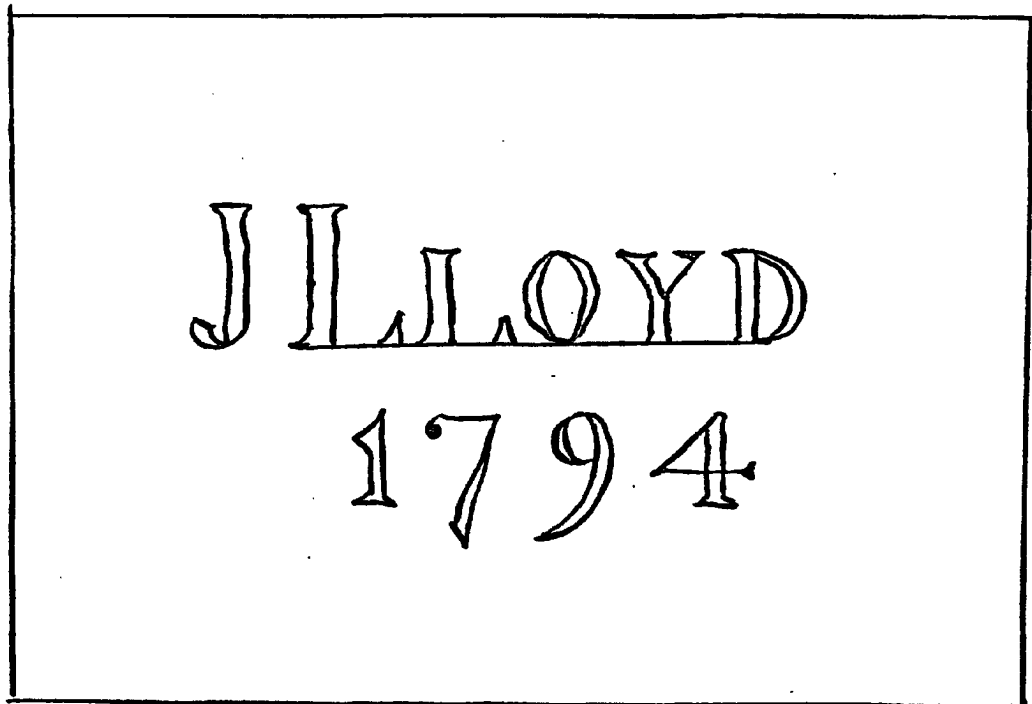


TWO OF LLOYDS  
WATERMARKS FOR  
PAPER



## GUNSMILL AS A PAPER MILL

F.J.T. Harris

This history of Guns Mill as a paper mill is virtually the history of the Lloyd family. The first reference is in the Gloucester Journal 19th July 1743 when Joseph Lloyd was advertising for "a paper man capable of undertaking a white vat".

He was apparently in business with his wife Hannah, his brothers John (died 1765) and Nathaniel ( of Weston-under-Penyard) (died 1791) as well as his nephew Thomas Evans (died 1797). ( Lloyd family tree page 40.)

They may be related to the Walter Lloyd referred to in Inquisitions Post Mortem in 1638 in connection with land etc at Weston-under-Penyard and Bill Mill, Herefordshire.

It has been estimated that there were about 278 mills in the U.K. in 1738, rising to 422 in England and Wales and 37 in Scotland in 1799. The industry consisted of many widely scattered units, mostly small and rented from landlords. All the paper was of course hand made and the majority were one-vat mills, employing no more than 15 persons. In 1799 the average production was about 36 tonne per mill per year.

Change however was close at hand; John Gamble received a patent in 1801 for a paper making machine and it had been developed enough by 1806 to be offered to the trade. 82 machines in the U.K. in 1835 produced 24,868 tonne, an average of 303 tonne each. Up to the invention of the paper making machine all the paper had been made sheet by sheet and after pressing to consolidate and to squeeze out some water, each sheet had to be hung up in a drying loft until dry. If the writing quality was then improved by treatment with a gelatine solution, the pressing and drying was repeated.

After the invention of the paper machine and later of the steam heated drying cylinder, it became possible to make

continuous lengths of paper and afterwards cut it into sheets.

Joseph Lloyd I died in 1761 and the business was carried on by his widow Hannah (died 1789) with their son Joseph II. In 1803, Balston, a paper maker from Maidstone visited many of the other mills in the U.K. and he records Jos. Lloyd at Guns Mill with several vats ( 2 or 9 depending on how one reads his notes) and Lloyd & Co. had just taken over Postlip Mills, Winchcombe, together with Sudeley Mill ( a total 4,5 or 8 vats). At this time Joseph II was 64 and his sone Joseph III 31 years old.

The poll for a knight of the shire in 1811 shows Joseph Lloyd and Joseph Lloyd Junior, as well as Mr. Lloyd occupying a mill at Awre.

Although an excise had been levied on paper from 1712, the earliest Excise list of paper makers which still exists dates from 1816 - the year the partnership of Joseph II and Joseph III was dissolved. Each paper mill had an Excise number which it tended to keep over the years. The watermarks used in the paper usually included either the makers name or excise number and often a date. The 1816 Excise list records :- Mill 103, actually Postlip and Sudeley combined, occupier Nathaniel Lloyd and Co. - a partnership of Nathaniel Lloyd (died 1845) Edward (died 1846) and Thomas (1853) all brothers of Joseph III. Mills 142 Hall (Awre) 143 Guns, 144 Middle, 145 Upper and 146 Bill Mill (Hereforshire) are all shown occupied by Joseph Lloyd.

There is no later Excise reference to Bill Mill, whilst Postlip changed its number to 633 and occupier in 1828 and Joseph Lloyd gave up Hall Mill in 1829.

In 1838, Mill 256, Overbury, at one time occupied by Mr. Robinson of the E.S.&A. Robinson family, was now occupied by Edward LloydJames, a son of Joseph III's sister Ann. He gave up Overbury in 1841 and apparently moved to Sudeley Mill.

In 1839 a George Lloyd appears at Mills 139 and 642 at Whitebrook and in 1842 at 137 Upper Whitebrook. These three he gave up in 1844.

There is no Excise reference to Mills 144 and 145 after 1832, when they were still occupied by Joseph Lloyd. Possibly this marks the date when they ceased paper making, although they may still have been used to prepare fibres for paper making.

Joseph Lloyd III died in August 1842 and in December the Excise list shows that Sudeley Mill had stopped - though it re-opened in 1844.

In 1844 George Lloyd moved from Whitebrook to Guns Mill, only to be followed with Excise lists in 1845 by Penelope Lloyd - the relict of Joseph III.

In 1847, after the deaths of Joseph III, Nathaniel and Edward, Edward Lloyd James replaced Penelope Lloyd at Guns Mill and in December, Sudeley Mill is offered for sale in the Gloucester Journal. However, Guns Mill closed in 1848 and was not working in 1851. At some time in or prior to 1860 it re-opened, and the names of Aaron Goold and John Birt have been connected with this period of its history. There was the Guns Mill Paper Company and in 1876 Henry Afleck was the Manager for Joseph Skipp Lloyd, a Cheltenham barrister and son of Joseph III. It finally closed in 1879 and all the machinery had been removed before 1890.

It is during the 1860 - 1879 period that there are references to a paper making machine at Guns Mill, apparently 48 - 53 inches wide (1.22 - 1.35m) making white and coloured printing papers, as well as brown papers.

Although Watt's first rotative engine was put up in Soho in 1782, few, if any, paper mills were using steam power prior to 1815. It is rather tempting to suggest that both the paper machine and steam were installed about 1860.

Having mentioned the people involved, let us now consider the equipment and methods used. The raw materials originally would have been linen or cotton rags, possibly new, but much more likely old and used. Ropes and canvas were used in brown or dark coloured papers, and most of the raw materials were imported from Europe.

The first operation would have been to sort the rags, removing all silk and wool if making white paper, as well as all buttons, hooks etc., and cut the rags themselves into pieces about 100mm square.

Before paper could be made the pieces of rag had to be completely broken up into separate fibres, which in turn needed to be shortened to some extent and fibrillated. This defibring was carried out by putting the rags in water under a series of iron shod stamps which were lifted by the cams driven by a water wheel.

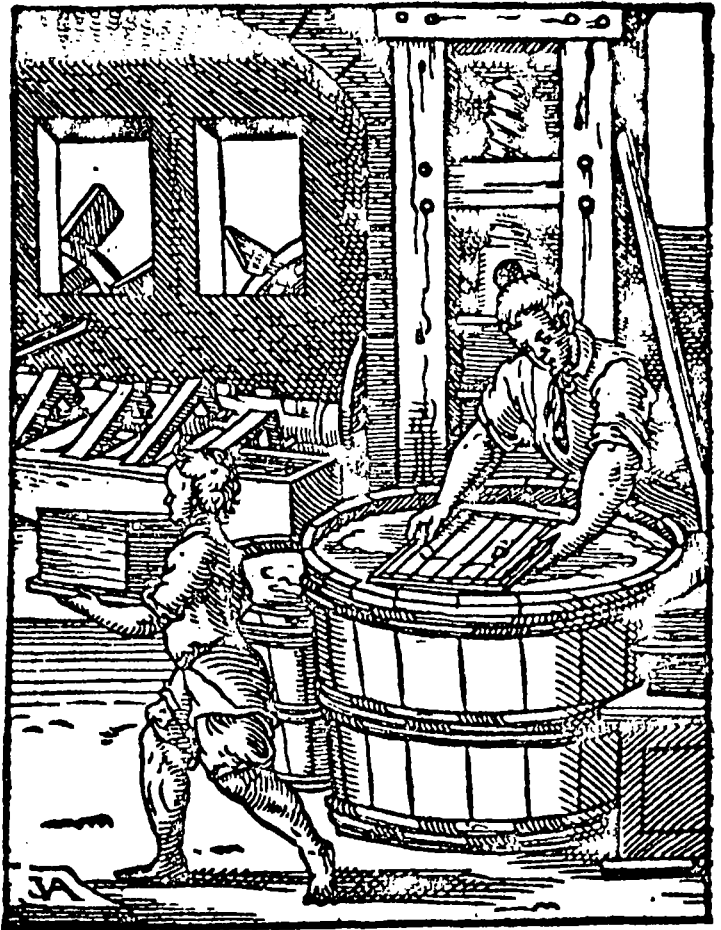
After this operation the suspension of fibres was run into a vat in front of the paper maker. He was the

skilled man in the team. He dipped a hand mould into the suspension and withdrew it again, nearly horizontal so as to collect a regular quantity of suspension in the mould. With a series of shakes he distributed the fibres evenly over the wire mesh which formed the bottom of the mould. The wet mat of fibres was the sheet of paper. Although the operation sounds simple, it was far from being so. On the paper maker depended the evenness and appearance of the paper.

He handed the mould to his assistant and took a fresh mould. The assistant removed the base, leaving the wet mat of fibres on the felt. The wet mat or piece of paper was covered with another piece of felt onto which in turn another piece of wet paper was deposited. In this way the paper maker and his assistant built up a stack of felt and paper which could be put in a screw press and squeezed so as to consolidate the paper and remove some of the water.

After pressing, the stack was broken down and the sheets of damp paper taken to a drying loft where they were hung on cords till dry. The drying loft was provided, on at least two sides with slats which could be moved sideways or opened so as to regulate the ventilation in the loft.

To improve the quality of the paper it was often 'sized',



*The first illustration of a paper-maker at work. (At rear) Water-driven stamp-mill; (centre) press for squeezing sheets; (foreground) vat-man using the mould, while his boy carries away finished sheets. 1568.*

by soaking the dried sheets in dilute size made mainly of gelatine, repressing and redrying.

In the second half of the 18th century the 'ordinary beating engine' or 'Hollander' was invented, doubtless as a result of the need for a greater output. The beater replaced the stamps and would work on a fairly large volume of rags and fibres in quite a small area. Some years later its use spread from Holland to the U.K. At that time the body of the beater was made of cast iron or leadlined wood.

The paper machine spread rapidly and as previously stated, in 1835 the machines produced 24,868 tonne out of a total U.K. production of 32,049 tonne. Incidentally the Excise collected £833,822 in that year - £26 per tonne.

Other changes which occurred involved the greater use of bleaching chemicals, such as chlorine or 'chloride of lime', the addition of 'smalts' or of 'ultramarine' to get a bluish tinge in the paper, and in 1820 a steam heated copper (cast iron later) drying cylinder was invented. This enabled continuous lengths of dry paper to be reeled up.

Because of the increasing shortage of rags, many attempts were made to find alternative materials and there were numbers of patents. One of the most successful alternatives was esparto grass. This appears to have been first imported in quantity in 1851, the 1860 imports were about 1,000 tonnes. The esparto was steeped and boiled in a very alkaline mixture, the process producing a polluting effluent.

The commercial production of fibres from wood - i.e. wood pulp, began about 1866 and has since become the major raw material for paper production. The wood pulp was often made overseas and imported although the necessary equipment was installed at Cone Mill near Lydney.

We should now look at the relics which the Lloyds have left behind.

Starting from St. Anthony's Well we first come to 'Upper Mill'. (See illustration opposite page 16.) This is a two storey building about 10.0 x 6.7m with a smaller building about 4.9 x 5.8m on the west side nearer the well. The water wheel was on the east side of the main building. The upper storey still shows evidence of the slats which were used to control the ventilation on this second storey. When this was a complete mill, the paper would have been dried on this floor, but it later apparently had the name 'The Grass House'. Perhaps sometime after 1860 there was an increased need for raw materials

at Guns Mill itself, which was met by storing esparto grass in the old drying loft, and boiling and bleaching it on the ground floor where the paper had previously been made. The fibres, after draining, being taken by cart down to Guns Mill. At the Upper Mill there are remains of an old cottage about 5.3 x 6.5m and also of another building about 12.6 x 5.0m. This may have been originally used to store and sort rags. If so, it was later converted into two cottages and is now being renovated.

Below this mill is the site of the 'Middle Mill'. The main storey building here was about 16m x 6m. Adjoining this was another two storey building about 4.5 x 5m and a single storey building some 19m x 7m. This later building appears to have been known as the 'Rag House' and was used to store and sort rags. After paper manufacture ceased in the mill it may have been used to wash and bleach old rags so that the fibres could be taken and used in Guns Mill. Most of the buildings here were demolished years ago, and are now almost completely obliterated. There are the remains of a further set of buildings a little lower downstream which appear to have been a corn mill.

Finally we come to Guns Mill itself. There was a range of one and two storey buildings, about 35m x 5.5m behind the dwellinghouse, but the paper mill seems to have been in two buildings adjoining the road to St. Anthony's Well, together with a drying loft behind the old furnace.

In July 1780 Joseph Lloyd of Gunns Mill insured his dwelling house against fire for a sum not exceeding £200; paper mill separate for £400, the utensils and stock therein £300 and also a water corn mill separate £40, as well as a stable cyder house and granary, under one roof £60. The buildings are described as 'all stone and tiled'. The total sum insured was £1,000.

There appears to be no records of the production before 1860 but it is noticeable that provision was made for a separate supply of fresh clean water to Gunns Mill, as would have been necessary if white paper was to be made.

During the period after about 1870 when Henry Affleck was manager, the products included blotting paper, printing paper, as well as brown and cartridge paper. Incidentally, Henry Affleck was also proprietor of the Shapridge stone quarries.

The paper machine and all the equipment was sold off some time between 1879 and 1890 and no record remains.

Paper made at Gunns Mill includes various watermarks as J. Lloyd, Loyd, Lloyd, Lloyd and Son, or Ll with or without 'Britannia and Pro Patria' or 'Crown and GR'. Lloyd and Co. was not used at Gunns Mill. A few of the watermarks also include the date, but not the excise number. Some of these marks may have been used at Upper or Middle Mill rather than at Gunns Mill itself. Drawings of two of the watermarks are attached as is a family tree of this interesting group of papermakers.

Finally perhaps reference can be made to the will of Joseph Lloyd III, wherein he bequeathed 'to my dear wife Penelope Lloyd ..... the carriage and carriage horse with the harness and other appendages .... also the gardening implements and utensils, greenhouse furniture and other moveable assets which shall be used .... about my gardens..'

I am indebted to Mr Townley for many of the measurements of the buildings.

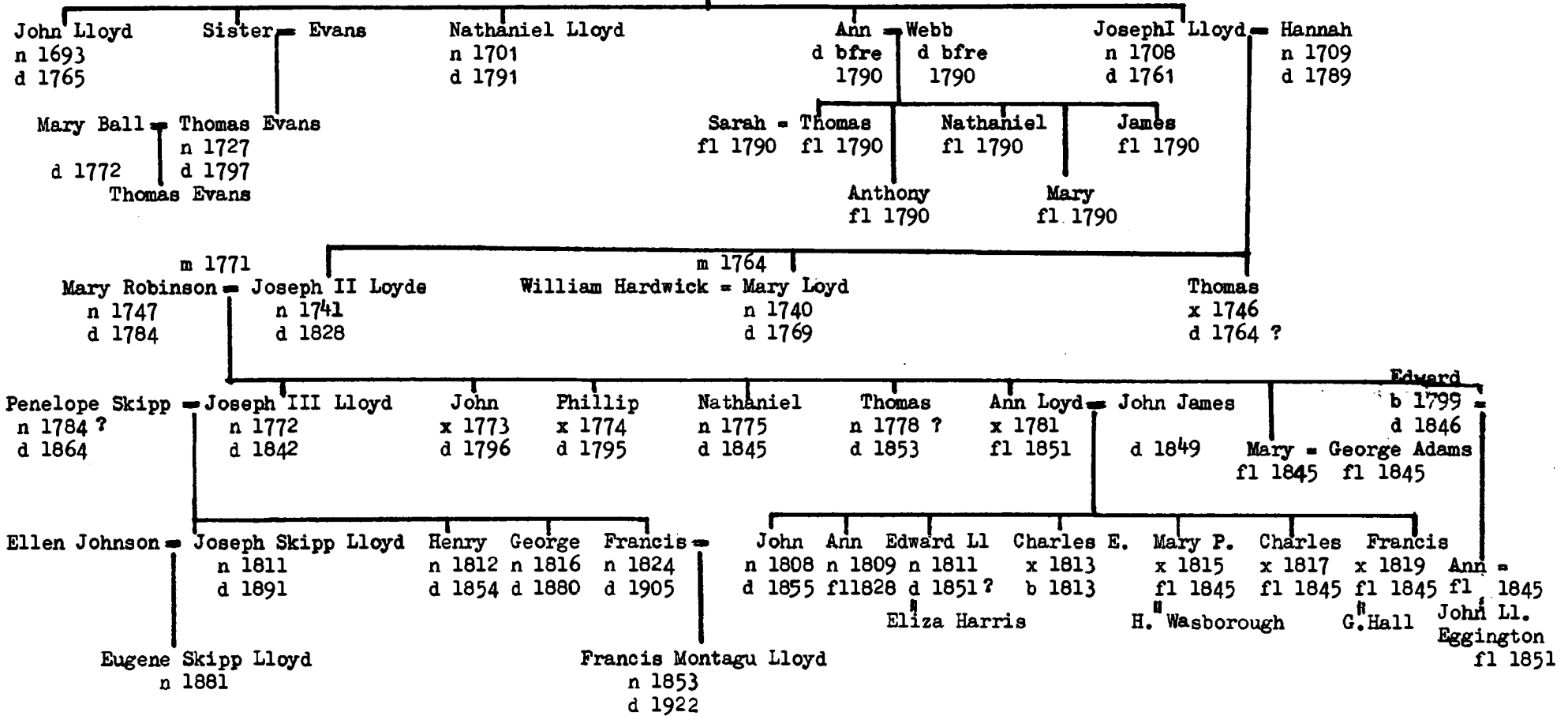
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Part of the insurance  
of Joseph Lloyd, 1780.

Joseph Loyde of Gunns Mill in  
the Parish of Gillingham County of  
Gloucester Papermaker on his new  
dwelling House only valued as a house and  
not exceeding Two Hundred Pounds — 200  
On his Paper Mill only separate not  
exceeding Four Hundred Pounds — 400  
Utensils & Stock therein only not exceeding  
Three Hundred Pounds — 300  
Water House Mill only separate not  
exceeding forty Pounds — 40  
Stable by doo house & granary only  
under one Roof not exceeding sixty Pounds — 60  
I. B. Warwick of Mair & Co. Bristol 1780



Thomas Lloyd = Sarah  
 b 1661  
 d 1731



THE LLOYD FAMILY TREE

fl = Floruit, Flourished.  
 x = Christened.