

The Mechanical Malting Company, Millend Mill, Eastington, and the Sleemans.

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Introduction

In the GSIA Journal for the year 2000, Stephen Mills's article on Millend Mill was published. He noted that the former textile mill had been converted in c. 1895 to a maltings. He commented that it was not known whether the maltings which operated between c. 1895 and the early 1930s lived up to the name of the company and operated as a pneumatic maltings. Stephen Mills also noted that the mill and maltings had been operated by the Sleeman Brothers, John and Oliver, and that they had a long history of milling around Portishead (Bristol) and Taunton.

The author visited the mill on 26 February, 2001 together with a member of the former Royal Commission on the Historical Monuments of England, now part of English Heritage. The building was only investigated from a maltings point of view. Its use as a textile mill was not considered on this occasion. The only recognisable maltings feature was the kiln. In consequence the description of the buildings from a maltings point of view is brief.

This short article fills in some of the gaps in respect of the building's history as a maltings and the activities of the Sleemans. The information for its maltings history comes from the *Brewers Journal* which the author has consulted with what seems now a rather unfortunate and arbitrary end date of 1931! Full details of the articles quoted can be found in the relevant *Brewers' Journals*.

The Buildings

It is more usual when reporting on a building to give its history, and then a description of the building. In this instance, as very little of the building which was clearly used as a malthouse and which was recognisable as such survived until conversion, it is appropriate to start with the structure.

Exterior

A red brick malt kiln was attached to the former stone built mill building, at its north west corner. Therefore the south east elevation of the kiln is the only joint wall. The roof to this brick structure is now a plain gable covered partly by slates and partly by pantiles.

The north east elevation shows that other buildings, now demolished, were attached to the kiln. This is confirmed by the illustration in Stephen Mills's paper which shows that the demolished structure was a cottage (1). There were also a number of windows and doors in this elevation. There is no obvious regularity to them nor any apparent reason for their location. Of note was a door at upper (top) floor level which appears to be associated with a gantry. There were what appears to be a tie bar but this may have been a later feature.

The north west elevation again has various blocked windows in it. Of particular interest was the rounded corner to the south west elevation. Of the various blocked windows in this elevation, of note are two broad ones with arched tops which are almost truncated by the rectangular windows above. Like the north east elevation there are ties, standard cross ones just under the present roof level and bar ones extending round the curved corner and two I section beams protruding from the wall below the large curved windows. It was difficult to determine whether the ties were random supports for the building or features related to its

malting, or later uses.

The south east elevation again has blocked apertures, including one as opposed to two broad curved top windows with a rectangular one immediately above. It is worth noting that the top bar which crosses the southern most broad window in the north west elevation also crosses the one in this elevation.

The main mill building is of four and five storeys and what survived of the kiln in 2001 was more or less a five storey building. The most interesting and unexpected feature was the blocking of the windows in this main stone built mill building by perforated kiln tiles. Two types were discernible and one was probably by Stanley Bros of Nuneaton and the other type appeared to be of a type manufactured in Bridgwater, Somerset.

Interior

The only area inspected to any extent was the brick built kiln. All the windows and doors were blocked, although an iron frame of six lights did survive in one window. The frames for two kiln drying floors did survive. Both were gridirons upon which the 12 inch square perforated kiln tiles could rest. The bottom floor rested on I shaped steel beams and so did the one above. The whole of the upper floor structure appeared to be slightly lighter in weight than the lower one. There was also what appeared to be a chute between the two floors, from the upper to the lower. In the north west wall of the kiln were two arched openings and above them two ordinary window apertures. These correspond to the externally visible blocked windows and the externally visible I section beams. Viewed internally it was possible to say that both sets of apertures were between the two drying floors. Finally, what appears to be the arched shape of the kiln furnace was visible on one wall.

The Sleeman Brothers

The 19th Century

From a malting point of view, a J Sleeman appears in the monthly patent lists in the *Brewers' Journal* over a long period of time. The details noted are given below. Thus on 23rd February 1894 patent number 3,916 was issued to a J. Sleeman, London for "Improvements in the method of malting and drying grain" (2). Whether it was the John Sleeman who was subsequently involved with the maltings at Millend Mill is not known. On 11th April of the same year patent number 7,232 was issued also to a J. Sleeman, London for "Improvements in the method of treating the air supply for malting cylinders or chambers" (3). Unfortunately no further details are given. On 27 August, 1898, patent number 18,412 was issued to S. White and J. Sleeman, London for "Improvements in the method of malting, drying and otherwise treating grain and the like...." (4). The next patent for a J. Sleeman would appear to be definitely the J. Sleeman involved with the Mechanical Malting Company since the details were given as "Apparatus for malting grain" - S. White of Taunton and J. Sleeman of Portishead (5). This also ties in the J. Sleeman of London as the J. Sleeman of Portishead, etc. as on both occasions he is linked with S. White. Another patent came in the following year on 19th March, number 5,769 J. Sleeman, London "Improvements in machines and apparatus for germinating, malting,". None of the details of these patents have been checked to establish the details but at least they show that there is every likelihood that the Mechanical Malting company did live up to its name even in the early years of its existence.

It should be noted that although a patent may be registered that does not automatically mean that specifications were drawn up. Some of the above patents may be no more than the descriptions noted above.

The 20th Century

Then in 1904 come the first full details of Mr Sleeman's mechanical malting process (6). The article in the *Brewers' Journal* includes illustrations and a detailed description but also states that Sleeman's continuous malting process was demonstrated at the Lower Harbour Maltings, Bristol. Whether it was also used at Millend is not known. Certainly there is no reference to Eastington or Stonehouse in the article.

The patents continued with number 19,140 in 1906 when Sleeman registered "Apparatus for malting grain" (7). It is our Sleeman as he was subsequently described as of Portishead, Somerset.

Millend Mill and Malting Inventions

There then appears to have been a considerable gap, until 1912 when there is a detailed description of "Malting Machinery" under recent inventions in the *Brewers' Journal* (8). The inventor is quoted as being J. Sleeman, Stonehouse, Glos, maltster. The patent number is 22,204 of 1911. Therefore it seems possible that the machinery described was tried out in the Millend Mill Maltings. The written description was accompanied by a drawing. The "apparatus" was a single grain chamber in which all the parts of the malting process could be carried out: steeping, germination, withering and drying [kilning]. The "apparatus" was rectangular in shape and of a relatively shallow depth, with an air chamber of similar shape constructed on one side of the grain chamber. The partition between the two chambers was removable and therefore the air chamber could also be used as part of the grain chamber when the germinating grain needed opening up [aerating] by the machinery being rotated. The design was such that the grain could easily be moved back to its original position. Other features included end trunnions on the rectangular casing so that it could be rotated; the partitions slid on runners on their corners and were actuated by screws and hand wheels. Figure 1 shows the machine standing vertically, but it is brought to the horizontal position to break up the germinating grain.

Then in 1914 just before the First World War broke out, there is another report on a recent invention by J. Sleeman of Stonehouse, Glos in the *Brewers' Journal* (9). This, too, was accompanied by a diagram, see Figure 2. This invention was substantially different from the previous one as it involved a rotating drum. There was a perforated partition in the lower portion of the machine which formed a floor upon which the grain lay and by which air was admitted by a trunnion at one end and drawn through the grain. When in use the grain was dropped into the cylinder through a manhole cover. This enabled the perforated floor to be covered in a thin even layer of grain. The cylinder was rotated from time to time to ensure that the germinating grain did not mat together. Then in December of that year (1914) there was another report of J. Sleeman's recent inventions (10). This was another cylinder type of mechanical maltings. It had two or more floors running longitudinally in the cylinder. (Figure 2A) The lowermost was for germination whilst the top one(s) were used during the withering and drying process. The upper floor could be raised in two parts to throw open the central space and combine it with that above it. The two parts were hinged and attached to winding shafts outside the cylinder by which they were lifted and held up close against the upper side of it [the cylinder]. There were the usual air inlets.

There was then a substantial gap until well after the War. Then in 1926 James Sleeman wrote in the correspondence section of the *Brewers' Journal* on the "Box-Drum" Malting Machine (11). This was in response to an article entitled "Improvements in Continental Malting and Brewing Plant, the 'Box-Drum'" (12). This letter is of interest for a number of reasons. Firstly

it gives the name of the company at Millend Mill: The Automatic Malting Co., Ltd. Secondly it gives details of Sleeman's inventions and what he says was in use at Millend Mill. According to his letter, Mr Sleeman had been working on malting by machinery for nearly 30 years [correct since the first recorded patent was in 1894] and that the type then in use at Millend Mill was the "older 'Box-Drum' machine and side by side with it other machines of the newer type." At least this indicates that there were two types of mechanical malting equipment in use at Millend. What is not so clear is whether either was really that described in the article of March 1926. In that context it may be worth noting some of the details. The drum was named as a "Box-Drum" because it was a malting box built in the form of a drum. The drum was carried by projecting rings on rollers. The growing malt was on a horizontal perforated floor supported on a frame work of T irons attached to the side of the drum. The aeration of the piece was achieved by means of a high pressure turbine blower which forced cooled and saturated air through the grain from below the false, perforated bottom. The depth in this drum was much greater than that in a Saladin Box or the older form of drum. It was considered an advantage that there was no Archimedean screw turner as in Saladin plant since the grain would not be injured and less power was needed for turning the drum.

Then in 1929 the *Brewers' Journal* recorded details of a new type of malting drum in a "A visit to the Maltings at Eastington, Gloucestershire" (13). It was remarked that the drums differed considerably from the more usual cylindrical ones and were driven by water power which could be seen in operation. They had been built in accordance with the designs of Mr James Sleeman (Patent No 887/28). They incorporated improvements resulting from his experience in mechanical malting since the construction of his first drum in 1889. A photograph is shown and the author of the article states that from this it can be seen that the diameter is greater in relation to its width [I think they mean length, having seen the photograph]. The width [length] had been fixed at six feet to obtain the best malting conditions. Increased capacity was obtained by making the diameter greater and this was limited by convenience and strength of the metal used in construction. Thus a 30 quarter machine would be about 15 feet in diameter and a 60 quarter drum 20 feet. The most recent design was shown only as a diagrammatic vertical section. (Figure 3.) It was the latest version of the design and showed that within the outer casing there was a central germinating chamber four feet wide. It had perforated metal sides, and outside of these was an air chamber. And above was a wider chamber for dispersal of the growing grain. The germination chamber was fixed at a considerable angle to the axis of rotation of the drum. This enabled all the grain to be turned regularly, and every grain received its equal share of air. The result was that the germination period was shortened by one to two days. Like the earlier machine this one was mounted on wheels driven by gearing and "actuating a circumferential cogged band around the drum." Turning was infrequent, gentle and slow, with one revolution taking about half an hour. When during rotation the machine was inverted, the comparatively narrow piece of grain in the germination chamber passed into the wide dispersing chamber, now at the bottom. The description then went on to say that at Eastington a similar drum was built over "a cement cistern, so arranged that the grain in the perforated chamber can be immersed in water. This system provides a most efficient means of washing and aerating the barley, The friction of corn against corn removes all foreign matter adhering to the husks, and this is removed by draining away the water. Fresh water is then supplied and the machine is given several turns to ensure the *putrescible* matters, a most important factor in successful malting. " Other important features were that it was considered that far less damage was done to the growing barley than was the case on an ordinary malting floor. The control of temperature was complete, and a description of the process for keeping the air cool in summer and warmer in winter was given. The control of malting conditions was so complete that when charging a steep it was easy to fix, within a few hours, the time when the malt would be ready for the

kiln. The whole process could be speeded up or slowed down as desired. The article went on to say that machine malting was often a failure when it came to the withering part of the process. Withering was only successfully carried out in machine malting when the thickness of the layer of malt was restricted which was possible in this system. [The implication being that it was not possible in other machine malting systems.] The result was that Sleeman's machine malting produced malt similar in appearance to good floor malt. Finally the article stated simply that kilning was carried out on a kiln of the usual type. The advantages of this system of pneumatic machine malting were re-iterated: complete control of germination, freedom from mould and atmospheric trouble all year round, with the resulting regularity and certainty of output, all the work was done by power, with one man by night and one by day operating a big installation of drums.

The last completely new invention that appears in the *Brewers' Journal* is in 1930 (14). It was Patent No 32,5495 granted on 19 February, 1930 to Oliver Sleeman, of Eastington, Glos. It related to a new apparatus to make malt more effectively and more economically.(Figure 4.) In particular it was considered to be particularly suitable for malting maize, wheat, oats, rye, beans and peas. The plant was a vertical malthouse with hollow walls to serve as air ducts. Between these walls were five or so perforated floors four or five feet apart. Each floor was divided into two sections which were hinged [at the sides]. The floors were kept horizontal until the germinating grain needed to be dropped to the floor below. Air could be drawn through the grain as necessary and sprinklers were provided above the top three floors which had suitable drip trays. The system worked by the steeped grain being loaded onto the top floor and after one or two days' germination it was dropped to the floor below and so onto the bottom floor whence it was removed to the kiln. It has to be said that it seems unlikely that this particular invention was ever tried out at Millend but it may have been.

There was one further patent granted to Oliver Sleeman in May 1930 which was described as an improvement in design of malting drums (15). It was very similar in shape to that shown in Figure 3. Again the machine was preferably cylindrical in shape. It had a central germinating chamber formed of parallel walls of perforated metal with an outer chamber for air distribution and an enlarged upper chamber for dispersing the grain during rotation. The difference between this design and the previous one was that one of the perforated walls of the germination chamber was lower [or shorter] than the other. This was "to facilitate a more complete interchange of the grain between the two side of the chamber during rotation." Other changes were to the perforated walls which were corrugated to produce a better separation of the grain, and the air current could be supplied from either side. The description and accompanying diagram were rather more detailed than the previous one. Again the container could be immersed in a tank of water for steeping, after which the machine was removed or the grain was transferred to another machine for germination. It is not clear whether this occurred in the earlier invention. Whether this improved malting machinery was used at Eastington is not known.

Concluding Remarks

The first point to be made is that more notice should have been taken of the other features in the main part of the mill when it was inspected by the former Royal Commission on the Historical Monuments of England. However, at the time the only recognisable maltings feature was the kiln. When there is a shortage of time decisions are made and it may only be later when further historical research is undertaken that the true importance of features is realised. Whether any features of the mechanical malting equipment survived is not known. It seems unlikely given that malting ceased in the 1930s and the metal work probably went for scrap either then or during the Second World War. What may have survived in 2001 were the

mountings for the equipment and possibly the trough described in the 1929 article.

The next point is that the evidence found in the *Brewers' Journal* does add substantially to our knowledge of both the site and the Sleeman brothers. It can be used as the starting point for further investigations into their history and that of the site. It also confirms that the Sleemans did have mechanical malting equipment at Millend Mill.

Finally it makes interesting reading from the development of mechanised maltings. A pneumatic but not mechanical maltings was in operation in England in 1878, and by the mid 1880s an early Saladin/Stopes plant appears to have been in operation in Yeovil (16). Certainly by the 1890s there were both Saladin box malting plants and drum malting plants in operation. That someone, in this case the Sleeman brothers, should spend considerable time (some 35 years) and effort in trying to develop an improved mechanical system when successful ones were in operation is something of a surprise. (There were of course attempts by other people to develop improved mechanical malting systems.) What is more surprising is that these attempts took place in what was essentially, by the end of the 19th or early 20th century, a non-malting county (17). How successful these attempts were is not known but at least one was built as attested by the photograph in the August 1929 issue of the *Brewers' Journal*. Clearly the Sleemans felt that there was still opportunities for improvements that could result in good quality malt but with less labour.

With regard to the little part of the building which survived as a recognisable malting, the kiln, it is hardly surprising that the kiln was a double one, given the Sleemans' interest in improved malting methods. What is a surprise is that they used ceramic tiles instead of wedge wire. This may have been to reduce costs and it may be that they were second hand ones readily available.

The story of Millend Mill, the Sleeman brothers and mechanical malting is still incomplete, but the above does at least add further to our knowledge. It also makes one realise that innovation can turn up in the most unlikely settings.

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- 3 *Brewers' Journal* for 1894, page 335.
- 4 *Brewers' Journal* for 1898, page 741.
- 5 *Brewers' Journal* for 1899, page 576.
- 6 *Brewers' Journal* for 1904, page 486.
- 7 *Brewers' Journal* for 1907, page 643 and 698.
- 8 *Brewers' Journal* for 1912, page 697.
- 9 *Brewers' Journal* for 1914, page 428.
- 10 *Brewers' Journal* for 1914, page 670.
- 11 *Brewers' Journal* for 1926, page 161.
- 12 *Brewers' Journal* for 1926, page 139.
- 13 *Brewers' Journal* for 1929, page 413.
- 14 *Brewers' Journal* for 1930, page 241.
- 15 *Brewers' Journal* for 1930, page 433.

- 16 Forthcoming paper in the Brewery History Society Journal by the author.
 17 Patrick, A (2004) Strategy for the Historic Industrial Environment Report No 2 - Maltings in England, English Heritage. (Copies of the report on CD obtainable from English Heritage.)

Figure 1 Sleeman's patented malting machinery of 1911. (No description was attached to the original drawing to enable easy interpretation - one has to rely on the description on the main text.)

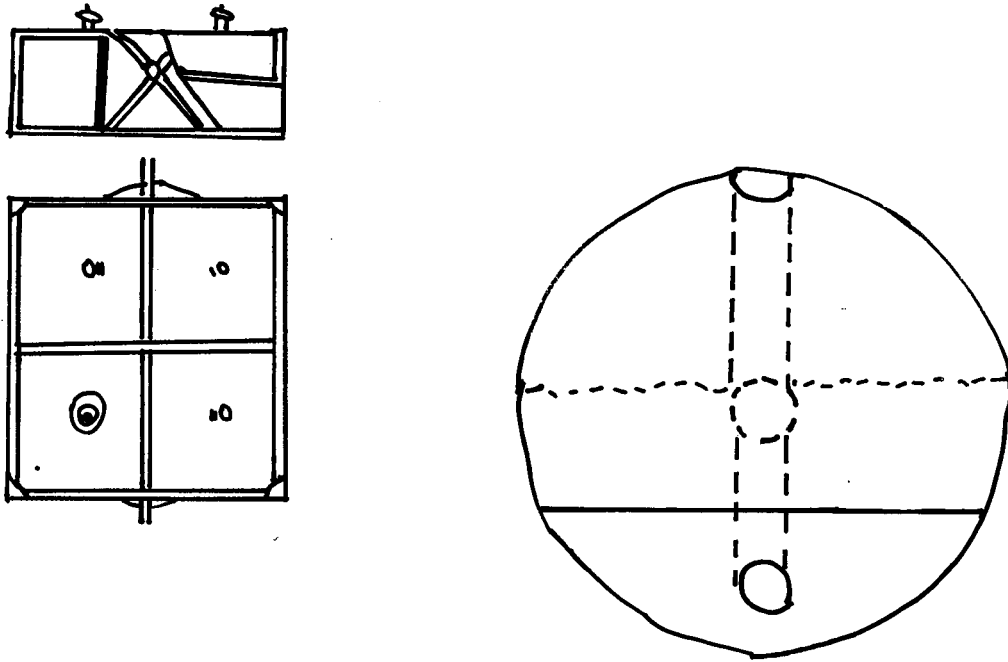


Figure 2 Sleeman's new improved malting machine which consisted of a rotating drum (July 1914). (No description was attached to the original drawing to enable easy interpretation - one has to rely on the description on the main text.)

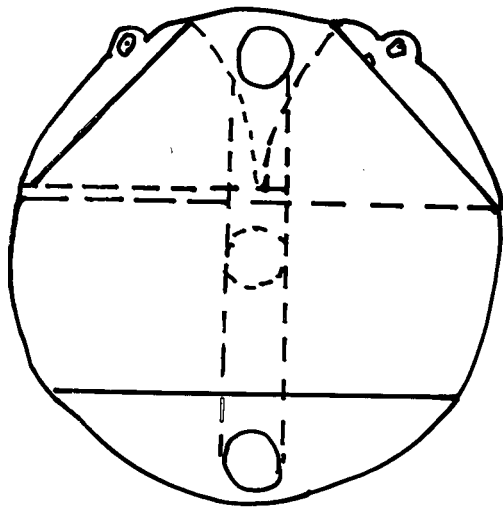


Figure 2A Sleeman's new improved malting machine which consisted of a rotating drum with two floors. (December 1914). (No description was attached to the original drawing to enable easy interpretation - one has to rely on the description in the main text.)

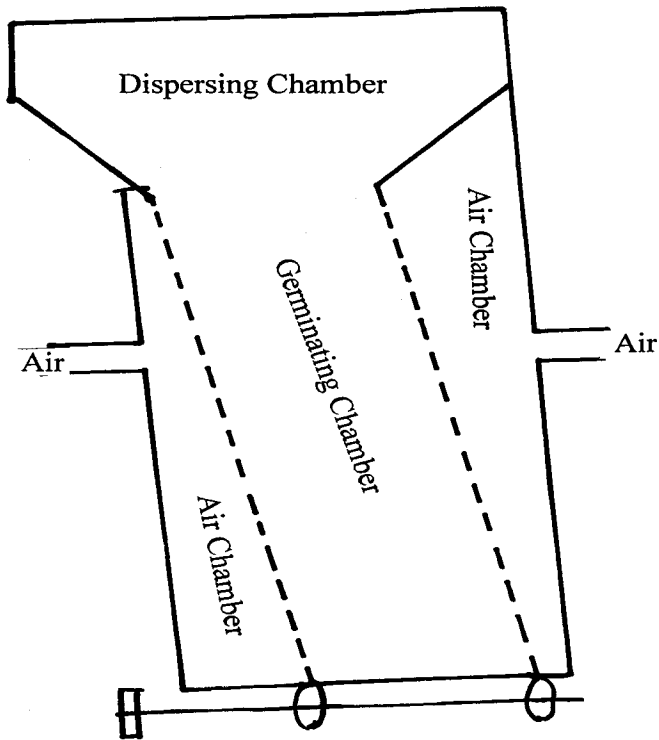


Figure 3 Sleeman's new improved malting machine - diagrammatic vertical section (1929).

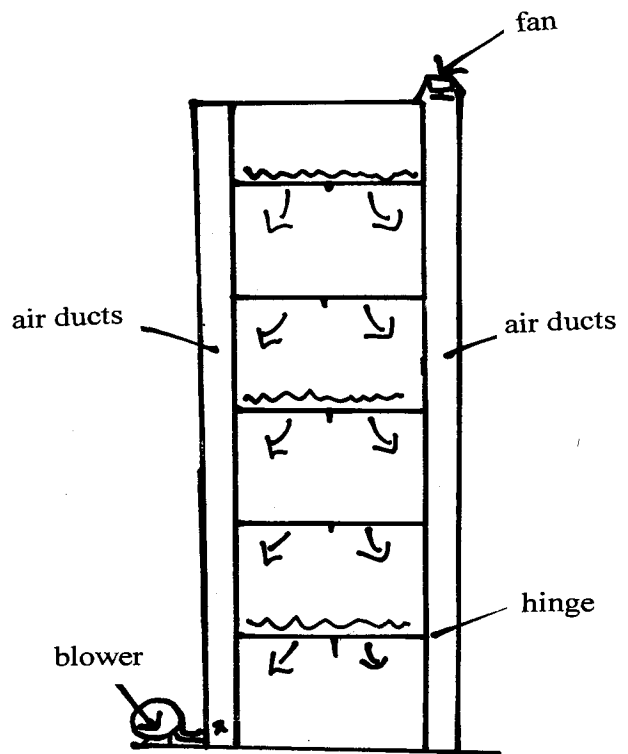


Figure 4 Sleeman's new improved malting machine, patented in 1930.