

# Beeston Maltings, Dovecote Lane, Beeston, Nottinghamshire

Amber Patrick

## Introduction

In December 2000 the production of malt ceased at Beeston Maltings. It was the last floor maltings to operate in Nottinghamshire. Malt had been produced there since 1878, but closure meant not just the end of malting at Beeston, but the end of Nottinghamshire's once extensive floor malting industry. Perhaps surprisingly, it was the floor maltings in the City of Nottingham which survived longest; Home Brewery's plant on Alpine Street and Shipstone's Eland Street maltings. The last floor maltings to operate outside Nottingham was in the once important malting town of Newark-on-Trent. Peach's (Gough's) closed their Spitals Maltings in 1980, although production continued at their Langwith plant, just over the county boundary in Derbyshire until 1991. The county's other important malting towns of Retford and Worksop had already ceased production with the last to close being Allbrew Maltsters Worksop maltings in 1975. Production in the small village and farm maltings had long since ended, so the closure of Beeston was a historically significant event in the county.

Beeston is located just to the west of the Nottingham (Fig. 1) and now forms part of its suburbs, but in the later 19<sup>th</sup> century it was a town in its own right. On its southern edge, and therefore away from the town centre, the railway lines from both Derby and Leicester ran eastwards into the City of Nottingham. Beeston Maltings was built within its own grounds on the north side of the railway line, just to the west of Beeston station. The buildings lie parallel to the railway line, aligned approximately east to west, and had their own sidings for much of the site's history (Fig. 2).

The Beeston Maltings were not a purpose built floor maltings. Originally it had been both the brewery and maltings of the Beeston Brewery Company, and the malting part was England's earliest pneumatic maltings.<sup>1</sup> Some documentary details do survive and, unusually, there is substantial written evidence on the development of the maltings and brewery. This is primarily due to their association with Frank Faulkner and his connections with the *Brewers' Journal*, (more details on Frank Faulkner are given in Appendix 1).



Figure 1. Location map.

### History: The Beeston Brewery Company, 1878 - 1922

The Beeston Brewery Company's premises were on Rylands Road (subsequently renamed Dovecote Lane), Beeston, Nottingham and was probably in operation as an unregistered company from mid 1878. In the July issue of that year an article in the *Brewers' Journal* refers to Galland's Pneumatic System of Malting, detailing its benefits, but giving no indication of which malthouses were using the system.<sup>2</sup> (For details see Appendix 2.) The September issue, however, clarifies that the July article referred to the large malting in the course of con-

struction near Nottingham by Messrs Waite, Corbould and Faulkner,<sup>3</sup> the first firm by some months to secure the royalty right to carry on Galland's patent system in England.<sup>4</sup>

This date is confirmed by a conveyance in Shipstone's archives dated the 12<sup>th</sup> September 1878, and an Inland Revenue Certificate of the 14<sup>th</sup> November 1878, both referring to the land on which the maltings and brewery subsequently stood as 'Meadow Land'. The December issue of the 1878 *Brewers' Journal* noted that the maltings were to have electric lighting for illumination - it was hoped that the experiment would prove successful!<sup>5</sup>

A mortgage from Shipstone's archives dated the 27<sup>th</sup> October 1879 refers to 'Pneumatic Malting Mills, Foreman's

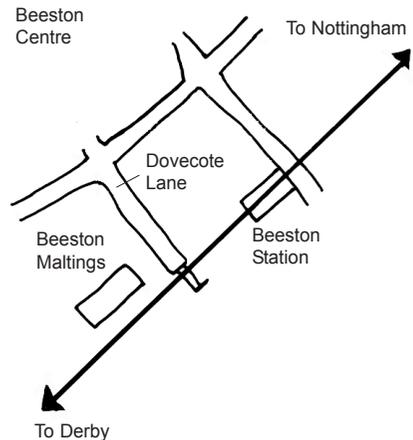


Figure 2. Area sketch plan.

Residence and stabling lately erected' at Beeston.<sup>6</sup> In the following year there is a note in the *Brewers' Journal* to the effect that the brewery had just been completed by Messrs Wilson & Co., brewers' engineers of Frome, Somerset. It goes on to state that the internal arrangements and design of the brewery were the work of Mr Wilson, and that the exterior had been made to harmonize with the pneumatic maltings.<sup>7</sup> Also in 1880 Mr Waite retired from the business with the result that the firm became known as Corbould and Faulkner.<sup>8</sup> A letter in Shipstone's archives notes that on the 13<sup>th</sup> December 1882 Messrs W. Showell, C. Showell and Frank Faulkner conveyed the maltings (and presumably the brewery) to the Beeston Brewery Company Limited<sup>9</sup> and in part this is supported by an entry in the *Brewers' Journal* for December 1882. This states that the maltings and brewery at Beeston were now fully worked by the Beeston Brewery Co Ltd. The company had been registered with a capital of £50,000 in 1,000 shares of £50 each and the share capital had all been taken up by the board. Furthermore, Mr Frank Faulkner had been appointed by his co-directors as their consulting brewer for a term of years.<sup>10</sup>

A further document in the archive dated the 2<sup>nd</sup> July 1883 refers to the land immediately adjoining Beeston Railway Station of the Midland Railway and the public roadway from the station to the village [of Beeston] and that the brewery and maltings are shown on the plan. The size of the building was given as

500,000 cubic feet, measured from the foundations 5 feet below the surface and include the Brewery and Malting erected for the main part about 6 or 7 years ago in a good and substantial manner and fitted with machinery and plant of modern construction and No 2, 14 horse power steam engine with boilers etc. ... In the yards are the stabling, cart shed & cottage residence for the manager and the WCs for the workmen a coopers workshop & well sidings from the railway with two large enclosed cages and hoist therefore to the various stories of the main buildings.

The letter further comments that the buildings were in good repair and the machinery was active and in good condition. There is a plan attached which is signed by Frank Faulkner<sup>11</sup> and this is significant because it is made apparent that by July 1883 the malthouse and brewery had reached their final westward extension. The north eastern addition (see below) is clearly missing as is to be expected, but there is also a smallish gap in the middle of the western half of the northern 'extension'.

It is clear from the above that Beeston was operating as pneumatic maltings from the outset and, from subsequent references, that they ran successfully. In October 1884 it was reported that the Beeston Brewery & Malting Co. was about to erect a fresh pneumatic malting and extend the brewery utilizing plans being prepared by Messrs Inskipp, Davison & Mackenzie.<sup>12</sup> The following year three tenders were submitted for

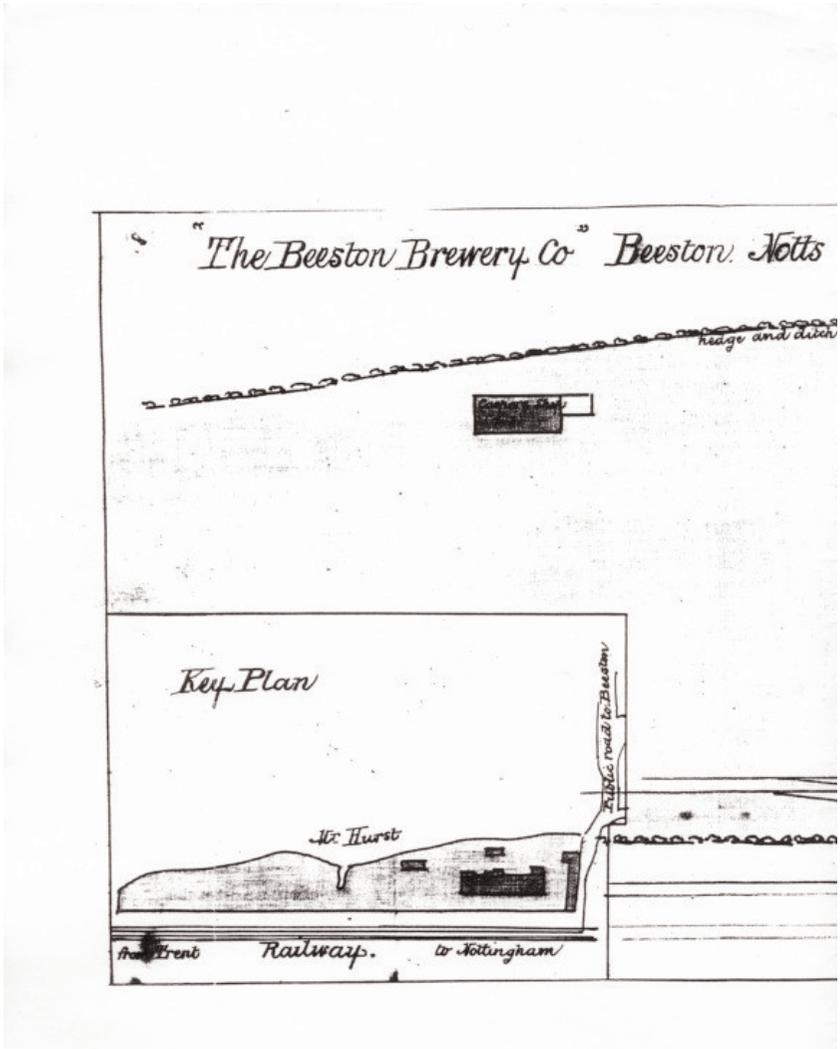
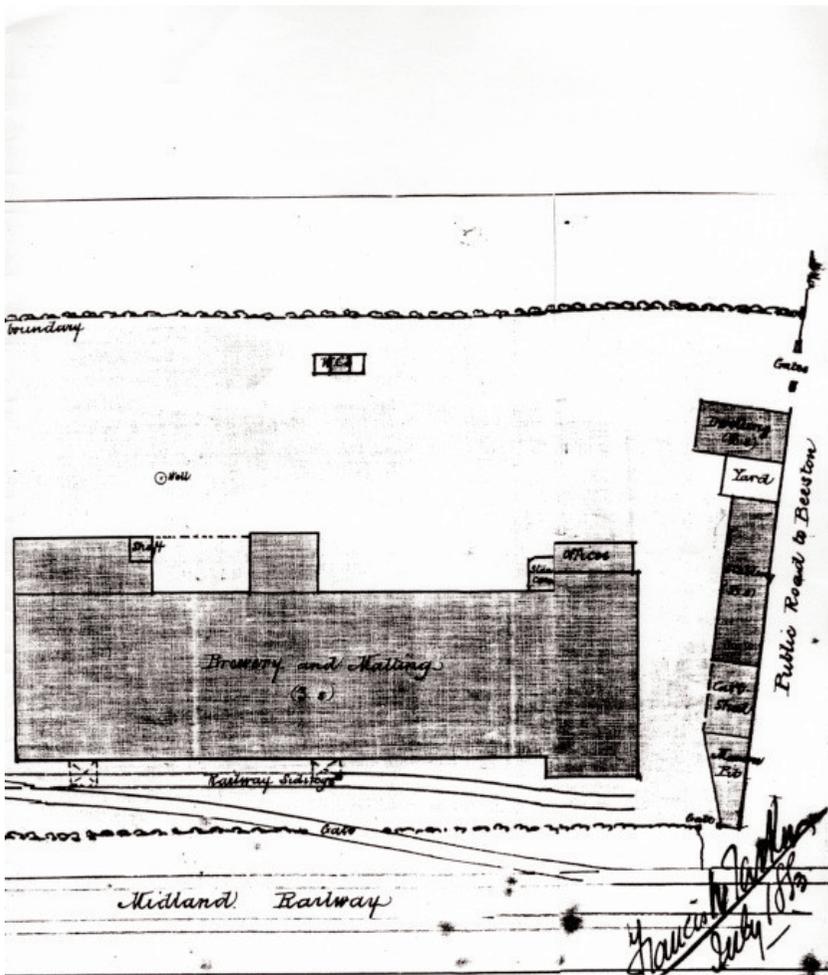


Figure 3. Plan of the Malthouse as a pneumatic maltings, 1883.



the work: J. Hodson & Son (£512.0.0); J. Budd (£472.7.0); and H. Vickers (£462.2.10). The last mentioned, the cheapest, was accepted and it is unfortunate that no further details are given about the potential contractors.<sup>13</sup> In fact the extensions were probably only to the brewery, not the maltings, and included new stores, coolers and a cooler room, and a hop back house.<sup>14</sup> The large scale, 25 inch Ordnance Survey maps for 1885 and 1901 reveal the differences and thus what was most likely added in this mid-1880s extension. The main building was made more rectangular in shape, by the in-fill of what is now the north eastern area of the germination floors, and the rest seem to have been additional structures to the north and west of the main building. It is useful to note that there was no westward extension between 1886 and 1901.

In 1886 Mr Faulkner had turners installed in the kilns.<sup>15</sup> These are described as being on the principle of Mr Perry's patent consisting of a revolving drum and shaft with blades and brushes travelling backwards and forwards along the kiln floor (see Appendix 3). The machinery was being made by Messrs Wilson & Co. of Frome, Somerset and was in operation in the maltkiln by June of that year.

On the 2<sup>nd</sup> October 1896 the New Beeston Brewery Company was registered as a limited liability company. This name was short lived because, in November 1897, the company reverted back to its original name of The Beeston

Brewery Company. Quite why these changes of names were necessary are unknown.

From time to time The Beeston Brewery appears in the *Brewers' Journal* under the section on company news, but unfortunately they are of little help with respect to its architectural history as they usually provide details of dividends. This of course was essential information for investors, but not so useful for 21<sup>st</sup> century industrial archaeologists! However, a more substantial piece in December 1900 notes that the brewery had 'been able to buy coke for malting purposes at between 8 shillings and 9 shillings cheaper than last year.'<sup>16</sup> Another report describes a long running court case between the Beeston Brewery Co. Ltd. and the Midland Railway Co.<sup>17</sup> This emphasises the importance of railway sidings to the company and indeed to other maltings and breweries. The rails of the sidings which linked the brewery and maltings to the main line were taken up on the 13<sup>th</sup> November 1884 and this not only severed their connections, but reduced the value of their property and caused great inconvenience to their business. The railway company expected them to have their goods loaded or unloaded at Beeston Station. The traffic amounted to 180 tons per week and it was almost impossible to deal with the brewery's traffic at Beeston station because the warehouse accommodation was very small, being only sufficient for three wagons. The station master for the last two years had been Mr William

Foster and he indicated that the taking up of the brewery's sidings had added inconvenience to the station yard. The case was eventually resolved satisfactorily.

Other references in the *Brewers' Journal* add less to our knowledge of the site, but provide human details. Thus it is recorded that Harrison, a traveller for the brewery from the 9<sup>th</sup> December 1882 to the 4<sup>th</sup> December 1886, left to work for a Newark brewer, Richardsons, which was just within 20 miles of Shire Hall and contrary to the agreement he had signed.<sup>18</sup> A later entry notes that a Mr George Stone, under brewer to Mr Faulkner at Langley and Beeston, was appointed to a large Australian brewery.<sup>19</sup> The census returns for 1881 might be thought to provide details on individuals, but linking a person who appears in the census as a maltster, brewer or labourer, specifically with Beeston Brewery and its malting, is impossible without other details. Such research is further complicated in this case as there was another maltings on the south side of the railway line, but just the east of the station. Neither Harrison nor George Stone appear in the Beeston census return, although there was a brewery traveller by the name of Frank Lewis.

There is an illustration of the brewery on a postcard dated to 1911<sup>20</sup> showing a view from the southwest. The quality of the card is unfortunately very poor and a large tree obscures the eastern end of the building, nevertheless it is possible to distinguish a number of features. The

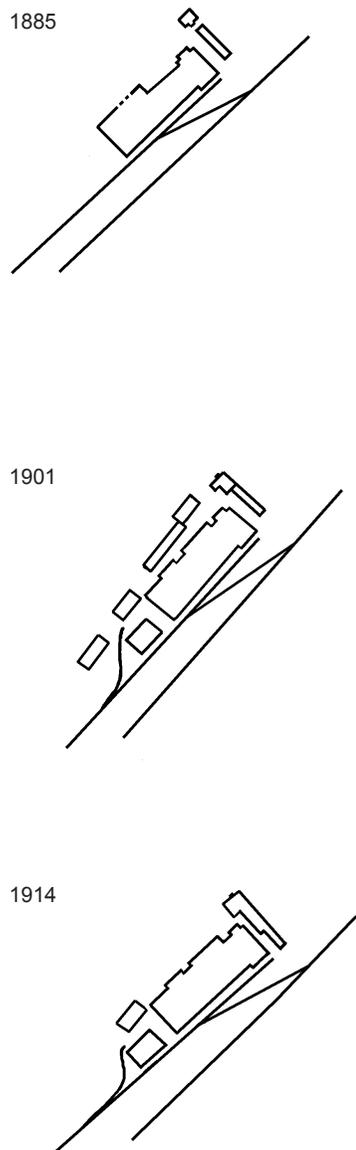


Figure 4. The development of the malt-ings from OS 25 inch maps.

west elevation of the cross wing (see below) is five bays wide, and the bottom floor appears to have a window or door in every bay, including the middle bay. The first floor has windows in bays separated by piers, and again there appears to be a door in the middle bay. These features are repeated in the second floor, but the third floor is different having just three windows, centrally located and close together, yet with the central one, above the middle bay door of the floor below, being taller than the others. This floor appears to be separated from the one below by a band of decorative brickwork. Finally, there is the top floor which has four or five broad and very definitely rectangular louvred windows. All the windows on these floors have segmental headed lintels. The south elevation of the cross wing was, as now, three bays wide and there is a wooden hoist housing to the central bay of the second and third floors. On the top floor the central window has a segmental headed lintel as now, but it is louvred like the two square ones on either side. These large louvred windows on the top floor indicate the location of the cooling and fermenting rooms.

A tall chimney can clearly be seen rising up behind the western end of the cross-wing. To the north of the cross wing, a single, or more probably two, storey building can just be seen. It had a sloping roof, which may have been a tall gable, and two tall windows with segmental headed lintels. It is not clear whether this was part of the engine house. There would also appear to be a building to the

west of the main brewery building, but the quality of the image is very poor in this area.

The part of the building which is to the east of the cross wing appears to be much as now with similar fenestration, dormers in the roof and the hoist housing occupying the seventh bay from the west. The present kiln section of the building is just about visible behind the trees and has a single gable which is at right angles to the main building. There may be a louvred ridge vent, although it is very difficult to see not only due to the vegetation, but also because of the condition of the photograph.

A large scale Ordnance Survey map of 1914 shows the establishment much as it is now. It also shows the chimney just visible in the 1911 photograph, and confirms that a building did exist to the west of the brewery. Unfortunately it does not appear to illustrate the structure which may have been the engine house; the building on the site is simply referred to as 'Brewery.' There is no mention of 'malt-house' which may be due to malt production having ceased by this date. Certainly only brewing was carried on at the site by the time of its closure and sale.

In 1922 the Nottingham brewers, James Shipstone and Sons Ltd, of the Star Brewery, New Basford, acquired a controlling interest in the company and brewing ended on the Beeston site, although the legal title was not conveyed until the 26<sup>th</sup> May 1924.

## Shipstone's Brewery and their No 4 Maltings, 1922 - 1990

Brewing may have stopped at Beeston, but Shipstone's did not leave the site unused. By April 1927 the brewery had been converted into a malting.<sup>21</sup> According to an article in the *Brewing Trade Review* the up-to-date maltings had been designed by Messrs Evans, Clark & Woollatt, architects of Nottingham, and the machinery had been supplied by Robert Boby of Bury St. Edmunds. Considerable detail is provided on the layout of the building. The barley

could be unloaded on the southern side if it came by rail, and on the northern side if it came by farm cart. It was then elevated to the top of the malthouse and transferred onto a band conveyor, run by a 15 h.p. motor, in the roof apex.<sup>22</sup> From the conveyor the barley was dropped into the storage bins with a total storage capacity of 10,000 quarters. The barley was steeped in one of four conical hopper bottomed steeps, made of steel, each having a capacity of 30 quarters. There were two germinating floors, and each was fitted with overhead trams and swing barrows. The kilns were

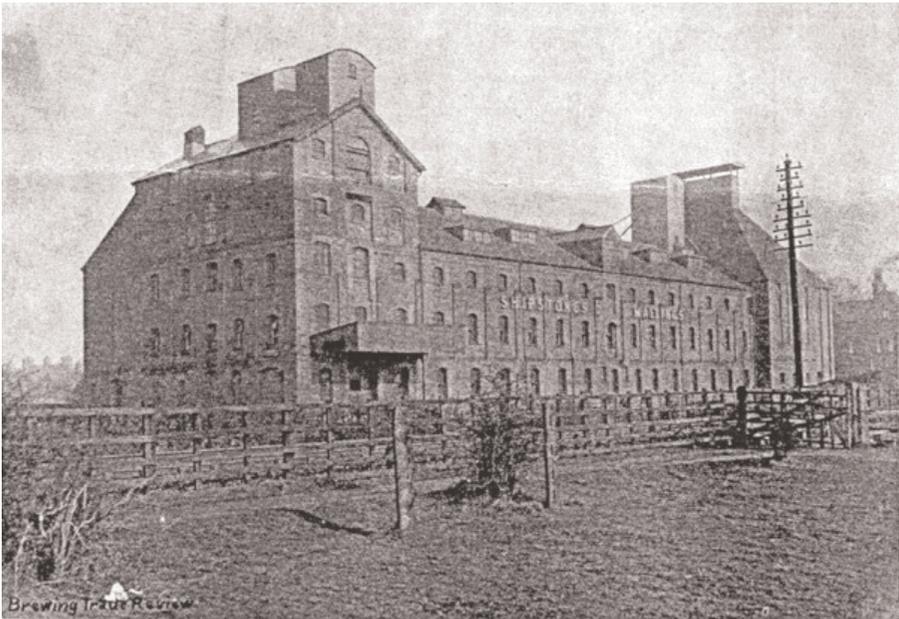
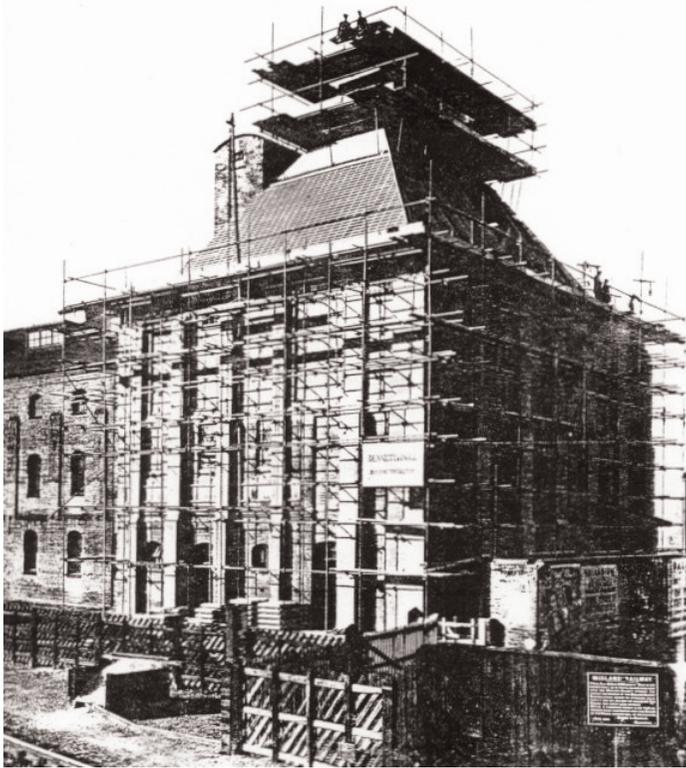


Figure 5. Illustration of Beeston maltings (from the south west) taken from *The Brewing Trade Review*: April 1927.



*Figure 6. Construction of the malt kiln for Shipstone's Brewery taken from The House of Shipstone, A Short Historical Survey published privately 1953.*

loaded by elevators, one kiln being 56 ft long and 42 ft wide, having two furnaces and a kiln turner. The malt stores were situated around the furnace shafts. (The parts of the kiln furnace which survived at closure had Bobby's name on them, as did the overhead barrows, and the screen (grain cleaning machine).) The kiln was used for barley sweating as well as kilning the green malt.

Shipstone's called this their No 4 Maltings, their other malthouses being spread around Nottingham. In 1895 one was located at 195 Highbury Road, Bulwell and by 1912 they are recorded as having others at 46 London Road, 4 and 6 Mosley Street, and Bond Street.<sup>23</sup> There was also a malthouse between Eland Street and Radford Road, known as Shipstone's Eland Street maltings, built in 1930-1.



Figure 7. Exterior from the south east - modern kiln.

For most of Beeston Maltings' history it produced malt for Shipstone's Brewery and therefore for the beer which was brewed for the workers in Nottingham's textile industry and the county's coal miners. There were several alterations and improvements to the building under Shipstone's ownership, and some of these enabled it to continue in production when others were closing. There is one illustration from the pre World War II period showing the rebuilding of the kiln in 1936. It would seem that the single cowl was installed at this date.<sup>24</sup> In 1978 Shipstone's Brewery was taken over by Greenall Whitley of Warrington, but brewing continued at Basford for a while. Inevitably malt production was due to cease at Beeston.

#### **Moray Firth Maltings and Bairds Malt Ltd, 1991 - 2000**

In February 1990 there was a serious fire at the Home Brewery's floor maltings on Alpine Street, Basford, Nottingham, and as a result new premises had to be found.<sup>25</sup> The Beeston maltings were due to become vacant so Moray Firth took them over in January 1991. Consequently, Shipstone's No 4 Maltings became The Beeston Malting Company - a trading name of Moray Firth Maltings supplying malt to micro-breweries. A number of modernizations were carried out, but the basic building remained the same. Subsequently, in 1999, Moray Firth became part of Bairds Malt although Scottish and Newcastle retained the

ownership of the building, granting the company a lease. This lease was terminated in 2000 when development plans were drawn up and malting ceased on the 19<sup>th</sup> December 2000.

### **The site and the buildings**

This description of the site and the buildings on it is intended not only to show the maltings as it was at closure, but also to include, where possible, details of some of the changes which have taken place over the years.

The malthouse and its associated buildings are set in their own grounds, running parallel to the northern side of the railway line and to the west of Beeston Station. When the building was in use as a malting the sidings were employed to bring in barley and coal, but the import of the latter ceased in the late 1960s, probably 1968, when the kilns were converted from coal to gas. Bringing in barley by rail ended well before then.

At closure the buildings on the site included the brick built maltings with its modern kiln at the eastern end. At the western end of the maltings, and forming part of it, was the modern hoist housing system and external stairs. This new structure rises to the roof level of the main building and the original slate hung hoist housing. The modern hoist housing projected to both the north and south of the maltings. Attached to the northern side of the kiln was the office building, an original 19<sup>th</sup>

century feature. At the north eastern edge of the site and adjacent to the road was the original manager's house. At the west end of the maltings and technically detached from them were eight modern, round, metal grain silos. There was also a weigh bridge on the northern edge of the site. Originally there was a donkey engine house on the north side of the brewery/malthouse. Sometime after 1980 the little engine house, which had been used for pumping water until the 1940s, was demolished.

### **The buildings**

The following description of the malthouse, both exterior and interior, is as it was at closure, not as it was when constructed as a pneumatic maltings and brewery.

#### **Exterior**

The main brewery/malthouse building is a long red brick building with a slate roof. There are three floors plus a fourth loft storey. The kilns are at the eastern end and form a distinctive feature, although they too have been modernised over the years, so that at closure they were no longer recognisable as malkilns, having neither the typical pyramidal roof structure nor a cowl. A number of distinctive features do survive, although few are typical of a maltings or indeed a brewery. Probably the most noticeable elements are the elevator housings which still

dominate the roof line, especially the five storey cross wing at the western end of the building.

### **The main part of the malthouse**

The main section of the malthouse is all that part of the building to the west of the kilns, and it includes the cross wing as well as the long elevations.

The cross wing, which was not part of the original 1878 building, is three bays wide (east to west) in the south elevation with windows to each floor. The middle bays probably had taking-in doors, although any other external evidence of hoist housing has gone. Like the rest of the building there are few ornamental features, apart from piers between the bays, and some slightly decorative brick work above the windows. The roof line is broken by elevator towers which have windows in them. The east elevation also has windows at top floor level.

The rest of the south elevation is architecturally uncluttered. The fenestration is regular, although the windows of the two bottom floors are rather large and less typical of a maltings. The top floor windows are smaller, with the exception of the window under the lucam which goes down to the floor level, suggesting that originally there were doors there for taking in. Brick piers separate the bays up to the level of the top floor cills, but they do not extend up to the eaves, perhaps indicating that the top floor was altered

at some date prior to 1911. There is very little decorative brickwork, although there are some bands of brickwork under the eaves which might be said to be ornamental. The roof of the south elevation has five dormer windows, and a canopy or lucam for the original hoisting equipment. The four most easterly windows are on one level, but the most westerly is slightly lower. The lucam is between the second and third dormer windows from the west, and towards the eastern end there is a ridge window.

The north elevation is more varied. At the eastern end the present two storey office, which abuts the kiln and is of domestic proportions, juts out. It has double windows at ground and first floor levels, one above the other, and either side of a large window which has a segmental headed lintel. The two light sash windows have flat headed brick lintels. Of more interest is the semi-octagonal tower which houses the original stairs and is lit by narrow windows. It has what might be described as a fake castellated top and is the only really decorative feature of the whole building which is otherwise severely functional. To the west of the tower the building again juts out to the full height of the maltings. This section (or extension) is an early addition to the original malthouse and brewery building. The surviving map evidence indicates that it probably predates the building's floor malting phase. This section thus has an eastern elevation which has windows on all three floors in its northern bay and a window in the apex of the gable. All the windows are

rectangular in shape. The northern elevation of this section is of seven bays with the central three ones in a gabled section, and the bays are delineated at upper level by stepped brick work. The once louvered vent to the malt screen protrudes from the eastern side of the central gabled roof. To the west of the extension, the elevation is again plain as on the south elevation. The windows are regularly spaced and, like the south elevation, those on the bottom two floors are taller than those on the top floor. Again the hoist housing in the cross-wing is visible, although the cross wing itself is almost completely obscured by the modern grain elevator system.

### **The kilns**

The kilns, of which there were originally two, are in a block at the eastern end of the building. The construction is of brick panel and pier in a bluff and robust form, and matches the rest of the south elevation. The east elevation is of a similar construction and like the main part of the maltings, the kilns are of three storeys. There are now no windows or doors except on the ground floor, with those in the south elevation having suffered least alteration. There was a door and a canopy to the east elevation, but both were altered when the kilns were modified in 1985.<sup>26</sup> This 1985 additional structure is approximately one storey in height and of hard red brick with no architectural features and no windows, none being necessary. The nature of the

original 1878 roof structure is not known, but from 1927 until 1985 it had a single dominant, pyramidal, slate roof with a substantial ridge vent type of cowl. The 1985 kiln is surmounted by a steep hipped slate roof. All semblance of a typical kiln has gone.

### **Interior**

The original layout of the maltings was typical: the barley was stored in the loft, and then steeped at one end of the building (the western end). It was grown on the working floors in the middle section of the building, and was kilned at the end of the building opposite to the steeps, the eastern end. Malt storage was in flat-bottomed, wooden bins on the floor above the top growing floor.

### **The main part of the malthouse**

There are two germination floors. The bottom one (Fig. 8) has a beautiful red quarry tile surface, with the tiles laid on the diagonal. The cast iron columns which carry the upper or top germination floor appear to be close set and are much taller than those usually found in a maltings, appearing more typical of a brewery (but see discussion below). The columns in the body of the floor support jack arching of shuttered concrete. There is some additional support approximately half way down the germination floor and additional steel I shaped columns have been added. The bottom floor northward exten-



*Figure 8. The bottom germination floor from the north east corner.*

sion of two bays also has a central row of cast iron columns, but they have small flanges, like couch columns, and, at the eastern end, the floor above is carried on I shaped girders, probably steel, which in turn support wooden beams. This eastern end would appear to be the 1885/6 extension. The western half of the extension is carried on 'I' shaped columns and flat as opposed to arched, shuttered concrete. The northern wall of the original building is supported on a substantial steel girder held by 'I' columns. It is not clear whether this structural steel work is the result of the 20<sup>th</sup> century conversion of the building from a brewery to a floor maltings or whether it was earlier and occurred when the building was extended in the 1880s. Some of the cast iron

columns in the original main part of the building have the maker's name on them: 'B. New & Co Maker Nottingham'. Originally there were Boby overhead buckets to move the grain around the bottom floor (extant in 1980). The windows have shutters across the bottom part and the upper is glazed.

The upper germination floor is less dramatic with a plain cement screed surface, the northern extension being similar to the floor below. The upper section of the original external wall of the building can be seen as it is supported on a steel beam which in turn is supported by I shaped columns. Like the floor below, it is not clear whether this structural steel work is the result of the 20<sup>th</sup> century con-



*Figure 9. The top of the steeping cistern.*



*Figure 10. The bottom of steeping cistern.*

version of the building from a brewery to a floor maltings or whether it was earlier and occurred when the building was extended in the 1880s. The next floor up, which is the malt storage floor, is carried on standard, if tall, cast iron columns which support double sets of longitudinal timber beams. Again the floor to ceiling height is good and not typical of a maltings. At the western end of the floor are the bottoms of the four conical steeps. They drain directly onto this floor and have a simple self-emptying mechanism. The steeps (Figs 9 and 10), which are now painted red, are constructed of steel plates strongly riveted together. Both the germination floors are the full width of the building north to south and both have

had air conditioning installed to assist with ventilation in the warm summer months. It was fitted by Shipstone's, but was undersized and not as effective as it might have been.

The floor immediately above the top germination floor was the original malt storage floor. It is a timber boarded surface with flat-bottomed timber malt storage bins either side of a narrow corridor. Originally the bins were closed off by boards slotted into groves in vertical timbers at each side of the bin's mouth. The floor above (Fig. 11) is carried on timber columns which support robust beams and timber joists. In the northern extension, which on this floor is separat-



*Figure 11. The roof structure - note the timber chutes and the iron bracing to the beams.*

ed from the main part of the building by an internal brick wall (probably the original external wall), is the Bobby rotary malt screen (Fig. 12). It is more modern than examples found in other malthouses, but it still has nicely finished timber work casing. It is powered by an electric motor and all the moving parts are operated by belt drives protected by wire mesh. The malt is transferred by metal cased chutes. Also in this area, to the immediate west of the Bobby screen, is the Porteus Malt Mill<sup>27</sup> (Fig. 13). At the extreme western end of this floor, and

therefore in the cross wing, are the tops of the four hopper bottomed steepers. The steepers are separated from the rest of the floor by a brick wall with a wooden board lining. The floor above the steep area is supported on substantial girders. There are windows in the northern, southern and western walls having the same iron frames as are found in some other parts of the building.

Barley storage was originally on the loft floor. This is largely an open floor space divided into open bays by the roof struc-



Figure 12. Bobby rotary malt screen.



Figure 13. Porteus Malt Mill.

ture (see below), although there are some wooden partitions and each bay was served by wooden chutes from the overhead conveyor. The floor is of timber boards and the sides of the walls, between the floor and the roof, are of vertical tongue and groove timber boards. The height of the wall at the sides is approximately the height of a sack of grain. The dormer windows provide some light and the access to the hoist in the south elevation still survives, although it is no longer operational. The floor is no longer used for barley storage which is now in the silos at the western end of the building. In the cross wing at the western end is a modern barley dresser which replaced an earlier example. The cross wing also houses a few wooden storage bins which, like the malt storage bins on the floor below, are made by inserting boards into grooves at either side of the front of the bins. When required the dressed barley was dropped into one of the four conical hopper bottom steel steeping cisterns, via one of two weighers.

The barley storage floor in the main part of the building gives directly onto the underside of the roof which is lined with vertical timber boarding. The roof structure, which is queen post, is a combination of wood and steel, with the steel work by Dorman Long & Co Ltd of Middlesbrough. The queen posts are of timber on the 'back', but with steel on the 'inside,' the steel members having a small flange to the underside of the beam. The timber 'back' rises to the junction with the princi-

pal rafter which, in any case, is protected by a steel shoe that in turn has a tie rod down the back of the timber post to the tie beam/floor. There are side braces which are strapped at their junction with the principal rafter and they are further strengthened with a tie rod to the main beam/floor. This roof structure was a surprisingly substantial and robust one.

In the apex of the roof is a timber boarded walkway that appears to be supported by pairs of timber columns above which



*Figure 14. The original main stair case shown on plan of 1883.*

ran the conveyor. From the conveyor chutes ran to both the top barley storage floor and the malt storage bins on the floor below. The chutes to the malt storage floor are so substantial that they appear to be structural features.

The original access between the floors was by the stone spiral staircase located adjacent to the kiln block, but reached from the eastern end of the germination floors on the northern side of the building (Fig 14). Part way down is a recess on the eastern side, just below the first window, which may have the base plates for line shafting. This stairway was probably part of the original building. The alternative access was by a series of ladders and hatches at the south west corner of the building.

### The kilns

The kilns are at the eastern end of the building. The 1927 furnaces, of which there were two, were provided by Robert Boby of Bury St. Edmunds, and were in standard brick shafts (Fig. 15). One of the original kiln furnaces survived with its cast iron doors, but the upper pair are in fact beautifully executed wooden reproductions, presumably because the original ones were damaged or 'lost'. There are two vertical side ventilators, one on either side of the furnace, and each has a vertical sliding slip to control the air flow. Also, there is a regulator above the furnace which retains its heat control mechanism. The original kiln floor was of



*Figure 15. Kiln furnace by Robert Boby of Bury St Edmunds the upper doors are wooden replacements.*

perforated tiles, however it was changed to wedge wire in the early to mid 1950s. In the late 1960s, probably 1968, the anthracite fired Boby kilns were replaced by gas fired models. The kilns are surprisingly high which created a better natural draught, but, in consequence, a great deal of heat was used. In the 1970s a heat recovery unit was fitted together with as a basic electronic instrument panel for temperature control. The pres-

ent pressure kiln was installed in 1985<sup>28</sup> featuring a heat recovery system with an indirect thermal fluid gas boiler. The pre-heated air is forced through the grain. The kiln has a punched metal floor which necessitated an updated control mechanism and the addition of a computer. In 1995 an automated loader/stripper machine and computer controls were installed, replacing a grain thrower for loading and a Redler shovel for stripping. The kiln is emptied by dropping the grain through the floor at the western end. The hot air chamber under the kiln floor is typical with a spark plate between the top of the furnace and the drying floor.

### **Other features**

It is also worth noting that there are timber marks on some of the main beams of the storage floor. A number of Boby or malt barrows remain for moving steeped barley/malt around, and one hanging barrow survives. There is also a very large wooden kiln stripper and a variety of malt ploughs, Robinson turners and power shovels, all of which were in use up to the final day.

### **The floor malting process at Beeston**

The basic floor malting process has altered little over the years, but times and temperatures have changed. There have also been developments in the methods of moving the grain, from hand shovelling, to steam power, and finally to elec-

tric power. Fuels for kilning have also altered as has the method of measuring, not just from imperial to metric, but, with it, a shift from a largely volume based system to a weight based one.

### **Later production under Shipstone's**

The process was still largely seasonal despite the introduction of air conditioning, malt production starting in September and continued until the second week in June. Throughout the summer the maltings were then limed (cleaned) and repaired as necessary ready for the next season's harvest. The barley used was all English with the majority coming from Lincolnshire, Norfolk and Suffolk, although, pre-Second World War, foreign barley had been used. In the post war years the barley malted included Archer, for a short time, then Proctor, Maris Otter, Golden Promise, and more recently Triumph, Halcyon, and Pipkin. Since Beeston only malted for Shipstone's it was their malting manager who decided which variety would be processed in any one season. The barley was mainly dried at Basford where there were two gas fired drying drums which could work 24 hours a day. Most of the barley was stored at the Eland Street maltings, although some was kept at Mosley Street. It was brought by lorry to Beeston, in consequence the railway sidings were rarely used for bringing in barley. Once at Beeston it was dressed prior to use in a large screen with three drums, like the present Boby

screen. This was a very efficient piece of machinery. This screen was subsequently replaced by a Spanish one. The offal (waste material which might be anything from small stones, husks and half corns to other rubbish) was graded and bagged off. During the summer shut down barley was also taken in at Beeston, dried on the (malt) kiln, and stored in one of the silos outside. Then in the 1970s the barley storage plant was extended to the current set of silos and a Cimbria drier was installed, thus removing the need for the barley drying on the kiln. It also meant the barley intake was moved from the Dovecote Lane end of the maltings to the western end of the building. A weigh-bridge was also installed.

At this time six tons of barley went into each steeping cistern which meant that 24 tons could be wetted at any one time. Steeping lasted from 45 to 55 hours; rest and wetting times depended upon the harvest. There was no CO<sub>2</sub> extraction until 1981. The distribution of the wetted barley onto the growing floors was by overhead barrows and, in warmer weather, the steeped barley was spread out more thinly. The new piece of steeped barley had to be spread out to the right length and, if a piece needed lengthening, it was easier to shovel it by hand. Growing on the floor would be for about nine or ten days and during this time it was turned, originally by hand, with shovels, but later mechanical means have been used so the skill of using a shovel is gradually dying out. Prior to mechanisation 14 to 16 men would be employed

doing this work. By 1980 there were just six, plus a foreman. When the green malt was ready to be kilned it was shovelled into Bobby barrows and tipped into the elevators. Stripping using a power shovel was introduced in 1977. The elevators conveyed it to the kilns. The green malt was dropped from overhead chutes into Bobby barrows and then it was levelled out on the kiln floor. Later, in 1983, a grain thrower was fitted and used to load the kiln, but hand levelling by shovel was still required, especially around the edges. Before the installation of gas fired kilns a large paddle wheeled turner, which ran the width of the kiln, was used to turn the malt. Kilning lasted for three to four days at a temperature of 125 F to 135 F. (51 C to 57 C) and fans operated during this period to ensure the humid air was effectively removed. By the end of the third day of kilning the moisture content had been reduced to 4%, and the fans were closed off for the final day's kilning at 250 - 260 F. (121 C to 126 C). This part of the kilning gave the colour and flavour to the malt.

The kilned malt was stored in the bins on the floor above the top growing floor, but in the 1980s these bins were replaced by modern malt silos. Originally, when the malt was stored in the wooden bins, it was loaded by the hoist in the north elevation (next to where the malt mill was later installed) onto lorries for conveying to the brewery. When the new malt silos were added this system of loading changed and there were two dedicated bulk loading-out bins. Under the old man-

ual system the malt was sent to the brewery in sacks, but with the changes during the 1980s bulk haulage was introduced. The malt produced was for mild ales and bitter beers brewed by Shipstone's, but when it was taken over by Greenall Whitleys some malt was also sent to Wilderspool, Warrington. The first load was transported to Greenall's on the 6<sup>th</sup> February 1986, and from the August malt was also sent to Davenport's.

### **Production in the 1990s for Moray Firth (Bairds)**

The barley was still stored in silos outside the original malting buildings. It could be unloaded from the lorries at the rate of 50 tonnes per hour and held in 2,100 tonne silos before being dried in a gas fired Cimbria drier at the rate of eight tonnes per hour. From there the barley went into a holder hopper prior to being dressed and kept until required. There was a total storage capacity of 2,400 tonnes. Steeping was in the original conical hopper-bottomed steepers. The quantity steeped in each vessel was 7½ tonnes, making a total steeping batch of 30 tonnes. In 1994 a steep water heating system was added, reducing the steeping time from three to two days and resulting in both a change in the production cycle and increased productivity from 3,200 to 3,750 tonnes per annum. The steep water was warmed to about 15 C and there were two or three changes of water during each steeping. CO<sub>2</sub> was extracted automatically. The steeped barley was

then distributed on the growing floors using a Bobby barrow, not the overhead ones which had been removed during the 1980s, and it was then spread by hand. Each floor had a capacity of 30 tonnes, equivalent to one steeping batch. Growing took five days and during this time the piece was turned using Robinson turners and was ploughed by hand. The pieces were then moved to the kiln using Redler power shovels,<sup>29</sup> green malt being kilned for two days. The modernization of the kiln in 1995 removed the need for men to work within it and this meant that more time could be allocated into sacking up the malt to meet the increasing demand from the micro breweries.

The first load of malt for Moray Firth went to Grantham on the 18<sup>th</sup> January 1991, followed by a batch for Allied Breweries (Allbrew maltsters). From May 1991 onwards malt was being sent directly to the following breweries: Redruth (Cornwall), Everard's (Leicester), Eldridge Pope (Dorset), Sam Smiths (Yorkshire), Crown Buckley (Cardiff), and Marston's (Burton-on-Trent), the latter being supplied until their take-over by Wolverhampton and Dudley. From 1992 onwards Moray Firth also began supplying micro breweries. Introduction of the Beeston Malting Company trading name, combined with its remote commercial operation, helped distinguish it from the other branches of Moray Firth who supplied its larger industrial and export customers. The malt mill was brought in from Matthew Brown's Brewery in Blackburn,

when it was closed by Theakstone's (then owned by Scottish and Newcastle) to provide pre-ground malt, a new niche market not catered for previously by large maltsters.<sup>30</sup> The computer system was expanded in 1997 to handle the increasing number of customers which by then exceeded 100. It also gave a more professional commercial appearance to an industry which has often appeared conservative. Unusually, Moray Firth never had their own vehicles for transporting their malt.

### **Working the maltings**

Phil Plumbley and Stan Blythen have spoken of their experiences working the maltings. Phil Plumbley started work at Beeston on the 14<sup>th</sup> February 1954 whereas Stan Blythen was a relative new comer having only worked at the maltings from 1977.

When Phil Plumbley began in 1954 there were eleven men working at the maltings. Most walked to work making it almost a pre-requisite that they lived in the Beeston area, within a mile or so of the maltings. The men were hired only for the malting season which ran from October (the time of Nottingham's Goose Fair) to May, although some of them might work at the brewery during the summer months. During this period there was no planned shift rota, an employee would just be told when he had a day off. For example, Phil Plumbley worked the following number of hours in January 1969:

8½ hours on a Sunday, 10 on a Monday, 11 hours on a Tuesday, Wednesday off, 8½ hours on a Thursday, 10 hours on a Friday, 8½ hours on a Saturday - long days.

It was not until 1977 that men were employed on a permanent basis, although in the same year the number was reduced by two when power shovels were introduced, one power shovel per growing floor. There were several experiments with the flooring; for example, placing young piece on one side (the north and south sides) of the floor and on the other side the old, but as each needed differing amounts of ventilation this system did not work very well. Another trial involved each floor having two pieces of different ages, the new one always being nearer the steeps, however this method of flooring was labour intensive.<sup>31</sup> The most efficient was one batch per floor, although not right up to the walls. Sometimes the new piece would not be spread out to grow the day it was brought onto the floor, it all depended upon the temperature (weather). On one occasion it remained in the couch<sup>32</sup> three days before it was spread out into 'gardens' (an unusual term for breaking out the couch). The piece was usually grown for ten days. The green malt was then conveyed to the elevators in Boby barrows, the same ones which were used for spreading out the green malt on the kiln, so the wheels were taken off and they were man handled from the bottom two floors up the spiral stone staircase to the kiln, a hard and tricky job. Once the green

malt was on the kiln it had to be levelled out. The turner got plenty of air into the malt. It took 25 minutes to travel across the kiln and that allowed just time to drink a pint. The kiln fire was full for two days and then damped down in the afternoon of the third day. The coal (anthracite) fire had to be made up three times during the day and during the evening. A night man came on a 10pm, a particularly lonely job. All the coal came in trucks from the railway line and these had to be pushed manually which required great effort until they started to roll. Working in the maltings is a way of life.<sup>33</sup>

### Analysis and discussion

When the maltings at Beeston ceased production their layout as a floor maltings was typical and relatively straight forward with the steeps at the opposite end to the kiln(s). In consequence the production of malt started at one end of the building and ended at the other. Historically, however, the buildings are most important as the first pneumatic maltings in England. The pneumatic system never gained the same popularity in England as it did in Continental Europe. New large floor maltings continued to be constructed in England in the early 20<sup>th</sup> century with Shipstone's Eland Street maltings, designed by William Bradford and completed in 1930, being a late, although not the last, floor maltings to be built.<sup>34</sup> So Beeston was an interesting experiment and an important part of pneumatic malting history.

### The development of the building

An examination of both the documentary evidence and the building clearly show that it was subject to at least two extensions, although it would appear that it was in its final footprint form by 1901 according to the Ordnance Survey map of that date. The two most obvious additions were firstly the westwards one, the area subsequently referred to as the steep house or cross wing, and secondly the northwards one, which increased the width of the growing floors and upper storage floors. The plan of 1883 does not show the northward extension at the eastern end of the germination floors, but the westward extension was part of the main block by then. It was almost certainly the completed brewery of 1880 referred to in the *Brewers' Journal* of September of that year. The brewery is described as being designed by Messrs Wilson & Co brewers' engineers of Frome, Somerset. The architect or designer of the maltings is not given, but it is reasonable to assume that it too was Messrs Wilson & Co. The next extension was that mentioned in the *Brewers' Journal* for 1884, this being designed by Davison, Inskipp and Mackenzie. This addition was the north eastern extension, although an examination of the exterior indicates that the northern elevation to the east of the cross wing was probably redesigned/rebuilt.

The 1911 postcard shows the building as it is now except for the kiln, but there is one feature which requires further com-

ment and that is the present second floor and the loft floor above it. It can be seen that the brick piers which separate each bay only reach to sills of the windows on the second floor. This may indicate that the building originally only had two floors, a ground and first floor, or at least if there was a second floor that it was semi-loft. That the present roof structure is later than the lower original part of the building is supported by the use of Dorman Long roof trusses. Dorman Long only started producing steel sections in 1886,<sup>35</sup> after the date of the first extension, and possibly after the date of the second. However, it is just possible that they were part of the second extension. The first reference to this addition is in the *Brewers' Journal* of 1884 and the tenders are reported in the July edition of the journal. Work on the brewery part of the extension was complete by February 1886, but other works, including that on the roof, could have continued into 1886. If that was the case then this was an early example of Dorman Long's structural steelwork. Of course, the roof structure may have been later than 1885/6, but it was certainly part of the building bought and converted by Shipstone's in 1927, and according to the evidence of the post card of 1911 was there at that date.

### **Pneumatic malting at Beeston**

Galland had patented his pneumatic system in 1873 and the maltings at Beeston was constructed some five years afterwards. The descriptions and illustrations

given in the *Brewers' Journal*, *The Brewers' Guardian* and Stopes' *Malt and Malting* show that this first type of pneumatic malting was a box system, and not the drum system for which Galland later became best known.<sup>36</sup> As the maltings was built two years before the repeal of the Malt Tax in 1880 the steeps and associated couch frame would have had to comply with the rigorous legislation which controlled their construction. The steeps would have been rectangular, flat bottomed ones. The wetted barley would have been shovelled into the adjacent couch frame, also rectangular and flat bottomed, where its volume would have been measured by the excise man to determine the tax payable. There would have been no possibility of using self-emptying hopper-bottomed steeps, like the ones installed in 1927.

Probably the majority of the movement of grain would have been by hand shovelling, although a basket and hoist system could have been used to fill or empty the pneumatic box. Certainly, with the deep layers of grain in the boxes, it would have been hard, labour intensive work turning it manually and that it was moved by hand shovelling is confirmed by the description of how this box system worked (see Appendix 3).

The fact that this early pneumatic system was still confined by the legislation of the Malt Tax is made clear in E.G. Hooper's *Manual of Brewing* of 1891, fourth edition, which on page 81 refers to the fact that Galland's system

varies from the ordinary process only in the treatment of the grain during the germination period - that is between the operations of steeping and kiln-drying.

Hooper goes on to say that it was

capable of use even under the old Excise regulations, which insisted that the grain in the process of manufacture into malt should be so treated that at any time it might be readily gauged by the Revenue Officer.

It was also claimed that the method enabled malt production all year round.

What is clear from the various descriptions is that this system of malting was purely pneumatic. The turning and moving of the grain was done by hand shovelling, not by machine. Therefore the change was the method of aeration, once done by turning with a shovel, to a pneumatic one with the air being sucked through the grain. In theory it was considered possible to malt for most of the year, including the warm summer months, but whether this pneumatic system was suitably efficient in reality is doubtful. Once a maltings was both pneumatic and mechanical it became much more labour efficient. The malting at Beeston never appears to have been mechanical, it was always only pneumatic, in consequence it would have remained a relatively labour intensive operation.

There is no indication of either how proficient this pneumatic maltings was, or how robust - did it need frequent repairs?

Initially it must have been relatively successful because there is proof that a second plant was being considered, although there is no evidence that it was ever built. Later progress, in the form of the pneumatic and mechanical maltings, overtook this early pneumatic enterprise and the whole building became a brewery before being converted back to a traditional floor malting. There is no clear evidence to show just how long the pneumatic maltings remained in operation. Even the early 1885 Ordnance Survey map only refers to the building as "Brewery", yet kiln turners were being installed in 1886. There are no certain references to its operation after that date, but that does not mean that the pneumatic plant was no longer in operation. The 1911 post card is unfortunately not of sufficient quality to be able to determine whether or not the kiln was in its present position and had a cowl which might have indicated that it was still in use.

### **The pneumatic malting in the building**

Linking any part of the present building to its pneumatic malting phase is problematic and therefore it is difficult to determine how the pneumatic system fitted into the building. It is relevant to consider whether the boxes ran east to west along the length of the building, or north to south, across the building. Neither arrangement seems very satisfactory. So, do any of the features in the maltings give an indication of the way the

boxes were positioned in the building or where the coke chambers may have been located? The short answer has to be 'no'.

The diagrams in the various publications indicate that a good floor to ceiling height was required, unlike ordinary malting floors, and that at the end of the boxes there were coking chambers. The need for a good ceiling height may be the explanation of the height of the bottom two germination floors. However, there is no certainty that both floors would have had pneumatic boxes on them. As for the coking chambers there are no obvious signs of their locations, although it is possible to exclude certain parts of the building. As indicated above, the cross wing was probably the 1880 brewery extension and therefore it could not have housed the coke chamber(s), nor could they have been in the northward extension added in 1885. The diagrams show windows along the length of the boxes and the texts refer to them at the ends. The diagrams also show two boxes either side of a central flue. What does appear certain is that the coke chamber had a blank wall behind it. That could have been the wall to the cross wing or the north wall (the present one is part of the post 1878 extension(s)), either set up would be feasible.

Unfortunately, none of the diagrams include a scale nor are any measurements given in the accompanying descriptions. There is just one reference to dimensions and that is given in Hooper's *Manual of Brewing*. Here he

refers to the use of this pneumatic malting system being installed and that there should be 12 to 18 inches (30 to 45 cms) between the bottom of the box and the floor level. If this was the case and the diagrams of the boxes are more or less to scale, then they show that there was approximately six feet above the floor of the box, plus the 18 inches (45 cms) under the box, giving a total height of seven feet six inches (2.3 m). It should also be noted that the coking chamber had a greater depth. In consequence the whole system probably had a height or depth of at least eight feet (2.5 m) and possibly considerably more. What is clear from this consideration is that there is no way the steeped and couched grain could have been thrown into this type of box from ground level. The most likely set up is that of the steep and couch being located on the floor above the boxes. Although steeps before the repeal of the Malt Tax had to be flat and had other restrictions placed on them, there was nothing to prevent them being located on an upper floor.<sup>37</sup> Therefore, the steep and couch were on the first or second floors depending upon whether there were boxes on both the ground and first floors. It seems more likely that the boxes were only located on the ground floor.

## Conclusions

At closure in 2000, Beeston Maltings was the last floor maltings operating in Nottinghamshire - it meant the end of a piece of economic and social history.

From an industrial archaeology point of view it appeared less important, the building was not constructed as a floor maltings and, when closed, it did not resemble a typical malthouse. There was no recognisable kiln, although it was there. The windows, although regularly spaced, were larger than a typical maltings and resembled more those of the local textile factories than those of a building associated with the brewing industry. However, its history was more complex and more interesting than was immediately apparent. It was known that it had operated as a pneumatic maltings, but little detail was then available.

Tracing the history of the building has revealed a number of important factors. It was cited as the first pneumatic malting in England, one that pre-dated the repeal of the Malt Tax and all the difficulties it imposed on maltsters. It was a pneumatic malting which was worked on Galland's early box system and not the drum system for which he later became best known. It was also a maltings with an early kiln turner. There remain many unanswered questions such as how grain was moved from steep to box, and from box to kiln, and where each part was located in the building? Despite these gaps in our knowledge, Beeston Maltings remains a very important part of England's malting history.

It is rare that a record of a building is complete and Beeston Maltings is no exception.<sup>38</sup> Had I know in the autumn of 2000 what I know now, then no doubt

other details would have been documented. Whatever its fate, there is at least some record of the building as Nottinghamshire's last working floor maltings and England's first pneumatic maltings.

## Acknowledgements

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## Maps

Ordnance Survey Map: 25 Inch County Series: Nottinghamshire Sheet No 41/16, Editions of 1885, 1901, and 1914.

## Site Visits

Visits to the maltings at Beeston on 1st March, 1980, 9th October, 2000, 8th January, 2001 - interviews with Phil Plumbley and Stan Blythen with the assistance of Steven Click.

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Copies of correspondence held by Howard Rees: a letter dated 13 December, 1982 from James Shipstone & Sons Ltd to Mrs J. Naylor, Chilwell, Nottingham; copy of a letter dated 2 July, 1883 from Francis Tasker, 2, John Street, Bedford Row, W.6 to W. A. Richards, Nottingham, and headed "re Negretti's Trust and the Beeston Brewery Proposal", together with plan; and a copy of the photograph of the rebuilding of the kiln in 1936 from The House of Shipstone 1852 - 1952 published by James Shipstone & Sons Ltd, Nottingham (anon).

## Appendix 1

### Frank Faulkner

The involvement of Frank Faulkner with the Beeston Brewery and its maltings was fortunate because his close association with the *Brewers' Journal* meant that developments at the brewery and maltings were reported more frequently than they might otherwise have been.<sup>39</sup> Furthermore he was a pioneer in modern brewing methods and was well versed in the continental brewing and malting methods, including pneumatic maltings and double floored kilns.

Currently, the early history of Frank Faulkner is unknown, but by 1879 it is clear that he was connected with the pneumatic maltings at Beeston. By 1880 there is a note in the *Brewers' Journal* on the National [Brewing] Exhibition stating that he had been responsible for a new brewing arrangement [perhaps Beeston] and that the work had been carried out by Messrs Wilson and Co,. His address, however, was given as The Brewery, St Helens, Lancashire. The *Brewers' Journal* in August 1882 referred to the fact that he had long been connected with its editorial staff, and certainly his earliest publications in that journal were some seven years earlier in 1875. The article also mentioned that for nearly 14 years he had been managing brewer at Messrs Greenall and Co's St. Helens Brewery. From September 1882 his address was to be either of The Brewery, Beeston, Nottinghamshire, or The Brewery,

Langley Green, near Birmingham. It was at this latter address that his laboratory and consulting office were located and, in consequence, his links were closer with that brewery than with the Beeston Brewery. It should be emphasised that the laboratory was a separate entity from Crosswell's Brewery (Langley Green, Oldbury). Some years later, in October 1889, the *Brewers' Journal* reported the move of his office from Furnival's Inn to 35, Queens Square, Bloomsbury, London.

In his early years Frank Faulkner was a prolific writer on brewing matters with much of his work appearing in the *Brewers' Journal*. By 1879 his output also included papers specifically on malting and, in 1884, he published *The Theory and Practice of Modern Brewing*. By the 1890s he was somewhat less prolific, but he continued to write on malting aspects with 'Modern Malting Notes' in the 1891 *Brewers' Journal*, and "A new aspect of the malt question" also in the *Brewers' Journal* of 1891 (December). Rather more importantly he translated, with D.C. Dobbs, Pasteur's work *Etudes de la Bière* from the French, the English title being *Studies in Fermentation*. He was also well versed in the Henning Drum System of Malting according to a book review in the *Brewers' Journal* for September 1890. Despite Frank Faulkner writing extensively, he never seems to have used the Beeston Brewery as an example of how any particular system might have worked.

Frank Faulkner seems to have had close links with the firm of malting and brewing

engineers and architects, Davison, Inskipp and Mackenzie. They have an advertisement in his book *The Theory and Practice of Modern Brewing*, and it states that reference should be made to Mr Frank Faulkner, thereby probably indicating that he would provide references in respect of their work. This might be said to be confirmed by the fact that the firm had designed plant for Greenall & Co.'s St. Helen's Brewery, where Frank Faulkner had spent some years as managing brewer. They also designed plant for Showell's Crosswell Brewery at Oldbury. The firm of Davison, Inskipp and Mackenzie were also well versed in the continental malting and brewing systems and adept at installing double floored kilns. Inskipp wrote a pamphlet on The Pneumatic Malting System in 1885.

## Appendix 2

### Perry's Patent

The details of Perry's patent were given in the *Brewers' Journal* in November 1882 (Vol. 18, p. 347), and were as follows:

1223 - Malting, kiln drying and turning grain; A. Perry, Roscrea; 14 March, 1882. This consists in the use of a travelling wheel, shaft or cylinder with buckets or blades attached thereto, which as it revolves works the substance circumferentially over the wheel, thereby turning it. The blades are preferably radial and parallel with the axis and revolve at a far greater speed than that at which the shaft travels horizontally.

## Appendix 3

### A description of Galland's Pneumatic malting system

This description is taken from the *Brewers' Journal* for November 1878, but the same description is also to be found in the *Brewers' Guardian* of the same month.<sup>40</sup>

We now supplement a short technical description with two illustrations. In the accompanying plan AA represents the germination chambers, with a perforated bottom. These chambers at the beginning of the process are filled with grain to the desired depth as shown in Figure 1 leaving at one end a space B unfilled with grain. The space B in each compartment serves for the men to stand on when beginning to turn the grain and as they throw the grain behind them, they walk towards the other end and a corresponding space B is finally left at the other end of the same compartment after one turning is completed. The coke filters in Figure 1 and 2 are marked EE; P is a pipe conveying the water used for cooling and moistening the coke. F is the fan for sucking the air through the grain and sending it upwards through the filter. The arrows indicate the direction which the air currents induced by the fan take. The perforated bottoms are supported by a convenient number of low transverse walls forming flues and leading into the central flue C. by slides which are made to cover the outlets D (of which eight are shown in this plan) the suction of air on each part of the perforated bottom can easily be regulated. These slides can be provided with handles

easily worked from the central passage over flue C. T is a door leading into this passage. GG are openings with slides allowing of either continuous circulation of the same air or partial or entire admission of fresh air as desired. (Local circumstances have to be

taken into consideration.) The wall dividing the coke chambers from the germinating chamber has openings H at the top, through which the moist air, regulated by the coke bed with regard to its temperature, passes to the germinating chambers.

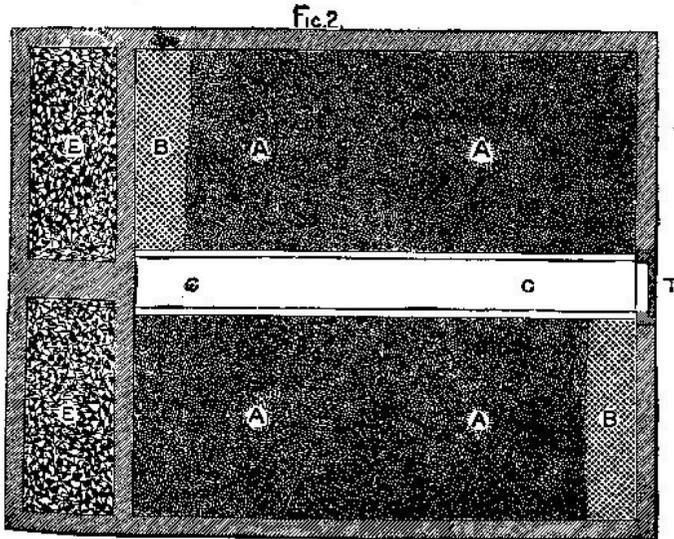
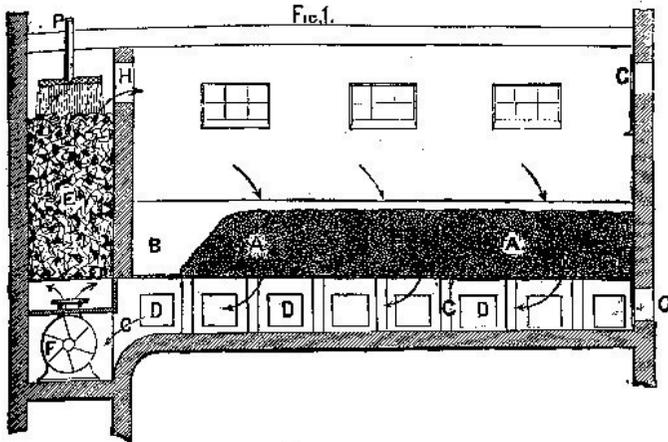


Figure 16. Illustration of a pneumatic maltings taken from Egbert G. Hooper's Manual of Brewing published in 1891.

## References

1. *Brewers' Journal*, Vol. 14, July and September 1878.
2. *ibid.* Vol. 14, July 1878, p.211.
3. A later letter in the Shipstone's Archive dated 1882, of which the author has a copy, shows that these three were Frank Asher Waite, John Corbould and Frank Faulkner.
4. *Brewers' Journal*, Vol 14, September 1878, p.268.
5. *ibid.* Vol. 14, December 1878, p.363.
6. Information supplied by Howard Rees in September, 1985, and copies of correspondence given to me in August 2001. Unfortunately it has not been possible to trace the present whereabouts of these documents. They do not appear to be in Nottingham Archives.
7. *Brewers' Journal*, Vol. 16, September 1880 p.288.
8. *ibid.* Vol 16, March 1880 p.84.
9. Letter from Shipstone's Brewery to Mrs J. Naylor, dated 13 December, 1982, copy supplied by Howard Rees. As the reference in the letter is in quotation marks, it implies the writer was copying from another document. It should be noted that Messrs Showells also operated the Brewery at Langley Green, Birmingham. This brewery was also known as Crosswell's Brewery.
10. *Brewers' Journal*, Vol. 18, December 1882, p.367.
11. Copy of a document included with the letter from Shipstones to Mrs Naylor. See note 4 above.
12. *Brewers' Journal*, Vol. 20, October 1884, p.356.
13. *ibid.* Vol. 21, July 1885, p.252.
14. *ibid.* Vol. 22, February 1886 p.62.
15. *ibid.* Vol. 22, February 1886, p.62.
16. *ibid.* Vol. 36, December 1900 p.696.
17. *ibid.* Vol. 21 various months, 1885.
18. *ibid.* Vol. 23 February 1887, p.76.
19. *ibid.* Vol. 19 November 1883, p.385.
20. Nottinghamshire Record Office (NRO) DD/5/H, 5/1/11 - 13.
21. *Brewing Trade Review*, April 1927, pp.157-8. I am indebted to Mike Bone for drawing my attention to this article.
22. See below in the section on the description of the building.
23. The various trades directories listed in the bibliography.
24. Illustration from *The House of Shipstone 1852 - 1952* published by James Shipstone & Sons Ltd, Nottingham (anon.). A copy of this illustration was provided for me by Howard Rees.
25. Moray Firth were the malting arm of Scottish and Newcastle who had acquired the Home Brewery in 1986.
26. Information supplied by Howard Rees in September, 1985.
27. Porteus were a Leeds engineering firm specialising in barley and malt screens and other brewing equipment.
28. See note 17.
29. Redlers were the successors to H.J.H. King of Nailsworth.
30. Information supplied by Steven Click.
31. This method was very similar to the piece method of malting where the piece or batch of malt was moved, as a whole, down the floor as it grew until it was adjacent to the kiln and ready for kilning.
32. Originally the couch was the part of the malting process when the volume of malt was measured for excise purposes. Later the term couch referred to steeped barley

discharged from the steep and heaped up to gain a little heat prior to being spread out on the floor to grow.

33. For a comparative account of working maltings from oral history see Patrick, A. (2002) 'The Brooks Maltings (Dalgety site), Mistle', *Essex Archaeology and History*, Vol. 33 pp. 340-2.

34. The last floor maltings to be built was Sander's at Grimsby a replacement for one destroyed by second World War bombing.

35. See note 43 in Clarke, J. (2002).

36. See Appendix 3 for a description of the pneumatic system.

37. No 2 Malthouse at Weymouth, built 1862, had its steep on the middle of three germination floors, and Allied Breweries malthouse on Sherwood Road, Worksop, built about 1875, also had its steep on the middle of three germination floors.

38. Fortunately Beeston Maltings was

photographed by English Heritage (formerly the Royal Commission for Historical Monuments England) just before closure.

39. *Brewers' Journal*, Vol. 18, August 1882, p.218.

40. *Brewers' Journal*, Vol. 14 November 1878 p.332, and the *Brewers' Guardian*, Vol. 8 November 1878 p.353. It should perhaps be noted that there is an illustration on p.255 in Corran, H.S. (1975) *A History of Brewing* of Galland's Pneumatic Malting Apparatus which states that it is taken from Thausing's Treatise of 1885. This illustration is different from that which appears in the *Brewers' Journal*, the *Brewer's Guardian* and on p.242 of Stopes, H. (1885) *Malt and Malting*, and p.83 of Hopper, E.G. (1891) *Manual of Brewing*. The illustrations in all these sources coincide with the description given in the two trade journals.