

THE ALBERT MILL SURVEY

Joan Day

Early in 1974 it was learned that the lease of the Logwood Mill at Keynsham (ST 656679) was due for renewal at the end of the year. The possibility that the chemical firm occupying the building might then decide to vacate it, caused some concern for the future of this important industrial site. When suggestions were made that the building and its equipment should be recorded, as far as possible, before any changes could take effect, Roger Wilkes immediately volunteered to lead a survey team and Colin Frayling offered to help him. The full team eventually consisted of several BIAS members and interested friends including: Roger Wilkes, Colin Frayling, Martin Watts, Chris Powell, Reg Tucker, Dr and Mrs Dale, John and Fran Tranter, Peter and Sue Stuckey, and Joan and Roy Day.

The mill building

The main building, which was surveyed by members of the BIAS unit, has square-coursed rubble walls of blue lias stone with Bath stone mouldings and quoins. A blue-slatted timber-trussed purlin roof spans the full width of the building with the gable walls, finished with a stone coping, rising well above the line of the roof. The window surrounds, although varying in size, are based on the Tudor style with a centre stone mullion and a squared hooded moulding and dressed-stone relieving arch above. The ground floor is mainly stone and concrete with an area of timber boarding in an end bay. The upper floors are timber boarding on timber joists, supported midspan by either cast-iron columns or timber posts.

It is not at all clear just how much of the building was constructed at one time. Differences in floor levels, type and size of column supports and the arrangement of the windows and doors, especially on the court-yard elevation, cannot be fully explained. Possibly they arose from the fire disasters of the 1870s which are detailed in the history of the site. On the other hand, there are no obvious signs of extension in the main external walls, the details are consistent and the masonry has weathered equally throughout.

Changes in the use of the building have resulted in windows being blocked up, new openings being formed and additions being made. Although the top floor does not now extend across to either end-bay, it can be seen that it did at some time in the past. There is a large opening in each cross-wall, high up in the apex of the roof, possibly to accommodate a horizontal drive

shaft for powering machinery or perhaps just for ventilation. Of the elaborate tudoresque chimneys built on each gable, one has a window immediately below it making it appear a dummy, the other has a brick flue but no present-day sign of a fireplace. High in the latter gable is a circular opening formed in the brickwork, possibly for ventilation.

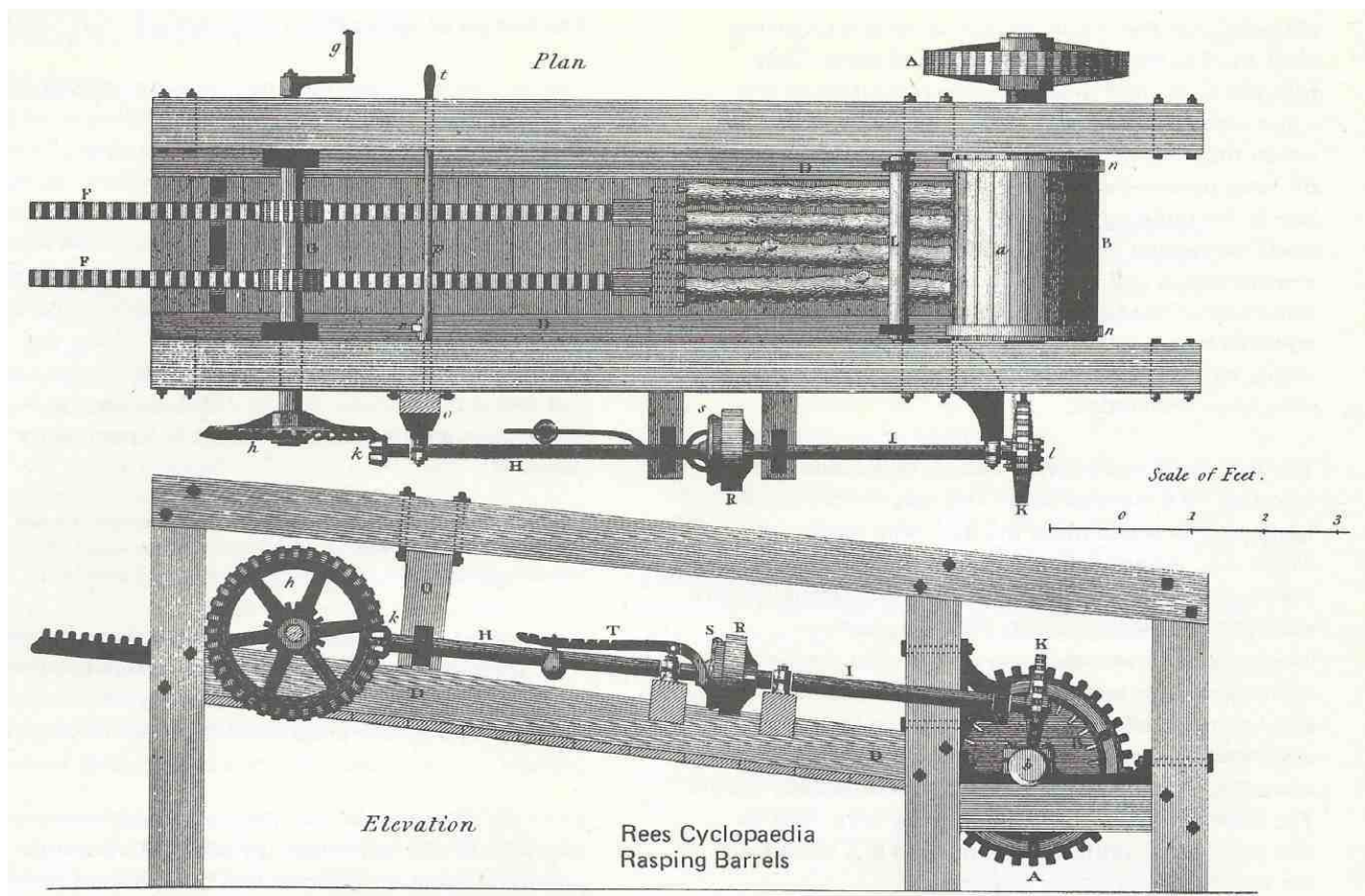
There are two arched inlets where the mill race enters the building, (see cover drawing). One culvert leads to the inner waterwheel, the other has long been blocked but suggests that, at one time, there may have been a second wheel inside the mill.

To the side of the mill race, close to the external waterwheel, is a pantiled extension in a similar style to the main building. It is said that a beam engine was already installed here when the dyewood industry took over the mill in 1874, and that this was the engine-house. It was measured externally, but it was not possible to check the interior for engine mountings which are said still to be there. The arched pathway over the weir has always been associated with this engine, it having been said to be built to carry away large quantities of ash to the island below the weir.

Apart from the main building surveyed, the mill comprises many extensions, storehouses and additional blocks. A large external doorway in the main building has been obscured by a major extension at right angles, which forms the third side of the courtyard opposite the millhouse. It was suggested that this part of the complex may possibly predate the main building as it exists today. Other blocks on the opposite side of a public footpath away from the mill race and river, are of much more recent origin. They have been involved mainly in the chemical side of the business but one bay has housed steam-driven edgerunners for dyewood processing. No attempt was made to include these additional buildings in the BIAS survey.

Equipment and processes

The two existing breast wheels were already in place when the Thomas family took over the site in the 1870s. Both are interesting, and possibly of experimental construction, but there are no identification marks and no information on their history.



The external wheel is at right angles to the flow of the head race, a large wheel of 18ft 1¼ ins diameter, and 9ft 11 ins wide overall. It has sixteen very light radial spokes tied in with the same number of curved members of equally light construction, an arrangement which appears to be unique. Some of the ventilated wrought-iron buckets are supported by shaped cast-iron spacers the remainder having been replaced with plain rods. Power was transmitted through a train of spur gears and a 7ft 3 ins diameter cast-iron flywheel to the chipper unit which carried out the first stage of dyewood processing.

This is still in place and consists of a heavy cast-iron disc in which four blades are inserted. Rotating at about 100 rpm, these were capable of shaving slivers of wood from the end of the log which was held in a sloping cast-iron shute. The logs were forced on to the cutting disc by means of a belt-driven feed. The chipped woods thus produced were often supplied to the customer with no further processing, in order that they could make up their own dyes.

At one time, however, it was possible for the Logwood Mill to supply an alternative to the chipping process. Some manufacturers preferred their dyewoods in the form of a sawdust. Chips were too coarse for their purposes and powders were too fine to be removed easily from the finished dyed goods. For their satisfaction the process of rasping was developed. The equipment

was made up of two horizontally-mounted drums carrying serrated-edged blades, on which logs were driven in a similar way to the chipper unit. The Logwood Mill equipment of this type was broken up in the 1950s, but it is known to have resembled the drawing in Rees Cyclopaedia dating from about 1815.

For dyeing woollen cloth, finely powdered dyewoods were usually preferred and these were produced by grinding piles of chips under edgerunners. The remaining pair of these vertically-mounted grind-stones still existing in the main building was powered by the inner waterwheel. At first sight this wheel is rather more conventional with normal radial spoking, but being hidden away is difficult to examine in detail. On inspection, the outer twelve spokes are made up of rods with lengths of wedged angle-iron acting as stiffeners bolted to the rods at intervals. The central arms are made of timber and bolted at either end. The sluice gate of this wheel is lowered, allowing water to flow over the top and thus creating a slightly greater fall than the more usual raised sluice gate of the outer wheel. For this reason, it is said that the inner is the more powerful of the two although, within an inch or so, they are of similar sizes.

The shaft of the inner wheel drives through a pit wheel and pinion to a vertical shaft, and then through two large spur gears which turn the edge-running equipment. The two vertically-mounted stones are now 4ft 6 in in

diameter, but are known to have worn several inches since the Thomas family first installed them. They turn one-and-a-half times to every revolution of the water wheel, on a massive dished stationary base, on which the chips of dyewood were placed. Another pair of water-powered edgerunners once existed in the west bay of the building but were broken up in the 1950s when the rasping barrels were destroyed. However, another pair is still in place in the newer buildings to the other side of the footpath. These were once steam-powered by a single overhead shaft from a horizontal engine by Cox and Wilson of Oldbury, which has long since been dismantled.

The mill could also provide 'raised' dyewoods when specified by a manufacturer. This was the process of fermentation which made the dye more permanent, but which was normally carried out by the concern making the dyes. Chips were piled into loads and sprinkled with water, then covered and left until they became iridescent. Skill was necessary in assessing the timing and atmospheric conditions, for temperature and smell also had to be taken into account. Once the critical point had been reached, the material had to be delivered immediately otherwise it would have completely spoilt. The upper floors of the main building were used for this purpose in addition to being used as a store for the processed dyewoods awaiting sale.

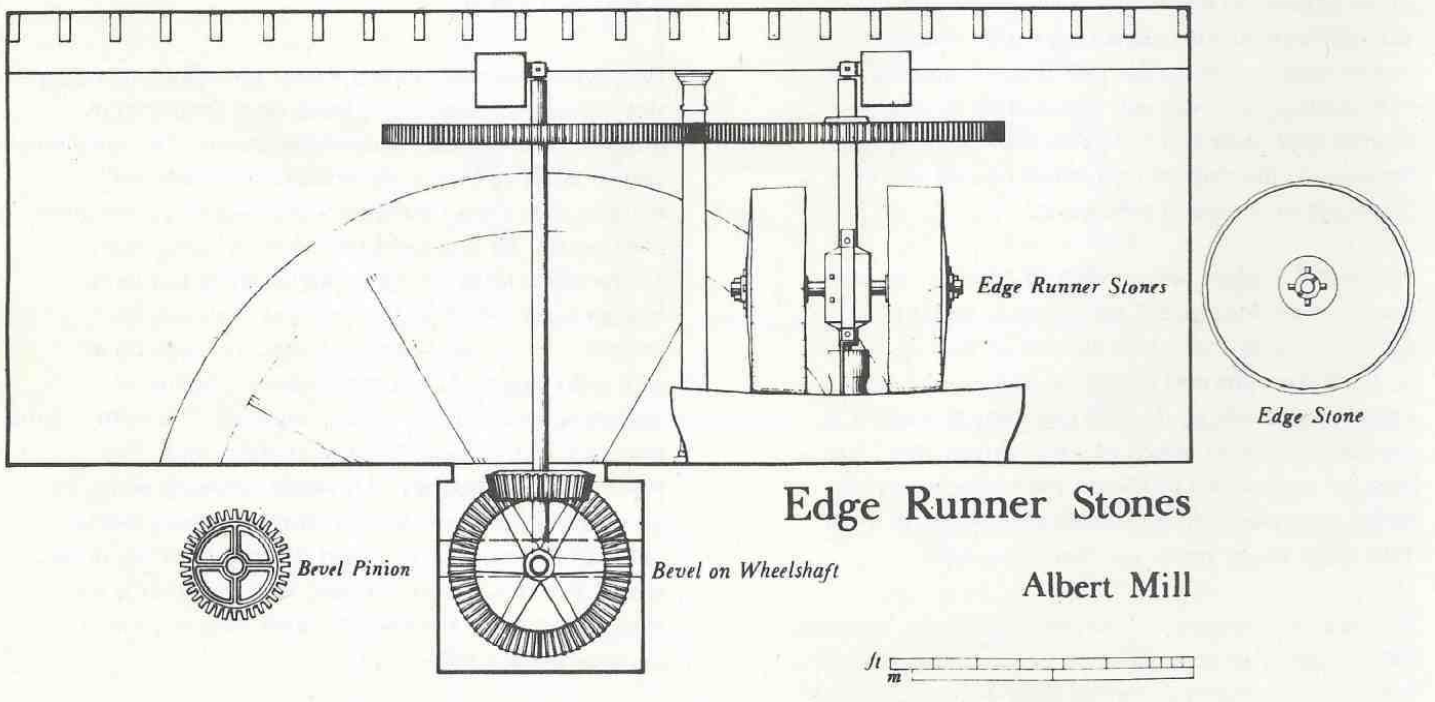
The history of the site

The Domesday survey recorded six watermills in the village of Keynsham and the Logwood Mill site, on the River Chew is believed to have been in existence then and one of those recorded. No further references have been discovered until the sixteenth century, when deeds from 1526 onwards connected with Keynsham Abbey describe the site as South Mill. From these deeds, an indenture of 1533 refers to three local grist mills 'called Avyn mill, Downe Mill and South Myll'. After the dissolution of the monasteries these mills came under ownership of the King, and by 1608, South Mill was included in a list of properties held in Somerset by James I:

'Parcel of the jointure of Lady Katherine, formerly Queen of England. 2 fulling mills, of which one is called Avon Mill and the other South Mill, parcel of the manor of Keynsham'

South Mill had changed its function to that of a fulling mill, scouring and finishing woollen cloth, in common with many other mills on the Chew. No information has come to light on the progress of this new industry, but probably it continued here for a considerable period.

In 1788, the owner of a cotton mill opposite Hotwell House in Bristol advertised the sale of his premises and announced that his business was being moved to the



village of Keynsham. It was revealed by later references that South Mill was the site to be adapted. Within ten years the proprietor was in financial difficulties and offering the new business for sale, apparently unsuccessfully, for the owner, a William Overend, continued to pay rates on the property. During this period local villagers applied for poor law relief because of 'shortage of cotton at the mills', or 'shortage of work at the cotton mill'. Possibly these difficulties were aggravated by import restrictions during the Napoleonic War. In 1808 the equipment at South Mill was again advertised for auction but by 10 August 1811, the then joint-owners, Messrs Oakley and Overend, were bankrupt when a final advertisement appeared in Felix Farley's Journal. The sale of equipment offered spinning jennies, scribbling engines, cotton and woollen carding engines and various other machines, together with the dyeing furnaces used in cotton and woollen manufacture. Also for sale were the drums and drumshaft connected with the single water-wheel which had driven all the mill machinery.

The results of the auction are not known, but it seems likely, from later references, that the mill was adapted to some extent for the processing of flax. By 1830 the Bristol brass company, which had its headquarters at the nearby Avon Mill, included the mill in its list of property. It was described as 'The Cotton Mills on the River Chew, comprising a large stack of Building with five floors, now used as a Flax Mill, with one water wheel and a fall of twelve feet - also a small dwelling house adjoining'.

The estimated value of the premises amounted to £4,300. Two closes of arable land adjoining the mill, called Lime Burners and Tibbett's Leaze, of about 15 acres were valued at £1,000. There is no indication in these documents that the business of brass manufacture had ever been carried out at the site, or of the length of time which the brass company had been owners of the property. In the Bristol Mirror, 18 June 1831, the brass company offered the flax mill for sale and later it was deleted from the list of company premises.

It was said, in one retrospective newspaper account, that the mill was involved in a serious fire at some time during this period. This may explain the subsequent description of South Mill which appears in an advertisement of the Bristol Mirror, 3 November 1836. It refers to a newly-built grist mill, containing four pairs of stones, with an unfailing supply of water from the River Chew. It was then occupied by a Mr Porter, who is known from Poor Rate Assessments to have continued running the mill well into the 1840s and possibly much later. It was still being described as a corn mill or grist mill until the early 1850s.

The next evidence of further change comes to light in the dramatic reports of the fire at South Mill in March 1873. Details then appeared of a new industry which had been established for many years past. The Blue Lias Lime Company had apparently been working on the site at a

much earlier period. The local Keynsham blue lias limestone was burnt to yield an excellent 'hydraulic cement' in demand for building purposes. It had the property of drying out slowly, even under very wet conditions, and much of this material is said to have been exported through the Port of Bristol. One newspaper, reporting the memories of an old local workman, referred to twenty one limekilns at the bottom of Dapps Hill where South Mill was situated. After burning, the stone was finely crushed, and probably the mill equipment would have powered edge runners for this purpose.

Some years prior to the date of the fire, a new firm called the Keynsham Lime, Paint and Colour Company had taken over the South Mill from the Blue Lias Lime Company. A Mr Owen of Victoria Street, Bristol had been the owner of the business and it is relevant to note that the name of Owen was also connected with other ochre works of the Chew Valley, in the Winford area. Ochre, a decomposed iron oxide, had long been extracted from the dolomitic conglomerate on Mendip and its outlier just south of Winford village, near Ridgehill. There were at least six watermills on the Chew at one period or another which were used for processing this material. The best of the ochre needed only to be sieved through a fine material in preparation, but coarser lumps had to be ground wet, under pairs of edge-runner stones. The resulting sludge was then dried in long coal-fired kilns with flues running under the length of the floor. The bright red powder was sold mainly for the production of paint, but also to linoleum and tile producers in Bristol and much further afield.

From the title of Owen's company, the production of ochre at South Mill appears to have been an addition to the previous business of limeburning. Thirty men were employed by him, plus an undisclosed number of boys but the industry was in the process of being greatly extended. At the time of the fire, new machinery and equipment was being installed which would have provided employment for 150 hands, but the disaster ended the whole business.

Newspaper accounts of March 1873 reported that valuable equipment and plant at the mill were completely destroyed, together with much of the premises. A building said to have been very badly damaged measured 100 ft by 60ft by 35ft. 'Roofs had fallen in, windows were out, walls were down, and the various pieces of substantial machinery lay about in chaotic confusion'. Horses and a large quantity of hay were saved, and little damage was reported to the engine, or the engine house.

Keynsham parish fire engine, normally kept in the church porch had been used in the first stages of fighting the fire but had proved to be quite inadequate. The Bristol fire engine of the Royal Insurance Office had also to be sent for, and arrived some two hours after the fire had been discovered to find the building a mass of flames.

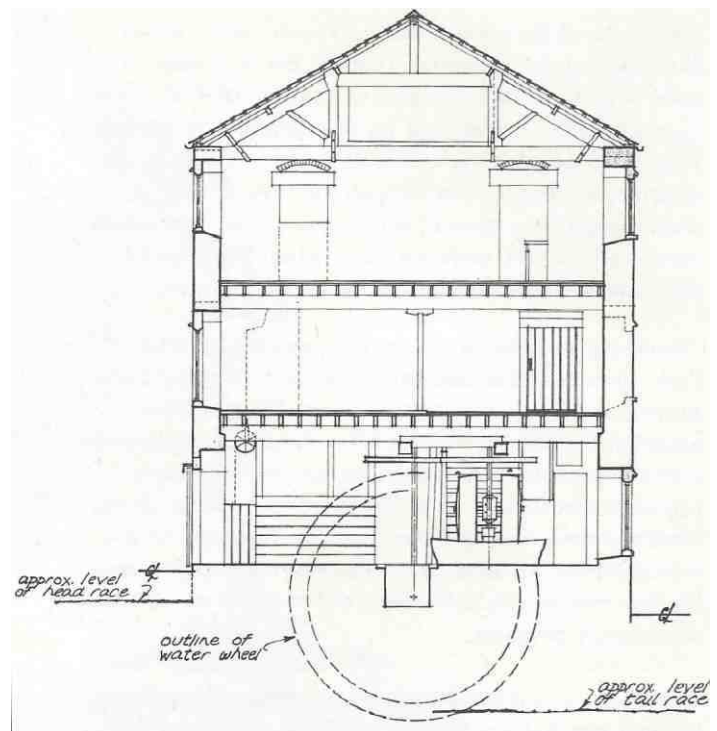
The abrupt cessation of the lime and ochre company allowed the Thomas family to bring their dyewood processing back to Keynsham. John Thomas had originally been involved in the dyewood industry at Chewton Keynsham mill, following the Napoleonic War. Later, he moved as manager to Swinford Mill during the 1820s, and later to his own business at Hack Mill, Wotton-under-Edge. After two further moves in the area of the Stroud woollen industry, his family took the opportunity provided by the South Mill fire to return to Keynsham. At this juncture, a Mr Gould joined the firm as a financial partner and from that time the business was known as Gould, Thomas and Company, a name which continued until recent years.

The Thomas's brought their equipment from their previous site at Rock Mill, Stroud, to be installed at South Mill, Keynsham by the Stroud millwright's firm of Jehu Shipway. The new business opened, presumably after extensive rebuilding, during 1874. It had only been working a few months when a second disastrous fire occurred, in January of 1875. Again, the parish fire engine was brought and help given by local villagers; all quite abortive.

A mounted messenger was sent to Bristol to the offices of the Liverpool, London and Globe Insurance Company, on this occasion. Their engine was immediately horsed and manned with a number of the fire brigade to set out for Keynsham as quickly as possible. This time, the combined efforts were instrumental in saving a large quantity of valuable machinery worth £500 to £600, and a wing of the mill building. The main part of the structure, 128ft long by 28ft wide was entirely gutted however, although the walls were prevented from falling. The total damage was roughly estimated to be valued at about £1,200 but the business was said to be fully insured. Undoubtedly this precaution saved the dyewood industry at South Mill, for the business resumed, and soon developed. Possibly because of the fire, additional premises were taken as a temporary measure at Albert Road in Bristol. In consequence the Keynsham site was renamed the Albert Works, and the mill itself became the Albert Mill, or the Logwood Mill.

The dyewoods processed here by the Thomas's required chemical mordants to 'fix' the dye and to extend the range of available shades. Traditionally, dyewood supplies had been handled by dyesalters, or traders in bulk chemicals of a coarser nature, as opposed to the pharmacists. Gould, Thomas and Company followed this pattern and several of their own products were manufactured at their Logwood Mill premises. Glauber's Salts were made, and ammonia was produced from the gas liquor at the nearby gas works at the bottom of Dapps Hill. Other chemicals were bought in bulk and bottled or packed in smaller quantities. The very slow decline in the use of dyewoods, once aniline dyes became successful, was absorbed by the Thomas's through the success of their

chemical business. They continued to produce dyewoods in ever smaller quantities after the First World War, and long after most other producers had failed. As other manufacturers ceased, the Keynsham supply became almost unique throughout the country. The commercial processing of dyewood continued at the Logwood Mill, just in occasional batches, until the early 1960s. From the Second World War, the West Indies had prohibited the export of their home-produced dyewoods for processing abroad, as they needed to protect employment in their own islands. From that time, the Keynsham mill was using up the last of its stocks. The final load of logwood, the main commercial dyewood, was processed in 1964, and the Logwood Mill had then, for some years, been the only source of supply in the country still capable of processing dyewoods.



Albert Mill Section

From that date, the mill has relied on the chemical business, becoming solely a chemical warehouse. In fairly recent years the premises have been leased to a company of chemical wholesalers although ownership of the whole site is still retained by the Thomas family. This situation still exists at the time of writing, and the unique dyewood processing equipment is still retained in the Logwood Mill.

Just before going to press, it has been learned that the site has now been listed as a Grade II building of 'special interest' by the Department of Environment.

The use of dyewoods

When exploring Central America the Spaniards discovered that chipped or powdered woods of some local trees were being used by natives as a source of dye material. The logwood tree, *Haematoxylum campechianum*, most commonly used for this purpose, yielded blue, mauve or purple shades but the range was extended by the use of various techniques including the addition of chemical substances. Logwood was found growing in the Bay of Campeachy in Mexico, giving rise to Peachwood as one of the many alternative names used later.

The use of these dyes was introduced through Spain to other European countries in the early sixteenth century and reached England during Elizabethan times. Almost immediately their use met with strong opposition from the English woad growers and traders. They claimed that logwood was very inferior to their home-produced woad, which gave a similar range of blue shades. The cause underlying the opposition appears to have been a fear for their own employment, although logwood was not, at that time, being processed to its full extent to yield a dyestuff which was fast. In consequence, the woad growers were successful in 1581 in obtaining an Act of Parliament banning the use of logwood for dyeing.

Many dyers, never-the-less, are believed to have continued to use the banned material and its import was still continued under various other names, such as peachwood mentioned above, or, quite commonly, blockwood and other invented alternatives. Whenever its use was exposed throughout most of the following century, supplies were promptly seized and burnt for the prohibition was strictly enforced.

In the meantime, other dyewoods were being introduced to England from other countries. Brazilwood, or braziletto from the tree *Caesalpinia echinata* found growing in South America, produced a range of red dyes, but was banned by legislation during 1631. The opposition against its use was less vociferous than with logwood, however, and the ban was soon lifted. This was mainly because there was no other substance at the time which could be used satisfactorily in its place. In contrast, the import of 'young' fustic or fustet was encouraged because its bright yellow or orange colour could be combined with woad dyes to produce a good black of which the woad growers approved. The tree was *Rhus cotinus*, found growing in Asia and the Eastern Mediterranean.

The ban on logwood was eventually lifted during Charles II reign in 1661, with the coming of Flemish immigrant clothworkers who were well acquainted with its use. It was then stated officially,

'that the ingenious industry of these times hath taught the dyers of England the art of fixing colours made of logwood, so that by experience they are found as lasting and serviceable as the colour made with any other sort of dye-wood.'

From that time the demand increased very rapidly but supplies were only available from Spanish possessions in Central America. English settlers formed small colonies in the more unfrequented areas to cut logwood trees in large quantities, before being forcibly ejected by the Spanish authorities. William Dampier was one such adventurer who, in his **Voyages**, described his experiences cutting logwood in the 1670s. The settlers returned to remoter areas in the years that followed but were a source of constant hostilities until an agreement was reached with Spain to allow British subjects to cut and ship logwood from the Bay of Campeachy.

From Campeachy the loads of wood were taken to Jamaica or other islands in the West Indies to await transport to England. Professor Minchinton's **Trade of Bristol in the 18th Century**, lists ships arriving at Bristol between June 1699 to June 1700 which includes:-

18 ships from Jamaica, carrying: Sugar, Logwood, Cottons, Indigo, Pomento and Dying Wood

28 ships from Antigua, Mountsarrat and St Kitts carrying: Sugar, Cottons, Ginger, Mollasses Fustick, Lignum Vitae.

Efforts were also being made to introduce the tree to the English possessions in the West Indies. By at least 1715 it was being cultivated in Jamaica from seeds obtained from Campeachy. Plantations were formed in a short time as the trees were said to be 10 ft high three years after planting. In a few years, logwood was growing luxuriantly in all parts of the island.

In the early years of the eighteenth century William III granted exclusive rights in several industries as a means of obtaining revenue. One of these grants involved the production of dyewoods and gave rise to new controls in the industry. In addition, in 1726, a further Act was passed affording protection to woad-growers by controlling the use of logwood. This legislation may have been responsible for the careful accounting of dyewood imports to the port of Bristol during the eighteenth century, as seen in Professor Minchinton sources on the 18th century port trade.

Swinford Mill is an early site which undoubtedly would have received supplies through the port of Bristol in this era. In his *History of Bitton*, Ellacombe declared that the mill had been a logwood mill from

Elizabethan times. In view of opposing legislation his statement must be questioned, but bearing illegal activities in mind, this early involvement was not impossible. However, the mill may well have been used to process the legal imports of dyewoods such as young fustic and brazilwood. During the eighteenth century the mill at Swinford was owned by the Tyndall family and left to Onisipherous Tyndall in 1737. He had been appointed Verdurer and Chief Ranger of Kingswood Forest in 1734 and had then been described as a drysalter, the trade which included the supply of dyewoods. The industry continued here until the mid-nineteenth century when the business was owned by the Lediard family.

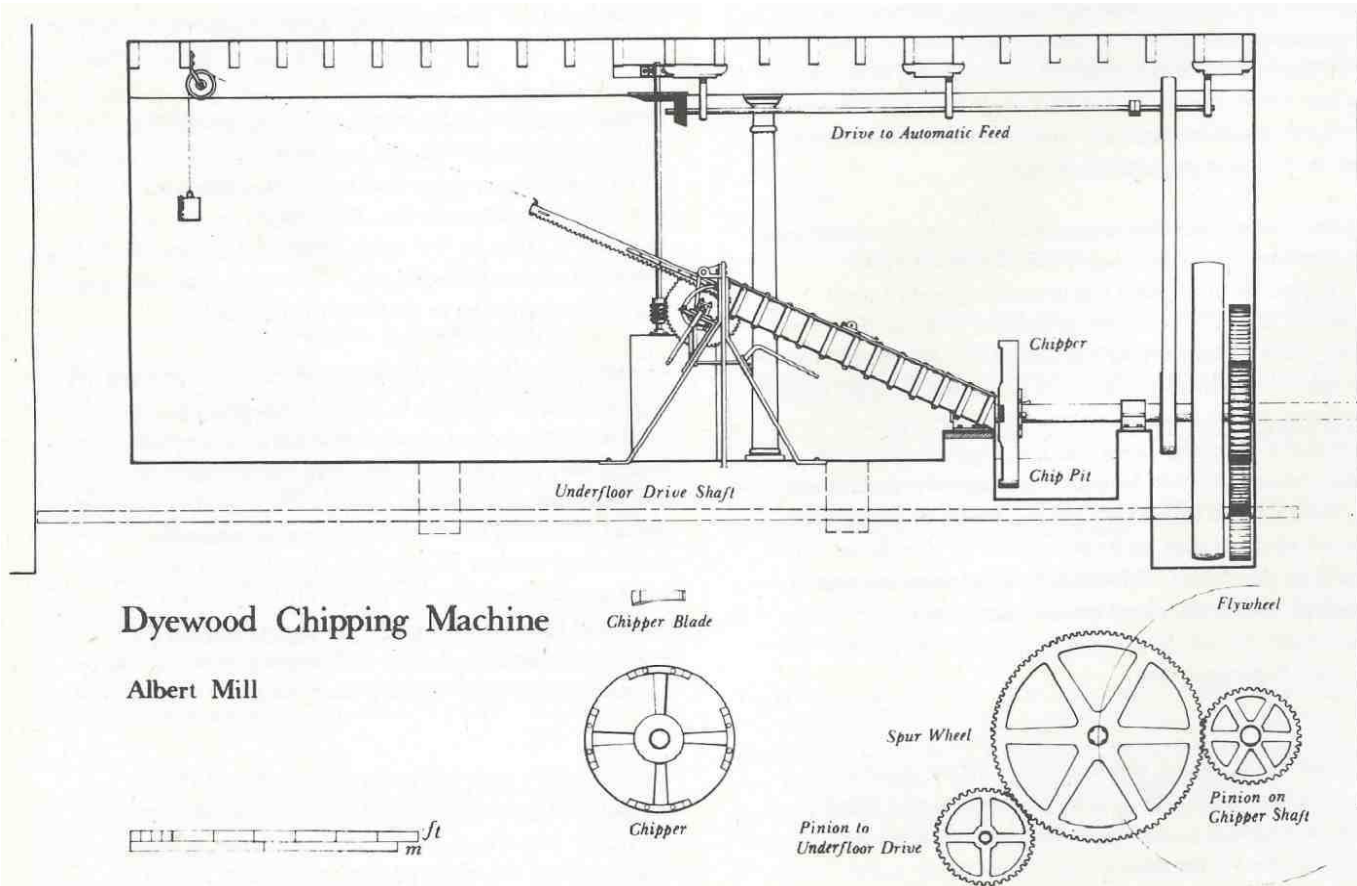
From at least 1764, land-tax assessments indicate that a former paper-mill site at Chewton Keynsham was involved in processing dyewoods. By 1771, Thomas Lediard, drysalter, was responsible for this business, and under this ownership John Thomas was originally employed. After Thomas left in the 1820s to manage the Lediard-owned mill at Swinford, Chewton Keynsham mill continued to process dyewoods until 1894, the last few years under the ownership of Colthurst and Hardings's paint firm. By this time, the Thomas family had returned to Keynsham and for some ten years had occupied the neighbouring mill site downstream which they renamed the Logwood Mill.

Other millsites in the area were concerned in the industry for varying periods. Robin Atthill's *Old*

Mendip refers to an advertisement of 1784 for the sale of a logwood mill at Stoke Bottom in the Nettlebridge Valley. Collinson the Somerset historian makes a note of the site in 1791 but no further references have been discovered.

The tithe map of Weston, Bath, shows that the former brass-mill site on Dutch Island was involved in logwood processing by the 1840s. During the 1870s, local directories show that F. Parsons and Company were still running a drysalter's business at the Logwood Mills Weston, but by the close of the century, the mill had been encompassed by the local woollen-mill concern run by the Carr family, but was still referred to as a logwood mill until at least 1904. Other sites are known to have existed at Frome, and at Wotton-under-Edge and Stroud mills were occupied by the Thomas's. At least three sites are known in Bristol including the Thomas works at Albert Road and a mill near the Bedminster Bridge area. An earlier site of the port's dyewood industry was Scarlet Mill, or Red Mill, near Rownham ferry and from the name of these premises it can be assumed that this particular works specialised in the production of red dye materials from brazilwood and the other imported woods. It is believed to have been situated at the former cotton mill premises vacated in 1788.

In its latter stages the Logwood Mill produced the whole range of available dyewoods. in addition to the logwood brazilwood and young fustic already mentioned, 'old



fustic' from Jamaica and South America yielded a lemon yellow dye, but combined with mordants produced brown or kahki, and was used for this purpose in the First World War. Sandarswood and Barwood from India and Camwood from Sierra Leone all gave various shades of red. Ebony from Jamaica was processed to produce olive green and Tanekaha came from New Zealand and gave a golden brown shade.

After processing the wood chips or powders were sent to the woollen or cotton mills for the manufacturers to make up the dyes. A special Somerset market was the glove-making works of the Yeovil area who valued the shades given by dyewoods in the production of their finest leathers. Like the fabric mills, the glove producers also made up their own dyes from the woods supplied from the processors. The Logwood Mill was not involved in the production of dyes on its premises.

Some of the dyewoods are still being used by those interested in the traditional crafts of weaving and dyeing. The old vegetable dyes are valued particularly for their subtle and delicate shades but are usually required in very small quantities. All have to be obtained from abroad and are now exorbitantly expensive compared with the days when they were being processed locally.

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Dyewoods

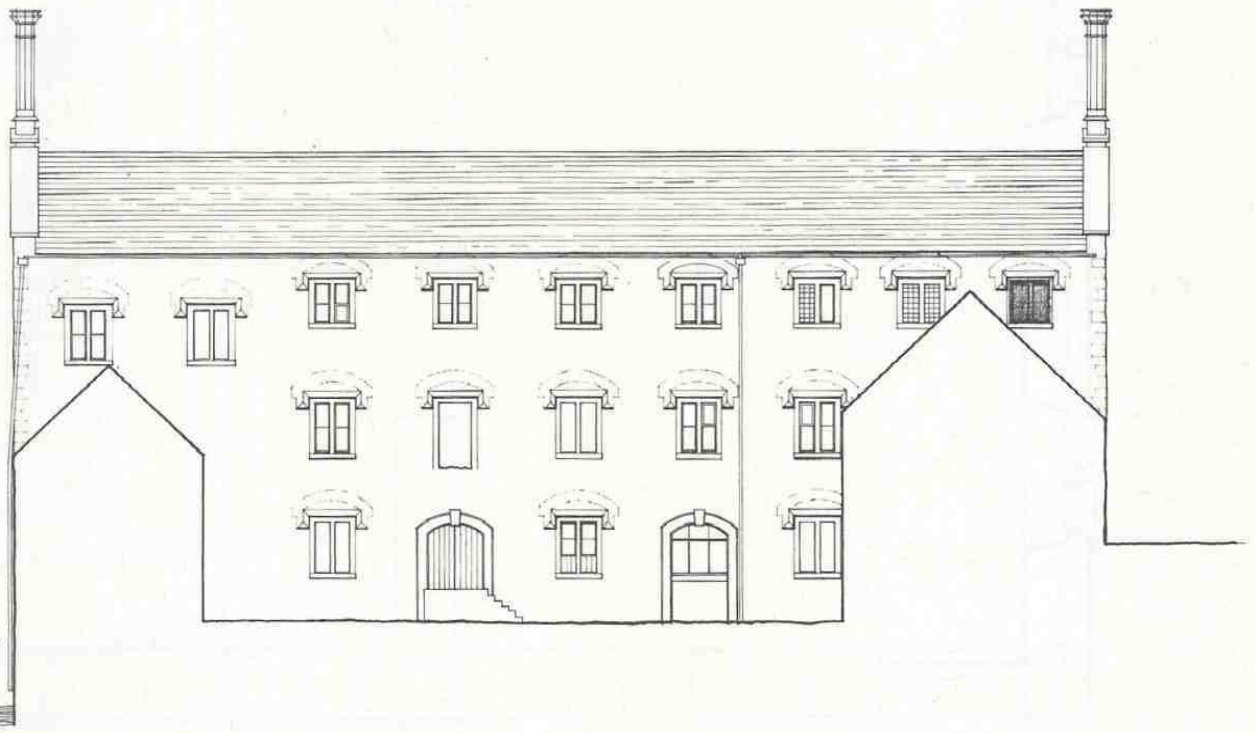
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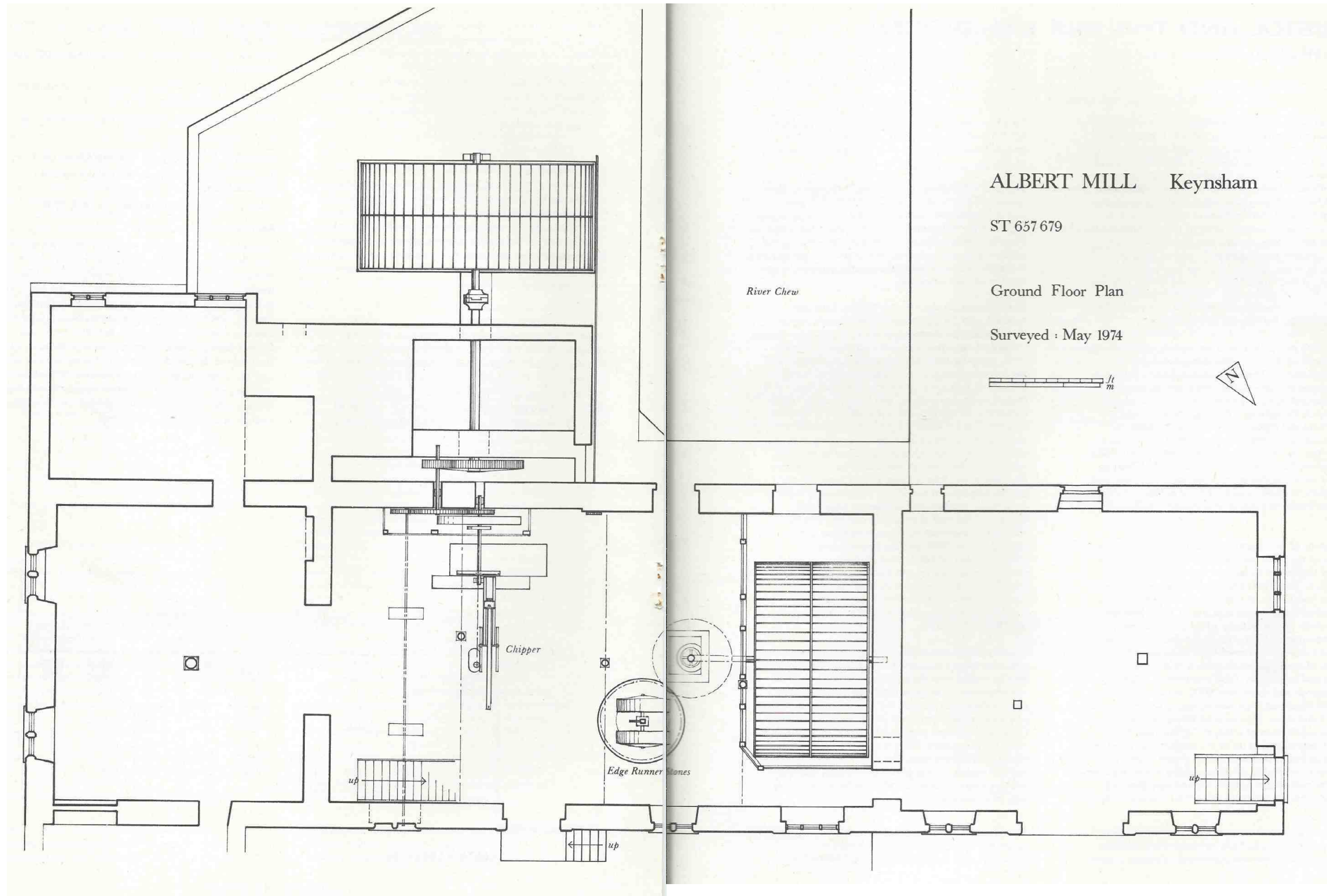
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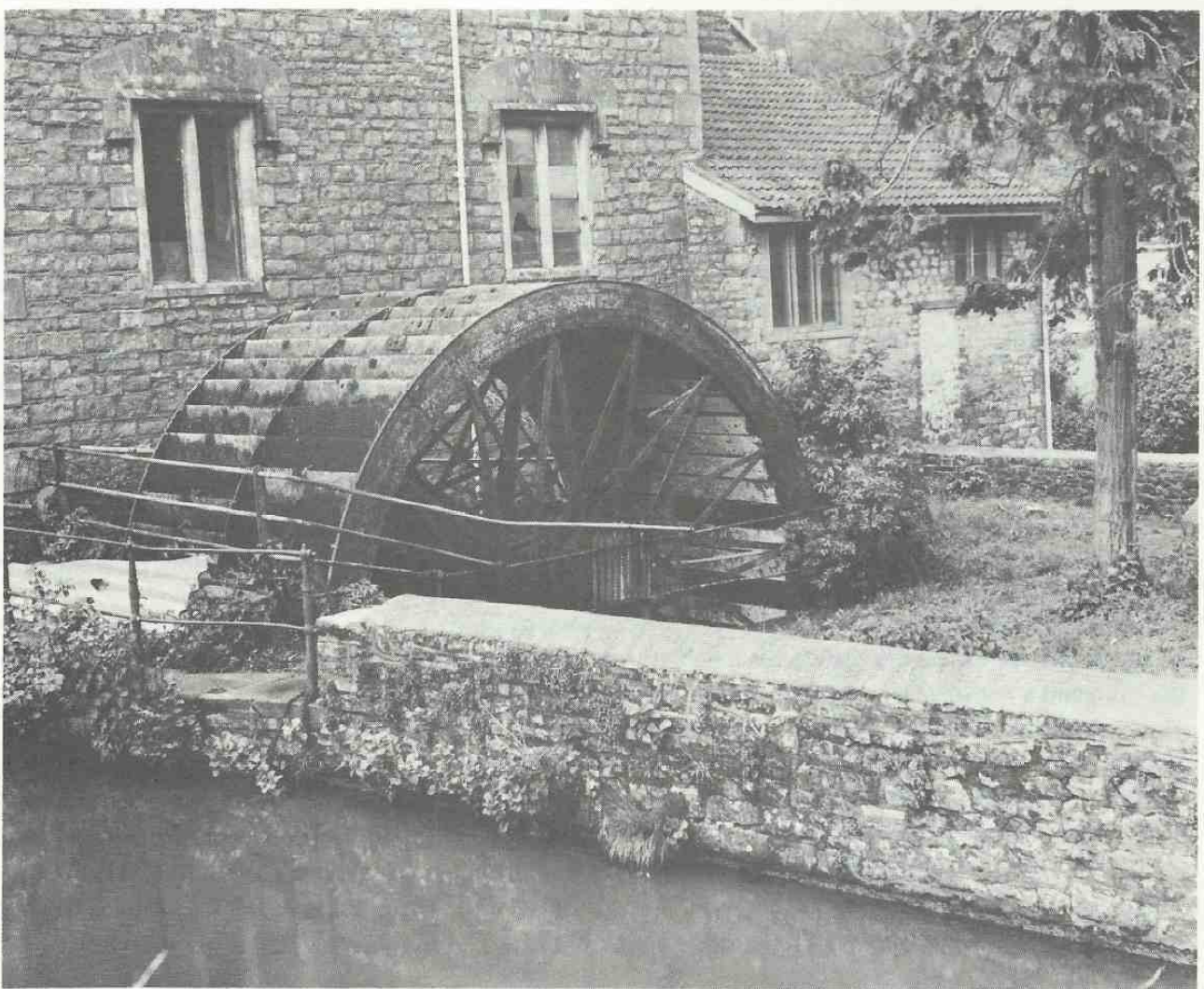
Acknowledgements

I must thank my fellow members of the BIAS Survey Unit for their valuable co-operation, particularly Roger Wilkes, Martin Watts and Colin Frayling who produced the finished drawings reproduced here. I am also indebted to the late Keith H Thomas to and to Bob Thomas, owners of the mill, and to the present occupiers Messrs Ellis and Everard, and their manager Mr Appleford; the late Robert Scott, Connie Smith and George Watkins who contributed details of information on the history of the site; Mary Fairclough and the Keynsham Civic Society and Kenneth Major and The International Molinological Society who were successful in getting the mill listed as a building of historical importance.



NORTH ELEVATION





Pictures by Roy Day

Albert Mill