation.*—The Commissioners of Inland Revenue are also authorized to remit the duty on grain that has sustained injury during the process of malting, or on grain that refuses to grow properly or contracts a bad smell or taste while on floor or kiln. In cases of this kind it is essential to the granting of the claim that the attention of the officer should have been drawn to the state of the grain while in operation, and the cause of its bad condition explained to him; also that the grain, when dried off, should be kept separate from all other malt in store. If these conditions are observed, there is seldom any hesitation in remitting the duty, provided the malt be mixed with linseed meal, under certain regulations which the officer will explain, and on a declaration being made before a magistrate, that the mixture will be used for feeding cattle and no other purpose.

ABSTRACT OF THE ACTS OF PARLIAMENT RELATING  
TO THE IMPOSITION OF THE DUTY ON MALT.

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GENERAL REGULATIONS.

12 Anne, stat. 1, cap. 2.

Sect. 7. The quantity of barley or other grain taken by gauge is to be regarded as so many bushels. The measure termed a bushel is to be according to the standard in the custody of the Chamberlain of the Exchequer, and commonly known as the Winchester bushel. [*Note.*—This bushel measure was to be plain and round, with an even bottom,  $18\frac{1}{2}$  inches wide and 8 deep, containing 2,150 and 21-50ths cubic inches. It was, however, discontinued by 5 Geo. 4, c. 74, and a bushel substituted termed the Imperial Measure, containing, when level, or struck, 2,218·192 cubic inches.]

Sect. 17. Gaugers are to measure corn or grain making into malt by the gauge only, and not by the bushel measure.

1 Geo. 1, stat. 2, cap. 2.

Sect. 13. If any maltster or maker of malt for sale or exportation, or any dealer in malt, shall mix unmalted grain with malt, or sell or expose to sale, or ship or attempt to ship for exportation, any such mixture, he is liable to a penalty of 5s. for every bushel of the same.

6 Geo. 4, cap. 58.

Sect. 1. The gallon measure having been changed by 5 Geo. 4, c. 74, from the old standard of 268 and 4-5ths cubic inches to the

new or Imperial standard of 277·274, by which all exciseable quantities were to be determined, it became necessary to fix new rates and allowances.

Sect. 2. The new duties in lieu of the former ones, viz. : for every 100 gallons, Imperial standard gallon measure, of malt made in any part of Great Britain and Ireland, from barley or any other corn or grain (except malt made for home consumption in Scotland (or Ireland) from bere or bigg only), or which shall be brought from Scotland (or Ireland) into England without a certificate from the proper officer that the full duty has been charged, an Excise duty of £1 13s. 4d. ; and for every 100 gallons of malt made from bere or bigg only in Scotland (or Ireland) for consumption there, a duty of £1 5s. [*Note*.—This rate for bere or bigg malt was extended to Ireland by 11 Geo. 4, c. 31, s. 1. The present rate of duty upon malt—2s. 7d. per bushel—was ordered by Treasury Warrant, dated the 11th of May, 1826, for the following reason : “As it appears that the rate of duty imposed upon the gallon of malt by the late Act, and which was assumed as being the nearest integer above the exact equivalent for the new Imperial measure of the new denomination, produces a considerable increase upon the quarter of malt ; and as my Lords are not of opinion that it would be expedient to impose a duty materially higher upon that article than what was charged upon it in 1825, they conceive that it would be more advisable to charge the duty by the bushel in the new measure, on which the exact equivalent comes very nearly to an integral sum, the difference being only 2,188 10,000th parts of a farthing increase upon a bushel.” The total duty upon a bushel of barley malt, as charged at present, is 2s. 8½d.—viz., 2s. 7d., as directed by this order, and 1½d. representing the additional 5 per cent. imposed by 3 Vict. c. 17, s. 1. The duty on bere or bigg malt is 2s. per bushel, which, with the additional 5 per cent. (1¾d.), is 2s. 1¾d. per bushel.]

Sect. 5. The duties and allowances granted and revised by this Act are to be levied in the same manner as former duties.

6 Geo. 4, cap. 81.

Sect. 2. Every maltster or maker of malt, if the quantity of malt made by him within the year ending the 5th of July in each year

shall not exceed 50 quarters, is to pay for a licence the sum of 7s. 10½d.; not exceeding 100 quarters, 15s. 9d.; 150 quarters, £1 3s. 7½d.; 200 quarters, £1 11s. 6d.; 250 quarters, £1 19s. 4½d.; 300 quarters, £2 7s. 3d.; 350 quarters, £2 15s. 1½d.; 400 quarters, £3 3s.; 450 quarters, £3 10s. 10½d.; 500 quarters, £3 18s. 9d.; 550 quarters, £4 6s. 7½d.; and exceeding 550 quarters, £4 14s. 6d. Beginners to pay 7s. 10½d., and within ten days after the 5th of July next, after taking out such licence, to pay such further additional sums as, with the said sum of 7s. 10½d., shall amount to the duty hereinbefore mentioned, according to the quantity of malt made within the preceding year or period for which such licence was granted. [*Note*.—An additional 5 per cent. is charged by 3 Vict. c. 17, s. 1, upon each of the rates imposed by this Act; but, for the sake of convenience, the total is here given. By Treasury Warrant of the 12th of December, 1826, bye maltsters are to pay for licence the sum of 2s. 7½d.]

Sect. 25. Maltsters are to paint or cause to be painted or fixed, in letters publicly legible and visible, at least one inch long, and not more than three feet from the top of the principal entrance to their entered premises, their name or names at full length, and the words "Licensed maltster," or "maltsters" such letters to be renewed during the time of licence as often as necessity may require, so that they may be always visible and legible—under a penalty of £20.

7 & 8 Geo. 4, cap. 52.

Sect. 1. Every maltster or maker of malt is to make entry of every building, place, cistern, couch-frame, kiln, and other vessels and utensils intended to be used in making or keeping malt, or corn or grain to be made into malt; describing in such entry the particular use for which each place or utensil is intended to be used: penalty, £100, and forfeiture of all malt, corn, or grain found in unentered places or utensils. An entry made of any building, place, or utensil, for more than one particular purpose, is null and void. [*Note*.—One room may, however, be used for keeping both malt and grain, provided they be separated by proper

partition, or raw grain may be dried on an entered malt-kiln. See 11 Geo. 4, c. 17, ss. 1 & 2.]

Sect. 2. Every cistern intended to be used for the purpose of steeping corn or grain to be made into malt, capable of containing or steeping more than eight bushels at one time, must be permanently made, and constructed with the sides and ends straight and at right angles to each other, of no greater depth than 40 inches in any part, having an even bottom, with no more inclination than half an inch for every foot in length for the dip. It must be placed in such a position that the officer may have sufficient light to gauge the grain therein, and to have a clear open space of 48 inches at the least above the top. The maltster is to provide for the use of the officer full and sufficient means to enable him to gauge the grain conveniently and safely in every part of such cistern. Every vessel, thing, or place used by a maltster for the purpose of steeping corn or grain to be made into malt is to be deemed and taken to be a cistern. (See s. 6 of this Act.)

Sect. 3. No cistern is to be used by a maltster who shall wet more than eight bushels at one time that is not so constructed; and before any grain is steeped in any cistern the maltster must obtain a certificate from the proper supervisor that he has surveyed and examined such cistern, and that it is legally constructed; and if a maltster shall wet grain in any cistern without having obtained such certificate, or in any cistern of which the dimensions or situation have been altered without notice to the supervisor, and a new certificate having been obtained (notwithstanding the cistern may have been entered), he shall be liable to the penalties imposed for wetting grain without notice.

Sect. 4. Maltsters having obtained such certificate, and not maintaining the requisite means to enable officers to conveniently gauge the whole of the corn or grain in such cistern, or not aiding and assisting the officer, either personally or by aid of servants, to forfeit £100.

Sect. 5. Every couch-frame used by any maltster must be constructed with the sides and bottom straight, and at right angles to each other, and having three of such sides permanently fixed, and the other formed by movable boards two inches at the least in thickness; and such couch-frame must be supported on every

part of the outside, that it may be of sufficient strength not to bend or curve, or fail to preserve, when filled with grain, the same dimensions as when empty, and so that the officer may easily and conveniently gauge the grain in every part. If any maltster shall use a couch-frame not so constructed he shall forfeit £100 and all grain found therein, which may be seized by any officer. (See the following section, also 27 & 28 Vict. c. 56, s. 11, as to making any alteration in the size or capacity of couch-frames.)

Sect. 6. The foregoing penalties not to be incurred for using cisterns or couch-frames constructed before the passing of this Act, so long as the dimensions remain unaltered, and cannot be altered without enlarging the malthouse, or other cause, to be shown to the satisfaction of the Commissioners of Inland Revenue.

Sect. 7. An officer or any person in his assistance may at any time, either by day or night, enter buildings used by maltsters, gauge any vessels or utensils, and take account of any grain or malt, and charge the duty upon all malt or grain making into malt found therein, and make a return of such account, and charge to the Commissioners or to such persons as they may direct; and where the minutes of the entries made by the officer in taking such account do not appear on the "specimen," he is, if demand in writing be made at the time, to give a copy of such charge to the maltster, and such return is to be taken to be a charge of such duty upon the maltster. (See 11 Geo. 4, c. 17, s. 4.)

Sect. 8. A specimen is to be kept by the officer in some conspicuous part of the entered premises, for recording therein minutes of the entries made by the officers in their books. Officers are at all times to have free access to such specimen, with liberty to remove it, and leave a new one; and if any person (not being an officer) shall remove, conceal, or damage it, or alter, cancel, or obliterate any entry, or make any entry therein, he shall forfeit £200. [*Note.*—Officers are required by 1 Vict. c. 49, s. 11, to enter in the specimen the number of bushels charged on each steeping.]

Sect. 9. A penalty of £300 imposed on any person obstructing an officer in the execution of his duty.

Sects. 10 to 25. Repealed.

Sect. 26. No grain is to be added to that in steep after the account has been taken by the officer, under pain of a penalty of £200.

Sect. 27. No grain is to be emptied from cistern at any other time than between 7 A.M. and 4 P.M., under a penalty of £200. (See sect. 46, as to servants emptying a cistern at illegal hours.)

Sects. 28 and 29. Repealed.

Sect. 30. No grain is to be taken out of any cistern within ninety-six hours of the last emptying of the same cistern, or of any other cistern under the same roof, under a penalty of £200; but grain may be emptied from any such cistern before the expiration of ninety-six hours, if emptied on the day on which such ninety-six hours expire, and not before 7 A.M.

Sect. 31. A penalty of £200 imposed on any maltster taking grain from the cistern so that it cannot be gauged by the officer in the couch-frame.

Sect. 32. Repealed.

Sect. 33. A penalty of £100 imposed on any maltster treading or forcing together grain in the cistern or couch-frame; or if grain be found in any cistern or couch-frame so hard, close, and compact as it could not have been unless it had by some means been trodden and forced together. [*Note.*—Illegal compression is defined in 1 Vict. c. 49, s. 5.]

Sect. 34 and 35. Repealed.

Sect. 36. No maltster is to have at the same time more than (five floors, including the couch-frame and kiln, arising from the same cistern, or from one or more cisterns emptied into the same couch-frame, under a penalty of £200. Floors may be divided into two or more pieces, for the purpose of working such pieces separately in the same malthouse in which the same was steeped, or the oldest floor may be divided for removing the same to the kiln, to be immediately dried thereon. [*Note.*—The Act 1 Vict. c. 49, s. 10, extends the number of floors from five to six, if they have arisen from the same cistern, or several cisterns emptied into the same couch-frame.]

Sect. 37. Every maltster is to deposit and leave the floors so that the sides or outward edges shall be in straight lines, and is

to level and lay the same in regular succession according to seniority of age, under a penalty of £100. [*Note.*—By 11 Geo. 4, c. 17, s. 19, this penalty is not incurred for not laying the corn or grain in straight lines, if the floors be deposited and left in such a form that they may be conveniently gauged, and also that they be levelled as required.]

Sect. 38. A penalty of £200 imposed on any maltster mixing grain of different steepings, either on the floor or kiln. [*Note.*—If any corn or grain which has been privately steeped, or which has been taken out of the cistern so that it cannot be gauged in the couch-frame, be mixed with any malt in operation, either on the floor or kiln, for the purpose of defrauding the Revenue, the whole of the floors so mixed are liable to seizure.]

Sect. 39. A penalty of £100 imposed on any maltster wetting or damping malt after having been taken from the kiln, and before delivery to the brewer or purchaser.

Sect. 40. A penalty of £200 imposed on any maltster fraudulently depositing, concealing, or conveying from the sight of the officer any malt, or grain making into malt; and all such grain is forfeited and may be seized by any officer.

Sect. 41. A penalty of £200 imposed on any maltster removing malt from the place where made before the account has been taken and the duty charged by the officer, or on any person knowingly receiving or having the same in possession; and all malt so removed shall be forfeited and may be seized by any officer.

Sects. 42 to 45. Repealed.

Sect. 46. If any person employed by a maltster shall maliciously begin to wet grain or empty grain from the cistern at illegal hours, or wet or sprinkle grain before the expiration of twelve days or 288 hours after being emptied from cistern, or mix either on the floor or kiln grain of different steepings, he may be arrested and conveyed by a constable, or other peace officer, before a justice of the peace, who, on confession of the party, or by proof on oath of a credible witness, may commit such offender to gaol, with hard labour, for any time not exceeding twelve nor less than three months. The maltster in whose service such person was employed is to be liable to the penalties for such offences,

unless he shall forthwith prosecute such offender to conviction, and shall, before the recovery of any such penalty, produce to the Commissioners a certificate of such conviction, and of the offender having suffered or being in prison under such sentence. [*Note.*—The legal hours for steeping grain or emptying it from cistern are specified in 23 & 24 Vict. c. 113, s. 22. By 11 Geo. 4, c. 17, s. 35, page 98, servants are punishable for other offences.]

Sects. 47 to 65. Repealed.

Sects. 66 to 75. Old regulations annulled.

Sect. 76. If malt be lost or damaged by fire or water in being removed from one part of the United Kingdom to another, the proprietor may make proof of such accident and the cause, on the oath of a credible witness, and of the duty on the malt having been paid, before the justices at the quarter sessions at the place where the malt was made, or where the accident occurred, or where the malt was put on board the vessel; or before the Commissioners of Inland Revenue; who are to examine such witnesses on oath, and upon proof being made that such malt had been totally lost or destroyed, and that the duty had been paid, they are to grant a certificate thereof, and of the amount of such duties; and the collector, where such duties were charged, upon production of such certificate, is to pay to the proprietor of the malt the specified sum; or upon proof as above being made that the malt had been damaged and not totally destroyed, the said justices or Commissioners are to adjudge and determine the quantum of such damage, and grant a certificate of the repayment to be made; and upon production of such certificate the said collector is to repay the specified sum. [*Note.*—The Commissioners are authorized by Treasury Minute of the 27th of January, 1849, to remit in certain cases the duty on malt that has been damaged, upon satisfactory proof being adduced of the cause and extent of the damage, and that the damaged grain has been consumed by cattle, or otherwise disposed of to the satisfaction of the Commissioners.

Sect. 77. Repealed.

Sect. 78. After the said justices or Commissioners have once examined or ascertained such loss or damage their decision thereon is final.

Sect. 79. In order to secure the duty on malt, owing by any

maltster, on whom the duty may have been charged, or by whom such duties have become payable, and for the enforcement of all penalties incurred by any maltster, for any offence against the Acts relating to the revenue on malt, it is enacted that all malt, corn, or grain, and vessels or utensils used in making or keeping the same, are to be subject to all such duties, penalties, and forfeitures. [Note.—The Crown's priority and lien is also provided for by 4 Vict. c. 20, s. 24, by which all goods and commodities subject to duty, and all materials, machinery, vessels, &c., used in the process of manufacture, are liable to be levied upon for duties, arrears, penalties, and forfeitures whilst in the possession of the trader, or any other person in trust, unless the goods and commodities charged with duty have been sold and delivered in the fair and ordinary course of trade before any extent or warrant shall have been issued, in which case the liability ceases.]

Sect. 80. Repeal of former regulations inconsistent with this Act.

Sect. 81. All fines, penalties, and forfeitures to be recovered, mitigated, and distributed as by former laws.

Sect. 82. The provisions of this Act to extend to the whole of the United Kingdom.

#### 4 & 5 Will. 4, cap. 51.

Sect. 27. When a trader shall complain of an overcharge or overpayment (which complaint must be made before two of the Commissioners of Inland Revenue, if within the limits of the chief office, or if not within such limits then before two justices of the peace, and within twelve calendar months after such overcharge or overpayment has been made), or in the case where a person is entitled to a return of duty within the time limited in that behalf, the said Commissioners or justices are to hear and determine such complaint, and discharge by warrant such overcharge or overpayment, or order the return of the duty to which the party is entitled. Such amount may be either paid out of the revenue or allowed out of the next duties becoming payable by the trader. The Commissioners are to hear no such complaint unless entered by the claimant, or some person on his behalf, in a

book kept for the purpose in the solicitor's office. The Commissioners are to give six days' notice of the time and place they appoint for the hearing. No such complaint is to be heard before any justices unless at least eight days' notice in writing be given to the proper collector or supervisor, specifying the time and place of hearing, the exact sum overcharged or overpaid, and the date of charge or payment, or the exact amount of duty claimed to be returned, and on what account, and the ground of complaint in each case. No such complaint is to affect proceedings to recover payment of duty charged on complainant. [*Note.*—The justices have no power under this section to interfere in any question as to the validity of the duty or the mode of charge; the method of proceeding in such cases is provided for by 4 Vict. c. 20, s. 33, on page 100. The decision of the justices or Commissioners may be appealed against, provided the sum in dispute shall not be less than £50. See 28 & 29 Vict. c. 96, s. 25.]

10 Geo. 3, cap. 44.

Sect. 1. A penalty of £100 imposed on any Excise trader (required to keep scales and weights) who shall use, or suffer to be used, in weighing his stock, any false scales or weights, in order to defraud the Revenue. [*Note.*—Unjust scales and weights are forfeited.]

Sect. 2. An offender prosecuted for the said penalty under this Act is not to be again prosecuted for the same offence under any former Act, nor, if prosecuted under any former Act, to be again prosecuted for the same offence under this Act.

Sect. 3. Penalties under this Act to be recovered or mitigated as other Excise penalties.

26 Geo. 3, cap. 77.

Sect. 8. A penalty of £100 imposed on traders, required to keep scales and weights, putting any substance into the stock or commodity to be weighed, or using any art or device to deceive the officer in taking the true weight, or forcibly obstructing him.

## 28 Geo. 3, cap. 37.

Sect. 15. Unjust or false scales and weights used by Excise traders, required to keep scales and weights in weighing their stock, are to be forfeited, and may be seized by any officer.

## 11 Geo. 4, cap. 17.

Sect. 1. A maltster may store and keep grain to be made into malt in a room or place entered for keeping malt, or may keep malt or any other grain or seeds in a room or place entered for keeping grain to be made into malt, provided such malt, corn, grain, or seeds be kept separate and apart to prevent mixing. (See 7 & 8 Geo. 4, c. 52, s. 1, on p. 90.)

Sect. 2. A maltster may, on giving (twenty-four hours') notice in writing to the officer, dry barley or other grain on his entered malt-kiln. [*Note.*—It will be seen, by reference, that the Commissioners have modified this regulation, and now maltsters may dry raw grain on their malt-kilns, provided notice be given to the officer prior to commencing to dry the grain, stating the time they intend to load the kiln, and the kind of grain to be dried. Small maltsters in Scotland may in certain cases (detailed elsewhere) remove their malt to the nearest public kiln to be dried. Maltsters are also allowed, upon application, to use their kilns for re-drying malt that has become slack, &c., in store. The local officers will give all required information.]

Sect. 3. Cisterns and couch-frames constructed and in use before the passing of 7 & 8 Geo. 4, c. 52 (July 2, 1827) may be continued in use with the approbation of the Commissioners, and under such regulations as they may direct, although not constructed agreeably to the said Act. [*Note.*—No objection is made to the use of movable tubs for steeping grain for private use where such practice has been customary; but the officer must be enabled to have easy access thereto, and to gauge the grain with accuracy; and maltsters in Scotland who do not wet more than eight bushels at one time are allowed to use couch-frames of movable planks.]

Sect. 4. Any officer who shall take account of and charge the duty on grain making into malt, and return the same to the

Commissioners, when the minutes of his entries do not appear on the specimen, is to give a copy of such charge to the maltster, if demanded, in writing, although such demand may not be made at the time of taking the account. (See 7 & 8 Geo. 4, c. 52, s. 8, on page 138, and 1 Vict. c. 49, s. 11, on page 148.)

Sects. 5 and 6. Repeal of former regulations.

Sect. 7. Every maltster, before beginning to wet grain to be made into malt, is to give to the officer twenty-four hours' written notice of the day and hour when he intends to wet such grain, under a penalty of £100, or for wetting before the specified time; and if the whole of the grain is not covered with water within three hours after the specified time the notice is null and void. (See 1 Vict. c. 49, s. 2, on page 147, and 23 & 24 Vict. c. 113, s. 22, on page 149.)

Sects. 8 to 12. Repealed, or repeal of former regulations.

Sect. 13. Maltsters are to keep the grain in the cistern covered with water for the full space of forty hours at least, under a penalty of £100.

Sect. 14. The water may be drained from the grain in cistern once during the time the grain is in steep, provided the day and hour when the water is to be drawn off be expressed in the notice to wet; and the grain must be again covered with water before the expiration of one hour from the time the water was begun to be drawn off. [*Note.*—The draining must take place between the hours of 7 A.M. and 5 P.M.]

Sects. 15 to 18. Repealed, or repeal of former regulations.

Sect. 19. No penalty is incurred by reason of the outward edges of any floor of grain not being in straight lines, provided that all such floors are deposited and left in such form that they may be conveniently gauged, and that they be levelled as required. (See 7 & 8 Geo. 4, c. 52, s. 37, on page 139.)

Sects. 20 to 25. Repealed, or repeal of former regulations.

Sect. 26. The proper officer, at the expiration of every six weeks, or at such times as the Commissioners may direct, is to make out and deliver to the Collector an account of malt made by each maltster, and for which such maltster shall have become chargeable with duty, and the duty payable thereon; and such account is to be a charge on the maltster, who is to pay and clear

off such duty within six days after the return is made, unless bond be given to the satisfaction of the Commissioners for due payment at the end of every (eighteen) weeks after the said account is made of all duties as shall become due, under pain of penalty for any neglect, of double the sum which such duties so neglected to be paid shall amount to. [*Note*.—The time for the payment of the duty is now limited to six weeks by 23 & 24 Vict. c. 113, s. 2, on page 151; but by 26 Vict. c. 3, s. 1, the payment of a portion of the duty may in certain cases be deferred for three months. See page 151.]

Sect. 27. Annulled by 18 & 19 Vict. c. 94.

Sects. 28 to 33. Repeal of former regulations.

Sect. 34. Repeal of the provisions of 7 & 8 Geo. 4, c. 52, not to revive the provisions of any former Act.

Sect. 35. If any labourer, servant, or workman, with intent to injure any maltster, omit to give any notice, or to do any act, matter, or thing required by 7 and 8 Geo. 4, c. 52, or this Act, such labourer, servant, or workman so offending may be arrested and conveyed before a justice of the peace, as observed in the recited Act. But no such arrest and conviction of any labourer, servant, or workman can take place after the expiration of one month from the date of the discovery of the offence. [*Note*.—This section extends the nature of offences which may be committed by servants, and may be read in connection with sect. 46 of 7 & 8 Geo. 4, c. 52, on page 140.]

Sect. 36. Repeal of former regulations.

Sect. 37. No person is entitled to relief under 7 & 8 Geo. 4, c. 52, for malt destroyed or damaged, unless a written notice, describing the nature, cause, and extent of the accident, be delivered to the Commissioners or the proper Supervisor within fourteen days after the same shall have come to the knowledge of the claimant; nor unless such person, or his agent, shall have given written notice of his intention to apply for such relief to the Collector or Supervisor in whose collection or district the quarter sessions are to be held at which he intends to apply; or to the Solicitor of Inland Revenue for England, if application is to be made to the Commissioners, within ten days before the beginning of such quarter sessions, or before the application to the Com-

missioners, nor unless such person shall apply for relief within four calendar months after the accident shall have come to his knowledge. (See 7 & 8 Geo. 4, c. 52, s. 76, on page 141.)

Sect. 38. All the provisions of 7 & 8 Geo. 4, c. 52, not repealed by this Act to remain in force.

Sect. 39. And, except as hereby altered or repealed, to extend to this Act.

Sect. 40. Commencement of Act (May 29, 1830).

1 Vict. cap. 49.

Sect. 1. Repeal of former regulations.

Sect. 2. When a maltster is required to give notice to an officer the time for giving such notice shall be the same as is required when the malt-house is situated in a city or market town, although not so situated. [*Note.*—By former regulations a maltster whose malt-house was situated in a city or market town, or suburbs thereof, was required to give twenty-four hours' notice, but if the malt-house was situated elsewhere forty-eight hours' notice was required for any operation; but the present section removes the distinction, and now all notices are the same, without regard to the situation of the malt-house.]

Sects. 3 and 4. Repeal of former regulations.

Sect. 5. An officer suspecting the grain in any cistern or couch-frame to have been trodden or forced together may direct the maltster or his workman to throw all the grain out of the cistern or couch-frame, and such officer, and any person in his assistance (which assistance the trader is to render if required), may return such grain to the cistern or couch-frame, and level the same again; and if any increase be found in the gauge or quantity of the grain, after being so returned, over and above the former gauge, exceeding 5 per cent. previously to such grain having been emptied eight hours from cistern, or 6 per cent. if emptied eight hours and not sixteen, or 7 per cent. if emptied sixteen hours or upwards, such increase shall be deemed conclusive evidence of the grain having been trodden or forced together; and the justices before whom such evidence is given shall thereupon convict the maltster in the penalty imposed by 7 & 8 Geo. 4, c. 52, s. 33. If a maltster

or his workman shall refuse, when directed by an officer, to throw grain from any cistern or couch-frame, or to aid in returning the same, he shall forfeit £100. It may also be proved by any other evidence that such grain had been trodden or forced together. (See the Act and section herein referred to, on page 139.)

Sects. 6 to 8. Repealed, or repeal of former regulations.

Sect. 9. Upon every gauge of grain taken by the officer in the cistern or couch-frame, or on the floor, during the period for which such grain is required to be kept in couch-frame, or directed to be deemed in couch, or gauged and taken account of as a couch, an allowance is to be made of  $18\frac{1}{2}$  per cent. of the quantity found by gauge, and upon every gauge taken on the floor or kiln, after the expiration of twenty-six hours, if such grain had been previously gauged in the couch, or if not so previously gauged then after the expiration of thirty hours, an allowance is to be made of one-half the quantity found by gauge before being dried off and removed from kiln; and the duty, when charged by gauge, is to be charged on the best of the several gauges after making the said respective allowances. [*Note.*—The 23 & 24 Vict. c. 113, s. 23, provides that grain may be removed from the couch-frame at the expiration of twenty hours from being emptied from cistern; but if not previously gauged it is to be deemed in couch for twenty-four hours. See page 150.]

Sect. 10. Maltsters may have six floors, including grain in the couch-frame and that drying on the kiln, in operation at one and the same time, arising from one cistern, or from more than one cistern emptied into the same couch-frame. (See 7 & 8 Geo. 4, c. 52, s. 36, on page 139.)

Sect. 11. The officer shall, in respect of every steeping of grain, at his next visit after the same is dried off and removed from the kiln, enter on the specimen the number of bushels of malt with which the maltster shall be chargeable in respect of such steeping, according to the best gauge had at any time, showing whether such charge has arisen from cistern, couch, floor, or kiln. (See 7 & 8 Geo. 4, c. 52, s. 8, on page 138.)

Sect. 12. Commencement of Act (October 10, 1837).

## 4 Vict. cap. 20.

Sect. 33. The Commissioners or justices have no power to interfere in a complaint of overcharge or overpayment in cases where the subject-matter of such complaint is a question whether the goods are liable to duty, or to a higher or lower rate of duty, or the mode of charging the duty; but in such case the complainant may, within six days after the return of the officer is made, give notice to the Commissioners, or to the proper Collector or Supervisor, of his intention to dispute the charge and his liability to the duty. (See 4 & 5 Will. 4, c. 51, s. 27, on page 142.)

## 18 &amp; 19 Vict. cap. 94.

Sect. 35. All barley making into malt must be kept in operation, from the time of emptying from cistern before any portion of it is put on kiln, the full space of 168 hours at least; and all other grain must be so kept for such time as the Commissioners may direct, under a penalty of £200.

## 22 &amp; 23 Vict. cap. 18.

Sect. 7. The time for the payment of malt duty by a maltster giving bond is to be limited to (twelve) instead of (eighteen) weeks after the duty is returned by the officer; and no maltster shall be entitled to credit unless he shall give security by bond, and in such sum as the Commissioners may deem sufficient. [*Note.*—The time is now limited to six weeks. See sect. 2 of the following Act.]

## 23 &amp; 24 Vict. cap. 113.

Sect. 2. The time for the payment of malt duty by a maltster giving bond is limited to six instead of twelve weeks after the return is made by the officer. [*Note.*—See 26 Vict. c. 3, s. 1, on page 151, as to the conditions on which payment of a portion of the duty may be deferred for three months.]

Sect. 22. No maltster is to begin to steep grain except between 7 A.M. and 5 P.M.; and if the time specified in the notice to wet be

later than 3 P.M. the grain must be covered with water within one hour from the time so specified. (See 11 Geo. 4, c. 17, s. 7, on page 145.)

Sect. 23. All grain is to be removed directly from the cistern into the couch-frame, and laid flat and level therein, and of no greater depth than thirty inches in any part, except where a greater depth is expressly allowed, and such grain must be kept in the couch-frame for twenty hours at least from the time of removal from cistern; provided such grain shall, for the purpose of being gauged and charged with duty, be deemed in couch, and gauged and taken account of as a couch, for twenty-four hours from the time of removal from cistern, although it may have been removed from the couch-frame, unless previously gauged by the officer.

Sect. 24. If there be more than one cistern used at the same time in any malt-house or malt-houses having any internal communication, all such cisterns are to be emptied during the legal hours in one and the same day; but where the grain from two or more such cisterns is emptied into one couch-frame, it is to be taken account of as one wetting, and the emptying of the last of such cisterns must be finished within three hours of the time of beginning to empty the first. (See 7 & 8 Geo. 4, c. 52, s. 30, on page 139.) The grain from any two or more of such cisterns may be emptied into one couch-frame; or the grain from any one cistern may be emptied into two or more couch-frames in the same house. Also two cisterns under the same roof may be emptied into two couch-frames, and treated as one steeping, under the same regulations as if emptied into one couch-frame only. (Order of the Board of Inland Revenue.)

Sect. 25. No grain is to be watered or sprinkled before the expiration of twelve days, or 288 hours, after removal from cistern, unless the same shall have been kept covered with water in the cistern for fifty hours, in which case it may be sprinkled at the expiration of (ninety-six) hours after removal from cistern, upon the maltster giving twenty-four hours' previous notice to the officer of his intention to sprinkle such floor. [*Note.*—Grain on the floor may now be sprinkled after the expiration of ninety hours from being emptied from cistern. See 28 & 29 Vict. c. 66, s. 11, on page 152.]

Sect. 26. Relates to malt made duty-free for distillery purposes, and will be found on page 167.

Sects. 27 to 32. Relating to malt for exportation, will be found on page 158.

Sect. 33. A penalty of £100 imposed for any breach of the provisions of this Act, and for which no penalty is expressly provided.

Sect. 34. Repeal of former regulations.

### 26 Vict. cap. 3.

Sect. 1. Any maltster who has given proper security may, if he think fit, defer payment of one moiety of the duty on malt made by him between the 1st of January and the 1st of April, and the whole of the duty on malt made between the 1st of April and the 16th of May for three months next after the respective times at which the same would otherwise become payable, provided the maltster give notice of his intention so to defer such payment to the proper Collector on or before the 1st of April in each year, and thereupon interest is to be charged and paid at the rate of  $3\frac{1}{4}$  per cent. per annum, computed for three months on the respective amounts of duty the payment whereof is so deferred.

Sect. 2. Bonds and securities given by maltsters under former Acts to continue in force. (See 22 & 23 Vict. c. 18, s. 7, on page 149.)

Sect. 3. Nothing in this Act is to affect immediate proceedings for duties considered in danger, and in default of payment the same are recoverable as duties in arrear.

### 27 & 28 Vict. cap. 56.

Sect. 11. No alteration is to be made in the dimension, size, or capacity of any couch-frame, after entry thereof has been made, without four days' written notice being given to the proper Supervisor of the intended alteration, under pain of a penalty of £100, and forfeiture of all grain found in any altered couch-frame. (See 7 & 8 Geo. 4, c. 52, s. 5, on page 137.)

28 &amp; 29 Vict. cap. 66.

Sect. 11. Any grain making into malt may be sprinkled at the expiration of ninety hours after removal from cistern, provided such grain has been kept covered with water in the cistern fifty hours, and the maltster has given to the officer twenty-four hours' notice in writing of his intention to sprinkle such grain. [*Note*.—See 23 & 24 Vict. c. 113, s. 25, on page 150. Some maltsters have endeavoured to evade the sprinkling regulations by watering or sprinkling the *floor*, and then turning the grain on to it before the legal time, setting up the plea that they did not sprinkle the grain, but merely the working floor; this practice, however, is illegal, and subjects the maltster to penalties.]

Sect. 12. (See this section, imposing a penalty for any offence against this Act, on p. 155.)

28 &amp; 29 Vict. cap. 96.

Sect. 25. In the case of any complaint brought before the Commissioners or justices under 4 & 5 Will. 4, c. 51, s. 27, in respect of any matter which may be the subject of complaint under the said section, if the complainant, or the Solicitor, Collector, or Supervisor, to whom notice of such complaint is required to be given, shall feel aggrieved by the judgment of the Commissioners or justices, either party may appeal in like manner, and upon giving such notices, and upon such regulations (so far as applicable) as are prescribed by 7 & 8 Geo. 4, c. 53; 4 & 5 Will. 4, c. 51; and 4 Vict. c. 20. Provided no such appeal shall be allowed when the sum in dispute shall not exceed £50. [*Note*.—This section refers to complaint of an overcharge or over-payment. See page 142.]

DUTY ON MALT CHARGED ACCORDING TO THE  
WEIGHT OF THE GRAIN USED.

28 &amp; 29 Vict. cap. 66.

Sect. 1. Commencement of Act (1st September, 1865).

Sect. 2. Any maltster who shall desire to have the duty payable on malt made by him charged according to the weight of the grain used under this Act, must give notice to the proper officer, and upon his complying with the provisions of this Act he shall be entitled to have the duty charged accordingly, in respect of grain steeped at any time after the expiration of four clear days after giving such notice; provided that if he shall have given such notice, and shall not begin to make or shall discontinue making malt under this Act for the space of one calendar month, the notice is null and void.

Sect. 3. Every maltster having given such notice must, before any grain is placed in the cistern to be charged under this Act, provide and affix to such cistern a secure cover, with fastenings, to the satisfaction of the Supervisor or superior officer, and when grain is in the cistern such cover is to be kept locked by the officer during such time as the Commissioners may direct; and after the cover is locked no access is to be gained to the grain.

Sect. 4. The maltster must give forty-eight hours' notice to the officer of his intention to steep grain, specifying the day and hour when such grain is to be placed in the cistern (which hour must not be later than twelve o'clock at noon of the day preceding that on which the grain is to be steeped); and if any notice be given contrary hereto, or if the whole of the grain is not steeped within three hours, or placed in the cistern within one hour after the specified time, such notice is null and void.

Sect. 5. Immediately after such grain is placed in the cistern the maltster is to fill up and sign a declaration, stating the weight per bushel of the grain; and such declaration is to be delivered to the officer on his first visit after the grain is placed in the

cistern, and no grain is to be substituted for that in the cistern after the account has been taken by the officer.

Sect. 6. After such grain is placed in the cistern the weight is to be ascertained by the officer, who is to take a sample before any water is added thereto, and the weight of a bushel so taken as a sample after the same has been screened and cleaned (if the officer shall think fit to require such screening and cleaning), is to be deemed the weight per bushel of the whole of the grain in the cistern; provided, that if in the weight of the sample bushel there shall be a fraction of a pound, amounting to one-half or upwards, such fraction is to be reckoned as an entire pound, but no account is to be taken of any fraction less than half a pound.

Sect. 7. For the purpose of calculating and charging the duty under this Act a measured bushel of dry grain, of fifty-three pounds weight, is to be deemed the standard weight on which the amount of duty payable on a bushel of malt shall be chargeable; and in order to ascertain the number of bushels of malt to be charged on any steeping of grain, the quantity is first to be ascertained by gauge under existing regulations, and then multiplied by the number of pounds which the sample bushel weighs, and the product divided by fifty-three; the duty is to be charged on the quotient; provided that if no sample shall have been taken, then the quantity of malt, when calculated by gauge, is to be multiplied by the weight per bushel as declared, and the product divided as above.

Sect. 8. Proper scales and weights and a bushel measure are to be provided by such maltster to the satisfaction of the Supervisor, and the trader is to allow the officer to use the same, and render any assistance that may be required.

Sect. 9. Any Supervisor or superior officer may measure or weigh any grain in the malt-house of any such maltster, and use the said scales, weights, and measures for that purpose; and the trader is to render any assistance that may be required.

Sect. 10. If after any grain has been placed in cistern as above, and before being wetted, the weight of a bushel thereof (screened and cleaned as aforesaid, if the officer shall require it) shall be found to exceed the weight declared by more than two pounds per bushel, the maltster shall forfeit £100.

Sect. 11. (Will be found on page 152.)

Sect. 12. A penalty of £100 imposed for any offence against this Act, over and above any other penalties under existing Acts.

Sects. 13 and 14, relating to "malt made for exportation," will be found on page 160.

Sect. 15. Nothing in this Act to repeal provisions of other malt Acts, unless specially repealed or altered by, or repugnant to, this Act.

Sect. 16. This Act to continue in force four years. [*Note.*— This Act was continued by 32 & 33 Vict. c. 85, until 29th June, 1870, and again continued by 33 & 34 Vict. c. 103, up to 29th June, 1871, and the end of the then next session of Parliament.]

### MALT FROM BERE OR BIGG.

3 Geo. 4, cap. 30.

Sect. 1. Duty imposed on malt made from bere or bigg. [*Note.*— This section imposed a duty of 1s. 11*d.* per bushel, but the rate has since been altered by 6 Geo. 4, c. 58, ss. 1 & 2, and 11 Geo. 4, c. 31, s. 1, to 2s., which, with the additional 5 per cent. imposed by 3 Vict. c. 17, s. 1, makes the total duty on this description of malt 2s. 1½*d.* per bushel. Bere, or bigg, has been described on page 3. This Act (3 Geo. 4, c. 30) applies to Scotland only, but has been extended to Ireland by 11 Geo. 4, c. 31, s. 2. See page 158.]

Sect. 2. Makers of malt from bere or bigg only, to make entry of all utensils, and to declare that they are to be used for the purpose of making malt from bere or bigg only. If such maltsters intend making malt from barley or other corn or grain, entry must be made for that particular purpose, such entry to express that the maltster intends to make or keep malt made from barley or other corn or grain. Every vessel or utensil used for making barley malt to be kept separate and distinct from such used for making bere or bigg malt. Utensils and places entered for making bere or bigg malt not to be used for barley malt; and utensils and places used for making malt from barley or other grain not to be used for bere or bigg malt. The bere or bigg, and bere or bigg malt, to be kept separate and apart from barley or

other grain until put into the mash-tun. Any person offending against any of the above particulars shall forfeit £200, and be deemed a maltster from barley or other grain, and subject to the duties and provisions of such maltsters.

Sect. 3. Any such entry to remain in force until notice of withdrawing the same is given to the officer.

Sect. 4. Maltsters under this Act are not allowed to withdraw entry until all the bere or bigg in their possession is made into malt and dried off, and the duties charged and paid.

Sect. 5. No maltster from barley or other grain is to make entry as a maltster from bere or bigg in the same premises until all the malt in his possession from barley or other grain is completely dried off, and the duty charged and paid, nor until all the barley or other grain is removed from his premises; and maltsters from bere or bigg, in changing to barley, are to be subject to a similar regulation.

Sect. 6. Places entered for making or keeping malt from bere or bigg are to be separate and wholly detached, and under a different roof from places entered for making or keeping malt from barley or other grain, under a penalty of £200 and forfeiture of all malt, bere, or bigg, or other grain in premises contrary hereto, which may be seized by any officer.

Sect. 7. No bere or bigg is to be brought into the possession of the maltster without his first giving notice to the proper officer, and furnishing him with a certificate from the grower from whom purchased; or, if not purchased from the grower, then from the seller, testifying that such grain is actually bere or bigg only, without any mixture of other grain, and stating the place, parish, and county where, and the person by whom grown. Any bere or bigg brought in without such certificate or notice to be forfeited, and a penalty of £200 incurred.

Sect. 8. A penalty of £200 imposed on persons giving false certificates to maltsters, or on maltsters using them.

Sect. 9. Bere or bigg delivered to maltsters under this Act is to be kept separate from any other bere or bigg for twenty-four hours after receipt, and until the officer has attended and examined the same; and such bere or bigg is thereafter to be kept separate from barley or other grain in the possession of such maltster,

under a penalty of £50 and forfeiture of the barley or other grain with which mixed.

Sect. 10. Bere or bigg is not to be steeped for twenty-four hours after receipt, or until the officer has examined it, under a penalty of £50 and forfeiture of the same.

Sect. 11. The officer is to take account of all bere or bigg, barley or other grain, or malt, in the possession of a maltster under this Act, and may ascertain the kind and quantity, and may take samples, not exceeding two ounces in the whole, out of each separate parcel; and any person obstructing an officer to forfeit £200.

Sect. 12. Barley or other grain, or malt made from the same, found in the possession of a maltster from bere or bigg only, to be forfeited, as well as the bere or bigg with which it may have been mixed; and the maltster is to forfeit £200 and the full duty for every bushel of malt in his possession, whether completely made or not, and from whatever species of grain.

Sect. 13. Maltsters from bere or bigg are liable to the regulations to which other maltsters are liable, and entitled to the same allowances.

Sect. 14. Maltsters intending to make malt from bere or bigg for exportation to be subject to the usual regulations, allowances, &c.

Sects. 15 and 16. Obsolete.

Sect. 17. In cases of seizure of grain under this Act the proof shall lie on the claimant, if claimed to be bere or bigg; or in cases of seizure of malt, the claimant to prove that the full malt duty has been paid thereon. [*Note.*—The Act 7 & 8 Geo. 4, c. 53, s. 26, also provides that proof of payment of duties, or that the goods seized are not of the sort or kind alleged, shall lie upon the proprietor or person claiming the same.]

Sect. 18. Penalties and forfeitures, &c. How to be recovered.

Sect. 19. This Act to continue during the present duty on malt.

11 Geo. 4, cap. 31.

Sect. 1. After the 10th of October, 1830, a duty of 2s. per bushel, to be imposed upon all malt made in Ireland from bere or

bigg only, for home consumption in Ireland. The full duty upon malt made from barley or other corn or grain to be charged upon all malt whatsoever which shall be made and brought into Great Britain from Ireland.

Sect. 2. The provisions of 3 Geo. 4, c. 30, for regulating the making of malt from bere or bigg only, in Scotland, extended to Ireland.

Sect. 3. Obsolete.

Sect. 4. In order to remove doubts as to the growth of bere or bigg grown in Scotland, the duty charged upon bere or bigg only shall only be charged when the bere or bigg is grown, malted, and consumed in Scotland; and the lesser duty charged upon bere or bigg malt made in Ireland to be charged only when the bere or bigg is grown, malted, and consumed in Ireland. The full duty to be charged upon malt made from corn or grain, other than bere or bigg, both in Scotland and Ireland.

## EXPORTATION OF MALT.

18 & 19 Vict. cap. 94.

Sect. 8. A maltster may remove malt for exportation from a malt-house entered for the purpose of making malt duty-free for distillery purposes, under such regulations as the Commissioners of Inland Revenue may deem necessary. [*Note.*—The remainder of this Act relates to the manufacture of malt duty-free for use at distilleries, and will be found on page 161.]

23 & 24 Vict. cap. 113.

Sect. 27. Upon the exportation by any licensed maltster of duty-paid malt, the maltster is entitled to a drawback of the duty paid in respect of such malt. [See 29 & 30 Vict. c. 64, s. 5, on page 160.]

Sect. 28. The exportation and payment of the drawback are to be under such regulations and securities (by bond or otherwise)

as the Commissioners may make, subject also to the following conditions, viz.

1. The malt must be made from barley, and not ground or crushed, and must be in the malt-house in which made, and the full duties must have been charged thereon. [*Note*.—This condition prohibited the exportation of blown and roasted malt, but this prohibition has been repealed by 29 & 30 Vict. c. 64, s. 5. See p. 160.]

2. The malt must be thoroughly screened and cleansed from all commings and dust, and from all extraneous matter whatever, to the satisfaction of the officer who packs the same.

3. (This condition, which related to the weight of malt, has been repealed by 28 & 29 Vict. c. 66, s. 13. See 29 & 30 Vict. c. 64, s. 5, on page 160, as to the required weight of malt to be exported on drawback.)

4. The maltster must give twenty-four hours' notice of his intention to export malt, specifying the quantity and the day and hour at which it is to be packed, and the name of the port from which to be exported.

5. The malt must be packed only between 6 A.M. and 6 P.M., and in the presence of the officer, and measured with a bushel measure into secure barrels, boxes, or bags, each containing not less than four bushels, and fastened and secured to the satisfaction of the officer.

Sect. 29. The maltster must provide for use at the malt-house, and also on board the vessel in which the malt is shipped a legal bushel measure and proper scales and weights, and allow the officer to use the same, and also provide sufficient assistance.

Sect. 30. The proper officer at the port from which the malt is shipped, at the expiration of one month after the exportation thereof is to give to the exporter a debenture, expressing the quantity of malt shipped and the amount of drawback payable. In calculating the quantity of malt upon which drawback is to be paid a deduction is first to be made of  $7\frac{1}{2}$  per cent. on the measured quantity; and when the malt is exported to Guernsey, Jersey, Alderney, or Sark, or the Isle of Man, the drawback is not to be paid without the production of a certificate from the Customs

officer that the malt has been landed in the island to which exported. [*Note.*—The deduction of  $7\frac{1}{2}$  per cent. before calculating the quantity of malt for drawback is made on the assumption that when the barley is of fair quality, and has been properly germinated, the quantity of *screened* malt measured from the kiln is supposed to exceed on an average the quantity ascertained by gauge by about this percentage.]

Sect. 31. If any malt packed or produced for exportation shall have mixed therewith any raw or unmalted grain, the maltster shall (over and above any other penalty to which he may be liable) forfeit £200, and also all such malt or grain, and the packages in which contained.

Sect. 32. Provisions of former Acts relating to the exportation of exciseable commodities to apply to this Act.

Sect. 33. A penalty of £100 imposed for any breach of the provisions of this Act, and for which no penalty is expressly provided by this Act; and all malt packed contrary hereto is forfeited, with the packages containing the same.

28 & 29 Vict. cap. 66.

Sect. 13. (This section repealed condition 3 in 23 & 24 Vict. c. 113, s. 28, regulating the weight of malt to be exported on drawback, and made other provisions in lieu of those repealed; but these last-mentioned provisions have, in their turn, been repealed by 29 & 30 Vict. c. 64, s. 5.)

Sect. 14. (This section repeals 12 Geo. 1, c. 4, ss. 48 to 59, 3 Geo. 4, c. 18, ss. 12 to 16, and 18 and 19, all relating to the making of malt for exportation and the exportation of such malt. All malt now made *duty-free* for exportation must be made under the laws and regulations applicable to the manufacture of malt for distillery purposes. See these on following pages.)

29 & 30 Vict. cap. 64.

Sect. 5. Repeal of so much of condition 1 in sect. 28 of 23 & 24 Vict. c. 113, as provides that "malt to be exported on drawback shall not be blown or roasted," and the 13th sect. of 28 & 29 Vict.

c. 66, except the repeal therein contained. The amount of drawback to be allowed on malt exported is to be calculated in the following manner: viz., When the malt weighs less than 40 lbs. per bushel, a drawback at the rate of the duty payable on one bushel of malt is to be allowed and paid in respect of every 40 lbs. of the malt exported; and when the malt weighs 40 lbs. or upwards drawback is to be allowed and paid according to the quantity ascertained by measure; subject, however, in either case, to the deduction of  $7\frac{1}{2}$  per cent., as directed by 23 and 24 Vict. c. 113, s. 30; provided, that no malt shall be exported on drawback which, after having been screened and cleaned as directed by sect. 28 of the said Act, shall be of greater weight than 44 lbs. per bushel, nor any malt (other than blown, roasted, or crystallized malt) which, after being so screened and cleaned, shall be of less weight than 36 lbs. per bushel.

Sect. 6. Roasted malt is to be exported on drawback only by a malt-roaster or dealer in roasted malt, and from the entered premises of such traders, and under the same provisions and regulations, so far as applicable, as ordinary malt exported from a malt-house.

#### DUTY-FREE MALT (FOR DISTILLERY PURPOSES).

18 & 19 Vict. cap. 94.

Sects. 1 to 4. (These sections relate to "Spirits.")

Sect. 5. Any distiller or other person who shall give the required security, may, on taking out a maltster's licence, make malt under this Act in a malt-house specially approved by the Commissioners, to be used solely in distilling spirits; and all malt so made shall be free from duty, provided that the regulations, penalties, &c., contained in other Malt Acts (unless repealed or altered by this Act) are to apply to this Act.

Sect. 6. Every malt-house under this Act must be specially entered, and no such entry is to be withdrawn whilst any malt, or grain making into malt, shall be in such malt-house, or in any store belonging thereto.

Sect. 7. Every person (other than a distiller) intending to make malt under this Act, must enter into a bond with two or more sufficient sureties, to the satisfaction of the Commissioners, and in such sum as they may think proper, conditioned that such maltster shall make into malt all grain received into his malt-house, and shall not sell the malt except to a distiller, and shall not remove any malt or grain, except malt removed by permit to a distillery, and shall not remove or conceal any malt or grain contrary to this or existing Malt Acts, and in any other terms that the Commissioners may think necessary; and such maltster shall give a fresh bond as often as required by the Commissioners, and in default shall not be entitled to make malt duty-free under this Act.

Sect. 8. A maltster under this Act may remove malt from his duty-free malt-house for exportation, under such regulations as the Commissioners may make. [*Note.*—These regulations will be found on a previous page. He may also, upon complying with certain regulations, dispose of such malt for feeding animals. See 27 Vict. c. 9, s. 1, on page 167.]

Sects. 9 and 10. Relate to distillers.

Sect. 11. Every person who shall make malt duty-free under this Act must make entry of his malt-house to be used for that purpose, and provide therein a proper and secure kiln, approved in writing by the Collector and Supervisor, to be entered and used for drying such malt; and the kiln is at all times to be kept locked by the officer, except when open upon notice and for a reasonable and proper specified purpose. Such kiln may be used for drying barley, under such regulations as the Commissioners may make. [*Note.*—See these regulations on a previous page.]

Sect. 12. A distiller who uses a kiln for drying barley or other grain, wheresoever situated, although it may not be used for drying malt, must make entry of the same under pain of a penalty for any neglect.

Sect. 13. If the malt-house is situated more than a mile from a market town, the distiller or maltster must provide (if required by the Commissioners) a proper residence for the officer, at a rent not exceeding £10 per annum, to be paid by the officer; but such residence must not form part of the distillery, malt-house, or dwelling-house of such trader.

Sect. 14. Secure rooms must be provided, approved by the Collector and Supervisor, and entered and used for the following purposes, viz. : a secure room at the malt-house for the deposit of malt on removal from the kiln, and so situated that the officer may at one view see the malt removed from the kiln into such store-room ; or, if the situation of the store-room will not admit of such view, the communication between the kiln and store must be by an inclosed passage, or otherwise such removal must be insured to the satisfaction of the Commissioners ; and if such store be not at the distillery of the person making the malt, the distiller must also provide a store at his distillery for the deposit of malt on removal from the malt-house to the distillery previously to grinding ; the distiller is also to provide a mill-room at his distillery, to be entered and used for grinding malt therein, and the removal of malt to and from the mill-room, and the grinding, deposing, and securing the same afterwards, to be subject to such regulations as the Commissioners may make. All such rooms are to be secured to the satisfaction of the Collector and Supervisor, and to be kept locked by the officer, and only opened under notice. [Note.—A distiller is allowed by 23 & 24 Vict. c. 114, s. 52, to grind his malt by millstones, or such other means as he may think fit.]

Sect. 15. All fastenings (except locks) for the security of kilns, store-rooms, &c., are to be provided to the satisfaction of the Collector and Supervisor at the expense of the trader, under a penalty of £100 for any neglect, or £200 for removing or damaging any locks or fastenings.

Sect. 16. Commissioners may revoke their approval of a malt-house, kiln, or store-rooms, or require alterations or additional fastenings ; and if the trader shall neglect to comply with any request of the Commissioners, all the malt then being at the malt-house or distillery, or thereafter made, and until such request be complied with, is to be charged with duty, and the amount paid to the Collector immediately after being charged.

Sect. 17. In respect of all grain making into malt in any such malt-house, the allowance to be made on the gauges during the time the same is in cistern or couch-frame, or whilst directed to be deemed and gauged as a couch, is to be at the rate of 17 per cent.

[*Note.*—The Commissioners are empowered by 23 & 24 Vict. c. 113, s. 26, to fix and determine such other allowances as they may think proper. See this section on page 167.]

Sect. 18. A distiller or maltster making malt under this Act must give six hours' notice to place grain on the kiln, specifying the floor and particular portion thereof, whether the whole, or first, or second portion; and for this purpose no floor is to be divided into more than two portions. The officer will attend at the specified time, unlock the kiln door, and permit the loading, which must take place at no other time than between 5 A.M. and 7 P.M., and must be completed within two hours from the time specified in the notice, or the door is to be again locked.

Sect. 19. Immediately after the loading the kiln is to be again secured, but while grain is thereon workmen may be admitted to turn the same upon six hours' notice being given; but the kiln is not to be unlocked oftener than four times in any one day, nor between 9 P.M. and 5 A.M., nor remain open for the said purpose for more than half an hour on any one occasion.

Sect. 20. Twelve hours' notice is to be given of the day and hour (not earlier than 5 A.M. nor later than 7 P.M.) to remove malt from the kiln. The officer will attend at the time, and the malt is to be forthwith measured in his presence, and from the quantity so found a deduction is to be made of 5 per cent. for heat, comings, and the unclean state of the malt; and if, after such deduction, the quantity is less than that given by the highest gauge of the grain while in process, deducting the proper allowances, the deficiency is to be charged with duty, and the amount forthwith paid to the Collector. The malt on the kiln when measured is to be removed in the presence of the officer to the store, and secured therein; but the distiller or maltster may, if he think fit, screen such malt on the kiln before being measured, in which case no deduction is to be made from the measured quantity, and the trader is to be charged with duty in respect of so much only as the actual quantity so found shall be deficient of the quantity given by the highest gauge.

Sect. 21. Twelve hours' notice must be given for removing the malt from the stores at the malt-house to the store at the distillery, specifying the time when, the places from and to which,

and the quantity to be removed. The officer will unlock the store at the specified time, and see the expressed quantity measured or weighed out, and he may take samples of such malt, and is to grant a permit for its removal. In the permit are to be expressed the time it is to be in force and the weight or measure of the malt; and if the malt is not duly removed and deposited according to the terms, or if the weight of the malt when deposited at the distillery-store shall differ by more than  $2\frac{1}{2}$  per cent., or the measure by more than 5 per cent., from the weight or measure expressed in the permit, the trader shall forfeit £200 and all such malt, which may be seized by any officer; and if any such malt be found removing or removed without a permit, or with a permit not in force, or not agreeing with the time and manner of removal, or with the weight or measure authorized to be removed, by more than the above rates, the malt shall be forfeited.

Sect. 22. The malt is to be removed from the malt-house to the distillery in sacks, each containing four bushels by measure, or 168 lbs. by weight, and secured in such manner as the Commissioners may direct.

Sect. 23. Twelve hours' notice is to be given for the removal of malt from the store at the distillery to the mill-room for grinding, specifying the quantity. The officer will attend and see such quantity measured or weighed, and forthwith conveyed to the mill-room and there secured; and four hours' notice must be given for the removal of ground malt therefrom to the mash-tun, specifying the quantity, and the officer is to deliver out the same at the specified time, and see it forthwith mashed.

Sect. 24. A book is to be delivered to every distiller and such maltster, to be kept at the store, and whenever any malt is removed from, or received into, store, the trader is to enter the quantity in such book in bushels or in pounds weight, if the same be weighed, and in the case of malt removed, the number of sacks or the weight of the malt, and also the day and hour when received into or removed from store, with the place from or to which received or removed. A penalty of £100 imposed for making any false entry in such book, or for cancelling or obliterating any entry, or concealing or destroying such book, &c.

Sect. 25. At least once in each year, and whenever the officer

may deem it necessary, the stock of malt in store is to be measured and weighed in the presence of the officer, and a balance struck, and if a deficiency be found exceeding 3 per cent. by measure or 1 per cent. by weight, the whole deficiency is to be charged with duty, and if at any time the whole of the malt be removed from store, and upon striking such balance a deficiency be found exceeding the said rates, the whole of such deficiency is to be charged with duty, and in such cases the amount is to be forthwith paid to the Collector; and if at any time, upon striking a balance, an excess be found exceeding 3 per cent., the whole of such excess is forfeited, and may be seized by any officer. For the purpose of charging the duty on deficiencies, when the stock is kept by weight, 40 lbs. is to be deemed equal to a bushel, and the duty charged accordingly.

Sect. 26. The stock account is to be kept either by measure or by weight, or both, as the Commissioners may direct.

Sect. 27. Distillers and maltsters are to provide a correct bushel measure, and scales and weights, and permit the officer to use the same and render any assistance that may be required, under a penalty of £100 for any neglect, or £200 for providing or using false scales, weights, or measure; and the same are forfeited and may be seized by any officer.

Sect. 28. Relates exclusively to distillers.

Sect. 29. Distillers and maltsters are to designate their malt-houses by painting conspicuously upon the principal entrance their name in full, together with the words, "Entered to make malt to be used in distilling spirits only," under a penalty of £20 for any neglect.

Sect. 30. Relates to distillers.

Sect. 31. If, after judgment is obtained against a maltster upon a bond entered into under this Act, by reason of any breach of the conditions thereof, he shall commit a breach of any bond subsequently entered into, and by reason thereof judgment be obtained again against him upon such last-mentioned bond, the Commissioners may revoke his licence, and refuse to grant to him any further licence as a maltster thereafter; and also refuse to grant, during the space of one year, such licence to any other person to exercise the business at the same premises where the offence, being the ground of such second conviction, was committed.

Sect. 32.—Persons found removing malt, or grain making into malt, from a malt-house on the principal gate whereof the above particulars are painted, except malt removed by permit, may be arrested by any Excise officer and conveyed before a magistrate living near the place of arrest, who, as soon as practicable, is to hear and determine the charge; and on confession of the offender, or on proof upon oath of such offence, is to convict him in the penalty of £100, which is to be forthwith paid to the officer, or in default such offender is to be committed to gaol with hard labour for not more than six nor less than two months, unless the penalty be sooner paid.

Sects. 33 and 34. Relate to distillers.

Sect. 35. [*Note.*—This section requires that all barley making into malt at any malt-house, whether for duty-free purposes or otherwise, shall be kept in operation from the time of emptying from cistern until put on kiln, for the full space of seven days or 168 hours; but the Commissioners make no objection to maltsters under this Act drying off the grain in operation, whenever they may consider the same fit to be placed on the kiln.]

23 & 24 Vict. cap. 113.

Sect. 26. With respect to grain making into malt for distillery purposes, the Commissioners may make regulations as to the time any particular kind of grain shall be kept covered with water in the cistern, and also the time it shall remain in couch-frame, and also fix and determine the allowance to be made upon the gauges of such grain during the time it is in cistern or couch-frame; and in default of compliance with any such regulations the full duty is to be charged on the grain in question, as in the case of barley malt; and the malt made from such grain is to be used in the distillation of spirits only.

#### DUTY-FREE MALT (FOR FEEDING ANIMALS).

27 Vict. cap. 9.

Sect. 1. Any person who shall give the required security and take out a maltster's licence, may make malt under this Act in a

malt-house specially approved by the Commissioners, for the sole purpose of being consumed in the feeding of animals; and all malt so made and mixed in such malt-house as hereinafter directed, with linseed cake, linseed meal, or other substance approved by the Commissioners, shall be free from duty; and any maltster (not being a distiller) entitled to make malt for distillery purposes under 18 & 19 Vict. c. 94, may mix malt with the said materials for the above purpose upon his complying with the provisions of this Act. [*Note.*—See the Act herein referred to, on page 161.]

Sect. 2. Every person intending to make malt under this Act must enter into a bond, with two or more sureties to the satisfaction of the Commissioners, and in such sum as they may think fit, conditioned that such maltster shall make into malt all grain received into such malt-house, and shall not remove therefrom any malt unless mixed and removed under the provisions of this Act, and shall not remove or conceal any malt or grain contrary to this or any other Malt Act; and in such other terms as the Commissioners may think necessary. A fresh bond is to be given as often as required by the Commissioners, and in default the maltster shall not be entitled to make malt duty-free under this Act.

Sect. 3. Maltsters under this Act must designate their malt-houses by having conspicuously painted upon the principal entrance their name in full, together with the words, "Entered to make malt to be used in feeding animals."

Sect. 4. All such malt must be deposited in a store-room provided by the maltster and entered for that purpose, the malt to be conveyed to and from such store under such notices and regulations as the Commissioners may make.

Sect 5. The maltster must provide a secure room in his malt-house, with proper fastenings, to the satisfaction of the Collector and Supervisor, which is to be kept locked by the officer, except when opened under notice.

Sect. 6. All such malt, before removal from the malt-house, must be ground and thoroughly mixed with one-tenth part at least of its weight of ground linseed cake or linseed meal, or other substance as aforesaid; and all such malt and the material to be mixed therewith must be ground to such a degree of fineness and in such a manner as the Commissioners may direct, and be mixed

together in a quantity not less than forty bushels at one time, by such means and in such manner as the Commissioners may direct; and for any offence contrary hereto the malt and also the materials mixed or intended to be mixed therewith shall be forfeited.

Sect. 7. The maltster is to keep an account of the quantity by weight or measure, as the Commissioners may require, of all malt so mixed delivered from his malt-house, with the dates and name and place of abode of the person to or for whom delivered, with such other particulars as the Commissioners may require.

Sect. 8. All malt found mixed with linseed cake, &c., shall be deemed to have been mixed under this Act; and if any person shall separate or attempt to separate any such malt from the materials with which mixed, or shall use any malt so mixed in or for brewing beer or distilling spirits, he shall forfeit £200 and all such malt and materials.

Sect. 9. Any person found removing malt or grain making into malt from a malt-house designated as above, except malt duly mixed and removed under this Act, is to be dealt with as directed by 18 & 19 Vict. c. 94, s. 32. (See page 167.)

Sect. 10. Provisions of former Malt Acts to apply to this Act.

Sect. 11. Justices making malt under this Act, or selling such malt, are not disqualified thereby for granting alehouse licences.

Sect. 12. This Act to be in force for five years from the passing hereof—the 28th of April, 1864. [*Note.*—This Act was continued by 32 & 33 Vict. c. 85, up to the 28th of April, 1870, and again continued by 33 & 34 Vict. c. 103, up to the 28th of April, 1871, and the end of the then next session.]

## GERMINATING GRAIN FOR ANIMALS.

33 & 34 Vict. cap. 32.

Sect. 6. Any farmer in Great Britain may germinate grain to be consumed by animals under the following conditions, viz.:

1. He shall deliver to the officer of Excise of the district a notice in writing, describing the particular buildings or places

in which he intends to steep and germinate, and to keep the grain when germinated.

2. Every such building or place shall be situate on the farm upon which the grain is to be consumed, and at a distance of a quarter of a mile at least from any malt-house, and from any kiln upon which malt or grain could be dried; or if not so situated, shall be otherwise situate to the satisfaction of the Commissioners of Inland Revenue.

3. Every such building and place shall at all times be open to the inspection of any officer of Excise.

4. The grain, after being steeped or germinated, shall not be dried, or ground, or crushed, in any manner whatsoever.

5. The grain must be wholly consumed by animals on the farm upon which it shall have been steeped and germinated.

If any person shall germinate any grain, or shall keep or have in his custody or possession any germinated grain otherwise than as allowed by this section, or shall prevent or hinder any officer of Excise from inspecting any building or place used or entered by him for the purpose of steeping and germinating grain, or for keeping grain when steeped and germinated, or shall dry, grind, or crush any steeped or germinated grain contrary to this section, or shall use or consume any steeped and germinated grain, contrary to this section, he shall forfeit all such grain and £100; and any person who shall be convicted of any of the said offences shall be incapable of steeping and germinating grain under the provisions of this Act.

## ROASTED MALT.

5 Vict. sess. 2, cap. 30.

Sect. 1. No malt is to be roasted for sale, nor roasted malt sold, except by a licensed malt-roaster or dealer in roasted malt.

Sect. 2. Every such roaster or dealer is to take out a licence, expiring 5th July annually, under a penalty of £100. A malt-roaster's licence is £20, and a dealer's £10.

Sect. 3. The licence duty to be under the management of the Commissioners of Inland Revenue.

Sect. 4. Every malt-roaster, before commencing business is to

make entry of every room, furnace, cylinder, &c., to be used by him, distinguishing each by a letter or number, or both, under a penalty of £200 for every unentered utensil, &c., which, together with the malt found therein, is to be forfeited. Every dealer is also to make entry of his premises under the like penalty and forfeiture.

Sect. 5. Premises and utensils are to be marked to correspond with the entry, and if not so marked to be deemed unentered. [*Note.*—Every malt-roaster and dealer in roasted malt is also required by 6 Geo. 4, c. 81, s. 25, to have his name in full over the principal entrance to his entered premises, and also the words “Licensed malt-roaster,” or “Licensed dealer in roasted malt,” as the case may be.]

Sect. 6. Officers empowered at all times to enter the premises of roasters and dealers and take an account or samples of all malt unroasted, roasting, or roasted; and a penalty of £200 imposed for obstructing an officer.

Sect. 7. A malt-roaster is not to receive or have in his possession any grain other than unroasted malt received from a licensed maltster or malt-factor; and no dealer is to receive or have in his possession any grain other than roasted malt received from a licensed malt-roaster, and accompanied by a proper certificate, under a penalty of £300 and forfeiture of all malt or grain received contrary hereto; and if, on any trial, a question shall arise whether any commodity is as represented, the proof shall lie on the defendant. [*Note.*—What is deemed unmalted grain will be found defined in 19 & 20 Vict. c. 34, s. 19, on page 174; see also 30 & 31 Vict. c. 90, s. 16, on page 174.]

Sect. 8. A book is to be delivered to every malt-roaster and dealer, and on the day on which a roaster receives any malt he is to enter in such book the date, number of bushels received, the name of the person or firm (and whether maltsters or malt-factors) from whom and the place from which received; and the invoice or delivery-note is to be produced to the officer on his next visit, and also the malt, or so much of it as remains; the officer is to examine such malt, and indorse the invoice or delivery-note. The malt-roaster, before nine o'clock in the evening of the day on which he roasts any malt, is to enter in the book the number of bushels roasted, and also, when he sends out any roasted malt, the

hour when and the number of bushels sent out are to be entered, together with the name of the person or firm to whom and the place to which sent. Every dealer, on the same day on which he receives roasted malt, is to enter in such book the date when and the number of bushels received, the name of the roaster from whom and the place from which received, and the date of the accompanying certificate. The certificate must be delivered to the officer on his next visit, and the malt shown to him. The officer is to examine the malt, and take up and indorse the certificate, and the dealer, on the day on which he sends out roasted malt, is to enter an account of it in the book. Such books are to be kept in some open part of the entered premises for the inspection of the officer; and any roaster or dealer offending contrary hereto in any respect, or fraudulently altering or making any entry in such book, or damaging it, to forfeit £200.

Sect. 9. Every malt-roaster, when required by an officer, is to level and cast all malt, roasted or unroasted (not being in sacks), into such form that it may be conveniently gauged, and a dealer is to do likewise with respect to roasted malt not being in sacks; and when any malt is contained in sacks the roaster or dealer, if required, is to declare to the officer the quantity in the sacks, or the quantity each sack is capable of containing; and the officer may, if he think fit, measure any malt in sacks with a legal bushel measure provided by the trader, who is to render any assistance the officer may require in taking the stock, and if the stock of malt be found to exceed the quantity which according to the entries in the said book ought to be found, the roaster or dealer shall forfeit £200, as having received malt without entering it in the said book, and all such excess is to be forfeited; and if a deficiency be found, the trader shall be deemed to have sent out malt without entering it, and shall forfeit £200; provided no roaster shall be liable to such penalty when the increase or decrease does not exceed 10 per cent., nor a dealer, unless such increase or decrease shall exceed 3 per cent. A roaster or dealer, offending against this section to forfeit £200.

Sect. 10. The book may be made up by a roaster or dealer before the account is taken by the officer, and malt in the cylinders may be included.

Sect. 11. No malt is to be roasted at any time between 7 P.M. and 5 A.M. between the 31st of March and the 1st of September, nor between 7 P.M. and 6 A.M. between the 31st of August and the 1st of April, under a penalty of £100, and forfeiture of all malt roasted or roasting contrary hereto.

Sect. 12. A certificate book is to be delivered to every malt-roaster and dealer, and no roasted malt is to be sent out unless accompanied by a certificate properly filled up and signed by the trader, and cut progressively from the book. The certificate is to accompany the malt, and be left with the person to whom the malt is delivered. The certificate book is to be kept in an open part of the entered premises for the inspection of the officer, and a penalty of £200 is incurred by any roaster or dealer offending contrary hereto, and all roasted malt removed without a certificate is to be forfeited.

Sect. 13. Relates to brewers.

Sect. 14. All malt received by a malt-roaster must be roasted in his entered premises, and all roasted malt must be sent out by a roaster or dealer whole and unground, under a penalty of £100 and forfeiture of the malt.

Sect. 15. No brewer or other person is to buy or receive roasted malt except from a licensed roaster or dealer, under a penalty of £100 and forfeiture of the malt.

Sect. 16. No maltster, malt-factor, or dealer in malt is to carry on the business of a malt-roaster or dealer in roasted malt in the malting premises, nor on premises where malt is kept, nor within a mile of such premises. No druggist, vendor of drugs, or grocer, is to carry on the business of a malt-roaster or dealer in roasted malt. Any entry made, or licence taken out contrary hereto, is null and void.

Sect. 17. Commissioners empowered to except maltsters, malt-factors, or dealers in malt, from the preceding section, who were in business prior to the 1st of April, 1842.

Sect. 18. Malt-roasters and dealers are subject to the like prohibition as to the custody or possession of certain articles (except roasted malt) as brewers or dealers in or retailers of beer in Great Britain and Ireland; neither are they to sell to any brewer, dealer in, or retailer of beer, any of the prohibited articles, under pain of incurring the like penalties and forfeitures.

## 19 &amp; 20 Vict. cap. 34.

Sect. 19. All grain found in the possession of a malt-roaster or dealer in roasted malt, which shall not have germinated to such a degree that the plumule shall have been elongated to the extent of one-half of the length of the grain, shall be deemed to be unmalted grain; but no penalty or forfeiture shall be incurred in respect of any malt by reason of its being found to contain a proportion not exceeding 5 per cent. of the grain which may not have germinated to the said extent, provided reasonable evidence be adduced to prove that such last-mentioned grain had been subjected to the usual legal process of malting. (See also 30 & 31 Vict. c. 90, s. 16, below.)

## 29 &amp; 30 Vict. cap. 64.

Sects. 5 and 6. [*Note.*—These sections allow roasted malt to be exported on drawback by a malt-roaster or dealer in roasted malt, and will be found under the head of “Exportation of Malt,” on page 161.]

## 30 &amp; 31 Vict. cap. 90.

Sect. 16. All corn or grain, whether roasted or unroasted, found in the possession of a malt-roaster, which shall not have been perfectly dried upon the kiln at the malt-house at which steeped, to be made into malt, is to be deemed unmalted grain within the meaning of 5 Vict. sess. 2, cap. 30. (See s. 7 of the Act quoted, on page 171; also 19 & 20 Vict. c. 34, s. 19, above.)

## ILLICIT MALTING IN IRELAND.

## 1 &amp; 2 Wm. 4, cap. 55.\*

Sect. 1. Every person keeping or using a kiln for drying grain, or a mill for grinding grain or malt, must make entry of every

\* The sections omitted from this Act do not relate to malt.

mill or kiln in writing, with the proper officer of Excise, stating his name and residence, and the place where the kiln or mill is situated. His name in full must also be painted in black upon a white ground, or *vice versâ*, the letters to be at least two inches in length, on some conspicuous part of the outside of the kiln or mill. The officer is to register the entry, and give a signed copy thereof to the person making it. A penalty of £30 imposed for any neglect; and all malt or grain found in an unentered mill or kiln is liable to forfeiture, and may be seized by any officer.

Sect. 2. If the owner of an unentered kiln cannot be found, the officer may require the occupier of the soil either to make entry of it or destroy or remove it; and if this is not done within fourteen days after the service of the notice, he is liable to the penalty for keeping an unentered kiln. If the kiln is erected on common or unoccupied land the officer is to cause a notice in writing to be affixed to some conspicuous part of the kiln, calling upon the owner within fourteen days to make entry thereof; and if not done within that time the officer may destroy it and dispose of the materials. Any person having used an unentered kiln (the owner not being found) is to be deemed the owner.

Sect. 3. No malt or grain making into malt is to be dried on a kiln kept for drying corn or grain, under a penalty of £30 and forfeiture of the same.

Sect. 4. A penalty of £30 imposed for placing malt or grain making into malt on a kiln not entered for making malt.

Sect. 5. A penalty of £30 imposed for receiving into a mill malt not legally made, unless the occupier make known the person by whom such malt was deposited in the mill.

Sect. 6. Officers empowered at any time in the day to enter mills and search for illicit malt, and seize and remove the same; and if an officer is not admitted on demand, he may, in the presence of a constable or other peace officer, force an entrance.

Sect. 7. A penalty of £100 imposed on any person knowingly receiving, concealing, or having in possession, or in any premises, malt illegally made; and the malt is forfeited, and may be seized by any officer.

Sect. 8. A penalty of £100 imposed on any person (not being a duly licensed maltster) who shall wet or steep grain to be made

into malt, or have the same in his possession; and such grain is forfeited, and may be seized by any officer.

Sect. 17. If an officer have cause to suspect that any corn or grain is being privately made into malt, or that any illegal malt is in any place, and shall make oath before a justice, stating the grounds of suspicion, the justice may grant a special warrant, authorizing the officer (by day or night) to break open the suspected place, and seize all such grain or malt found therein, and either detain it at the place where found, or remove it to the nearest Excise office. The proprietor or occupier of the premises to forfeit £100, and any person obstructing an officer is liable to a like penalty.

Sect. 18. Nothing in this Act to prevent any officer searching for and seizing any illicit malt, or grain making into malt without the magistrate's warrant; and the person with whom the same shall be found, or who shall obstruct an officer, is liable to the same penalties as if the officer had a special warrant; and if an officer shall have entered any place without a warrant, and found illicit malt or grain, such finding shall fully justify the officer.

Sect. 19. A penalty of £100 imposed on any person found in any place where grain is being privately made into malt (over and above all penalties to which the proprietor may be liable), and such person may be arrested by an officer and conveyed before a justice, to be dealt with as directed by this Act.

Sect. 20. Officers empowered, on the seizure of illicit malt or grain making into malt, to effectually destroy the same.

Sect. 21. A like authority vested in any justice of the peace, landlord, or bailiff.

Sect. 26. All bags, utensils, &c., containing malt or grain forfeited under this Act, and all horses and conveyances used in the removal, are forfeited, and may be seized by any officer.

Sect. 27. A penalty of £100 imposed on persons being owners of or interested in any illicit malt, or grain making into malt.

Sect. 28. A penalty of £60 imposed on persons knowingly permitting any private making of malt in any house or premises in their occupation.

Sect. 29. Persons forcibly obstructing an officer in the execution of his duty, or any person acting in his assistance, to be adjudged

guilty of felony, and liable to be transported for seven years, or, at the discretion of the Court, to be imprisoned with hard labour for not more than three years nor less than six calendar months.

Sect. 30. A penalty of £10 imposed on any person who shall give notice of the approach of an officer by making signal to persons engaged in illicit malting; such offender may be arrested by any officer and conveyed before a justice, to be dealt with as directed by sections 34 and 39.

Sect. 37. Persons liable to arrest, not being detained at the time, or after detention, making their escape, may be afterwards arrested by any officer.

Sect. 38. Any person coming forward to claim any illicit malt, in order to clear the party in whose possession it was found, to be immediately convicted on his own confession.

Sect. 39. Justices empowered to mitigate penalties under this Act to not less than £6; but no person is to be committed to gaol for non-payment of penalties for less than three calendar months.

[*Note.*—The remaining sections in this Act relate to illicit spirits, powers of magistrates, recovery of penalties, &c.]

20 & 21 Vict. cap. 40.

Sect. 6. Proceedings under 1 & 2 Will. 4, c. 55, to be conducted and penalties recovered as directed by the "Petty Sessions (Ireland) Act, 1851."

24 & 25 Vict. cap. 91.

Sect. 18. Justices in Ireland not deprived by 20 & 21 Vict. c. 40, s. 6, of any jurisdiction possessed before the said Act was passed, relative to offences against 1 & 2 Will. 4, c. 55, nor to affect sect. 31 of the said Act, further than to provide the additional mode of proceeding for penalties and costs; and two or more justices at petty sessions may hear and determine any information for an offence against the last-mentioned Act, or do any act necessary to affect any judgment thereupon.

Sect. 19. Persons aggrieved by the judgment of justices on informations under 1 & 2 Will. 4, c. 55, may appeal therefrom to

the next quarter sessions to be holden for the place in which such judgment was given, after twenty days from the giving of the same, upon such notices and terms as are prescribed by 7 & 8 Geo. 4, c. 53; 4 & 5 Will. 4, c. 51; and 4 Vict. c. 20.

Sect. 22. Powers given to excise officers by 1 & 2 Wm. 4, c. 55, as to seizures of illicit malt, &c., extended to Customs officers.

30 and 31 Vict. cap. 90.

Sect. 14. The provision contained in sect. 22 of the "Petty Sessions (Ireland) Act, 1851," to the effect that "in every case of summary jurisdiction, where the justices shall be authorized to award any penal or other sum, the same shall be paid either forthwith or at such time as they shall see fit to fix," is not to extend to penalties for offences under 1 & 2 Will. 4, c. 55, as to the illicit making of malt, &c.

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Containing an Abstract of all the Laws and Regulations in force relating to the Licences, Liabilities, and Privileges of those Traders. Also a Summary of the principal Enactments relating to Brewers and Postmasters; with Explanatory Notes, a variety of Useful Forms, and a Comprehensive Index to each Section of the Work; the whole corrected up to the present time.

# W. R. LOFTUS,

MANUFACTURER OF

## HYDROMETERS, SACCHAROMETERS, AND GAUGING INSTRUMENTS

To the Inland Revenue, Customs, Admiralty, and Dominion of Canada,

146, OXFORD STREET, LONDON.

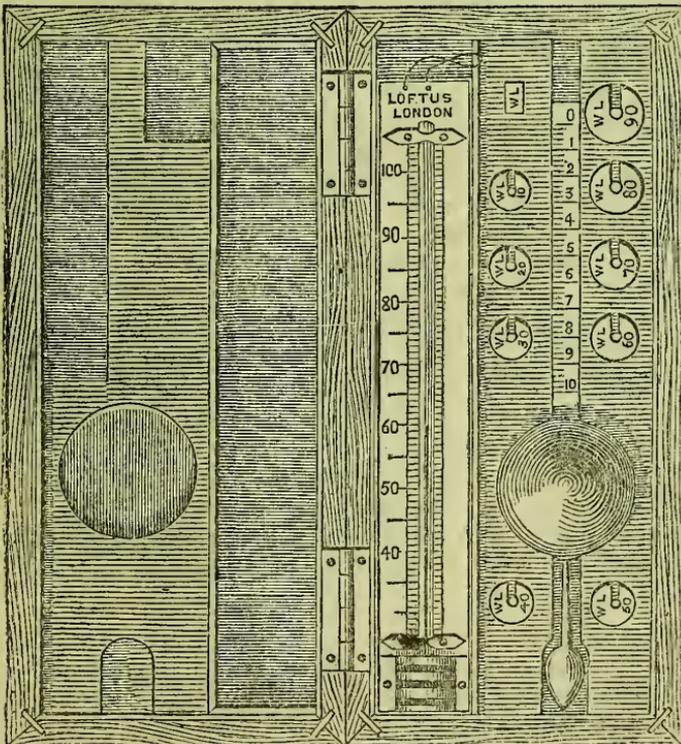
### SYKES'S HYDROMETERS,

For the use of Wine and Spirit Merchants, Distillers, &c. &c.

£ s. d.

Sykes's Hydrometer, extra and best gilt, with Comparative and Reducing Rule, Ivory Thermometer, Book of Tables, Trial Glass, and full instructions, complete .. (1st Class)

4 10 0



Sykes's Hydrometer, without rule. Fig. 1 .. .. . 4 4 0

K

	£	s.	d.
Sykes's Hydrometer, with Book of Tables, and Trial Glass, complete .. .. . (3rd Class)	3	15	0
Ditto ditto .. .. . (4th Class)	3	0	0
Ditto ditto .. .. . (5th Class)	2	11	0
<i>N.B.—The 1st, 2nd, and 3rd class Hydrometers are precisely those used by Distillers, and only manufactured by W. R. Lorrus.</i>			
Top Weight Hydrometer, extra and best gilt, with Tables and Trial Glass, fitted, complete .. .. .	3	3	0
Loftus's Small Pocket Sykes's Hydrometer, best double gilt, with Ivory Thermometer, Enamelled Tube, small Book of Tables, Trial Glass, complete .. .. .	4	4	0
Sykes's Hydrometer for exportation, and fitted expressly for hot climates, with screwed boxes to prevent warping, and Tables calculated to 100 degrees temperature, extra to the above prices, 10s.			
Dicas's Hydrometer, best double gilt, with Rules, &c., complete .. .. .	5	5	0
Glass Hydrometer, with Ivory Scale, and instructions for its use (warranted correct) .. .. .	0	10	6

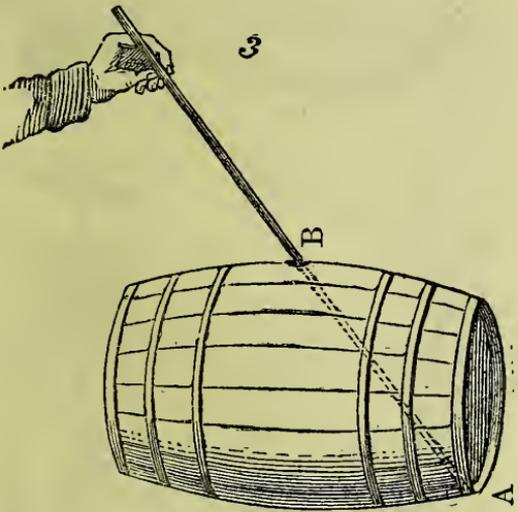
## GAUGING INSTRUMENTS & RULES, &c.

Corndrometer, to show the weight per bushel of Barley, &c., in case, &c., complete .. .. . $\frac{1}{2}$ -pint	2	2	0
Ditto ditto .. .. . $\frac{1}{4}$ -pint	1	16	0
Ditto ditto .. .. . $\frac{3}{8}$ -pint	1	12	0
Calliper Gauging Instruments, complete, as used by H. M. Customs, with Book of Directions .. .. .	3	10	0
FIG. 2.—Boxwood Two-slided Gauging, Ullaging, Valuing, and Reducing Rule, with Instructions, length 12 inches (ordinary size), post free .. .. .	0	10	6
Ivory ditto ditto made of best Ivory ditto ..	1	5	0
Boxwood ditto ditto 24 inches in length, very open scale, suitable for Warehouses, Cellars, &c., &c. ..	0	14	0
Miniature Boxwood Two-slided Gauging, Ullaging, Valuing, and Reducing Scale, length 6 inches, for the pocket, post free .. .. .	0	7	6
Ditto Ivory ditto .. ditto post free .. ..	0	15	6
Excise Vacuity Slide Rule .. .. .	0	13	0
Loftus's New Reducing and Comparative Rule, with full Instructions, showing the quantity of water requisite to reduce spirits to any required strength, and its comparative value when so reduced, 9-inch, boxwood, sent post free .. .. .	0	4	6
Ditto ditto Ivory, best make, post free .. ..	0	10	6
Boxwood ditto 12 inches length .. .. .	0	5	6
Ditto ditto 24 inches length .. .. .	0	8	0
FIG. 3.—Loftus's New Dipping Rod, with line of inches and tenths and diagonal; will show the quantity in any cask, both lying and standing, and will also show the full contents of the cask, with Instructions .. .. .	0	5	0

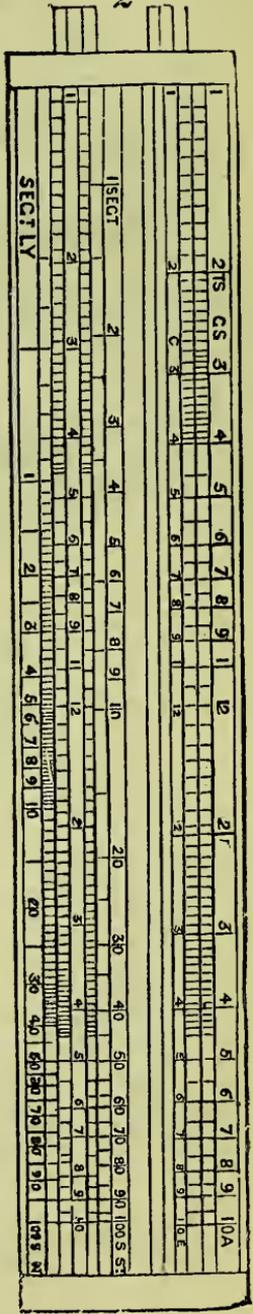
	£	s.	d.
The same Rod, but in six folding joints .. .. .	0	7	6
5 feet, six-jointed Wine and Spirit Dip Rule .. .. .	0	7	6
Small Miniature ditto, 36 inches length .. .. .	0	7	6
Jointed Pin Dips, for Firkins, Kilderkins, and Barrels, lying or standing, with inches and tenths .. .. .	0	4	6

2

This Rule will show the Ullage in any regular made Cask, let it be either Lying or Standing. Example—Suppose a Barrel or 36-gallon Cask is present on Ullage, and that it is Standing, or St.; seek for such on the Rule, viz., Barrel 36-galls. St.; dip the Cask perpendicularly, and the wet inches on that line will be the number of Gallons therein. Should the Cask be Lying, or S. Ly., seek for such, viz., Barrel 36-galls., S. Ly.; the wet will also indicate the content, or ullage. Whatever be the full content of the Cask, a similar result will be found, by looking on that part of the Rule where such is denoted, observing that each size Cask has two scales, or lines, viz. for S. Ly. and St.



To find the full content of a Cask when such is not marked thereon, or known,—with that part of the Rule marked “Imperial Gallons,” dip the Cask as in the engraving, and the mark at B is the number of gallons it will contain when full.



# CORKING MACHINES.

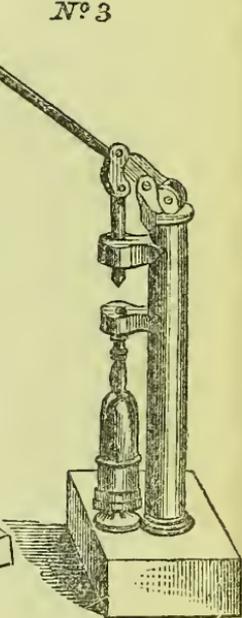
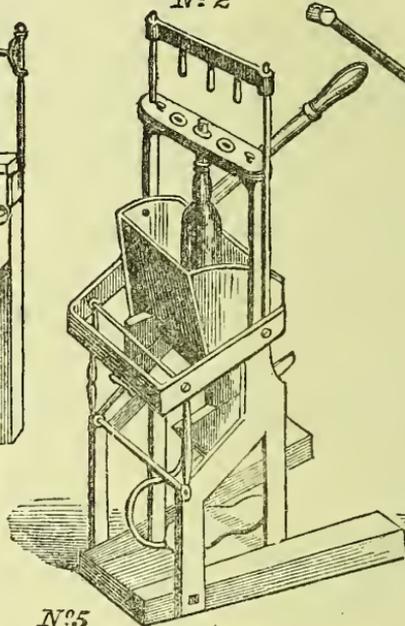
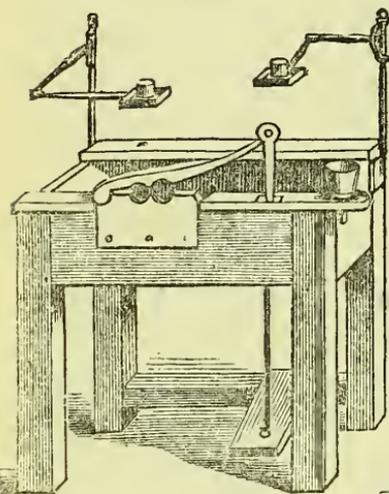
## PRICES.

		£	s.	d.
No. 1.	With wrought-iron gripe and jointed candlesticks ..	2	5	0
" "	" cast-iron gripe and tin candlesticks ..	1	12	0
" "	" ditto ditto ..	1	5	0
	Boot and Driver, extra .. .. .	0	8	6

N<sup>o</sup> 1

N<sup>o</sup> 2

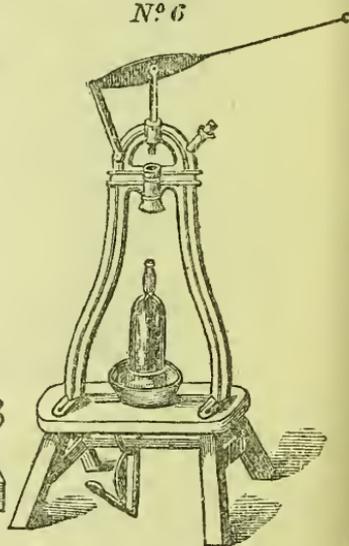
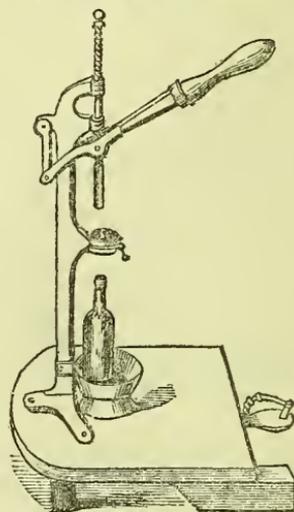
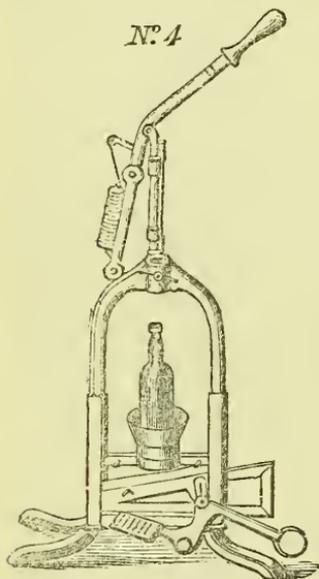
N<sup>o</sup> 3



N<sup>o</sup> 4

N<sup>o</sup> 5

N<sup>o</sup> 6

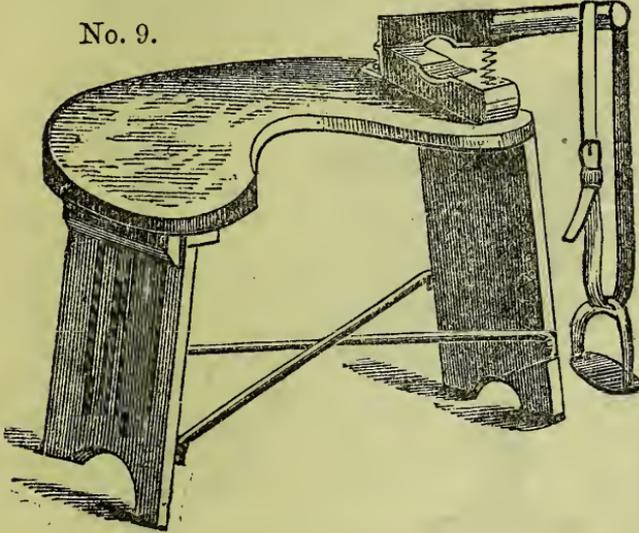


No. 2.	Masterman's Patent .. .. .	3	10	0
" "	ditto with improved spring lever ..	4	5	0

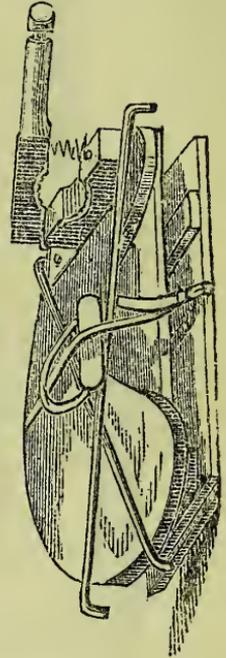
**CORKING MACHINES—Continued.**

	£	s.	d.
No. 3. With self-acting support for bottle .. .. .	4	5	0
No. 4. With double action spring lever (a very useful machine)	2	10	0
No. 5. With single-action lever .. .. .	1	15	0
No. 6. The cheapest form of Lever Machine .. .. .	1	5	0
No. 9. Portable Corking Machine .. .. .	0	15	0

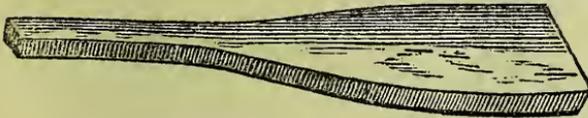
No. 9.



The same folded up.

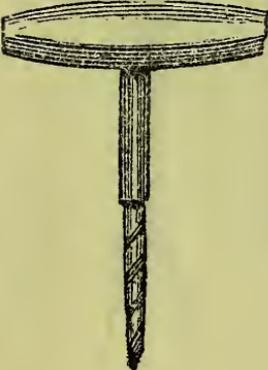
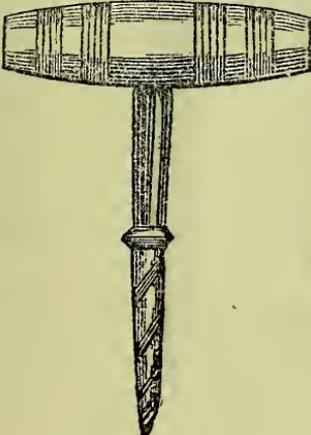
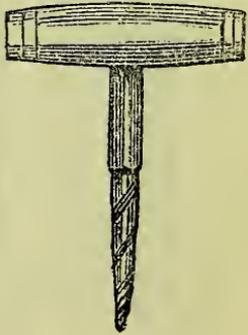


Cork Drivers. 1s., 1s. 6d., 1s. 9d. each.



**PACKING AND SAMPLING TOOLS.**

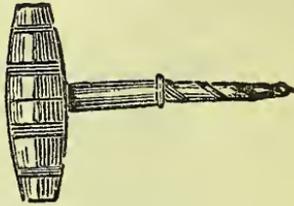
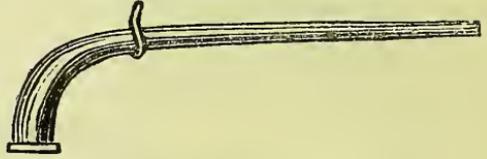
**FRETS FOR SAMPLING CASKS.**

With Wood Handle, 2s.	With Wood Handle, Extra large for Spile Tap, 2s. 6d.	With Brass Handle. 3s.
		

PACKING AND SAMPLING TOOLS—Continued.

SILVER TASTING TUBE, 10s. 6d.

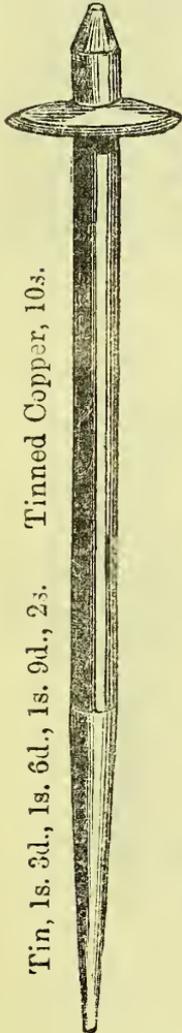
With Fancy Wood Handle, 2s. 6d.



VELINCHERS FOR SAMPLING CASKS.

Ebonite, 10s. 6d.

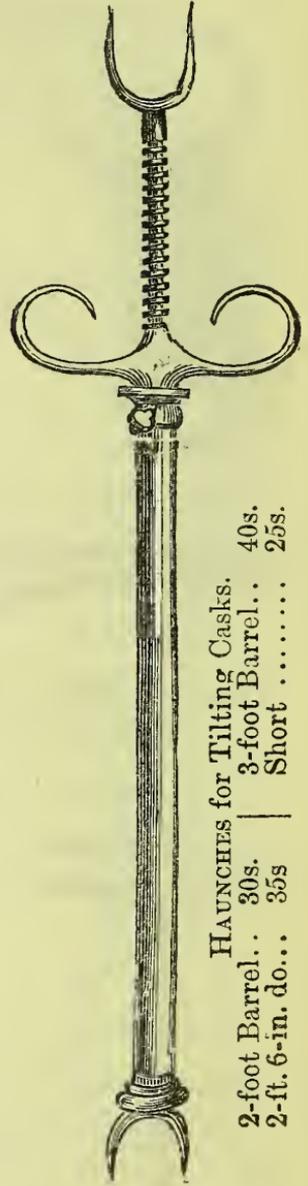
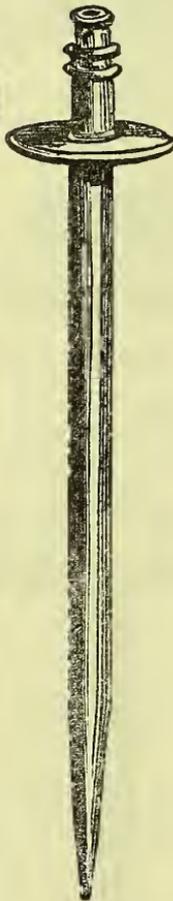
Glass, 4s.



Tin, 1s. 3d., 1s. 6d., 1s. 9d., 2s. Tinned Copper, 10s.

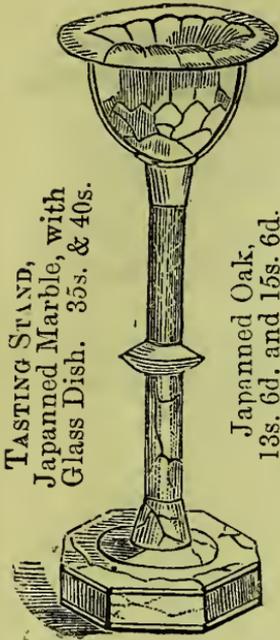


Pewter, 7s. 6d.



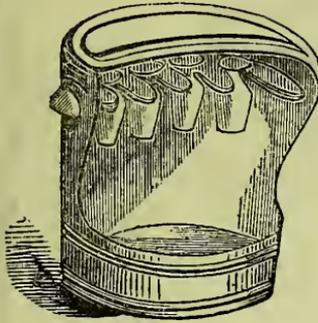
HAUNCHES for Tilting Casks.  
 2-foot Barrel.. 30s. | 3-foot Barrel.. 40s.  
 2-ft. 6-in. do... 35s. | Short ..... 25s.

PACKING AND SAMPLING TOOLS--*Continued.*



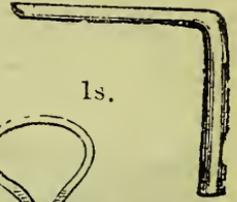
TASTING STAND,  
Japanned Marble, with  
Glass Dish. 35s. & 40s.

Japanned Oak,  
13s. 6d. and 15s. 6d.



JAPANNED GLASS TUB  
For three glasses, 12s. 6d.  
" four " 13s. 6d.  
" six " 18s.

NEEDLES for



1s.

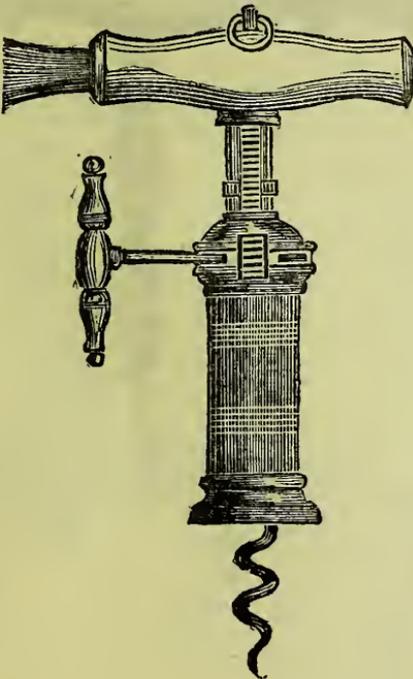


1s. 3d.

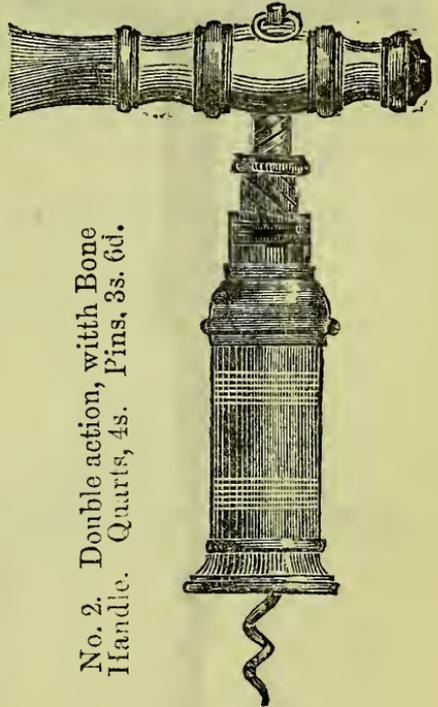
Bottling Claret.

CORKSCREWS.

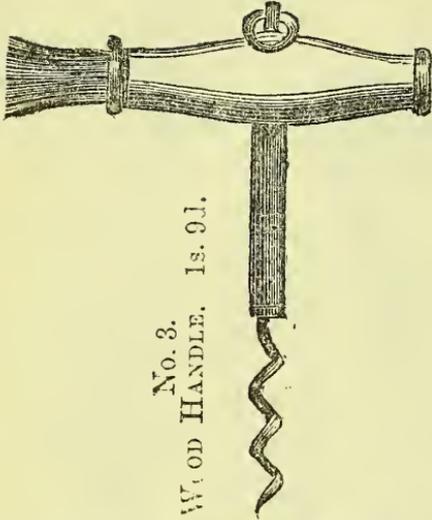
No. 1. Rack Movement, Wood Handle. 7s. 6d.



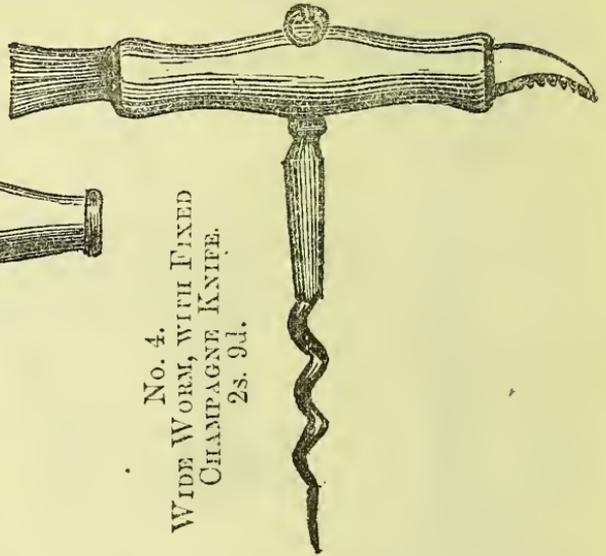
No. 2. Double action, with Bone  
Handle. Quarts, 4s. Pins, 3s. 6d.



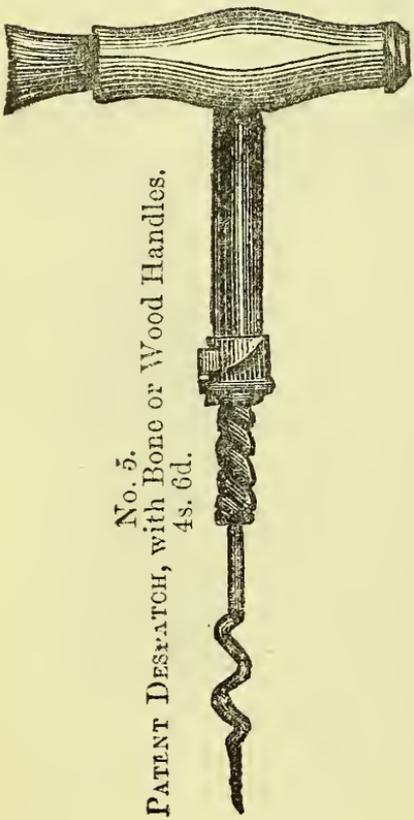
CORKSCREWS—Continued.



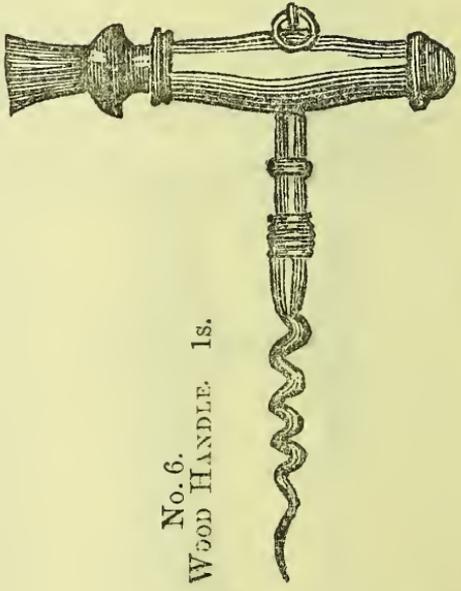
No. 3.  
WOOD HANDLE. 1s. 9d.



No. 4.  
WIDE WORM, WITH FINE  
CHAMPAGNE KNIFE.  
2s. 9d.



No. 5.  
PATENT DESPATCH, with Bone or Wood Handles.  
4s. 6d.



No. 6.  
With WOOD HANDLE. 1s.

CORKSCREWS—*Continued.*

No. 7.



2s. 6d.



2s. 9d.



3s.



3s. 3d.

No. 8.



1s. 9d

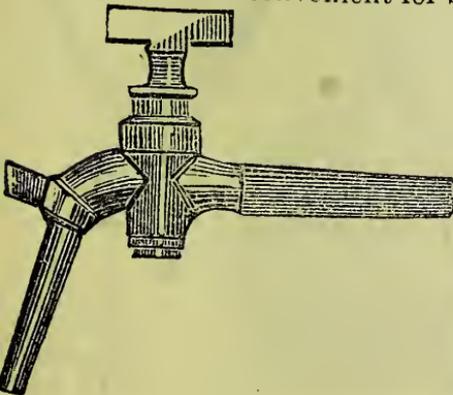
**BOTTLING TAPS,**  
BRASS OR PLATED.

Made of Metal, the durability of which has been tested by experience. Finished with great care, and proved to bear a pressure of 200 lbs. to the inch.

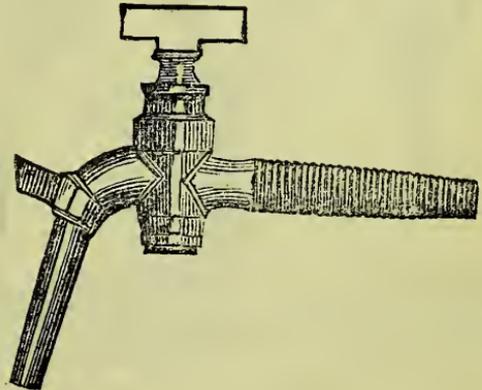
The plated are so thoroughly coated inside and outside with pure silver, that they may be left in the cask a long time without affecting the wine.

The quart size is that generally used by the trade.

The pint size is convenient for Sherry in quarter casks.



No. 1.

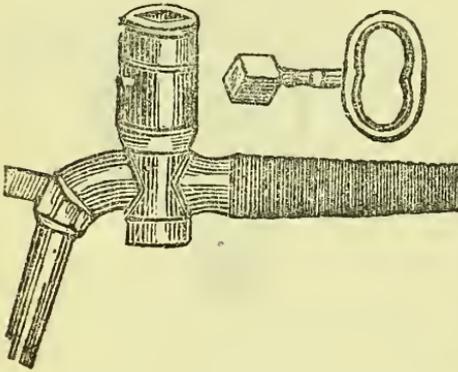


No. 2.

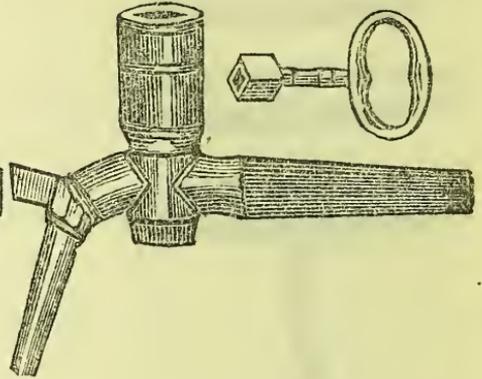
K 3

BOTTLING TAPS—*Continued.*

No. 1, Quart, to drive, Brass, 3s. 6d. Plated, 6s.	No. 2, Quart, to screw, Brass, 4s. Plated, 6s. 6d.
No. 1, Pint, to drive, Brass, 2s. 6d. Plated, 4s. 6d.	No. 2, Pint, to screw, Brass, 3s. Plated, 5s.



No. 3.

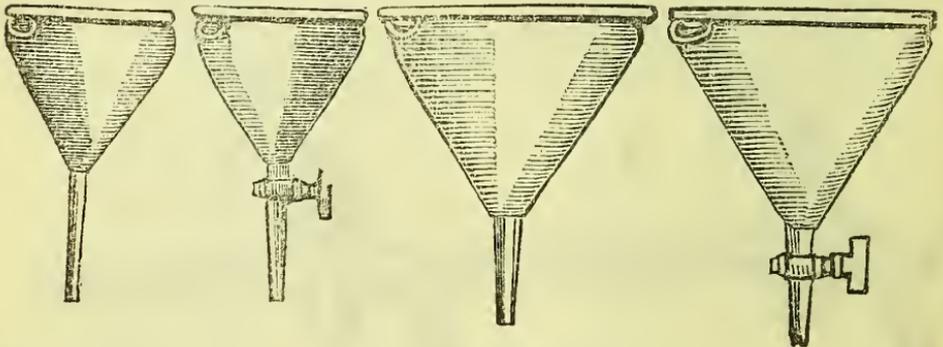


No. 4.

No. 3, Quart, Lock, to drive, Brass, 4s. 6d. Plated, 7s. 6d.	No. 4, Quart, Lock, to screw, Brass, 5s. Plated, 8s.
No. 3, Pint, Lock, to drive, Brass, 3s. 6d. Plated, 6s.	No. 4, Pint, Lock, to screw, Brass, 4s. Plated, 6s. 6d.

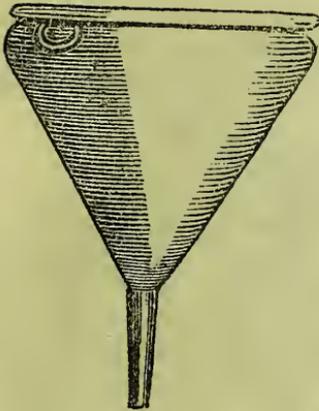
## COPPER FUNNELS.

Pint Bottling, 5s. 6d.	Pint Bottling, with Tap, 8s. 6d.	Quart Bottling, 6s. 6d.	Quart Bottling, with Tap, 9s. 6d. Strainer Extra, 1s. 6d.
	Strainer 1s. 6d. Extra.		

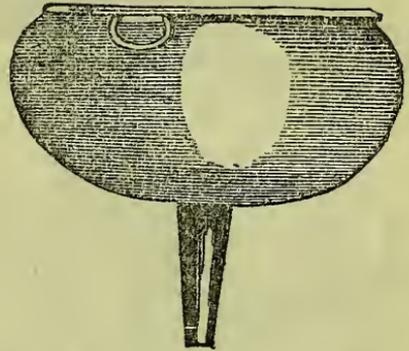


Half Gallon .. .. 9s. 6d.	Two Gallon .. .. 12s. 6d.
Ditto with Tap .. .. 13s. 6d.	Three Gallon .. .. 15s. 6d.
Ditto with Tap & Strainer 15s. 0d.	Four Gallon .. .. 22s. 0d.
One Gallon .. .. 10s. 6d.	Five Gallon .. .. 24s. 0d.
Ditto with Tap .. .. 18s. 6d.	

COPPER FUNNELS—Continued.



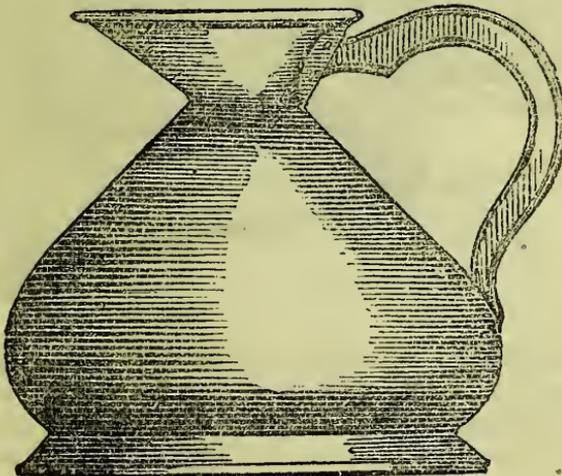
BOWL SHAPE. 15s.  
 : : 20s.  
 : : 25s.  
 8 inch.. : :  
 9 inch.. : :  
 10 inch.. : :



COPPER SPIRIT MEASURES.

EXTRA STRONG. TOWN MADE. STAMPED IMPERIAL.

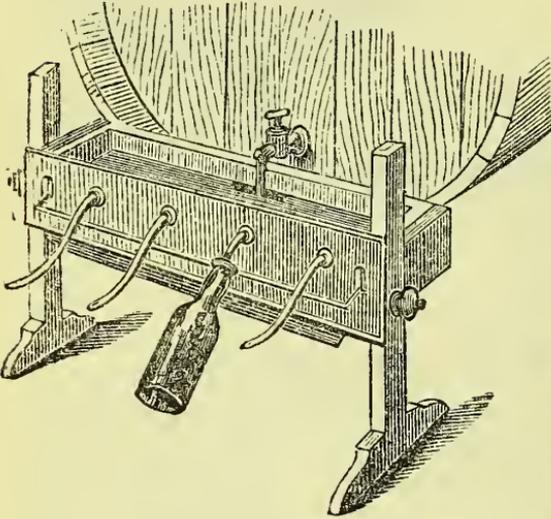
			PRICES.	£	s.	d.
Copper Imperial Measure, for	Wine and	Spirits	..5-gallon	2	0	0
Ditto	ditto	ditto	..4-gallon	1	12	0
Ditto	ditto	ditto	..3-gallon	1	5	0
Ditto	ditto	ditto	..2-gallon	0	19	0
Ditto	ditto	ditto	..1-gallon	0	12	6
Ditto	ditto	ditto	..2-quarts	0	10	0
Ditto	ditto	ditto	..1-quart	0	7	6
Ditto	ditto	ditto	..1-pint	0	6	6
Ditto	ditto	ditto	..½-pint	0	6	0
Ditto	ditto	ditto	..1-gill	0	5	0
Ditto	ditto	ditto	..½-gill	0	4	6



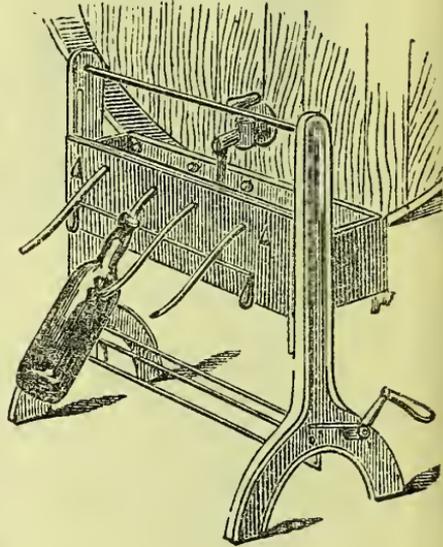
## PATENT BOTTLING APPARATUS.

These Machines act by means of a trough which is kept filled to a certain level by a tap with float and valve, whence the liquor flows into the bottles through syphons, with so gentle a stream that no froth

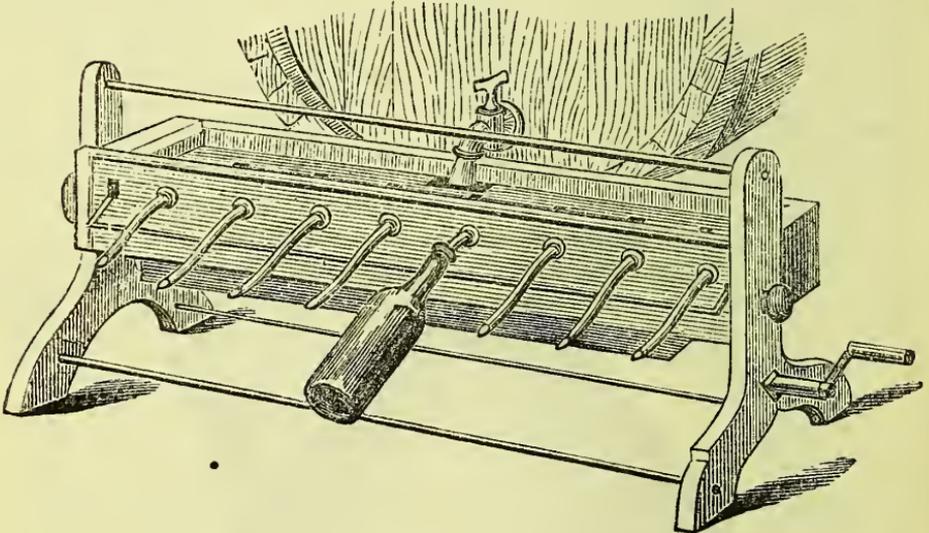
No 1



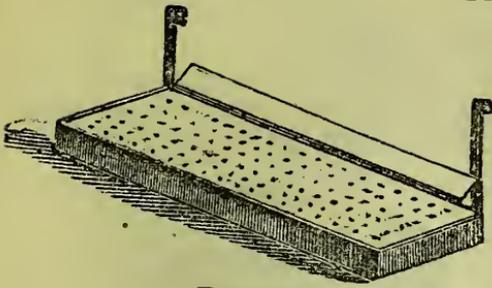
No 2



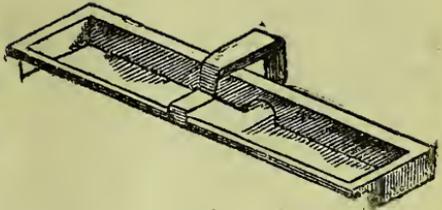
No 2a



is caused; all the bottles are filling at the same time, and fill so precisely to the point required, that they may be corked without being even looked at; a great saving of time is thus effected, and all waste is avoided. Forty dozen per hour may be bottled with these Machines.



DRAINER.

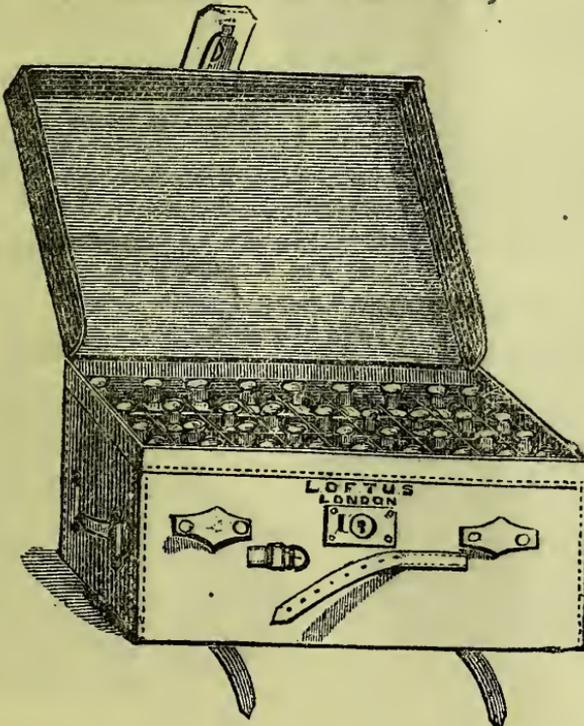


COVER.

PATENT BOTTLING APPARATUS.	4 SYPHON MACHINE.	6 SYPHON MACHINE.	8 SYPHON MACHINE.
No. 1, with wood frame and legs . . . .	£ s. d. 3 10 0	£ s. d. 5 5 0	£ s. d. 7 7 0
No. 2, improved, with iron legs, rack movement to raise trough, &c. . .	4 5 0	5 15 0	7 15 0
These prices include the Machine itself, 1 tap, valve, float and nozzle.			
Extra Set of Syphons, for pints . . . . .	0 9 0	0 13 0	0 17 6
Extra Tap . . . . .	0 6 0	0 6 0	0 6 0
Glass Cover with metal frame for trough	0 7 6	0 10 6	0 17 6
Drainer with Hanging Bars, for front	0 10 0	0 14 0	0 17 6

If with Trough, Tap, and Syphons Electro-plated, extra 25s.

**SAMPLE CASES,**

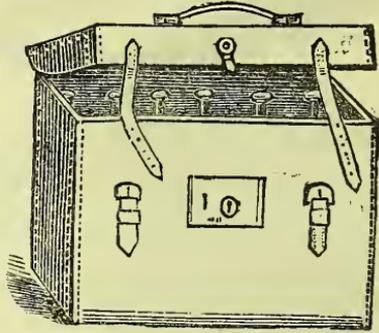


IN SOLID LEATHER AND WITH GOOD LOCKS.

SAMPLE CASES—*Continued.*

All Manufactured on the Premises, and of the Best Materials. The following are the usual sizes, kept fitted with No. 1 green glass bottles with patent stoppers, but they are made to order of any size or for any pattern bottle.

	£	s.	d.
3 bottles .. ..	0	15	0
4 do. .. ..	0	17	0
6 do. .. ..	1	0	0
12 do. .. ..	1	6	0
18 do. .. ..	1	15	0
24 do. .. ..	2	4	0
36 do. .. ..	3	0	0
including No. 1 bottles.			

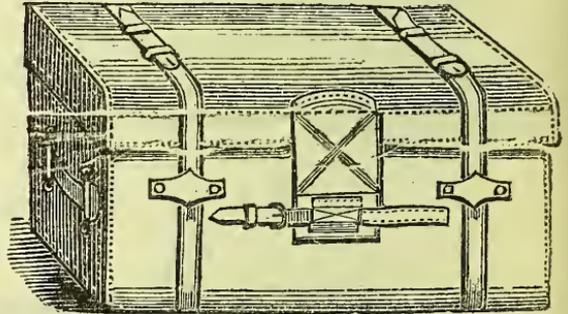


The above, fitted for Pint Dock Samples.

	£	s.	d.
12 bottles .. ..	2	10	0
24 do. .. ..	3	5	0
without bottles.			

They are also made in AMERICAN CLOTH.

	£	s.	d.
6 bottles .. ..	0	12	6
12 do. .. ..	0	16	6

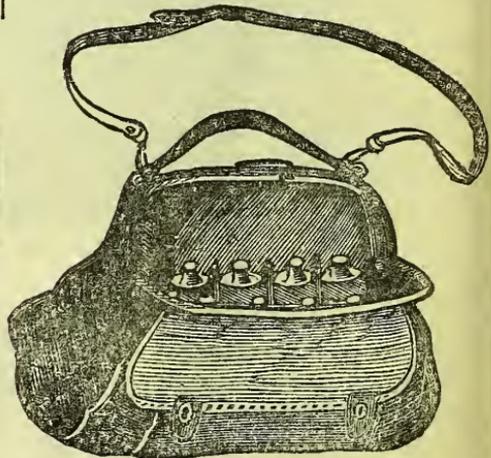
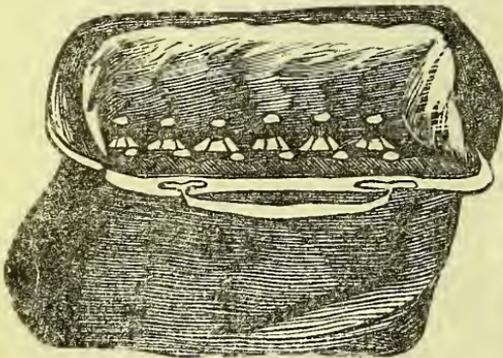


## BEST ENAMELLED LEATHER BAGS.

6 bottles £1 5s. } including  
12 do. £1 10s. } No. 1 bottles.  
Or for 4 Pint Dock Samples £1 15s.

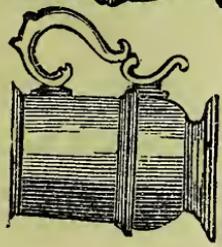
## BEST MOROCCO LEATHER COURIER BAGS.

6 bottles £1 1s. } including  
8 do. £1 2s. } No. 1 bottles.



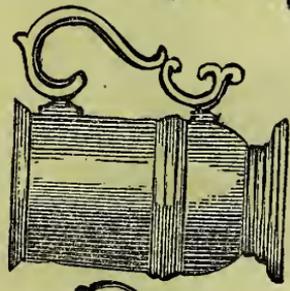
**PARLOUR POTS. TOWN MADE.**

Half Pint.



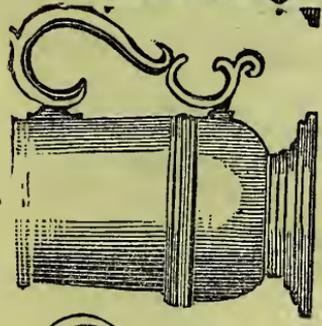
24s.

Pint.



33s.

Quart.



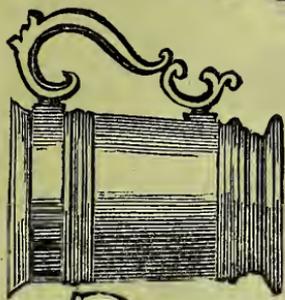
44s.

Half Pint.



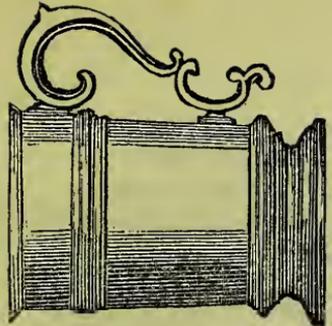
24s.

Pint.



33s.

Quart.

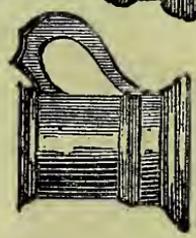


44s. per doz.

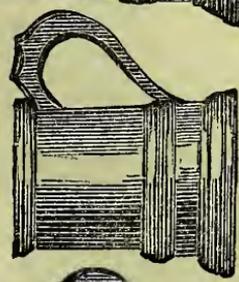
**PEWTER POTS. STAMPED IMPERIAL.**

WITH BRASS RIM FOR MEASURING.  
Quart.

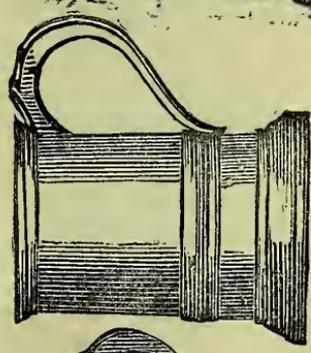
Half Pint.



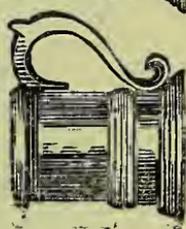
16s.



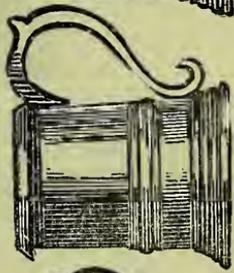
23s.



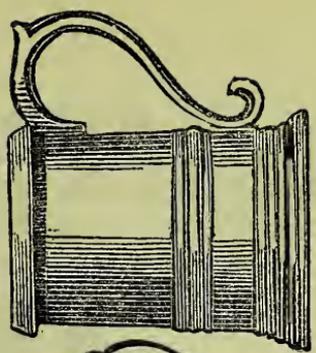
32s. per doz.



4s. 4d.



5s. 4l.



6s. 4d. each.

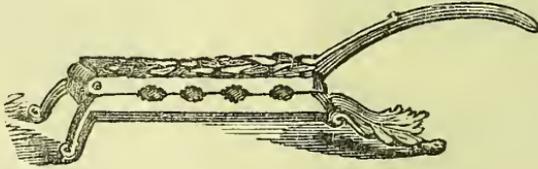
# HAND CORK GRIPES.

CAST-IRON.

Japanned.. 1s. 6d., 2s. 3d., 3s. 0d.  
Bronzed... 2s. 0d., 2s. 9d., 3s. 6d.

MALLEABLE.

Japanned.. 2s. 6d., 3s. 3d., 4s. 0d.  
Bronzed... 3s. 0d., 3s. 9d., 4s. 6d.



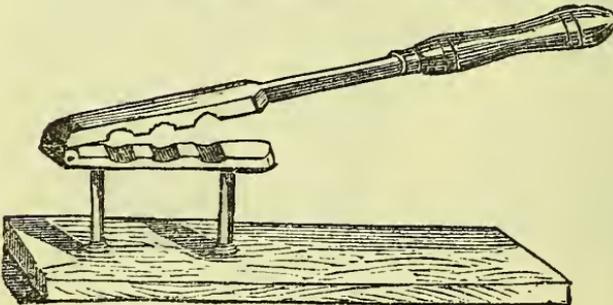
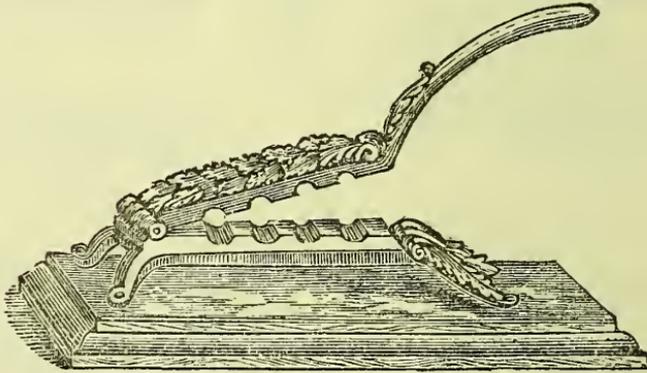
WITH SPRINGS.

Cast-iron, Jap. 2s. 0d., 2s. 9d., 3s. 3d. | Malleable, Jap. 3s. 0d., 3s. 9d., 4s. 6d.  
Do. Bronzed 2s. 6d., 3s. 3d., 3s. 9d. | Do. Bronzed 3s. 6d., 4s. 3d., 4s. 9d.



ANY OF THE ABOVE.

On Plain Oak Block, extra 1s. 3d. | On Polished Oak Block, extra 1s. 9d.



BRIGHT WROUGHT IRON,  
WITH SPRING, AND ON  
STAND.

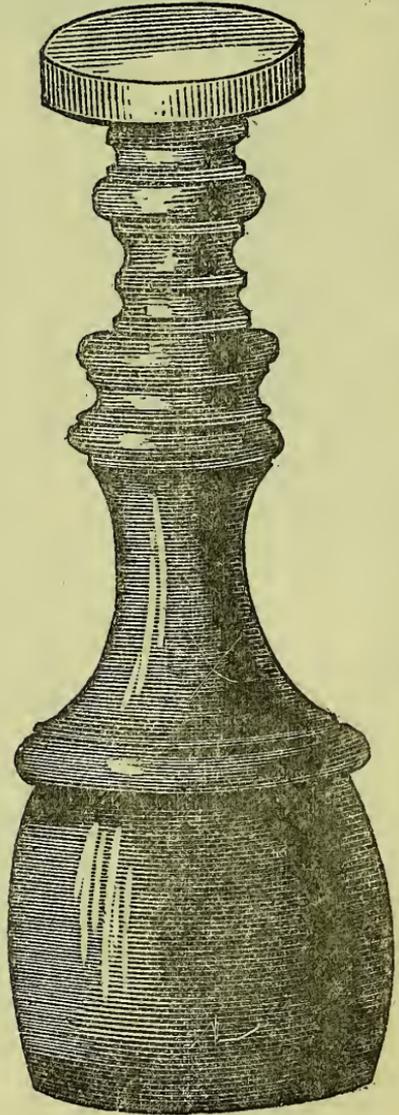
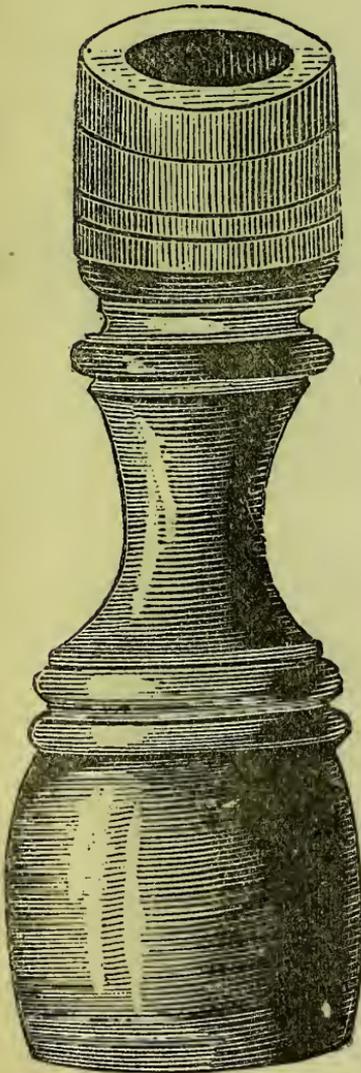
For 2 sizes of Corks 10s. 6d.  
Ditto, for 3 ditto ... 12s. 0d.  
Ditto, for 4 ditto ... 13s. 6d.

BRIGHT MALLEABLE, DO.

For 2 sizes of Corks 6s. 6d.  
Ditto, for 3 ditto ... 7s. 6d.  
Ditto, for 4 ditto ... 8s. 6d.

**BOTTLE SEALS,**

OF THE BEST MAKE, WITH THE LETTERS DIE, SUNK IN  
A STYLE SUPERIOR TO THOSE USUALLY SOLD.



Stock for Quart Bottles, plain ..	3s.	0d.	Ferrule Seal for Quart Bottles, plain ..	1s.	6d.
Stock for One Gallon Bottles, plain ..	3s.	6d.	Ferrule Seal for One Gallon Bottles, plain ..	2s.	6d.
Stock for Two Gallon Bottles, plain ..	4s.	0d.	Ferrule Seal for Two Gallon Bottles, plain ..	3s.	6d.
Letters on ditto..	..	..	..	..	2d. each.

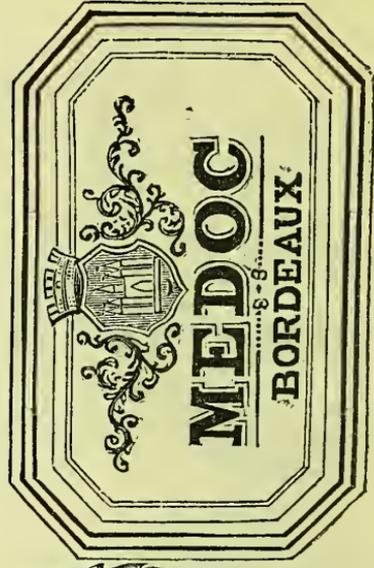
Moveable Centres for Port, Rum, &c. &c., 2s. each.

# SEALING WAX FOR BOTTLES.

	Per lb.	Per cwt.
Red, Green, Yellow, and Brown	.. .. .	28s. 0d.
FINE—Black, Red, Green, Yellow, Brown, and Blue	.. .. .	37s. 4d.
SUPERFINE—Black, Red, Green, Yellow, Brown, Blue, and White	.. .. .	56s. 0d.
EXTRA HARD, FOR INDIA.—Ditto	.. .. .	54s. 0d.
FANCY—Orange, Pink, Light Blue, Pea Green, and Maroon	.. .. .	1s. 0d.
Ditto—Gold Spangled	.. .. .	1s. 6d.
FOREIGN CAKE—Black, Red, Green, Yellow, Brown, and Blue	.. .. .	0s. 7d.

N.B.—An Order for a Cwt. may be made up of any variety of Qualities and Colours, but no less quantity can be supplied at the Cwt. price.

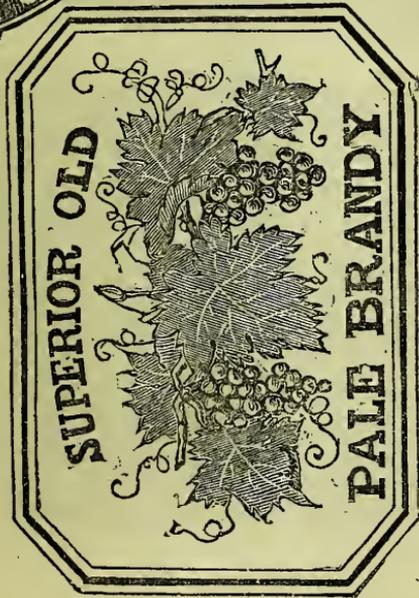
# PAPER BOTTLE LABELS. RICHLY COLOURED AND GLAZED.



4red.

3s. per hundred.

4s. 6d. per hundred.



7s. 6d. per hundred



2s. 6l. per hundred.



3s. 6d. per hundred.

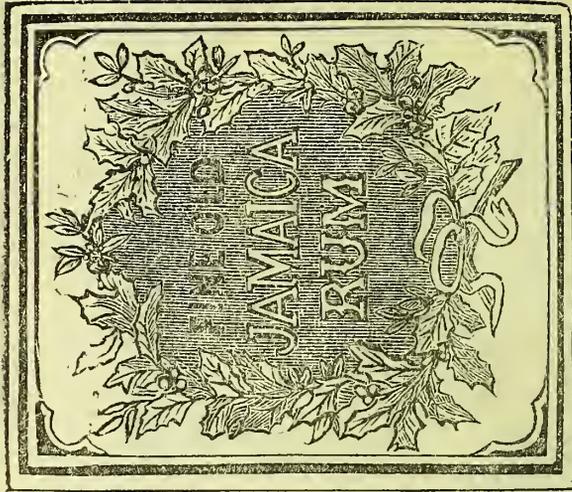


2s. 6d. per hundred.

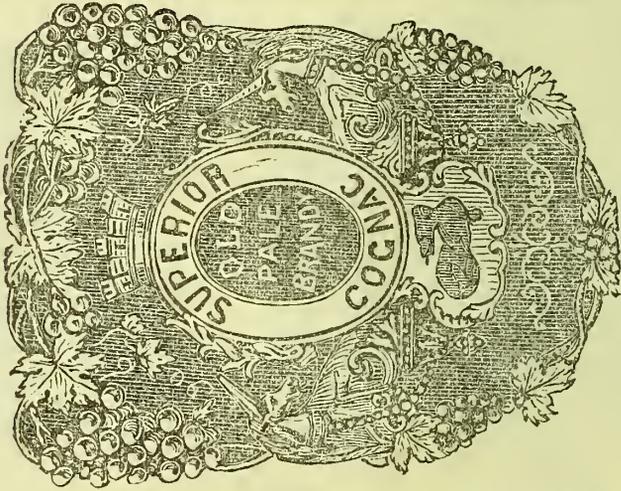


2s. 6d. per hundred.

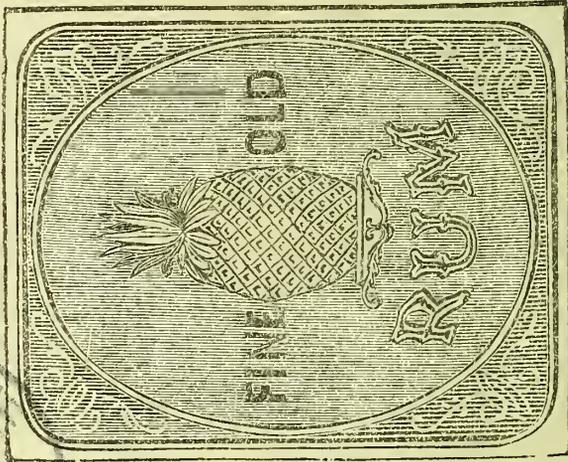
PAPER BOTTLE LABELS—Continued.



6s. per hundred.



7s. per hundred.



6s. per hundred.









