

# Victorian Maltings in England, 1837 to 1914

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## Introduction

The period in question is a long one, more than 75 years. It is hardly surprising therefore if there were a number of quite substantial changes during that time in the development of the buildings in which malt was produced. More than halfway through the period, Stopes in his book published in 1885 stated that 'malting was a decaying industry', yet some of the largest buildings were still to be built. This paper cannot be a complete record of either all the maltings of the period, nor can it deal with all the developments over that time. However, it will attempt to identify some of the major changes and developments during the period, and to assess the impact of changes, such as the repeal of the Malt Tax in 1880, on the design and layout of maltings. Other features which were developed sometimes primarily for other industries but which were used in maltings will also be mentioned.

One of the major problems is identifying the date of buildings, sometimes there are full records, but often it is a combination of map evidence, and entries in trade

journals which give some indication of the date of a building. Generally Victorian maltings can be identified as belonging to the period, although there can be difficulties with those built at the beginning, however precisely dating later maltings can be difficult.

Throughout the paper where possible the current fate of the maltings is given.

## The Buildings

Victorian maltings were constructed usually of the material most conveniently available, and this was either brick or stone, although weatherboard on a timber frame might be used for a part of the building, for example at Malthouse No 2 at Weymouth (converted) or at Watton Road, Ware Hertfordshire (part converted). At these maltings the barley and malt stores which are at opposite ends of the buildings were timber framed with a weather board exterior. No maltings of this period are known to have been completely timber framed. The use of brick and stone continued throughout the whole period. There was however



*Figure 1. South block of the mass concrete maltings, Trentside, Newark-on-Trent, Nottinghamshire*

one experiment, if it can be called that, with the use of mass concrete. Two maltings were built at Newark-on-Trent, Nottinghamshire on the west bank of the river and to the north of Trent Bridge [Fig. 1]. Perhaps surprisingly there is apparently no record of their building, despite the fact that it must have been a noteworthy event. They were three storey buildings on the Newark pattern.<sup>1</sup> Both have now been converted. At the beginning of the period tile, pantile, or local stone tiles were still the usual roofing material, although thatch may have continued in use on existing maltings. However, slate was starting to be widely used and it rapidly became the

most usual roofing material especially with improvements in the transport system .

Over such a long period it would be most surprising if maltings had not increased in size. Certainly this was the case with maltings at the end of the period having eight floors (Free Rodwell's Malthouse No 1, Mistley, Essex - converted), but size was not the only development. Although the main construction materials were the same at the beginning of the period as at the end, there were differences. Early Victorian maltings were usually constructed with timber main beams supported, when the width of the floor required, by

cast iron columns, usually slender ones, or sometimes by timber columns for example as at the malthouse at Regent Wharf, Loughborough, Leicestershire built in the late 1830s or early to mid 1840s. Certainly upper floors where the barley and malt was stored (separately) often had timber columns. They were not only necessary from a constructional point of view but helped to form the storage boxes. By the end of the period it was more common to use steel beams instead of timber ones to support the upper floors. This not only provided greater strength but helped to fire-proof the building. (Maltings were notoriously prone to destruction by fire.)

Another method of fire prevention was the use of jack arching. This used a combination of concrete ceilings arching to steel beams. Examples are often surprisingly early as at Midford, North Somerset (converted) where the malthouse has been dated to the 1840s.<sup>2</sup> An equally effective method was to use flat ceilings of shuttered concrete and examples of this feature were to be found at Lower Bristol Road, Bath (converted) and at the Bridge Street Maltings in Northampton.

The epitome of a fire-proofed maltings is probably Bass's Sleaford maltings (part re-used and part derelict) [Fig. 2]. In fact,



*Figure 2. The Bass Maltings, Sleaford, Lincolnshire.*

despite substantial fire damage in the late 1970s when the buildings were no longer in use as maltings, they have survived with relatively little further deterioration. They are constructed of brick but with cast iron columns, and jack arching. Only on the upper floors was timber used.

### **Designed Maltings**

The Sleaford maltings were designed by Bass's engineer Herbert Couchman, but it was not uncommon for malthouses to be architect or engineer designed and firms specialising in breweries and malthouses were in operation by the 1870s with a few working before then. A surprisingly early example is Malthouse No 2 at Weymouth, designed by local architect, G.R. Crickmay. It is an attractive and

almost delicate building. Not all architect designed maltings were so attractive, most were plain, even severe, and essentially functional, for example the maltings of 1899 in Merchants Road, Gloucester (unconverted) by J.W. Wood. Rather more attractive and aesthetically pleasing examples include Strong's Romsey Brewery Maltings (converted) of 1902 by Arthur Kinder a well-known brewery architect [Fig. 3]. Somewhere in between are Rigden's Brewery maltings at Faversham, Kent (converted to supermarket) of 1884 by R. Waite of Duffield, Derby, and the Goat Maltings (unconverted but due for conversion) at Burton-on-Trent by the well-known brewers' architect, Scamell and Collyer of London, built in 1883. Then there is Free Rodwell's



*Figure 3. Romsey Brewery Maltings, Romsey, Hampshire, designed by Arthur Kinder.*



Figure 4. Peach's Spitals Maltings, Northgate, Newark-on-Trent, Nottinghamshire.

Malthouse Nos 1, and Nos 3 and 4 (both converted) at Mistley, Essex of 1897 and 1888 respectively. (Free was responsible for designing his own maltings which enabled him to incorporate his own patents of hopper bottomed steepers and his kiln designs.) In 1890 there is Bishops (Peach's) Spitals Maltings in Northgate, Newark-on-Trent, Nottinghamshire (demolished) designed by George Sheppard, the borough surveyor [Fig. 4]. There were of course many others, but it was essentially the large maltings which were designed by a specialist architect or engineer.

### Location

Malt is lighter to transport than barley. The buildings in which malt was made were essentially large and occupied a lot of space. Thus their location in urban

areas was less economic when it was easier to transport the malted grain. To do this good transport links were needed. Therefore, to make the malt in a rural area close to the barley crop and transport the lighter commodity to where it was needed made economic sense, especially when large quantities of the product were required. So, Victorian maltings, like their predecessors of the 18<sup>th</sup> century and earlier periods, were often established where there were good transport links.

At the beginning of the period, in the late 1830s, they were built adjacent to navigable rivers and canals, but by the end of the period a railway location was equally if not more important. If both water and rail were available, the location was even more desirable.<sup>3</sup> Although road transport was in use by the end of the period it was

not sufficiently important to exert any influence on the location of maltings being built - water and rail retained their pre-eminence as a desirable location.

Looking at the maltings built throughout the Victorian period it is apparent that not all were built with adequate transport facilities available to them. There was another major factor governing location, the brewery. A brewery in an urban area might well have its maltings nearby if not actually on site and in this case easy transport facilities were often less important. The important factor was the market for the beer.

## Water transport

An early example is that built in Raglan Road, Retford, Nottinghamshire (fate not known) by the Chesterfield Canal in 1837 [Fig. 5]. At the other end of the period Robert Free built his malthouses, Nos 1, 5 and 6 (very little left of these last two) at Mistley on the quayside, on the southern bank of the navigable river Soar. Malthouse No 1 was built in 1897 but the precise building dates of Nos 5 and 6 are not known, although they would have been no earlier than the late 1880s and no later than the middle of the first decade of the 20<sup>th</sup> century. Further up the



*Figure 5. Maltings, Raglan Road, Retford, Nottinghamshire. The maltings fronts onto the Chesterfield Canal, which linked the north Midlands to the river Trent.*

East Anglian coast, at Ipswich, maltings were built in particular in the later 19<sup>th</sup> century, along the banks of the river Orwell, and further still up the coast, the Snape Maltings, (part converted and the rest due for conversion) the building of which started in the middle of the 19<sup>th</sup> century took advantage of the river Alde, although they were later also served by a railway line. Likewise Great Yarmouth was an important malting centre, and right round the top, Wells-next -the-Sea (converted) was another important malting town. A later canal example is Downings maltings in Merchants Road, Gloucester built in 1899 on the banks of

the Gloucester and Sharpness Canal, although it did have a railway siding as well. Another 19<sup>th</sup> century canal example, a magnificent stone built malthouse is to be found at Elland, West Yorkshire (fate not known) on the banks of the Calder and Hebble Navigation. All the above mentioned maltings belonged to firms of independent maltsters as opposed to being brewery maltings.

### **The Railways**

The main transport development of the Victorian period was the railway system. This encouraged the brewers, in particular, to site their maltings in the barley



*Figure 6. Thomas Berry, Sheffield Brewers' Maltings at Sherwood Road, Worksop, Nottinghamshire.*

growing lands. The most impressive example being the Bass Maltings at Sleaford completed in 1906. There were of course more modest examples of breweries with maltings at a distance but linked by a railway line. Truswell's of Sheffield had their maltings at Barnetby-Le-Wold in Lincolnshire (built 1875 and probably demolished by now), and Thomas Berry, also Sheffield Brewers who had their maltings at Sherwood Road, Worksop, Nottinghamshire (also built about 1875, and now demolished) [Fig. 6]. The London brewers, Whitbread had some of their maltings at East Dereham, Norfolk (part converted and part demolished), and Trumans also of London had maltings at Long Melford in Suffolk (part demolished and the rest converted).

Independent maltsters also located their maltings next to or near to railways, for example it would be expected that those in Victoria Road in Diss took advantage of the nearby railway line of late 1840s date. F. & G. Smith's maltings at East Dereham (un-used) and Great Ryburgh (working) were both adjacent to railway lines. A later railway example is Tuckers at Newton Abbot (working), built 1900 and extended in 1903, somewhat after the railway was opened.

### **Other locations**

Examples of breweries which appear to have had their maltings on site or nearby and with no transport links, include Cirencester, where the Cirencester Brewery had its maltings (all but the front

demolished) further down Cricklade Street. The Cheltenham Original Brewery had their maltings on site at the junction of Henrietta Street and St Margarets Road. The shell of the maltings still stands. At Langthorpe, Boroughbridge, (North Yorkshire) Warwick's Anchor Brewery had two maltings on site (converted). A railway line passed through the site separating the later malting from the brewery but it was not linked to it any way. Adnam's Sole Bay Brewery in Southwold, Suffolk had its maltings in the town. Of course the biggest concentration of breweries and maltings was in Burton-on-Trent. In this case some breweries had their maltings nearby or on the same site, for example Peter Walker, brewers had the Goat maltings in Clarence Street, and Salt and Co had their maltings on site, on Wharf Road, off Wetmore Road (part demolished and the rest re-used). Bass has already been mentioned, but besides and well before their Sleaford maltings, they had them in Burton itself, on Shobnall Road (demolished), Wetmore Road (converted) and the Plough Maltings, built in 1903, their only pneumatic maltings, in Horninglow Street. All the maltings and breweries in Burton were interlinked by railways.

Some malthouses, however, seem to have been built perhaps where land was available. An example is to be found in Derby on Forman Street (early re-use), where a large malthouse of late 1830s or early 1840s date was built with no immediate proximity to transport but in a town with an established trade in malt. A further example is the malthouse in St Andrews

Road, Montpellier, Bristol (converted). It was built over a railway line in the 1870s but had no siding and was operated by various malting firms so was not located especially near a brewery. Likewise the malthouse in Northgate, Pontefract, West Yorkshire (demolished) and probably of an 1880s date, had no direct connection with the railways, and this was probably the case with a number of Pontefract's other maltings, but Pontefract like Derby already had a well-established malt trade. The Warminster Maltings in Pound Street, Warminster (working), Wiltshire are another example of an urban maltings without water or rail links, and this lack of transport links applied to Warminster's other 19<sup>th</sup> century maltings. Again Warminster had an established malt trade in the 18<sup>th</sup> century. A pre-existing trade in malt seems to have led to maltings being established even when water or rail transport was non-existent or not so well developed, but which may have been served by the turnpike roads of an earlier period.

## **Invention and Innovation**

Throughout the Victorian period there were developments intended to improve malt production, making it more efficient and therefore more cost-effective. These improvements might be small developments, only finding occasional favour, or they might be widely adopted improvements. The malting industry is traditionally a conservative one and innovations were not always readily accepted with the

result that old methods were practised not just throughout the whole period but even well into the 20<sup>th</sup> century.<sup>4</sup>

The areas in which improvement were made included kilns, steeps, and ventilation. Other developments, such as changing power sources, and the movement of grain (conveying and elevation) were not exclusive to the malting industry, but resulted from improvements and developments in other industries which were then adopted in maltings. Thus steam power was introduced in some maltings but at a relatively late date compared with say the textile industry. Examples of maltings with engine houses include Beeston, Nottingham, Barnetby-Le-Wold, Lincolnshire and Salt's in Burton-on-Trent. Gas engines were probably far more common than is realised but little trace of them rarely survives and their mention is often a simple throw away comment that there was a gas engine in the corner of the building. One example is that at the Nailsworth Brewery Maltings (see below), and another is recorded at the Kimberley brewery's maltings.

It was the introduction of conveyors and elevators which eventually enabled multi-storey maltings to be built. The movement of grain meant less manual labour but also greater ability to move large quantities of barley and malt around. Malthouse No 4 at Weymouth had a complex conveying system, and many malthouses had bucket elevators installed, often by well-known firms such as Robert Boby.

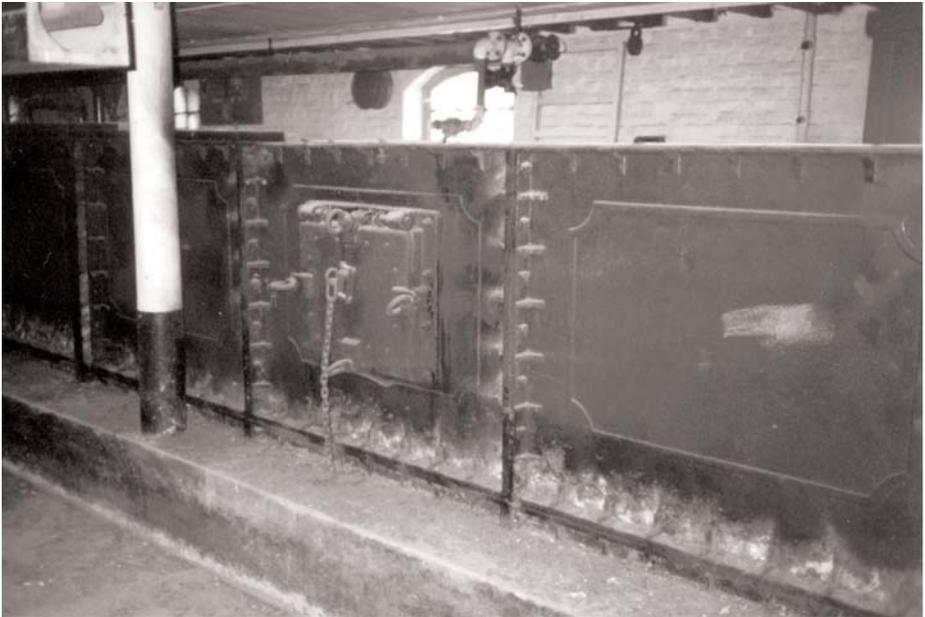
## Widespread Developments

The two developments specific to the malting industry and which had considerable impact were in the location and construction of steepes and the design of kilns. The former was initially governed by the Malt Tax, but the latter was not.

### Steeps

At the beginning of the period, in 1837, steeping cisterns had to be constructed in accordance with the strict legislation. As a result they had to have flat bottoms, with a slope of no more than ½ inch in each foot, and a depth of no more than 40 inches. The height above them had to

be 48 inches. The couch frame, the construction of which was also specified, had to be next to the steep and again with a height of 48 inches above it.<sup>5</sup> Thus the emptying of the steep was by manually throwing the wetted grain out and directly into the couch frame. This was a labour intensive procedure. It also tended to limit the location of the steep, in the earlier maltings to the bottom floor, always a germination floor, and later maltings to the middle floor. In this case it was possible to throw the steeped, and couched grain onto the germination floor adjacent to the steep and couch and to let it down to the growing floor below via chutes, and it was possible to throw it up to an upper



*Figure 7. Front of cast iron steeping cistern at Rigden's Brewery Maltings, Faversham, Kent.*

germination floor. The best example of this type of malthouse is Malthouse No 2 at Weymouth.

The steepers were constructed of either stone, in the very small maltings, but more usually of brick, and rendered to water proof them. Until the repeal of the Malt Tax in 1880 there was no possibility of any other design of steep. Afterwards, hopper bottomed steepers became popular and this meant the use of new material for construction - cast iron, and later steel. Hopper bottomed steepers had two main advantages in that they were self emptying thereby reducing labour and they could be located on an upper floor with their top in a barley storage area thereby reducing labour still further, for example at the Goat Malting, which was Peter Walker's brewery maltings, in Clarence, Street, Burton-on-Trent. Even when hopper bottomed steepers were not favoured, cast iron was still used for rectangular ones, and these too often had hatches inserted in the bottom so that they, like their hopper bottomed counter parts, could be emptied straight onto the floor below. Examples of this type are known to have existed at Rigden's Brewery Maltings in Faversham. Kent [Fig. 7], and at the old Maltings, at Warwick's Anchor Brewery, Langthorpe, Boroughbridge, North Yorkshire (converted to residences).

### **Kilns**

The first problem in considering kiln development until the later period is that of allocating a kiln to a specific date. Even

when the malthouse can be dated it has to be borne in mind that the kiln may not be of the same date. Kilns were changed and altered no doubt to improve their efficiency but also possibly because they were poorly or inadequately constructed in the first place. Broadly speaking, however, kilns were either open furnaces with no doors, or they were furnaces with doors, or they were fire basket furnaces.

These kilns continued in use but as new maltings were built, especially in the last quarter of the 19<sup>th</sup> century patent kilns were used. There were three main producers of such kilns: Robert Boby of Bury St Edmunds, Robert Free of Mistley, Essex, and H.J.H. King of Nailsworth, Gloucestershire. The last mentioned firm also produced heat regulators and was well-known for their production. Two others produced kilns/kiln drying floors. The first was Bryan Corcoran who vied with Robert Free and Henry Stopes for kiln developments. The second was E.S. Beaven who was better known for barley breeding but was involved in kiln design at the time of the arsenic in beer problem. His patent kiln of which there is only one known example is to be found at his Warminster Maltings in Pound Street, Warminster. The maltings still operates but not using his kiln which is well-preserved. The only examples of Robert Free's kilns to survive were those in his own maltings at Mistley, but there were examples of Boby's Kilns at Ketton (demolished/converted) in Rutland [Fig. 8], and at Beeston. H.J.H. King's kilns are known to have existed at the Cirencester



Figure 9. H.J.H. King Furnace, Malthouse, Clemthorpe, York.

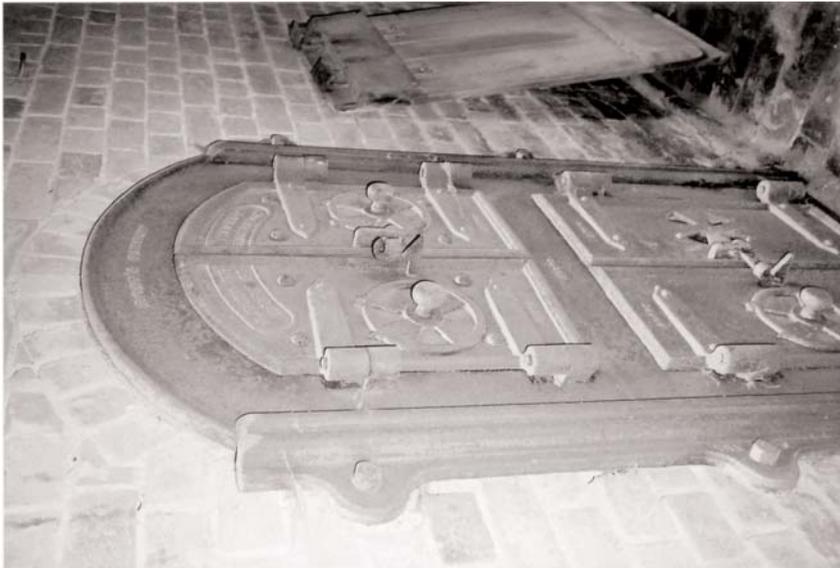


Figure 8. Bobby Kiln Furnace, the Maltings, Ketton, Rutland.

Brewery Maltings in Cricklade Street, Cirencester and at Clemthorpe, York [Fig. 9].

Not only were there developments in furnace construction but also in kiln drying floor construction. There were two main developments. The first was the progression from perforated ceramic kiln tile drying floors to wedge wire drying floors, although the former did remain popular and in use until the end of the 20<sup>th</sup> century. The flow of air through the wedge wire being far greater than through the perforated tiles. The second development was the introduction of double floored kilns, for example Merchants Road, Gloucester. The success of these is doubtful, certainly in the 19<sup>th</sup> century, as most examples which still survive seem to have ended up using only one of the floors, or the kiln itself only remained in use for a short time. Also there were improvements in the draw of air up through the kiln drying floors by the introduction of fans in the cowls, for example Blackman's fans.<sup>6</sup>

### **Specific Developments**

There were of course many other developments, but one improvement which does deserve mention is Last's Patent Ventilating system. There is only one known example of this in Malthouse No 4 at Weymouth and it resulted in the building, now converted to residences being upgrade and listed as Grade II\* [Figs. 10 & 11]. The most easily available description is to be found in H.E. Wright's *A Handy Book for Brewers*. The

second edition of 1897 states at page 71 that it was dependent on the draught created by the rush of air through the kiln fires. The arrangement consisted of a series of openings made in the short wall at the kiln end of each floor (a dozen or more to each floor) which openings have falling doors to close them. These apertures open into the space surrounding the kiln (the dunge). At the opposite end, (the cistern end) are similar openings but less numerous for admitting air from the outside and obtaining a longitudinal air current. Malthouse No 4 at Weymouth has the openings as described on each growing floor but not as many as 12. The original plans showed 24 apertures in the wall of the northwest kiln dunge and 18 in the wall of the northeast kiln dunge, however in this latter wall there was door access to the growing floors. In the northwest kiln it would appear that there were 12 apertures to the bottom growing floor, eight to the middle and four to the top, rather less on the top two floors than the description! However, the description does not give the kiln size, so this may have been a smaller kiln or perhaps reality did not match theory. This malthouse, like Malthouse No 2 was designed by G.R. Crickmay. In the outer wall, at the opposite end from the kiln there are just 6 apertures to each of the top two growing floors, making 12 in all. The apertures at the other end of the growing floors appear to have been built in accordance with the architect's plans.



Figure 11. Malthouse No 4, Weymouth - Last's patent ventilator - interior.



Figure 10. Malthouse No 4, Weymouth - Last's patent ventilator - exterior.

## The Innovators

Although hopper bottomed or self-emptying steeples came to be widely used, two men in particular were known to specifically promote them. They were Henry Stopes and Robert Free. There was certainly rivalry between these two men who both came from Essex and who both died in 1902, Robert Free on 24 January, and Henry Stopes on 5 December.<sup>7</sup> Each is sufficiently important for space to be devoted to them.

### Henry Stopes

Henry Stopes is probably best known for his book *Malt and Malting* published in 1885. This book became, in the later 19<sup>th</sup> century, almost the maltster's bible. It contained details on all aspects of maltings including the construction of maltings, the various types of kiln, details of minor and major pieces of equipment, and on what malt is and how it should be made, and some details on the history of malt. He was a great believer in a variety of improvements and in particular was a great advocate of self-emptying hopper bottomed steeples and double kiln drying floors.

He did design whole maltings but his forte seems to have been malthouse improvements. One example of his complete design is William Jones's Belle Vue Maltings in Shrewsbury. The building has been converted to offices, and probably no complete record of it now exists. An example of his kiln design is also to be found in Shrewsbury in another of William

Jones's maltings at a building far better known for other reasons, Bage's Ditherington Flax Mill which in 1884 was converted for use as a maltings by the insertion of cast iron hopper bottomed steeples and a double kiln drying floor to designs by Stopes. The double floor survived but had not been in use when malting ceased on the site in 1984. It has to be admitted that the kiln, the visible part of Stopes' work was essentially functional and certainly not attractive.

The *Brewers' Journal* records a number of works with which Stopes was apparently involved. In 1882 these included: a malthouse for Tamplin's Brewery at Brighton where a double kiln was installed and then one for the maltsters Giradot, Flinn & Co of Bishops Stortford.<sup>8</sup> Two years later Stopes was involved in the building of new kilns or the improvement of existing ones at Cameron's of Hartlepool, Messrs Crisp & Son, Beccles, Flowers & Sons at Stratford-upon-Avon, a seventh kiln for Giradot, Flinn & Co of Bishops Stortford, J. Green of Luton, J. Legg of Bridport, A Leney & Co of Dover, a second kiln, Morrells Trustees, Oxford (Morrells Brewery held Stopes' plans of these improvements), Phipps and Co of Northampton, T. Ramsden & Sons, Halifax, and The Redruth Brewery Co, Redruth.<sup>9</sup> Subsequent years of the *Brewers' Journal* give similar reports. There can be little doubt that Stopes had a substantial impact on the design of maltings whether large or small.

An extremely small example of his work

survives at two maltings in Nailsworth which is surprisingly well-documented. In 1883 a reference in the *Brewers' Journal* (page 149 refers to the work being undertaken by Messrs H. Stopes and Co and this included being 'engaged in adapting to their plans the maltings and kilns of Messrs Clissold & Sons, [Brewers] Nailsworth'. Unusually for a small town brewery, it was visited by Alfred Barnard and a record of his visit is to be found in his *Noted Breweries of Great Britain and Ireland*. He noted that there were two maltings located some 100 yards from the brewery and that they were of 15 and 30 quarter steep capacity. The No 2 malting had been recently built and was 80 feet in length and 32 feet in width and contained two cement steeps. The floors in both maltings were laid with asphalt and they were lighted with eight ventilating windows. The ceilings were supported on stout cast iron columns. Over the growing floors were spacious barley garner and malt stores. The kiln was a double one and both drying floors were laid with Hermann's patent wire flooring, and the green malt was delivered by a chain hoist worked by a gas engine. In the roof was a gangway on which the barley was wheeled in bins. No 1 [malting] kiln logie contained two open furnaces enclosed in brick chambers which were fitted with patent draught regulators and heat dispersers. The kilns' heat regulators were supplied by H.J.H. King according to their catalogue for 1906.<sup>10</sup>

### **Robert Free**

Robert Free was a practising maltster and

innovator. His malting business was established with Mr Rodwell in Mistley, and at Thorpe-le-Soken, Essex. The Thorpe-le-Soken maltings consisted of two built end to end, in 1875 and they were able to take advantage of the railway. Those at Mistley, and eventually there were seven, were built at a later date, mainly in the 1880s and the 1890s, with the last one, Malthouse No 7 being built in the first decade of the 20<sup>th</sup> century. All are or were impressive buildings, but Nos 1, 3, 4 and 7 being larger and with more floors than any others ever built in England. Malthouse No 1 on Mistley Quayside had eight floors, separate barley stores, an engine house with a massive chimney, and two barley kilns. It was built in 1897 but damaged by fire the following year.<sup>11</sup> Maltings Nos 3 and 4 in School Lane were built nine years earlier in 1888 and were of five floors.<sup>12</sup> Although near to the quayside these two maltings had no direct access and did not have a rail link (despite the illustration). From the malting point of view they were without a barley kiln. This was rectified when Malthouse No 7 was built adjacent to Nos 3 and 4 and linked by a gantry.

The survival of these maltings is mixed. Malthouse No 1 with its barley stores and barley kiln has been converted to mixed use. Maltings Nos 3 and 4 have been converted to residences, although most of No 4 was demolished in this process and No 7 which was damaged by fire in April 1995 has been demolished. Malthouse Nos 5 and 6 further up Mistley have very minimal remains surviving. Malthouse No

2 does survive and is the only one still connected with the malting industry as EDME, producers of malt extract is on the site.

It is known that in Malthouse Nos 1, 3, 4 and 7 that Free installed his patent kilns.<sup>13</sup> The *Brewers' Journal* also has references to other malthouses installing Free's patent kilns,<sup>14</sup> and to his patents.<sup>15</sup> With regard to the hopper bottomed steepers, these did exist in Malthouse Nos 3, 4 and 7, as well as No 1. The latter is the only one which has been recorded. Free's patent for steeping cisterns was taken out in 1882.

### **Pneumatic Maltings**

Probably the most important development during the Victorian period was the development of the pneumatic system of producing malt. Today pneumatic malting is synonymous with a pneumatic and mechanical system. This was not always the case and the early attempts to use pneumatic systems did not include the mechanical turning of the grain which was still turned manually.<sup>16</sup>

Also, it has to be admitted that pneumatic malting was never particularly successful in England until the second half of the 20<sup>th</sup> century. Although pneumatic malting is primarily associated with the last quarter of the 19<sup>th</sup> century, the first innovator in this line was Patrick Stead a successful Suffolk maltster of Scottish origins who in 1842 patented a pneumatic

method of malting. Some plans of his Halesworth maltings do survive, but his attempts at pneumatic malting were not successful and were not pursued. All that remains of his one substantial enterprise is a small malting block on Quay Street now converted to residences.

There was then a gap of some thirty years before there was a further successful attempt at implementing a pneumatic malting system, although there were largely unsuccessful attempts notably by Tizard. No known examples of his buildings survive. The two systems which were eventually successful and remained in use until the end of the 20<sup>th</sup> century were those of Galland and Saladin. The former produced the drum system of malting and the latter the box system. In the drum system the germinating grain was placed in a drum which was rotated to achieve the turning of the grain. In the box system, the turning of the grain was achieved by rotating screws being run backwards and forwards in the box. In the box system air was forced through the perforated bottom of the box and in the case of the drum system the air was forced through a central air shaft. However, Galland's first pneumatic malting system was not a drum malting but a box one, furthermore it was only pneumatic not mechanical. The grain was still turned by hand.

Galland's first pneumatic malting was constructed at Maxeville, near Nancy, France in 1873. It was then introduced into Ireland at Roscrea for Messrs Perry

and Co. In England the first pneumatic malting on Galland's box system was at Beeston, just outside Nottingham. It was constructed in 1878, for Messrs Waite, Corbould and Faulkner of the Beeston Brewery Company. It was closely followed by one for Messrs Flowers and Sons at Stratford-upon-Avon, and there was some contention as to which was the first, the one at Beeston or the one at Stratford but it was generally accepted that the Beeston maltings was the first pneumatic maltings. Two other pneumatic maltings on the same system were constructed shortly afterwards, firstly for Nimmo and Sons at the Castle Eden Brewery, County Durham, and then

slightly later for Messrs Sedgwick and Co at Watford.

Of these examples, the only building known to survive with at least its original shell is that at Beeston [Fig. 12]. The pneumatic maltings were part of the Beeston Brewery Company's premises, and the whole process appears to have been undertaken in one building. It is difficult to determine how successful it was, although an extension was proposed in 1884.<sup>17</sup> The whole building was converted to a floor malting for the Nottingham brewers Shipstone's in 1926. What happened to the other pneumatic maltings is not known.



*Figure 12. Beeston Maltings, Nottingham - the first pneumatic maltings in Britain.*

It is generally believed that the next successful pneumatic plant was the first Saladin Box plant built at Wainford, Ditchingham, Norfolk for R.W. Mann and operational in 1891. It survived into the last quarter of the 20<sup>th</sup> century but was demolished in the 1980s. However, references in the *Brewers' Journal* indicate that in the mid 1880s pneumatic maltings were under construction and that the Wainford box maltings may not have been the first. In 1884 there is a reference to the building of a new malthouse for a Mr L.. Brutton at Yeovil on the 'improved pneumatic and Stopes system'.<sup>18</sup> The costs included 'machinery in the basement - J. Saladin, Nancy £667. 0s. Od.'. The exterior of the malthouse was illustrated as the frontispiece in Stopes' book *Malt and Malting*. It is also worth noting that an illustration in the *Brewers' Journal* for the previous year, 1883, shows a Stopes/Saladin box with turning screws.<sup>19</sup> So clearly there was the theory available to construct a pneumatic maltings on the box principle but whether it worked is not known!

Likewise it has generally been accepted that the first drum malting plant was built for H.A. and D. Taylor at Lower Sheering in Essex. The first reference to its construction comes in the *Brewers' Journal* in 1894 when the plant designed by Inskipp and MacKenzie was under construction.<sup>20</sup> Work was completed and the malting was operation in 1896 when it was illustrated in the *Brewers' Journal*. This building does survive but has been converted to residences. However, again,

as in the case of box malting, there is an earlier reference to drum maltings in the *Brewers' Journal*, in 1891 when a Galland drum maltings was constructed for the distillery of Messrs Haigh and Co at Hammersmith, London.<sup>21</sup>

What is clear from a perusal of the *Brewers' Journal*, and it has to be remembered that by no means every pneumatic maltings constructed was noted in this publication, is that it was primarily brewers and distillers who were prepared to invest in pneumatic plant.<sup>22</sup> The method favoured appears to have been the drum malting system, although again this may only be a reflection of what was reported in the *Brewers' Journal*. The one exception was the above mentioned malting for H.A. and D. Taylor. The reason for the apparent reluctant uptake may lie in some of the history of the Wainford Saladin Box maltings. Its building and opening may not have been reported in the *Brewers' Journal*, but the financial demise of its owners was. In 1906 just 15 years after it started operating, the failure of R. & W. Mann, Suffolk maltsters of Ditchingham was reported and the cause of the 'failure' was given as 'heavy cost of pneumatic malting erected in 1891 and the fall in the value of our property'. The cost of the pneumatic malting was '£15,000 and upwards' whereas they had been led to believe the cost would be about £8,000.<sup>23</sup> Indeed even in the 20<sup>th</sup> century Ross Mackenzie noted 'the initial cost of installing the pneumatic system is appreciably higher than the primary

expenditure on the floor method, and the latter is maintained and worked more economically.<sup>24</sup>

The true extent of England's early pneumatic maltings will never be known. After an initial first flurry of building of pneumatic, but not mechanical plant in the early 1880s, there was a gap of several years before pneumatic and mechanical were constructed. Even then the uptake was relatively slow and pneumatic malting was never as popular as the floor maltings which continued to dominate the maltings built in the Victorian period.

## Conclusions

The malting industry is a notoriously conservative one. At the beginning of the period malthouses of two to four storeys were being built, whereas at the end of the period they were built with three to eight storeys. Generally there was an overall increase in size and smaller malthouses tended to be squeezed out of business. The repeal of the malt tax in 1880 which enabled hopper bottomed and self emptying steps to be used, helped to permit the increase in size, but this was not the only factor. The increased use of power and the elevation and conveying of grain (barley and malt) were also major factors in the increase in malthouse size. There was progress in other features such as kiln design and ventilation. There was certainly innovation by a number of men, notably Henry Stopes and Robert Free, and there were

numerous patents, many of which were probably not successful. By the end of the period fully pneumatic and mechanical maltings were in operation, but for many maltsters and even brewers, the outlay was too great an expense. The seeds of change had been sown, but real change, however, did not come until long after the demise of the Victorian period.

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My records on some 400 malthouses, ranging in date from c 1500 to c 1970.

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1. Patrick, A. (1996) 'Establishing a Typology for the buildings of the Floor Malting Industry'. *Industrial Archaeology Review*, **18** (2), 180-200.

2. See National Monuments Record, NBR 95749.

3. See Alderton, D. (2005) 'The chicken or the Egg? The Relationship Between Industry and Transport in East Anglia'. *Industrial Archaeology Review*, **27** (1), 121-128.

4. For example the 18<sup>th</sup> century malt-house and kiln at Brockhampton, Gloucestershire continued in production until 1939.

5. See Ford, W. (1862) *A Practical Treatise on Malting and Brewing with an Historical Account of the Malt Trade and laws deduced from 40 years experience*. London, 156 et seq.

6. See Stopes, 205 for an illustration of a Blackman fan.

7. *Brewers' Journal* for 1902, 75 and 700 respectively.

8. *Brewers' Journal* for 1882, pages 14 and 218 respectively.

9. *Brewers' Journal* for 1884, 315.

10. When this paper was given as a lecture on 25 February 2006, I commented that these maltings were not protected, that is they were not listed. Therefore, it will be of interest to readers to know that in my post on my return home was a notification that they had been listed, on 20 February 2006, at Grade II.

11. *Brewers' Journal* for 1897, 34 and for 1898, 390.

12. *Brewers' Journal* for 1888, October illustration.

13. The kilns in these maltings were seen by the author as follows: Maltings 3, 4 and 7 in July 1993 and Malting No 1 in March and August 2000.

14. *Brewers' Journal* for 1884, 252 refers to Messrs Benskin & Co of Watford erecting a new maltings fitted with double drying floors on Free's patent system.

15. *Brewers' Journal* for 1888, 107 refers to Free's patent for 'improvement in kilns for drying malt'.

16. See the *Brewers' Journal* for 1878, 332, and the *Brewers' Guardian* for 1878, 353 for a description of pneumatic malting at this date.

17. *Brewers' Journal* for 1884, 356.

18. *Brewers' Journal* for 1884, 213.

19. *Brewers' Journal* for 1883, 348.

20. *Brewers' Journal* for 1894, 334.

21. *Brewers' Journal* for 1891, 149.

22. Of some 18 pneumatic maltings constructed in England and noted in the *Brewers' Journal*, only two were for maltsters. The rest were for brewers or distillers.

23. *Brewers' Journal* for 1906, 115.

24. Ross Mackenzie, J. (1921) *Brewing and Malting*. Pitman, London, 26.