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St. Mary Cray Paper Mill

by Peter Heinecke

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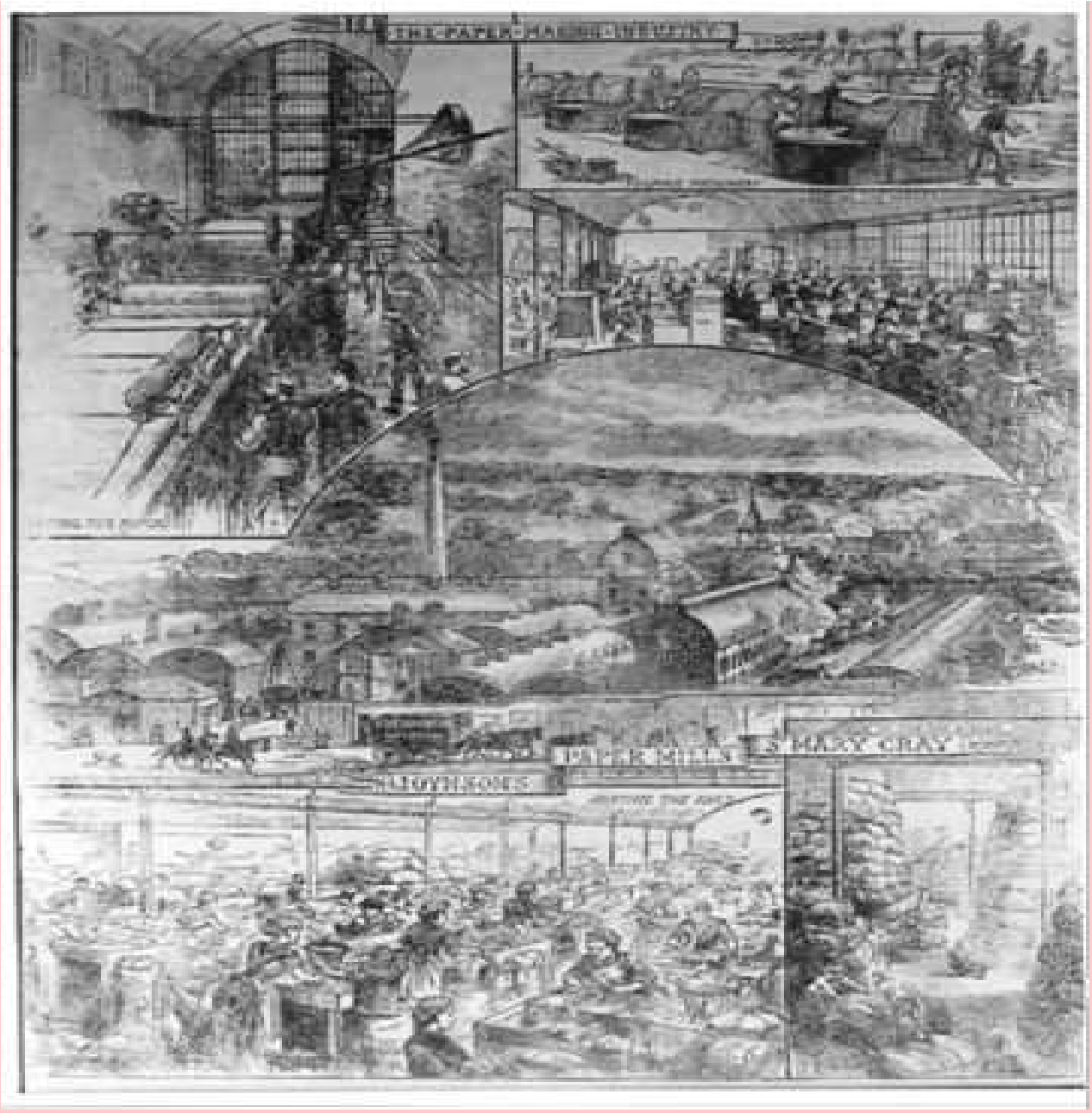
Five additional pictures supplied by the author for this web page.

Paper making in St. Mary Cray has a history spanning two hundred and ten years. The record in neighbouring St. Paul's Cray is slightly longer. For much of their history the two centres were associated with two famous names in the industry: St. Mary Cray with William Joynson and St. Paul's Cray with. William Nash. On the latter, the reader may consult a detailed company history written by W. S. Shears, William Nash of St. Paul's Cray, Papermakers, published in 1950. St. Mary Cray mill never found a comparable historian and now although less than a quarter of a century has elapsed since the mill closed, little remains: a single box-file of papers, a couple of scrap-book albums, an old plan, scattered references and reminiscences and the battered yellow brick wall which divides the present industrial estate from the main road, Sevenoaks Way. The earliest mentions of paper makers in St. Mary Cray are no more than names and dates in insurance records: Nicholas Townsend in 1757 and William Sims in 1771, With them we are at the beginning of the Industrial Revolution. The subsequent story, the harnessing of water power, then steam power to industry, the introduction of new machinery, the patenting of improvements, the growth of labour intensive industry and its eventual decline, reflects the general pattern of that revolution.



Poster showing working of mill, circa 1890. [Property of Mrs.C.Hellicar]

In 1786 Samuel Lay of Sittingbourne was manufacturing paper in St. Mary Cray. Lay's watermarked paper may still be identified. The earliest example, dated to 1789 shows a fleur-de-lys on a crowned shield while another marked S.L.1794 shows Britannia in a crowned circle. Whether these were produced at St. Mary Cray or Sittingbourne is not known. He seems to have worked both mills until after 1800 and in 1801 is described as a master paper maker. The paper was of course still hand made and in 1806 Martha Lay ordered two hand moulds for the St. Mary Cray mill. Ten years later two mills are recorded on adjacent sites, operated by Martha Lay and John Hall. Lay's mill appears as No.326 in the government Excise Lists and Hall 's as No.327. These moulds consisted of wooden frames with a covering of wire acting as a sieve. The single sheet of paper was formed by dipping the mould in a vat of fibres suspended in water, lifting it out and draining the water. Writing his 'Reminiscences' some 60 years later Charles Cowan described the process:

A romantic view printed in sepia in postcard size, possibly used by Joynson as a trade card. [Property P.M.Heinecke]

“In the end of May 1819, I was despatched to learn my business as papermaker to St. Mary Cray, Kent, . . . where I was to work at the various branches of the trade: attending the paper engines for the preparation of the pulp, making the paper at the vat in single sheets, couching -the damp sheet being (as soon as formed upon the frame or mould) couched upon a woollen felt, of which there were from seven to eight or nine quires in a ‘post’ -requiring the labours of two men and a boy for half-an-hour for each ‘post,’ or about twenty ‘posts’ in each day often or twelve hours. . . . Paper when made by hand required at least three weeks, under favourable circumstances, before it was fit for market . . . The labour imposed upon the vatman and coucher, owing to their constant stooping posture aggravated by the heat of the vat and the often dense steam, is peculiarly severe. I do not consider it as actually unhealthy, but I am confident that such men became prematurely old, and at fifty years of age have the appearance of having reached fully the threescore and ten.

‘The formation of the sheet on the mould is a very delicate operation, requiring great skill and practice, particularly the ‘shake’. There is nearly as much difference in the ‘shakes of different workmen as in the features of their countenances. The mould with the film of wet pulp upon it is then received by the coucher, who presses it upon one of a pile or ‘post’ of woollen felts, which imbibe a portion of the water, and which ‘post’, when full, being a sheet of paper and a felt alternatively, is brought under a powerful mechanical or hydraulic press, by which the water is pressed out, after which the sheets of paper, though still very wet, can be handled.

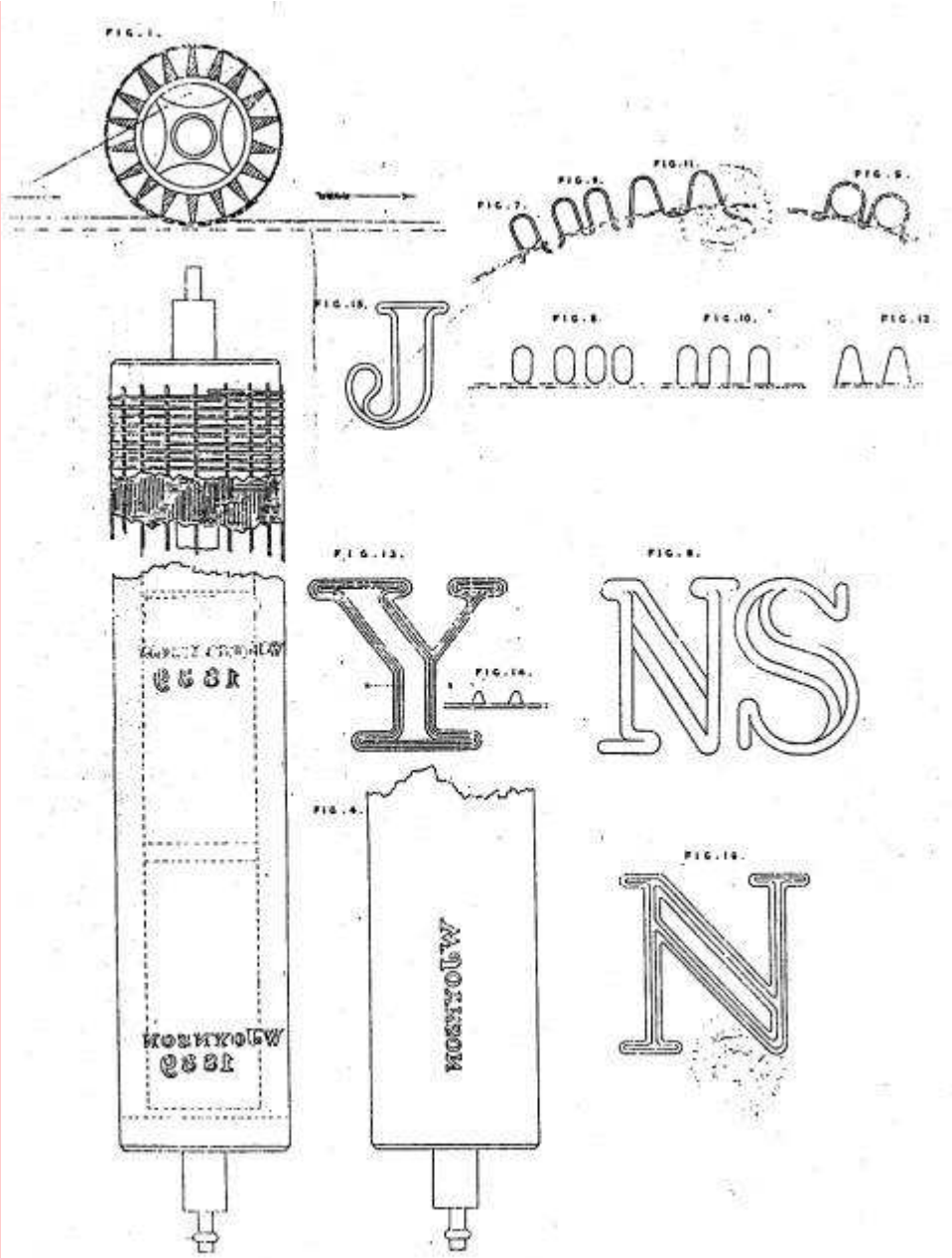
So long as paper was made by hand no sheet could be made larger than the length to which the vat man could stretch his arms in order to dip the mould or frame in the vat. and if the sheet exceeded three feet in length the labour was exceedingly severe. . . . I worked for six months at all the processes for making paper by hand. . . . When I worked at the mill at St. Mary Cray, it was upon a very small scale, there being but two vats. There was a beautiful stream of clear water called the Cray, and there

was a constant levee of splendid trout in the tail-race below the water-wheel. ...The weight of the paper at the two vats per week did probably not exceed 1500 lbs. By the time Cowan was writing, Joynson's had increased the output some forty-fivefold. Cowan does not say whether he worked for Martha Lay or John Hall, but the point is academic, for in 15 years both had gone, while his detailed description takes us behind the names and dates into the reality of these early hand mills.

I believe this photograph to be by a Mr. Harman, a photographer whose travelling darkroom can just be seen in the bottom left corner.

The mills and land were the freehold property of the lord of the manor, Joseph Berens of Kevington who in June 1835 leased them to William Joynson. The lease was extended in 1845, 1851 and 1870 to run to 1884, after which Joynson's appear to have acquired the full freehold. For his £500 per annum (later reduced to £485) Joynson got one working mill, formerly John Hall's or the Lower Mill, together with the mill pond, a wheelhouse and fall of water which had been canalised, the site of Martha Lay's mill which had been dismantled and about half an acre of land extending westwards on which he was later to expand. Joynson, who came from Snodland, commemorated the establishment of his new business by having three lead cisterns cast with the initials and date W.J.1834.

The years 1801 to 1807 had seen the development and patenting of the papermaking machine which was to become known as the Fourdrinier. Between 1830 and 1842 the number of machines in the country increased from under 100 to 356 while the number of vats declined proportionately. Joynson was quick not only to install a machine but to patent his own improvement to it. In the 1820s a roller with a laid wire surface had been added to the Fourdrinier. This dandy roll passed over the pulp and assisted in forming the paper. The wire left a permanent impression of lines in the paper, a watermark of sorts. In 1839 Joynson was granted Letters Patent No.7977 for his invention of A certain improvement or certain improvements in the manufacture of paper, consisting of affixing projecting letters, figures, or devices upon a revolving axis carrying arms, rings, or covered with wire cloth, such as is known by the name of the dandy roll, the dancer, the top roller, &c. for making paper by rotary machinery, and whereby I make water-marks in the paper by the indentation of the said raised letters, figures or devices while in the process of making the paper. ' , William Joynson is rightly given credit as the inventor of the machine watermark



"Dandy Roll" with Joynson's 1839 watermark.

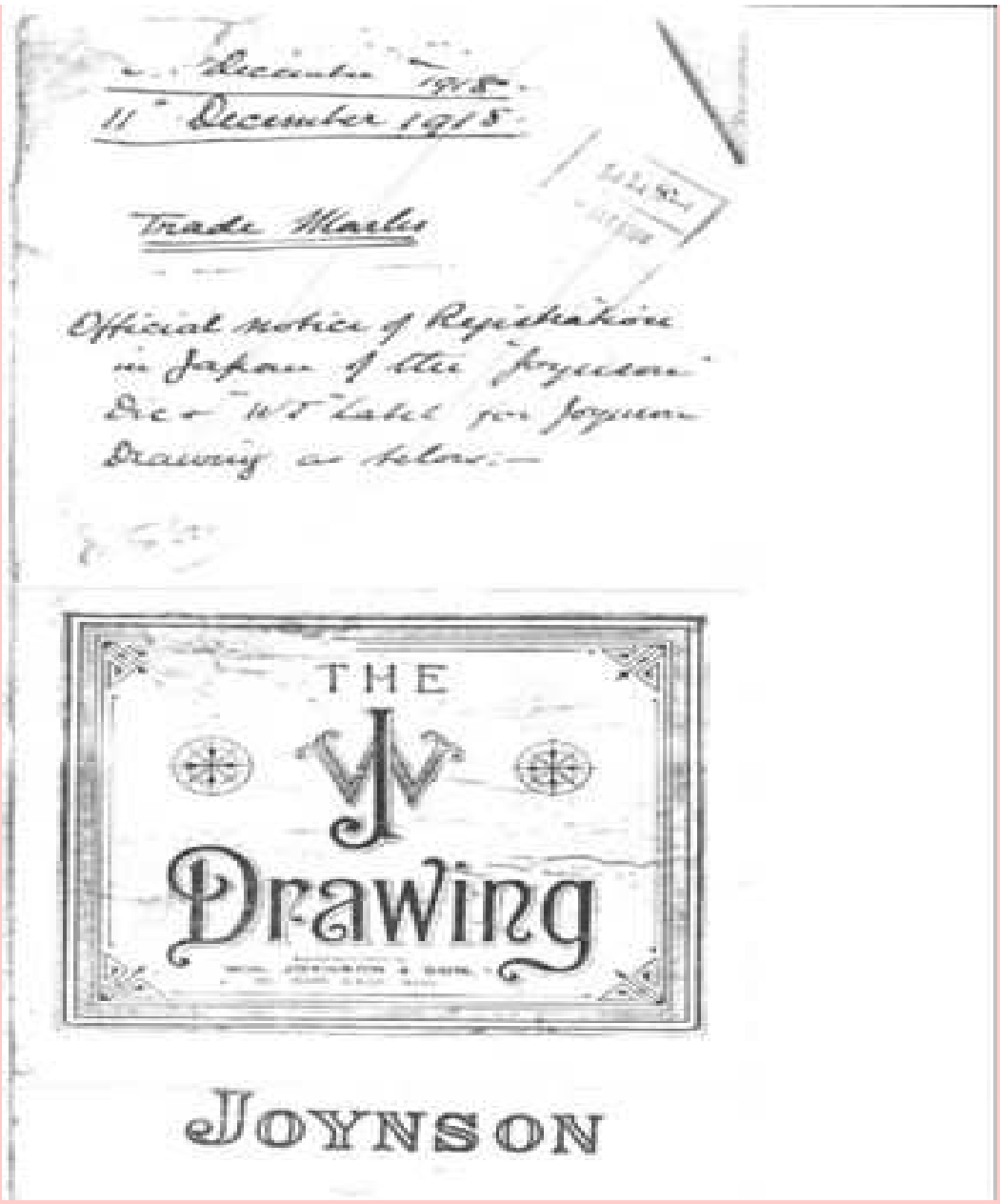
Dandy Roll with Joynson's 1839 Watermark

Expansion followed rapidly with the installation of a second machine and construction of the New Mill extending westwards to the present frontage. The date 1860 has appeared in print and needs correction. It was taken from a letter by the then very elderly Edmund Joynson to the works manager in 1948, in which he admitted, but I have no real data to go on. In fact the second machine was in place by 1853 for in that year Gabriel Planche published De l'Industrie de la Papeterie, in which he recounts a visit to Joynson's, a mill which is considered to be of first class in the papermaking industry a mill with two machines. . . . Planche is full of praise for Joynson's management qualities, his steam driven machines and other quite exceptional equipment, with which he produced 25 to 30,000 Kg (between 55,000 and 66,000 lbs) of fine papers a week, from only the best quality rags.

William Joynson died in 1874 leaving the business under trusteeship to his two grandsons who were not yet of age. One of them, William, drowned on a continental tour the following year, leaving Edmund Hamborough Joynson the sole heir. The years of trusteeship saw a sharp decline in profits from £38,694.8s.2d. in 1876 to less than half that in 1881, although output was kept up at about 70,000 lbs per week in 1878 with a market value of around £3,000, and the mill employing some 700 people in 1881. E. H. Joynson took over the firm in September 1882 and within a year was investing in a large installation of rag boilers, rag-breaking engines and a new steam engine, and building a new beater house in the Old Mill near the Church.

Difficulty in obtaining sufficient rag, with consequent need to import and rising prices were a constant problem of 19th century papermakers. In his first year E. H. Joynson discovered that of his total expenditure 43½% was on rag, compared with 12% on wages and salaries. As early as 1852 his grandfather had tried lowering costs by making paper with a large mixture of straw, but Edmund seems to have stuck to rag-made high class writing papers which are so largely used by all the first-class firms. . . . noted for their superior quality, absolute purity and perfect finish in the words of an advertisement of 1891. A list of his customers verifies this claim, including such famous trade names as Wm. Collins, De La Rue, J. Dickinson, C. Letts, Low Sampson, Spicer, Waterlow and Wiggins Teape. In 1914 it was to Joynson that the Bank of England turned for the paper on which to print the first currency notes, the £1 and 10 shilling, known as Bradbury's.

Joynson's 'logo' on drawing book.



Trade mark, Ms note dated 1918 and rubber stamp 1924. [Wiggins Teape Archive]

One who worked in the mill when banknote paper was being produced, was Edward James Tickner (1902-1985). Like Cowan a century before him, he recorded in old age his recollections of his first work experience. They are worth setting in print

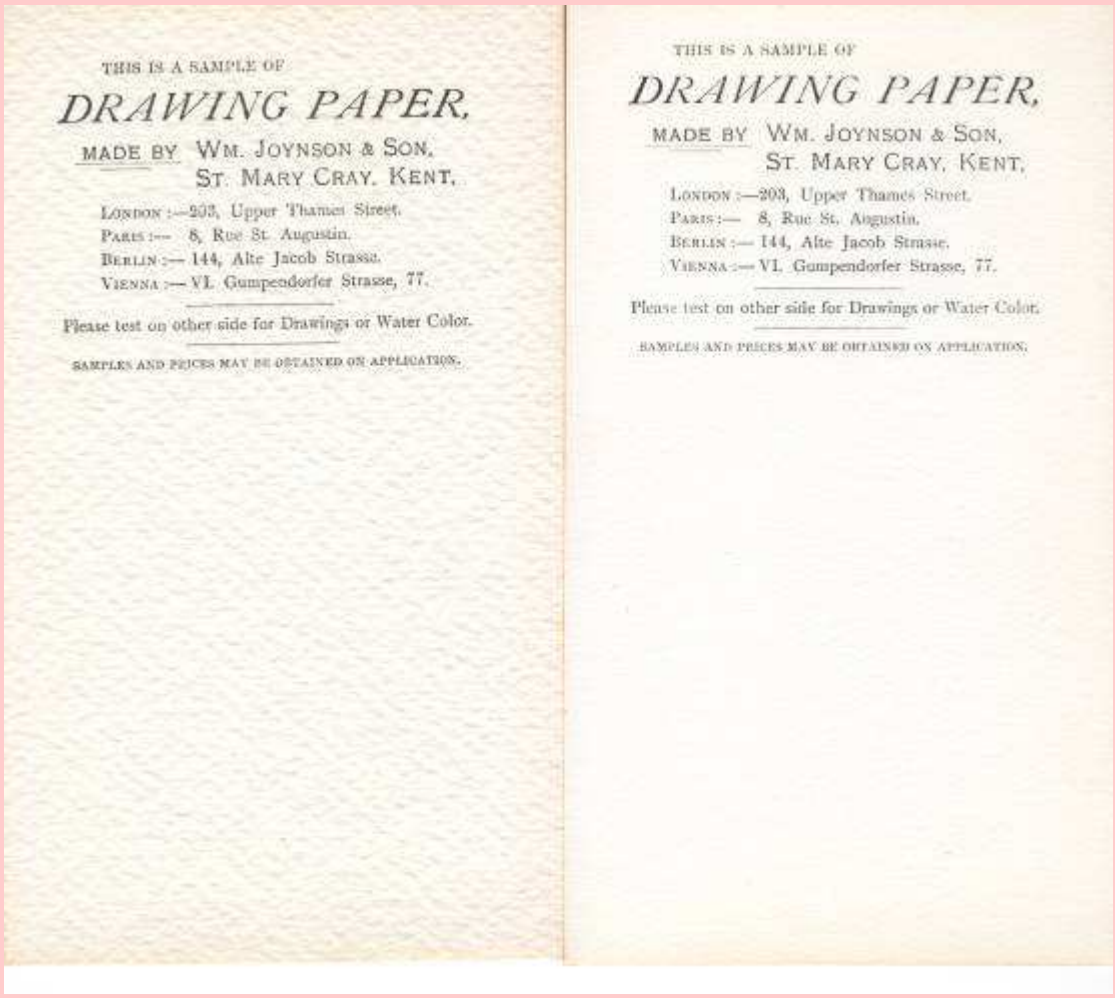
"I left school at 14 and went straight into the mill on night work twelve hours a night. My first week's work, during the First World War, was seventy-two hours. Seven shillings and six pence I got for the whole week. After eighteen months I got a rise and then they started taking more men into the army and we lads were doing men's jobs. As the men came back, they got their jobs back. As they couldn't lower our pay, I went on to boy's work at man's pay. There were thirty of us and we all got the sack. There was no compensation in those days.

My father went into the mill when he was 12, my grandfather when he was 10. He did one day's work and one day's school alternately. My father ended up as beater-man, which was next to the foreman.

A piece of rag went through six different processes to turn it into paper. The horses and carts went to the Station to collect the bales of old rags. First they went into the dusting room where they were put into a machine and they would fly round and the dust would come out. The women used to cut all the rag up and slice it before it went to the boiler house. The boilers were large circular ones with spikes. It was cooked for eight hours. The spikes went round and turned the rag over. From the boilers it went to the breakers, where it went into a machine like a lawn mower with a big drum, where the rags were cut up to a length of about an inch to 3/4 inch. From there it went to the bleach house. It was bleached for almost eight to twelve hours, depending on the colour, in vats with a stirrer going round. From

there it went to the beaters. The beaters was the same kind of machine as the breakers, but with more teeth on the drum. That cut it up finer. From there it was pumped into big vats and it was stirred with big stirrers that went round and round.

Then it was ready to make paper. It came out onto the machine wire as a liquid pulp. It flowed on a gauze wire that took the water out. The machine man was always working out the thickness. He had to get the exact thickness of a pound note. They were the first to make bank note paper. It went onto a roll to work out the water. The roll vibrated to get the thickness of the paper. The more it vibrated, the thinner it got. Then it went onto a roll called the name roll, which gave it the watermark. The watermark was worked in wire on the roll. Then it went through two more big press rolls and onto the cylinders to dry .The machine-man used to tear bits off to a certain shape. He had a metal plate to measure this shape. He would weigh this piece. He might rush back and start tapping here and tapping there, because he knew the weight was wrong and so the thickness was wrong.



Samples of Joynsons paper. They are over 100 years old. [from Simon Fisher and held by Richard Barrows]

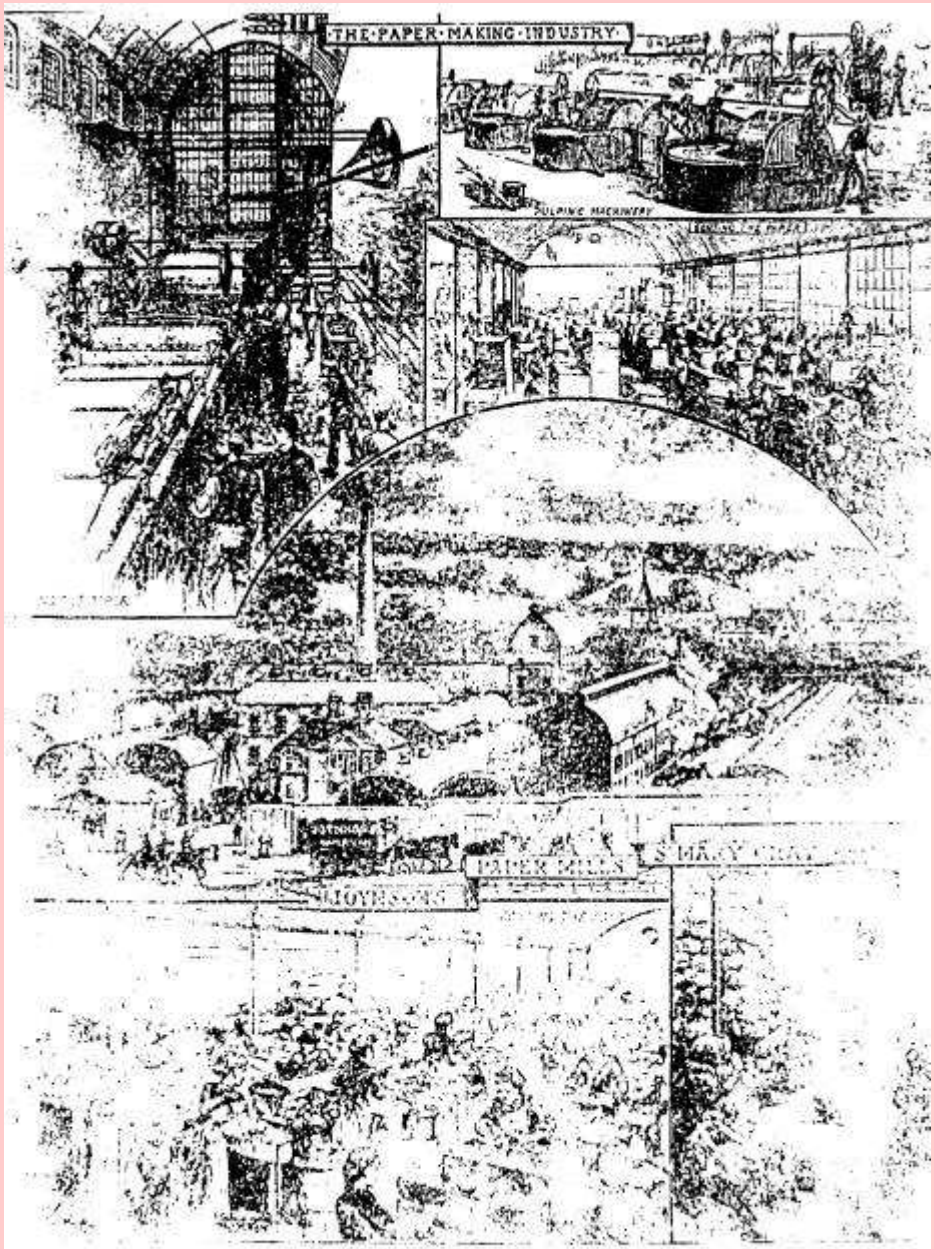
When it left the cylinders, it was dry paper. From there it went to the size bath. Size made it waterproof. Size was made from bullocks' nostrils. They came from slaughter-houses. The size-man used to make a bit of money on the side, because sometimes there were brass rings in the nostrils. The size was boiled right down to a liquid.

The paper went through the size and then up to the top of the building by machine. It went up four storeys and down again on cylinders. Those cylinders were wire gauze with fans inside to dry it. It was dried slowly; it went over 200 to 300 drums. If the paper is dried too quickly it goes brittle. The size and the slow drying made it flexible. From the driers it came down onto the spindles that rolled it up. The cutter-men used to measure: it, tear it off and put a new spindle on and start again. The cutter-men would take a piece: of paper and weigh it again. If it was banknote paper, the place would be full of government inspectors watching that nobody took any of the watermarked paper. They used to walk with it and watch it being packed. In those days there were no metal bands in the banknotes.

There were two mills there: the old and the new mill. The new mill made the currency paper and the old mill made the writing paper. In the new mill the process of drying was faster, in the old mill it was very slow. To go over 300 drums used to take twenty minutes in the new mill, in the old mill it would take over an hour. Some of the paper was very thick and would take longer to dry.

The boilers would fur up and the mill had to close so that we lads could work on chipping the chalk from the boilers. We worked twelve hours a day and the mill closed from Saturday afternoon to Monday morning.

There were some bad accidents. The driers went up four or five floors. At first they had no handrails and one chap fell head first from the top and killed himself. Then they had handrails put up. There was a man called Watson who was on the cutters lining up the sheets, when down came a hand. He was doing something to alter the speed of the machine when his hand slipped under the knife and was cut clean off. Once, at one o'clock in the morning they were working on calendars, which glaze the paper, and somebody was yelling and yelling. He had got his fingers in the rollers and his hands were smashed in the rollers. Somebody stopped the machine, otherwise his arms would have been pulled in."



Engraving of Joynson's Mills about 1890, showing rag picking, pulping, making and sorting paper.

Engraving of Joynson's Mills about 1890, showing rag picking, pulping, making and sorting paper.

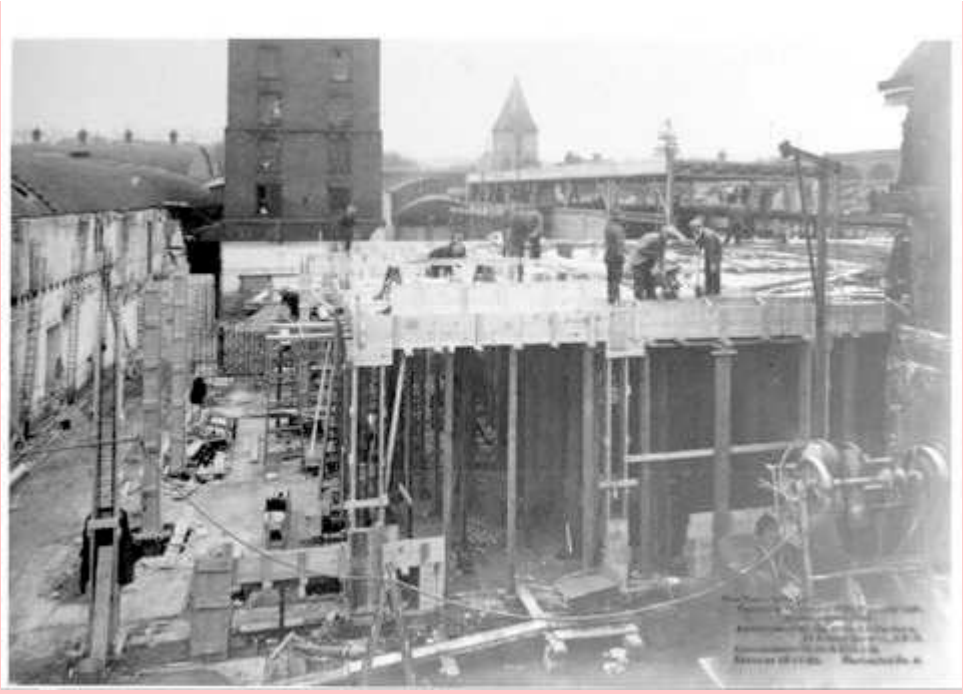
..Yes. there were many accidents. but it's very interesting to think what a piece of rag went through: first it was cleaned, then it was boiled, then it was bleached, then it was breaked, then it was soaked in vats and went to the beaters and back to the vats and machines to make paper.

Shortly before the First World War E. H. Joynson took his son, William O. H. Joynson into partnership. W. O. H. Joynson saw active service in both world wars, with the rank of captain in the first and lieutenant-colonel in the second. Between the wars he had a distinguished career in local politics and administration, becoming the first Chairman of Orpington Urban District Council and a Justice of the Peace. He returned to the partnership in 1920. From Shears' book on William Nash we know that the following decade was a difficult one tor the mill owners facing economic fluctuation and trade union demands, but how the Joynsons responded is not clear. They seem to have cut back their labour force from 387 (224 male and 163 female) before the War to about 271 (171 male and approx. 100 female) in about 1930.

Advertisement for "greaseproof paper" in The Paper Container. *July 2 1934.*

Advertisement for greaseproof paper, 1924

In the middle of the slump, in 1931, E. H. Joynson retired aged 70. The mill was sold to a partnership between Papeteries Delcroix of Belgium and Wiggins Teape and Co. Wiggins Teape in these years were engaged in a series of mergers and acquisition. including Dartford Paper Mills. St. Mary Cray Mill was closed for about 18 months and then after a substantial rebuilding and re-equipment programme during 1932, reopened in April 1933 as The Vegetable Parchment Mills (Delcroix) Ltd., with about 80 of the initial work force of 100 being former Joynson employees. Vegetable parchment was produced by treating an absorbent base paper with sulphuric acid to partly dissolve the cellulose fibres. The result was a highly grease-resistant and non-porous paper or card extensively used as food wrapping but also for some art printing, industrial and medical applications. Sheets could be laminated together to produce a vulcanised sheet of great strength used for example as backing for abrasive grinding discs. The production of vulcanised fibre began in 1942-43 with 30 tons and reached 400 tons in 1959. The mill became a wholly owned subsidiary of Wiggins Teape in 1957 and a programme of technical improvement began in 1959.



The rebuilding in 1932 for Vegetable Parchment (Delcroix) Ltd. Photo dated 17. Nov.1932. [Property of St. Mary Cray Action Group]

In 1963 The National Paper Museum was opened, for which a small guide book was produced. Wiggins Teape had made available to the Technical Section of the British Paper, and Board Makers Association, at a nominal fee, Joynson's old beater house in which twenty items of equipment from the days of hand papermaking were set up.

How appropriate that the Cray Valley should have become the home of the National Paper Museum. Alas, it was not to remain for long, for in 1967 Wiggins Teape, in rationalisation, decided to close down three of their smaller mills, including the Vegetable Parchment Mills at St. Mary Cray. The buildings soon vanished, replaced by a new industrial estate, but the museum exhibits resurfaced in Manchester at the Museum of Science and Industry, which holds the National Paper Collection.

Just twenty years before the final closure, the Kentish Times had reported: Twelve men and one woman, pensioners of the Vegetable Parchment Mills, St. Mary Cray having between them 679 years service, were entertained to tea at the works canteen on Wednesday. . . . Among the guests of honour were a man and his wife with 94 years service and two men whose grandfathers had worked at the mill 105 years ago.. . . Holder of the longest term of employment, Mr F. A. Price, who began work when he was 12 years old, had been at the mill for 66 years.

Such figures give the barest hint of how the Joynsons and their mill moulded not merely paper, but the whole structure of a community. On this there is far more to relate

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