



**HOLMES MILL,
GREENACRE ST,
CLITHEROE,
RIBBLE VALLEY**

**Archaeological Building
Investigation**



Oxford Archaeology North

April 2014

NGR: 374128 441369

CONTENTS

SUMMARY	2
1. SETTING	4
2.1 Site Location	4
2.2 Survey Methodology.....	4
2. HISTORICAL BACKGROUND	6
2.3 Historical Background	6
3 RESULTS	11
3.1 Introduction.....	11
3.2 1823 Spinning Block.....	11
3.3 Second Spinning Block.....	40
3.4 New Mill Original Power Plant	64
3.5 New Mill Secondary Power Plant.....	71
3.6 Structures to Rear of Power Plant.....	84
3.7 Weaving Shed	89
3.8 Gatehouse.....	93
4. DISCUSSION	96
3.9 Introduction.....	96
3.10 Phase 1 - 1823	96
3.11 Phase 2 – c 1830	97
3.12 Phase 3 – Mid-Nineteenth Century.....	98
3.13 Phase 4 – Late-Nineteenth and Early-Twentieth Centuries	99
3.14 Phase 5 – Mid/Late-Twentieth Century	100
BIBLIOGRAPHY	101
Primary Sources	101
Secondary Sources	101
ILLUSTRATIONS	102
List of Figures	102

SUMMARY

Holmes Mill is situated on Greenacre Street, on the southern fringe of Clitheroe (centred at NGR 374128 441369). It comprises two spinning mills founded in 1823 and c 1830 by John Taylor of Shawbridge, and Edmund, John & James Mercer & David Murray. The complex was extended in the mid-nineteenth century with the addition of a weaving shed and two-storey warehouse to the New Mill. A new steam-power plant was also added to New Mill in 1910. The complex was designated a Grade II listed building in March 2013.

All of the principal component buildings survive extant, although the weaving shed and warehouse were refurbished to leave only the external walls in the late twentieth century. The complex comprises two three-storey spinning blocks, one with attached hoist tower and privy block, three engine houses, one boiler house with flue to a reduced-height chimney, the external walls of a weaving shed and reduced-height warehouse, a further single-storey warehouse and covered yard, and a gatehouse adjacent to the Greenacre Street entrance.

The building investigation, commensurate with an English Heritage Level 2/3-type survey, was carried out in September 2013, and identified four phases of construction within the complex, well-preserved fabric from each of which survives throughout.

The primary phase comprised the erection of a 14 bay, three-storey mill, in limestone rubble and of non-fireproof construction, with a projecting privy tower. An attached four-storey engine and boiler house, incorporating a fireproof stair tower and loading loophole, may represent an early addition to the eastern gable. The timber ceiling beams were carried on fluted cast-iron columns, the majority of which survive *in-situ*.

A second three-storey spinning block was erected under separate ownership c 1830, and was of similar construction, but had an attached beam engine house and single-storey boiler house attached at the south-eastern corner. A chimney, placed between the two mills, was rebuilt in brick prior to 1848, but retains what appears to be an earlier sandstone base. The northern, later mill was extended in 1853, with the addition of a weaving shed and integral two-storey warehouse.

The New Mill power plant was replaced in 1910, with the addition of a cross-compound horizontal engine, supplied by Clayton, Goodfellow & Company, of Blackburn, and placed within a new engine house, with a boiler house erected on its southern side to accommodate Lancashire boilers. The engine survives intact, in its original condition, complete with a rope drum on a secondary motion shaft, and associated drive and line shafts within New Mill. Many original features of the engine house, including gas-light fittings and decoratively painted wall plaster are also well-preserved. The fluted columns within the two main structures are possibly unique, but form part of spinning blocks which are typical of the expansion of the factory system in the first part of the nineteenth century.

The extant power plant retains one of only five *in-situ* steam engines in Lancashire, and the last surviving engine by the renowned firm of Clayton, Goodfellow & Company. Whereas the other engines at Oak Mount Mill in Burnley, Queen Street Mill in Harle Syke, Bancroft Mill in Barnoldswick, and Grane Mill in Haslingden, have all been fully or partially restored, that at Holmes Mill survives in its original condition. The associated decoratively painted plasterwork of the engine house is again possibly unique, the fashion for the period generally tending towards the use of glazed brick for ornamentation of Edwardian engine houses. Many aspects of the associated power transmission system all survive *in-situ*, including sections of line shafting for two hoists and bevel gear and top end bearings for the primary and upright drive shafts.

1. SETTING

2.1 SITE LOCATION

- 2.1.1 Holmes Mill is situated on the northern side of Greenacre Street, on the southern side of the centre of Clitheroe (centred at NGR 374128 441369), which lies in the borough of Ribble Valley. The mill is bounded by Woone Lane on its western side, and by Mearley Brook to the east, and presently has open waste ground beyond its northern boundary wall (Fig 1; Plate 1). The complex was designated a Grade II listed building (Listing 1413649) in March 2013.



Plate 1: Aerial view of Holmes Mill in 1938, looking north

2.2 SURVEY METHODOLOGY

- 2.2.1 The building investigation was carried out in March 2013. It aimed to provide an understanding of the historic fabric and key architectural features of the mill complex, and to provide an archive record of the component structures. It has provided a drawn, photographic and textual record of the buildings to English Heritage (2006) Level III standard. Records were made of all principal structural elements, both internal and external, as well as any features of historical or architectural significance. Particular attention was paid to the relationship between the earliest and latest parts of the building, especially those that would show their development and any alterations.
- 2.2.2 **Photographic Survey:** a photographic archive of the buildings was compiled, consisting of both general and detailed interior photographs, which were captured using digital formats

-
- 2.2.3 **Instrument Survey:** floor plans of the buildings were surveyed by means of reflectorless total-station survey, to produce plans and a cross section through the main mill building. The drawings were used as a basis for annotation to illustrate the phasing and development of the buildings. Detail captured by the annotation included features such as window and door openings, and changes in building material and phasing. The final drawings are presented through an industry standard CAD package (AutoCAD 2004).
- 2.2.4 **Interpretation and Analysis:** a visual inspection of the buildings was undertaken, and a description maintained to English Heritage (2006) Level III. These records are essentially descriptive, and provide a systematic account of the origin, development and use of the mill complex.
-

2. HISTORICAL BACKGROUND

2.3 HISTORICAL BACKGROUND

- 2.3.1 The present Holmes Mill complex originally comprised three independent buildings, before becoming a combined enterprise, also known as Greenacre Mill. The first spinning mill and size house was erected in c 1823 by John Taylor of Shawbridge; this mill is marked on the Ordnance Survey first edition 1:10,560 map as Holmes Mill. It was a three-storey mill of random limestone with sandstone architectural details, 14 bays long with a latrine turret on the western gable end and a taller, four-storey bay at the eastern end (Rothwell 1992, 10), which may represent an early addition. This housed offices, a lapping room and warehouse with three central loading slots on the exterior and a hoist beam at the apex. The integral beam engine provided power from the rear of the mill. A second three-storey loading bay had a large round-headed door in the north wall. Before 1848 a circular brick chimney on a circular dressed stone base was erected to the rear of the mill. A single-storey shed later contained the reduced remains. However, the mill was advertised for let in 1831, and the machinery, described as 'entirely new' was for sale. This included six mules of 304 spindles, ten carding engines, a dyer's frame, drawing frame, and fly frame (*Preston Chronicle*, 2 July 1831). The machinery had been the property of Cuthbert Heatley, occupant of Holmes Mill and formerly of Samlesbury, who had evidently died (*Preston Chronicle* 30 July 1831). A newspaper article of 1838 refers to an incident involving Robert Scott, 'an overlooker in the employment of Messrs Mercer of Holmes Mill, Clitheroe' (*Blackburn Standard*, 12 September 1838). This mill was stripped in 1884, and was later used as Clitheroe Technical School up until 1916 (Plate 2).

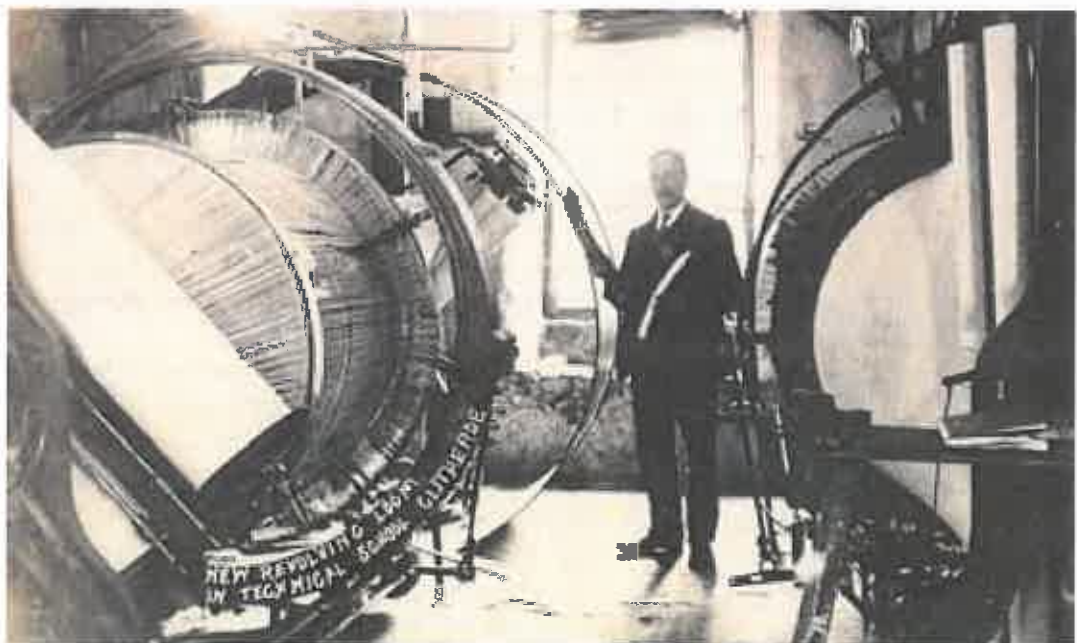


Plate 2: Interior of original mill during use as a technical school, undated photograph © A Goodbody

- 2.3.2 Constructed at a similar time was the small foundry. Mercers and Murray bought this from James Alston in 1836, when the site was amalgamated. This building was later used as a shoddy store, but was demolished.
- 2.3.3 New Mill, the second spinning mill, was erected by Edmund, John & James Mercer & David Murray in c 1830, and also bought the original mill with its mules and 130 looms. In 1836 a joiner and builder, William Anderson, bought Murray's share in the partnership. By 1855 he had left the company and Edmund had died. Two years later James retired and the company became John Mercer the elder and John Mercer the younger. After this a relation through marriage, Edward Hodgson, became the principal partner until 1884.
- 2.3.4 New Mill was a three-storey block with attic that was 14 bays in length. It was initially used for mule spinning then yarn preparation. The loading doors and house were in the eastern gable end. To the north a weaving shed was added in 1853 with northern roof light. At least two beam engines powered the 16,000 mule spindles, and 707 looms requiring about 400 staff.
- 2.3.5 In 1884, a newspaper article stated that 'the proprietor of Holmes Cotton Mill at Clitheroe, having given notice of his intention to close the mill, the workpeople have resolved to form a co-operative company to keep the concern going' (*Lancaster Gazette*, 3 September 1884). The newly formed co-operative, Clitheroe Manufacturing Company Limited, took over production in 1884. It seems that there was a strike at the mill shortly afterwards, as a newspaper article reported that 'the strike at Holmes Mill, Clitheroe, had almost terminated' (*Blackburn Standard*, 24 April 1886).
- 2.3.6 By 1887, 577 looms, weaving printers and shirtings were in operation powered by a beam engine aided by a 24" x 3' stroke horizontal engine. In 1889, 'a serious mill breakdown' was reported. This had resulted from the crank shaft of the engine breaking, and noted that the mill employed 200 people, 'who will consequently be thrown out of work' (*Blackburn Standard*, 1 June 1889). In October 1891, the directors of the Clitheroe Manufacturing Company had a meeting at which it was stated that 'further losses had occurred on the workings. It was eventually decided to call a meeting of shareholders to consider the advisability of giving twelve months' notice to give up the mill' (*Blackburn Standard*, 10 October 1891). In 1905, New Mill and associated buildings was sold to Henry Parkinson, a builder and lime maker, who furnished it with 496 looms and leased it subsequently to James Thornber of Burnley in 1906.
- 2.3.7 New boiler and engine houses were erected during 1910-11, together with a weaving shed with a single beam engine house with a hipped roof and narrow round headed window. At this time the beam engine was replaced with a Clayton, Goodfellow & Company cross-compound horizontal engine, the works numbers of which was 544/545 and incorporated a nine groove flywheel to drive a fly pulley producing c 250 hp with the 15" and c 32" cylinders. Further alterations in the following years included improvements to the fire-fighting system in 1910 (Plate 4), an extension to the engine house, and the infilling of the yard to its rear in 1913 (Plate 5), and a proposed extension to the weaving shed in 1915 (Plate 6), which was never undertaken.

- 2.3.8 Post-WWII the looms were respaced as automatics were introduced. In 1949, James Thorner submitted plans for new conveniences at the mill (MBC 1107, 3571). In 1966 the weaving shed housed 314 looms making fancies in terylene, rayon and cotton. The steam provided by the 1905 Yates & Thom Lancashire boiler ceased use in 1968, although the engine stayed on site.
- 2.3.9 In 1990 New Mill was the only weaving company still in operation in Clitheroe. The first mill was reopened, after its time as a school, in 1939 by Norman Roberts of Farnworth for yarn doubling. The company later became named Castle Doubling Company Limited and SH Shore became the principal partner and managing director following the death of Roberts. Shore closed these works in 1977, and from then leased it to FW Bramwell Limited, yarn agents and merchants, for ten years when they moved to Altham. James Thornber Limited acquired the buildings and continued textile production with 80 Northrops with jacquard and dobby attachments and 30 high-speed Rapier looms (Rothwell 1992, 11).



Plate 3: New Mill weaving shed in 1950, shortly prior to its internal refurbishment

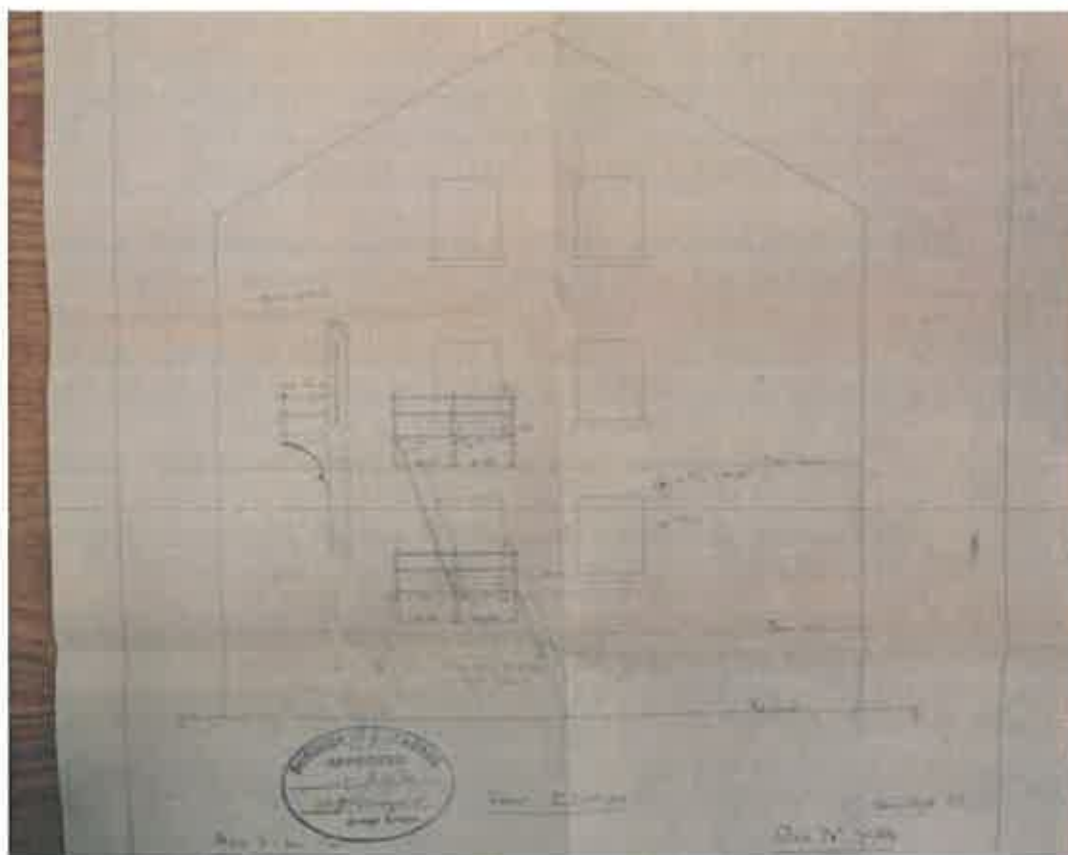


Plate 4: Architects' drawing for a fire escape for New Mill, dated 1910

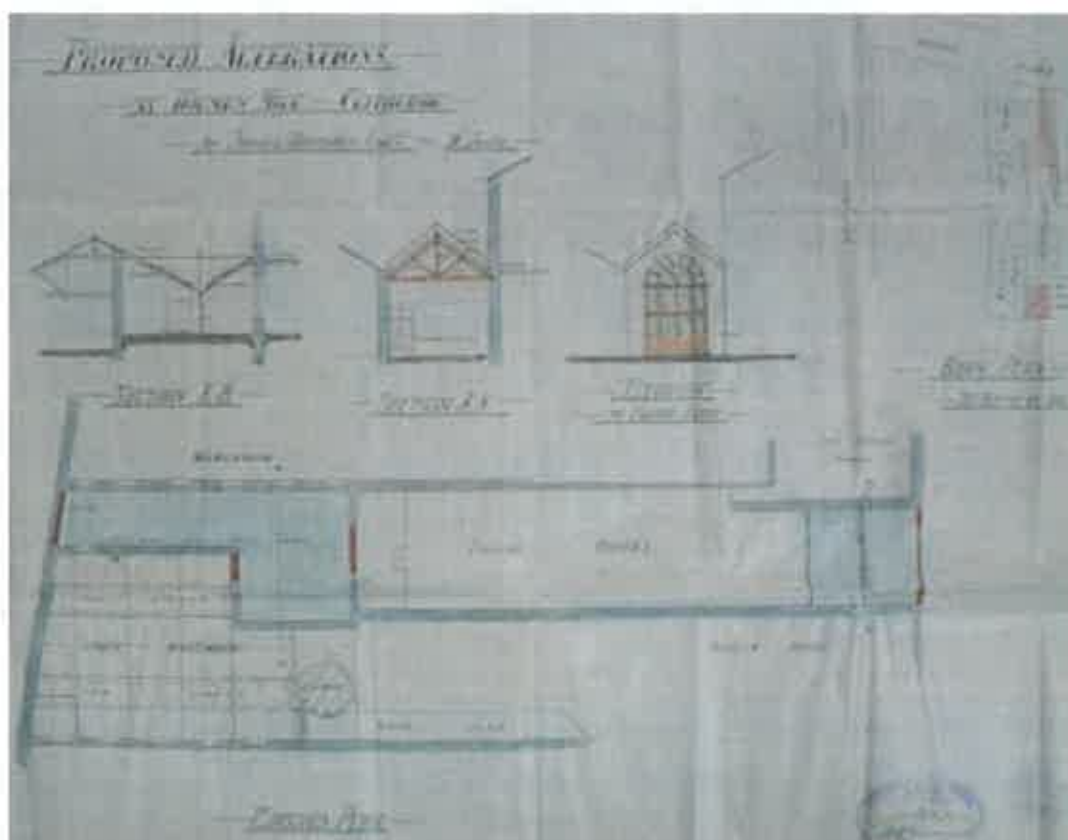


Plate 5: Architects' plan for a infilling between the two mills, dated 1913



Plate 6: Architects' plan for a proposed extension to the weaving shed, dated 1915

3. RESULTS

3.1 INTRODUCTION

- 3.1.1 Holmes Mill is a well-preserved example of an early spinning mill complex. It retains two of a very few examples of extant Georgian spinning blocks, operated as two separate concerns, but possibly sharing a chimney, which also served a foundry, placed between the two mills. The northern mill (New Mill) had a weaving shed added on its northern side in 1853, and its power plant refurbished in the early twentieth century. Whilst the weaving shed retains little historic fabric, much survives of the power plant, including an extant horizontal steam engine dating to 1910.

3.2 1823 SPINNING BLOCK

- 3.2.1 The southern spinning block is the earlier, comprising two main phases of construction, with the original 14 x 2 bay rectangular mill being constructed in 1823. It is of roughly-coursed limestone rubble construction, to three storeys (Plate 7), below a pitched roof, now of Welsh slate, but possibly of sandstone flag in its original form, and measuring 135 x 45'10" (41.15 x 13.97m). The returns of the original structure have rough limestone quoins, capped with dressed sandstone kneelers to the gables (Plate 7).



Plate 7: North wall of original spinning block, with projecting privy tower and later hoist tower

- 3.2.2 Each bay of the original south wall has vertical central windows to each floor, with slightly projecting sandstone lintels and sills (Plate 8), most retaining a nine-light timber window (Plate 8), clearly representing a refenestration of the original apertures in this wall. A doorway four bays from the western end of the mill at ground-floor level, retains a narrow double batten-door, with a ramp down from Greenacre Street to the immediate south (Plate 8), and appears inserted. The nine windows to the east at ground-floor level are clinker block blocked and externally rendered. A row of tall *Leylandii* trees has been established along the Greenacre Street frontage during recent years, to prevent vandalism to the structure (Plate 8)



Plate 8: South elevation of original spinning block, masked by a tall Leylandii hedge

- 3.2.3 Similar windows were provided to each bay of the north wall, with the frames possibly representing earlier replacements than those to the south (Plate 7), and with an original doorway, with monolithic rubbed sandstone surround, placed in the eastern bay of the original structure at ground-floor level (Plate 9). The adjacent bay has a much smaller window at ceiling height, with flat timber lintel, and housing a 13-light timber window, with three-quarters of the frame retaining its original small panes (Plate 9). This is flanked on its western side by a blocked 18" (0.45m) wide bearing box, also at ceiling level (Plate 9). A further doorway, placed two bays to the west, is much wider, and represents an inserted wagon door, whilst doorways from the spinning block into a later hoist tower, adjacent to the 6th bay from the west, were inserted on each floor into existing window apertures, with the eastern jamb squared to hang the door.



Plate 9: North wall of original spinning block, with projecting privy tower and later hoist tower

- 3.2.4 The original east gable is obscured by a later two bay addition, and the western gable is externally rendered above ground-floor level (Plate 7), and has also been plastered internally (Plate 10). Gaps within the plaster, and in the roof space, reveal clinker block rebuilding (Plate 10), suggesting that the majority of the western gable was rebuilt above ground-floor level, although it appears that windows were not included within the original construction at this level.



Plate 10: Internal view of west gable of 1823 mill, with door to privy tower (right), and inserted hoist, (left)

- 3.2.5 The northern end of the west wall has a projecting 8'6" x 7' (2.59 x 2.14m) rectangular tower of three storey height (Plates 7 and 11) and with a single pitched roof, matching that of the main mill. It has roughly-dressed quoins and small rectangular vents in its southern face to each floor (Plate 11), and represents an original privy tower. Partially obscured quoins at ground-floor level in the west face at street level (Plate 11) appear to represent the soil collection aperture.
- 3.2.6 The eastern end of the mill may form part of the original construction, but was more probably extended at an early date, and certainly prior to the production of the Ordnance Survey edition of 1844 (Fig 2), and comprised a four-storey, two-bay addition (Plate 12). It was of similar limestone rubble construction, with roughly quoined returns, and with the additional detailing of a projecting sandstone string band at first-floor level (Plate 12). On its southern face, this butts the slight wall scar of the eastern jamb of a tall narrow window, which appears to retain the scar of a round-headed lintel midway up the third-floor window level of the adjacent bay (Plate 13). This represents the position of a tall engine house window in the western bay of the extension, and its continuation to ground level suggests that it had a doorway affording access to bed level below. Its height demonstrates that the full height of the structure within this bay was occupied by the engine, placed to the south of a stairwell (Fig 4), whereas the eastern bay appears to have been utilised for preparation work or warehousing from the second floor, above the boiler.



Plate 11: Privy tower against west gable of 1823 mill



Plate 12: Four-storey tower at east end of 1823 mill

- 3.2.7 The adjacent window at ground floor in the eastern bay is also a remodelled aperture, with the window matching those above inserted when the boiler was removed from within the original mill, to a separate boiler house to the north. Six angled stones, adjacent to the western jamb of the remodelled aperture (Plate 13) represent part of the arched lintel to the original opening, which presumably formed a low window into the boiler house, given the probable longitudinal arrangement of the boiler internally. It would almost certainly have had its entrance and charging platform in the east wall, demonstrating that the present window here is also an insertion, with rebuilding above the lintel providing physical evidence, although the remainder of the wall face is obscured by render (Plate 14).



Plate 13: Butt joint of eastern jamb of engine house window, and arch of boiler house aperture



Plate 14: Doorway and remodelled window in east gable of 1823 mill

- 3.2.8 Elsewhere, the eastern gable had similar windows to those of the original structure in each bay, except that at ground-floor level in the northern bay, which had a horizontal 18-light window, with a central sandstone mullion, again with replaced timber frames (Plate 12). On the upper three floors, these windows flanked a narrow, central loading loophole with projecting monolithic sandstone surround (Plates 12 and 15), the first- and second-floor openings of which were remodelled to form windows (Plates 12 and 15), and with the dressed sandstone aperture and wall slot for a hoist beam above (Plate 12). That at first-floor level was offset to the south of those above (Plate 12), above the aperture at ground-floor level, and reflecting the internal arrangement of the power plant at ground- and first-floor level within the original construction.
- 3.2.9 The ground-floor doorway was also offset to the south of the loophole (Plate 12), and has a flush surround and decorative raised keystone (Plate 14), affording access to a corridor between the boiler house and lapping room, presumably affording access into the engine house, possibly with a stair to deck level, as access to the bed appears to have been provided in the south wall.
- 3.2.10 Internally the original mill, to the west of the power plant, comprised 14 bays of 9'8" (2.94m) width within an open-plan floor space of 131' x 43' (39.93 x 13.10m), with a ratio of almost exactly 4:1 in length to width, and significantly wider than the Arkwright-type mills of the late eighteenth and early nineteenth centuries, which were typically no wider than 30' (Williams with Farnie 1992, 55).



Plate 15: Loading loophole in east gable of 1823 mill

- 3.2.11 The structure was of non-fireproof construction, with narrow 7" (0.18m) wide rectangular-section timber beams spanning the full width of the mill at each bay division (Fig 4; Plate 16). These were supported two rows of slender, hollow, cylindrical cast-iron columns of only 3½" (0.09m) diameter. These differ from columns typically associated with mills of the mid-nineteenth century onwards, being fluted in their design (Plates 10, 16, and 17), replicating classical architectural styling, generally reserved for the larger columns carrying the entablature beams of the last generation of beam engines. At their feet, the columns flared slightly to a simple astragal above a rectangular base plate (Plate 10), with those of the ground floor presumably placed on sandstone pads at floor level. The head plate was similar, and flat, but with ribs to the column along the long-axis of the chamfered head plate (Plate 17).
- 3.2.12 These columns did not incorporate bolt holes for direct attachment to the beam, instead being housed within a shallow cut-out in the soffit (Plate 17). At first-floor level, several of the original columns had been replaced with steel I-section stanchions (Plate 18), whilst at second-floor level, all the original columns had been removed, with only the shallow sockets within the beam soffits marking their original position (Plate 19). A central row of wider columns replaced the original examples, and comprised sections of cast-iron water mains pipe (Plate 19), with pads and chocks below the beams (Plate 19) to allow them to be fitted tightly to support the trusses above, once the outer column rows were removed.



Plate 16: Ground floor of 1823 mill



Plate 17: Detail of column capital



Plate 18: General view of first floor, with replacement cylindrical and I-section columns



Plate 19: General view of second floor with replacement columns, and scars for original double row of columns

- 3.2.13 A central row of columns was also inserted at first-floor level, but this represented a much earlier modification, comprising 4" (0.10m) diameter hollow cylindrical columns with a bolting plate for line shaft hangers on their northern faces (Plates 18 and 20). Two of the columns differed, that placed immediately to the west of the secondary hoist tower having two bolting plates on adjacent faces (west and north), with through-bolt holes only on the eastern face (Plates 21 and 22). A further column to the east had a rib to a lower horizontal bolting plate, with two L-section vertical struts to the flat head plate above (Plate 23), which was bolted into the soffit of the ceiling beam (Plate).



Plate 20: Inserted hollow cylindrical column with bolting plate



Plate 21: Inserted column with double bolting plate



Plate 22: Through bolt-holes on double-plated column



Plate 23: Inserted column with vertical struts allowing shaft to pass through column head

- 3.2.14 At ground-floor level, the privy tower was blocked and rendered, whilst at first-floor level, the planked doorway survived *in-situ*, but was blocked by two water pipes (Plate 10). At second-floor level the doorway was again overlain by water pipes, but the door had been removed from its hinges, affording internal inspection, which revealed an extant long-drop, with timber seat (Plate 24).



Plate 24: Possible original privy

- 3.2.15 Internally, the two-bay extension added to the eastern end of the original mill has been heavily remodelled. It initially comprised an engine house, boiler house, stairwell and lapping room at ground-floor level (Fig 4), with the engine house apparently occupying the full height of the structure (Section 3.2.6). The 10' (3.05m) wide engine house occupied the southern 29' (8.84m) of the western of the two bays, and had been converted to a gas boiler and store room at ground-floor level, with a concrete plank ceiling inserted (Plate 25) to create a first floor which housed privies to the main mill, presumably inserted upon conversion of the structure to a school in 1884. The upper floor has a timber plank floor, again inserted to form a room presently used as a store (Plate 26). Three large-scantling transverse ceiling beams are original (Plate 26), and bear several scars, presumably relating to the attachment of lifting gear for the engine. A horizontal roughly dressed sandstone pad, projecting from the western face of the dividing wall between the engine house and main mill, at second-floor level (Plate 27), probably represents a pad for the entablature beam of the engine.



Plate 25: Remodelled engine house, ground floor, original mill



Plate 26: Upper floor of original mill engine house



Plate 27: Sandstone pad projecting through wall between engine house and original mill

- 3.2.16 The stairwell to the north of the engine houses a quarter-turn sandstone stair with angled winders around the newel between flagstone landings to each floor (Plate 28), demonstrating it to be of typical fireproof construction, unlike the main body of the mill. Its walls were all plastered, with those forming the stairwell presumably of stone, and with a central single-skin brick newel which housed simple cupboards at ground- and first-floor level. The newel only rose to first-floor ceiling level, with a timber banister to the second floor and its open landing (Plate 29). Many of the steps were capped with timber planks (Plate 28), presumably relating to the conversion of the extension to an office block, but all retain the original sandstone block beneath.



Plate 28: Angled winders in fireproof stair tower



Plate 29: Open landing to upper floor of original mill

- 3.2.17 The boiler house was placed in the south-east corner of the extension, and given its size and apparent orientation, as shown on the Ordnance Survey edition of 1844 (Fig 2), it appears to have housed a small wagon boiler, although it is possible that it housed a vertical haystack boiler, although these were rarely used by this date. At ground-floor level, the partitions between the boiler house, corridor and lapping room were removed for the conversion of the area to form a reception area (Plate 30) and conference room for the offices that were inserted, presumably during the conversion of the mill for yarn doubling in 1939.
- 3.2.18 A separate dog-legged stair was also inserted in the north-east corner of the eastern bay (Plate 30), providing access from the reception to the offices situated on the first floor above. The stair affords access to both the main stairwell, and on into the mill, and also to a 3' (0.91m) wide corridor along the engine house wall (Plate 31). This is of single-skin brick construction, with timber panelling below a dado rail, and has doorways into three offices. At its northern end, adjacent to the first door, it also has an 'Enquiries' hatch (Plate 32), presumably both for visitors and staff, who probably received payment from this point. The office behind has similar cladding, and is divided by a timber partition from a smaller office to the south. A door at the southern end of the corridor affords access to the larger manager's office (Plate 33), all rooms currently being used only for storage.



Plate 30: Remodelled reception area in east bay of original mill



Plate 31: Corridor inserted into first floor of former boiler house



Plate 32: 'Enquiries' office



Plate 33: Manager's office above former boiler house

- 3.2.19 A three-storey hoist tower also represents an early addition to the original mill, again being in place prior to 1844 (Fig 2). It measures 23 x 15' (7.03 x 4.56m), and was placed adjacent to the sixth bay from the western end of the mill (Fig 4), and is of similar limestone rubble construction (Plates 7 and 34). It has a pitched roof, above which a tower for the hoist headgear projects, and with a chimney stack placed centrally above the north gable (Plate 7), demonstrating that the structure originally had an internal hearth, although no visible evidence for this survives. Vertical rectangular windows in the west wall, extant at first-floor level, but blocked above (Plate 7), and a similar nine-light window in the east wall in the northern bay at second-floor level (Plate 34), suggest that the structure may have originally formed offices in its northern bay. The window below in the east wall has been remodelled into a narrow external door (Plate 34), with the doorway at ground-floor level in the same bay apparently representing original access, but having been blocked subsequently.
- 3.2.20 The southern bay has bay-wide segmental arches of full ground-floor height in both walls (Plates 34 and 35), below a loading loophole in the east wall (Plate 34). Both retain double batten doors, with extant closing mechanisms (Plate 36), with the upper doorway also retaining a hoist beam, which is still connected to belt-driven headgear within the raised roof above (Plate 37). The use of 'Dorman Long & Co Ltd' rolled steel I-section joists, to carry the headgear, strongly suggests that the *in-situ* mechanism was re-installed using new beams upon the recommencement of textile manufacture in the mid-twentieth century, as these were not in production by 1884, when spinning was first ceased, and although the technical school incorporated large machinery (Plate 2), it closed shortly after the date such beams were first introduced. The tower also retains a straight timber stair, placed against the west wall between first and second-floor level (Plate 38).



Plate 34: Hoist tower extension to original spinning block



Plate 35: Arched doorway into northern side of hoist tower



Plate 36: Double door in hoist tower, with original opening mechanism intact



Plate 37: Headgear for hoist within hoist tower



Plate 38: Stair within hoist tower

- 3.2.21 The roof of the mill retains its original trusses at each bay division, with the tie beams forming the ceiling beams of the upper floor below. The trusses are queen strut trusses, each with an upper king tie above the collar (Plate 39). This has a jowled head, housing the principal rafters and claspings the slender ridge board. The foot of each queen strut is also jowled on the outer side, housing the foot of a straight brace to the principal rafter, placed between the lower two of three tusk-tenoned, slender butt-purlins (Plate 40). Lime undersealing of the slate roof survives, but any flooring that may have been present within the roof space, that was designed to be a usable floor, by the use of queen struts rather than making post, have been removed.



Plate 39: Roof structure within original spinning block



Plate 40: Tusk-tenoned purlins in original mill roof

- 3.2.22 The ground floor has been remodelled, with the insertion of several timber stud partitions (Plate 16) to create offices and stores, and a conveyor belt, placed against the south wall, allowing materials to easily be transported between the ground and first floors (Plate 16). An electric internal hoist tower was also placed centrally against the west gable (Plate 10), and presumably dates to re-introduction of textile manufacture in 1939, or shortly thereafter. A partition between the southern two bays of the original structure at first-floor level comprised vertical timber tongue-and-grooved planks (Plate 41), and probably dates to the use of the building as a college between 1884 and 1916.



Plate 41: Timber plank partition on first floor of 1823 mill

- 3.2.23 Good evidence for the power transmission system survives within the structure, particularly at ground-floor level, in the eastern bay of the original structure. A swan-necked cast-iron bracket placed on the east wall towards its southern end (Plate 42), carries an additional slender ceiling beam (Plate 42), and allowed what was presumably a short shaft to pass behind it, along the east wall. This was carried by an L-shaped cast iron bracket to the south, and on a T-section corbel, projecting from the wall face to the north (Plate 42). It is almost certain that a bearing box was placed adjacent to the south wall, with a secondary motion shaft being driven by a pinion wheel from the adjacent engine, and placed 2'6" from the south wall. This was carried in the adjacent bay by a T-section cast iron hanger, with an L-section mounting plate, bolted to the soffit and eastern face of the ceiling beam, and also into the south wall (Plate 43). The shaft was cupped within a strengthened housing at its northern end (Plate 43). Although this was the only extant example of a line shaft hanger, several beams retained cut-outs for similar brackets (Plate 44).



Plate 42: Swan-necked bearing carrying additional ceiling beam



Plate 43: Line shaft hanger adjacent to south wall of 1823 spinning block

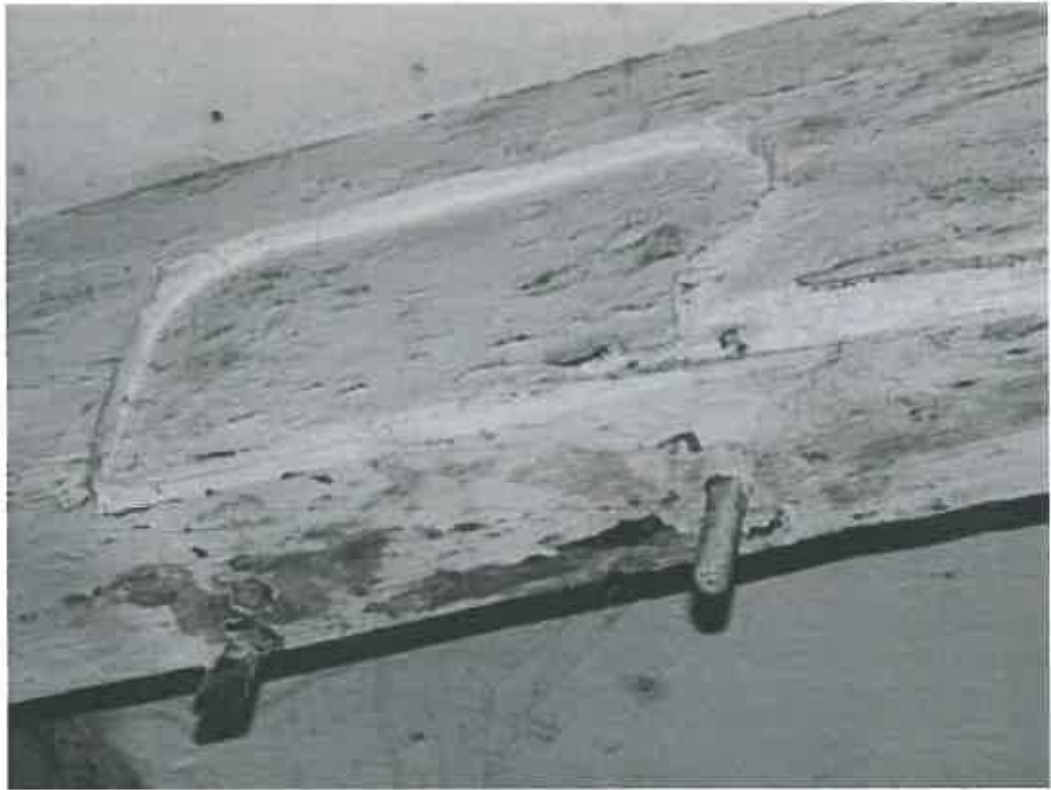


Plate 44: Scar of line shaft hanger

3.2.24 Little provision for fire-fighting appears to have been made within the original mill, and neither were standpipes or automated sprinkler systems added at a later date. Instead hose reels were connected to a mains water pipe on each floor, the reels being supplied by *Ravenhose Ltd*, Salford (Plate 45). These were presumably installed c 1939, when the building became used as a doubling mill.



Plate 45: Maker's plate on fire-fighting hose

3.3 SECOND SPINNING BLOCK

- 3.3.1 Although presently under the same ownership as the original mill, and being placed only 75' (22.87m) to the north, the second spinning block, generally referred to as 'New Mill', was independently-owned until 1987, despite both mills often being referred to as Holmes Mill (eg on the Ordnance Survey edition of 1844 (Fig 2)). This second spinning mill was erected c 1830, by Messrs Mercer and Murray and was similarly of three storeys, and of random limestone rubble construction (Plate 46). On its northern side it was of only 12 bays length (Fig 2), and was shorter than the earlier structure to the south, being only 121'4" (37m) long. The south wall was an extra 7'2" (2.18m) longer at its western end, comprising an additional half bay to the offset angle of Woone Lane, which formed its western boundary (Fig 4; Plate 46).



Plate 46: General view of New Mill from Woone Lane

- 3.3.2 Stylistically, New Mill was very similar to its predecessor to the south, having rough-pointed quoins to each return, below coped kneelers to the pitched slate roof (Plate 46). The moulded gutters of the roof were also set on edge-set flagstone slabs, similar to the earlier mill (Plates 8 and 46). The window apertures are of similar style, but with narrower openings in the half bay in the south wall (Plate 46), but house five-light, timber-framed windows, with central top-hung vents (Plate 46), unlike the nine-light frames within the earlier mill. Many of the windows at ground-floor level were blocked, or remodelled to form doorways following the addition of a weaving shed to the north, and the addition of a second engine house and infilling of a yard to the south (Fig 4).
- 3.3.3 The western gable differs from the original mill, in that it contains two windows to each floor (Plate 46). Those at ground and first-floor level were originally slightly narrower than those in the long walls, and vertically aligned (Plate 46), although the southern window at first-floor level was widened subsequently, when offices were inserted around the internal perimeter of the floor. The windows of the second floor are significantly narrower and shorter, and were placed closer together (Plate 46), below a bearing box in the gable above (Plate 46).
- 3.3.4 Principal access to the New Mill was through an external stair tower, placed centrally against the eastern gable (Plate 47), and internally measuring 16' x 13'6" (4.88 x 4.11m). A 4' (1.22m) wide passageway along its southern side leads to the dressed sandstone doorway into the spinning block, with a sandstone block and flagstone fireproof stair placed against the west wall (Fig 4). This differed from that in the earlier mill, being a half-turn stair with a stone central spine wall, with a 3'6" (1.07m) wide, 12'6" (3.81m) deep store room placed on its northern side (Plate 48). The store room at first-floor level was remodelled

subsequently to form a corridor into a later structure infilling the angle between the stair tower and the weaving shed, with that at second-floor level affording access onto its roof (Plate 48). A further structure was appended to the southern side of the stair tower, infilling the space between the stair tower and engine house (Plate 47), prior to 1912, when it is depicted on the Ordnance Survey 25":1 Mile plan. The original steeper pitch of the stair tower roof is visible as an internal scar within its roof space (Plate 49).



Plate 47: New Mill stair tower and engine house, with infilling to either side of stair tower



Plate 48: Store to west of stairwell, with roof access at second-floor level



Plate 49: Scar for original roof line of stair tower

- 3.3.5 A loading loophole was placed in the eastern face of the stair tower (Plate 47) with extant doors to each floor, below a hoist beam, with *in-situ* pitched canopy. Internally the hoist beam survives, comprising two I-section steel beams, with sockets in the adjacent south wall, with associated wheel scars (Plate 50) for two winding drums. Within the roof space of the mill, the remains a cable drum and gear wheel survive *in situ* (Plate 51), almost certainly representing the original hoist mechanism of c 1830.
- 3.3.6 Internally, the bays are typically of the same longitudinal width as those within the earlier mill, at 9'8" (2.94m), but the structure is significantly narrower, at only 40'9" (12.42m) internal width. Rectangular-section timber ceiling beams span each bay division (Plate 52), and are carried on slender, hollow, cylindrical cast-iron columns, again of only 3½" (0.09m) diameter. These differ from those within the earlier mill, in that only the eastern two examples are fluted at ground-floor level, and with only a single fluted column at second-floor level below the western beam (Plate 53). Elsewhere the columns are all of simple cylindrical design (Plate 52), with shallow ribs terminating in a bolt to a wide head plate (Plate), and with a simple rolled astragal below (Plate 52). Whereas the earlier mill originally had two rows of columns, only a single column supported each beam in New Mill, but each was offset 1'8" (0.51m) to alternating sides of the centre line of the mill (Plate 52), in a most unusual arrangement. Two columns at second-floor level, in the sixth and seventh bays (from the east) represent late replacements, comprising lengths of mains water pipe, as seen in the earlier mill. Throughout the second floor, the columns are decorated with two-tone colouration with painted spots at the interface between the two colours (Plate 53). Despite its traditional impression, this however, represents a late embellishment, as it also incorporates the replaced water pipe columns.



Plate 50: Scars for winding drums at upper floor level of New Mill hoist



Plate 51: Winding gear in attic for New Mill hoist



Plate 52: Ground floor of New Mill, looking east



Plate 53: Fluted column on second floor of New Mill

3.3.7 The ground floor retains what appear to be original sandstone flags (Plate 52), typical of mills throughout the region, with 8" (0.20m) wide planked boards on the floors above possibly also original, given their substantial width, which is typical of the Georgian period. Most of the ground floor windows were remodelled following later additions to the complex. The majority of those in the north wall were blocked during the addition of a weaving shed in 1853 (Plate 54), with those in the sixth and penultimate bays from the western end being remodelled into doorways. Within the south wall, many of the windows were retained, despite the addition of an engine house immediately to the south in the early twentieth century. However, to the west of the engine house, the windows were removed, with the apertures either being left as large openings, or remodelled into open doorways (Plate 55) into a single-storey structure formed by enclosing a yard c 1913 (Section 3.7).



Plate 54: Blocked windows in north wall of New Mill following addition of weaving shed



Plate 55: Remodelled apertures in south wall of ground floor in New Mill

- 3.3.8 Apertures were also inserted into a further infill block, placed between the stair tower and engine house (Plate 47), prior to 1912, when it is shown on Ordnance Survey mapping. It houses toilets on each floor, with access along its northern side at first-floor level, into the remodelled engine house (Fig 5).
- 3.3.9 The roof of New Mill is carried on very unusual collar and tie beam trusses. These do not have any vertical struts or posts (Plate 56), with the principal rafters being braced along their soffits by an additional timber, which carries the end of the collar, to which it is bolted within a cast-iron elbow bracket (Plates 56 and 57). The slender ridge board appears clasped between the apex of the principal rafters, with four butt-ended purlins to each pitch, bolted through the principal rafter (Plate 57). Chiselled carpenters assembly marks were observed on the eastern face of several of the trusses, at the junction between collar and brace (Plate 57). Angled struts from joists between the tie beams formed framing for partitions to the eaves, below the second of the purlins (Plate), with the area between the shuttered eaves retaining a timber planked floor (Plate 56). This created a large open floor space, which could easily have housed longitudinally placed mules, similar to those shown in the illustration by Thomas Allom, and engraved by James Tinkle c 1834 (Plate 58), of mule spinning within an attic, possibly at Swainson & Birley's cotton mill, Preston (although this has also erroneously been identified as Holmes Mill).



Plate 56: Attic of New mill, with line shaft adjacent to its original position



Plate 57: Detail of New Mill truss



Plate 58: Thomas Allom's engraved print of mule spinning within an attic (Baines 1835)

- 3.3.10 The only vertical posts within the roof space relate to the framing of the original hoist above the stair tower, comprising a narrow drum on an axle, with a toothed gear wheel on its northern side (Plates 51 and 56). The collar above has the bottom plate of a line-shaft bearing (Plate 51), with similar brackets surviving on many of the other collars (Plate 56). A length of line shaft, complete with belt drums survives within the roof, laying between several trusses adjacent to the bearing mountings, and represents the slightly displaced remains of a powered line shaft within the roof space (Plate 56).
- 3.3.11 Evidence for power is also clearly visible on the floors below. At ground-floor level, the extant secondary motion shaft from the 1910 horizontal engine enters the mill in the south-eastern corner, and immediately powers a bevel gear, encased within metal shuttering (Plate 57). The secondary motion shaft continues to the north, where it is supported by a large cast iron bearing attached to the east wall, and placed immediately adjacent to a large cut-out in the wall, for a drum or gear (Plate 57). This houses a small drum, presumably associated with the early twentieth century remodelling of the power transmission system, but the aperture almost certainly relates to the original power system, as the original engine house also extends beyond the south-eastern corner of the mill, specifically to enable a drive shaft to enter the spinning block in its present position (Fig). A second T-section cast-iron corbel, rebated into the wall face 9' (2.74m) to the north (Plate 58), and almost certainly housing a smaller bevel gear, demonstrates that the shaft continued beyond the position of a southern line shaft, and the style of the corbel strongly suggests that this predated the early-twentieth century remodelling of the power transmission system.



Plate 57: Enclosed bevel gear on secondary motion shaft, with further bearing to left



Plate 58: Cast-iron corbel carrying secondary shaft to weaving shed

- 3.3.12 A second shaft ran from the bevel gear in the south-east corner of the ground floor, along the south wall, and survives from the toothed gear-wheel for a truncated length of approximately 0.1m (Plate 57). However, a further 8.4m length of the same shaft survives *in situ* in the western four bays (Plate 59), carried on slender J-shaped cast-iron hangers (Plate 59), typical of the early-twentieth century. Bolts protruding from cut-outs in the soffit of these and several other beams relate to earlier hangers for a shaft placed immediately to the east (Plate 59). A 3.4m length of a further slender line shaft survives *in situ* at ground-floor level, in the penultimate bay from the western end, positioned 6'6" (1.98m) from the north wall, and also retaining a small drum and V-section angle-iron hangers, again of relatively late date (Plate 60).



Plate 59: *In-situ* line shaft and hangers, ground floor, New Mill



Plate 60: In-situ slender line shaft, ground floor, New Mill

3.3.13 Elsewhere at ground-floor level, bolt-holes, and cut-outs in the faces and soffits of the ceiling beams (Plates 61 and 62) denote the position of further line shafts. The bolt holes, arranged in pairs, fixed line shaft hangers to the timber beams, and appear to show the presence of three further shafts, spaced 9' (2.74m) apart, between the two outer line shafts. The southern of these three shafts aligns with the cast-iron corbel in the east wall, whilst the central line shaft has an end-bearing box within the face of the west wall (Plate 63). A similar bearing box was also placed in the wall at its southern end, aligned with the partially extant shaft (Plate 64).



Plate 61: Bolt and scar of earlier line shaft hanger, New Mill



Plate 62: Bolt and cut-out denoting position of earlier line shaft, New Mill



Plate 63: End bearing box for line shaft, ground floor, New Mill



Plate 64: End bearing box adjacent to south wall, for line shaft, ground floor, New Mill

- 3.3.14 Bolt-holes and gouged and cut-out ceiling beams at first-floor level (Plates 65 and 66), clearly show the position of two line shafts at first-floor level, placed approximately 3' (0.91m) to the north of ground-floor shaft against the south wall, and 4' (1.22m) to the north of the central shaft at ground-floor level. This latter line shaft has an end-bearing box in the east wall of the spinning floor (Plate 67), placed immediately adjacent to the entrance from the stair tower (Fig 4). The bearing box appears to occupy a much large, infilled aperture, possibly suggesting that it replaced an earlier end bearing for an original shaft.



Plate 65: Bolt holes and scars denoting position of line shaft, New Mill



Plate 66: Bolt holes and scars denoting position of line shaft, second floor, New Mill



Plate 67: End bearing box, first floor, New Mill

- 3.3.15 At second-floor level, three further sections of line shaft survive (Fig 6). All relate to an internal hoist shaft, inserted against the north wall (Plate 68) in the sixth bay from the stair tower (Fig 6), presumably inserted to serve the weaving shed, erected on the northern side of the mill in 1853. A shaft placed immediately to the south of the central column line, above that at ground-floor level, spans the sixth bay, and has three drums attached (Plate 69). The southern of these is grooved, and carries a belt from an electric motor, suspended from the ceiling to the north (Plate 69), and which latterly powered the hoist. The second, wider drum, had a belt which powered a second shaft immediately adjacent to the hoist shaft (Plate 70), whilst the third, slender drum, at the eastern end of the extant line shaft drove a belt that, appears to have operated a perpendicular shaft on the eastern side of the hoist, which carried two drums, possibly associated with the safety chain for the hoist, which lays across the shaft (Plate 71).
- 3.3.16 It is unclear how the power was translated through 90° onto this shaft, but the required pulley was almost certainly removed when this shaft became redundant, probably after the installation of the electric motor. The position of a further line shaft against the south wall, and above that at ground-floor level, was indicated by bolt holes and cut-outs in the tie beams of the trusses above (Plate 65), with two further shaft positions identified in the northern part of the floor, the southern of the two being directly above that on the ground floor, whilst the northern example was placed adjacent to the wall (Plate 66). A large bearing projecting from the west gable, at its southern end (Plate 72) represents the housing for a bevel gear on an upright shaft, possibly a top bearing, although power was also provided to the roof space above the central line shaft.



Plate 68: General view of second floor, New Mill, with internal hoist on right



Plate 69: Central line shaft on second floor, with added electric motor



Plate 70: Line shaft for internal hoist tower



Plate 71: Line shaft with slender rope wheels, possibly for safety chain for hoist



Plate 72: Upright shaft top end bearing, second floor, New Mill

- 3.3.17 Although New Mill was of similar non-fireproof construction to the earlier mill to the south, its continued use for textile manufacture at the turn of the twentieth century led to an improvement to the fire-fighting equipment, not seen in the earlier structure. A deposited building plan of July 1913 shows approved drawings for an external fire escape (Plate 4), which was installed by *G Mills & Co Ltd, Radcliffe* (Plate 73), and comprises two lattice iron landings carried on cast iron corbels below the northern first- and second-floor windows in the western gable, with an *in-situ* ladder between the two platforms (Plate 74).



Plate 73: Maker's stamp on external fire escape landing



Plate 74: New Mill fire escape, added 1913

- 3.3.18 Greater provision was also made internally, with the installation of an automated sprinkler system, presumably around a similar date. The main control valve, or 'Christmas Tree valve' was placed against the western gable, probably adjacent to an external water main, and bears an '*Angus Fire*' name plate (Plate 75). Pipes and sprinkler valves run from here, throughout the three floors and attic, with the entire system, including the sprinkler bulbs, extant (Plates 52-54, 56, 60, 68, and 76), and presumably in working order. A valve also bearing the name *G Mills & Co Ltd, Radcliffe* (Plate 76), suggests that the entire system was installed by this firm. A small water tank placed at the top of the stair tower, within the attic, is unlikely to relate to the sprinkler system, but more likely pertains to a late domestic-type hot water system used throughout the mill, and particularly in the canteen, inserted at first-floor level into the infill block between the stair tower and the weaving shed.



Plate 75: 'Christmas Tree' control valve for New Mill automated sprinkler system



Plate 76: Pressure valve in sprinkler system, bearing maker's stamp

3.4 NEW MILL ORIGINAL POWER PLANT

- 3.4.1 New Mill has a three-storey beam engine house attached to its south-eastern corner (Plates 47 and 77). It is of similar limestone rubble construction to the main mill, below a flat roof, and measures 30' x 14'6" (9.15 x 4.42m), extending a further 6'6" (1.98m) on its southern side, overlapping the eastern bay of the mill (Fig 4). It has rough-pointed quoins, but differs from the main structure at the wall head, having convex sandstone corbels to the moulded gutters (Plate 77). The long walls both have flush sandstone string bands at second-floor level (Plate 77), presumably corresponding to internal beam level of the vertical engine. The eastern façade retains a large, round-headed central aperture, extending from first into second-floor level (Plate 78) and having slightly-projecting rubbed sandstone surrounds, with highlighted imposts and key stone (Plate 78). The aperture retains a 10-light timber framed window, with a vent opening in the top fanlight (Plate 78). This may be an original feature, and certainly predates the insertion of a second floor, which was placed across the window (Plate 78). A further aperture below the window has been enlarged, with a rendered surround, but represents the remodelling of an original aperture to engine bed level. Two further doorways original afforded access into the engine house, in the northern wall (Fig 4; Plate 79).

- 3.4.2 The upper doorway, at first-floor level, had a projecting rubbed monolithic sandstone surround (Plate 79), representing the original access to engine deck level presumably via an external cast-iron stair, below which a further doorway formed a second narrow access to the engine bed.
- 3.4.3 At the south end of the front, eastern, wall, a convex limestone corbel projects from the quoined return of the façade (Plate 80), and represents the impost for an arched doorway into an adjacent boiler house, demolished and replaced subsequently during remodelling of the power plant. This forms the only extant evidence for the position of the original boiler house.
- 3.4.4 Internally the structure has been heavily remodelled, with the insertion of two floors to form two offices at first and second-floor level, with a stair between the two floors against the rear wall, following the removal of the engine (Plate 81). At first-floor level, a rebate at the southern end of the west wall provides the only visible evidence for the overlap between the engine house and the spinning block. At ground-floor level, this housed the end bearing of a secondary motion shaft, driven from a pinion on the flywheel, which would have been placed against the south wall. Evidence from within the mill suggests that the upright shaft was placed here, rather than in the angle between engine house and mill, above the secondary motion shaft.



Plate 77: New Mill power plant, comprising boiler house, two engine houses and chimney



Plate 78: New Mill original beam engine house



Plate 79: Original entrances in north wall of beam engine house



Plate 80: Dressed impost for arched aperture of original boiler house



Plate 81: Office inserted into beam engine house, with enclosed entablature beam within ceiling

- 3.4.5 The ceiling of the engine house retains three large-scantling exposed timber beams (Plate 82), which carry the flat roof, whilst an encased beam at first-floor ceiling level, suggests the possibility that the entablature beam of the engine was retained in situ for structural integrity (Plate 81).



Plate 82: Large roof timbers of beam engine house

- 3.4.6 As with the earlier structure to the south, no evidence survives for an original chimney for New Mill. The documentary sources have revealed that Mercer and Murray bought the adjacent foundry in 1836, and were thus certain to have been using the chimney associated with the foundry after it was rebuilt in 1848. Whether the structure was shared by the foundry and two mills at an earlier date remains unclear, but the Ordnance Survey edition of 1844 shows a more significant physical link between the older mill and the chimney than that to New Mill, despite the chimney being under ownership of the latter by this date.
- 3.4.7 The extant chimney occupies the site of that shown on the Ordnance Survey edition of 1844, and its circular section and offset plinth, match the style of that depicted (Fig 2), suggesting that although the chimney was rebuilt in 1848, it retained the original base. This was of coursed, rough-pointed sandstone block construction (Plate 83), forming a chimney of 11' (3.35m) diameter above a squared plinth, with rounded corners, refaced on its western side in brick (Plate 83). This stone chimney survives to approximately first floor window-head height (Plate 84), where it has rubbed sandstone copings below a similar height of brickwork, comprising hand-made, mould-thrown brick laid in stretcher bond, forming a slightly tapering cylindrical stack (Plate 84). This part of the chimney certainly represents the rebuild of 1848, with iron bands to both brick and stone sections also possibly dating from this time. Had the chimney been partially rebuilt in brick during the early twentieth century remodelling of the power plant, this would have undoubtedly been undertaken using hard glazed engineering brick, widely and cheaply available locally, from major production centres such as Accrington, only approximately 8 miles to the south.



Plate 83: Base of chimney



Plate 84: Two-phase chimney, with sandstone flag capping of original flue visible within wall

3.5 NEW MILL SECONDARY POWER PLANT

- 3.5.1 The power plant was extensively remodelled in the early twentieth century, with the installation of a new engine house and two Lancashire boilers. The documentary sources suggest that a Lancashire boiler was installed prior to the engine, in 1905 by the firm of Yates and Thom, of Blackburn, with the engine, by Clayton, Goodfellow & Company, also of Blackburn, not being built until 1910. Unfortunately, it was not possible to establish this stratigraphically, as junction between the two structures is obscured beneath plaster on the northern face, and behind a truss and wall of the boiler flue on the southern side.
- 3.5.2 The boiler house, placed to the south of the engine house, is of coursed, roughly dressed limestone rubble construction, with tooled and rusticated projecting quoins to each return (Plate 77). The rectangular seven-bay structure measures 66'4" x 34' (20.22 x 10.36m) and has vertical windows with flush sandstone lintels and projecting sandstone sills to each bay, retaining four-light timber framed windows (Plate 77). The lack of windows within the north wall suggests a possibly contemporary construction of the new engine house. The boiler house has a pitched Welsh Slate roof, the eastern gable of which is rendered above a full-width opening, now housing a central man-door, flanked by large double batten doors, all incorporating a glazing band (Plate 77).
- 3.5.3 Internally the boiler house has been remodelled to form a warehouse, following the removal of the boilers, although the bed foundations probably survive below the extant concrete floor, as the charging platform, at or below present floor level, would have been significantly above the boiler bed. The remains of three flues survive in the rear western wall, each constructed with a refractory brick lining (Plates 85 and 867) and leading westwards into a single flue to the chimney. The southern two flues would have each served a Lancashire boiler, the scar of the spine wall of each being visible within the rear wall (Plate 86).
- 3.5.4 The northern flue probably represents the remains of the flue from the original boiler house, placed on the southern side of the extant beam engine house, as this would have been required to service the boiler until the engine was replaced in 1910. A bracket attached to the west wall above the central flue houses an electric motor and flanks a vertical aperture in the wall that presumably carried an earlier drive shaft to control the dampers at the rear of the boilers. A further bearing box in the north wall, in the eastern bay of the boiler house carried a further shaft, possibly to power an automatic feeder for a boiler.



Plate 85: Flues and damper aperture at rear of boiler house



Plate 86: Flue at southern side of boiler house, with spine wall of Lancashire boiler to right

- 3.5.5 The boiler house roof was open to the rafters, which were carried on three I-section steel purlins to each pitch (Plate 87). These overlay collared trusses comprising T-section cast-iron principal rafters (Plates 87 and 88), the feet of which were angled to bolt into the wall face (Plate 88), and I-section cast-iron collars (Plate 87).



Plate 87: Roof of boiler house



Plate 88: Detail of metal roof truss within boiler house

- 3.5.6 The engine house of 1910 originally measured 80'6" x 22'3" (24.54 x 6.78m) internally, narrowing slightly at its eastern end around the earlier engine house. It comprises nine bays, each with a collared truss, all members being stop-chamfered (Plate 89), as are the three butt-ended purlins to each pitch (Plate 89). Both pitches are planked internally, with a continuous glazing band to either pitch between the upper and central purlins (Plate 89). The northern principal rafters are housed within the wall face, whilst those on the southern side have vertical, channel-section cast-iron wall pieces supporting their foot within the upper part of the wall (Plate 90), which was rebuilt in brick during subsequent remodelling of the structures to the south-west (*Section 3.6*). The west wall of the engine house retained a round-headed, blocked window within the gable (Plate 91), with the wall erected in engineering brick below, with recessed panels on its outer face (Plate 92), through which a doorway had been inserted (Plate 92). This only afforded access to a corridor, placed within the construction of the engine house, but separated from it by a timber panel wall with continuous glazing band at ground-floor level, with steps to a panelled doorway at its southern end (Plate 93). The corridor provided access from the spinning block of New Mill to both the engine house and flues beyond, and to further structures laying to the west (*Section 3.6*).



Plate 89: Engine house roof detail



Plate 90: Wall bracing to trusses in south wall of engine house



Plate 91: Arched aperture in west gable of engine house

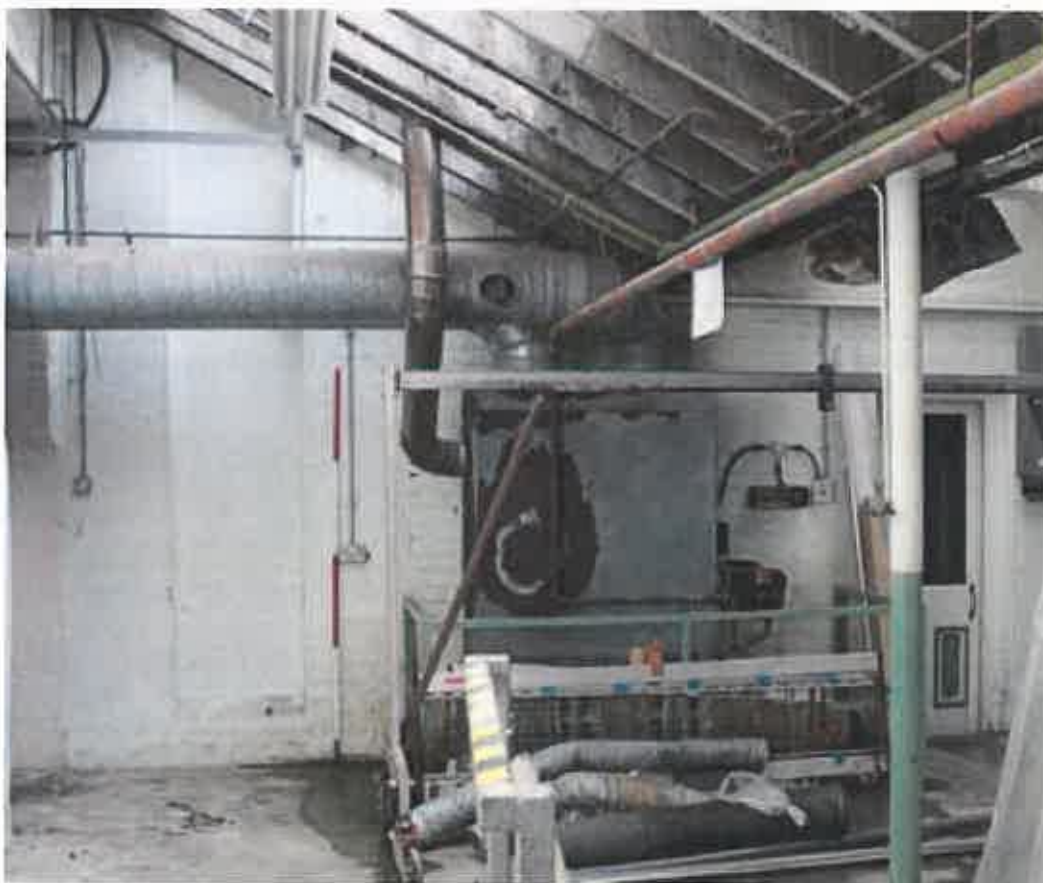


Plate 92: Panelled brick west external wall of engine house, and column supporting later valley gutter



Plate 93: Timber partition and door into engine house

- 3.5.7 The engine house was also remodelled at its eastern end, with the repositioning of the north wall, flush with the façade of the boiler house (Plate 77) being undertaken in 1913, when a deposited building plan was approved (Plate 5). The new east wall increased the length of the structure by 21'8" (6.60m), adding a store at engine bed level adjacent to the yard, and used predominately as a vehicle store (J Thornber, *pers comm*). Its rebuilt form was of a possibly more Edwardian style than the original gable, with the rendered face having bull-nosed brick detailing to a large round-headed window at engine deck level comprising plaster tracery to a 10-light fan window (Plate 77). Double batten doors below gave access to the new store, whilst a similar style man-door at the southern end of the façade afforded access to a corridor which had a doorway into the boiler house, and steps up to the engine deck adjacent to the substantive bearing block for the rope drum (Plate 94).



Plate 94: Door and corridor into extension to east of engine house

- 3.5.8 Within the engine house the walls are of painted plaster, comprising pale green above claret red (Plate 95), separated by a painted frieze dado (Plate 96). Not only is the manufacturer's engine plate, bearing the works number for the engine (544/545) still attached to the wall (Plate 97), but other valves, a work bench, a large array of pigeon holes (Plate 98), and several gas taps for lighting (Plate 96), also survive *in situ*.



Plate 95: General view of engine house looking south-east



Plate 96: Painted plasterwork and extant gas tap in engine house



Plate 97: Engine maker's plate on south wall of engine house



Plate 98: Pigeon holes against timber partition in west bay of engine house

- 3.5.9 The engine itself is a 250hp cross compound horizontal engine, with a 15" high pressure and c 32" low pressure cylinder (Plates 95, 99, and 100). The entire engine survives intact, and even retains what appears to be original coachwork decoration (Plates 99 and 101). A central grooved flywheel, the central section of which is socketed for barring the engine (Plate 95), retains all eight ropes, which pass through a grill, included to prevent the ropes slipping or jumping from their groove (Plate 100) to a second drum (Plate 100), placed on the secondary motion shaft, which aligned with the drive shaft from the earlier engine to the north-east (Plate 102), and also continues to the south, into the boiler house. The axle for the secondary motion shaft is of substantial cast-iron construction, and is housed within a large brick built base (Plate 103). This base retains a projecting sandstone corbel in its north-eastern corner (Plate 102), which presumably represents the pad for a tie beam within the original boiler house, which was sited in this position.



Plate 99: View of the engine, looking north-east

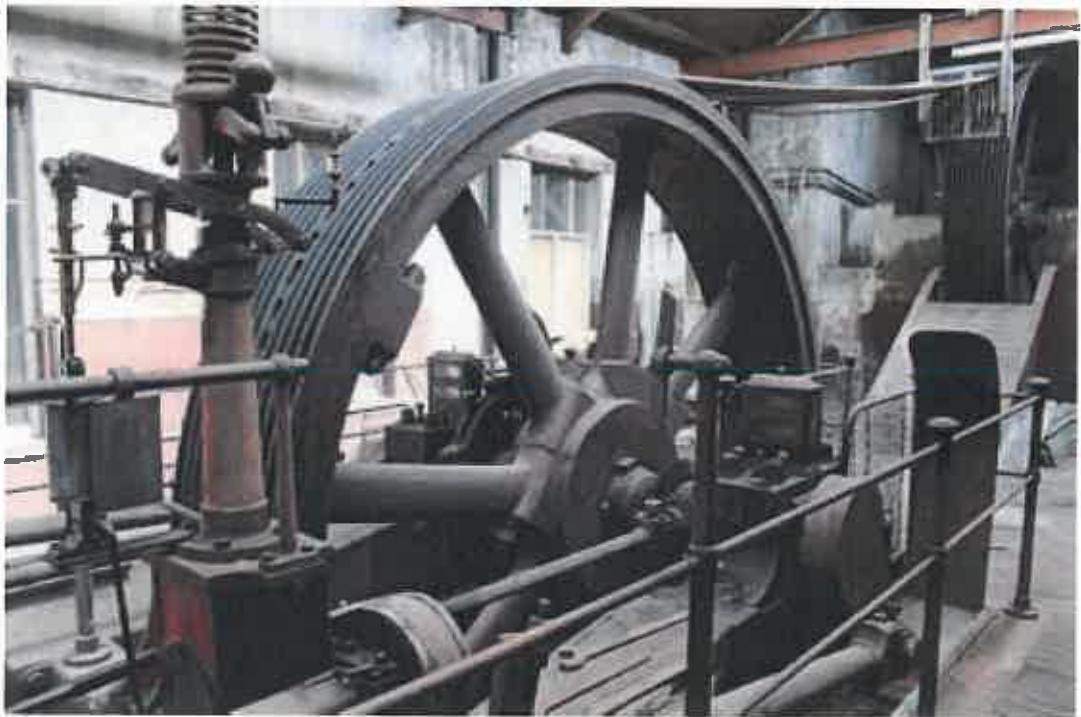


Plate 100: Flywheel with rope-driven secondary motion shaft



Plate 101: Original coachwork on engine cylinder



Plate 102: Secondary motion shaft, and corbel for earlier boiler house truss



Plate 103: Substantial bed for secondary motion shaft housing

3.6 STRUCTURES TO REAR OF POWER PLANT

- 3.6.1 The area the rear of the power plant contained structures of several phases between the two spinning blocks. The site originally formed the rear of a foundry in the mid-nineteenth century, housing both its chimney, and a gasometer, with the remainder of the area being depicted as a garden or orchard on the Ordnance Survey edition of 1844 (Fig 2). The edition of 1884 shows very poor detail in this area, but appears to depict a range of buildings between the two spinning blocks, with a narrow gap on the northern side. This is confirmed by the edition of 1912, although the two structures at the eastern end represent the remodelled power plant, which was not in place until 1905-1910.

- 3.6.2 The earliest of these structures is an L-shaped single storey, four bay shed, of limestone rubble construction, placed against the boundary wall to Woone Lane (Plate 104), and enclosing the base of the chimney. Its junction with the flue, to the east of the chimney is unclear, although the wall above flue height appears to represent a second phase of construction, with the original flue apparently being capped with sandstone flags, still visible within the external wall face (Plate 84). This suggests that the flue was probably enclosed within the new structure, with its north wall being rebuilt in brick subsequently (Plate), to form the wall of the 1910 engine house.



Plate 104: Single-storey warehouse, with blocked access from Woone Lane

- 3.6.3 To the west of the chimney, the south wall retains five-light timber window frames within vertical apertures, whilst the north wall has only a door, placed at its western end (Plate 105). The west wall also had a central doorway affording access from Woone Lane (Plate 104), set high in the wall on its internal face, and blocked subsequently with brick. The aperture has an internal threshold step within the aperture (Plate 106), and presumably had a timber stair to internal floor level.
- 3.6.4 Trusses placed at each bay division are carried on convex sandstone corbels (Plate 107), and are queen post trusses with the posts comprising iron rods, bolted into a cast bracket housing the ends of the principal rafter and straining beam (Plate 108). A timber upper king strut, clasps a slender ridge board, and angled timber braces span from the outer edge of the queen post rods between the upper and central butt-ended ridge purlins (Plate 108). The pitched Welsh slate roof is under-sealed with lath and plaster, with a central glazing band on both pitches (Plate 108). To the east of the chimney, the tie beams are interrupted adjacent to the southern queen post rod, the eastern two of which have been replaced with a timber post (Plate 109), whilst that to the west also retains its rod (Plate 109), suggesting that the wall may have been moved during the construction of the secondary power plant in 1910.



Plate 105: Doorway in north wall of warehouse



Plate 106: Interior of doorway to Woone Lane



Plate 107: Corbel carrying truss



Plate 108: Timber and metal trusses of warehouse



Plate 109: Remodelled trusses adjacent to 1910 engine house

- 3.6.5 The L-shaped yard to the west of the 1910 engine house was enclosed in 1913, with deposited building plans clearly depicting the alterations (Plate 5), including the addition of a valley gutter, placed above the north wall of the single storey shed, and carried over the open area to the chimney on a single hollow, cylindrical cast-iron column, without decoration (Plate 92). The valley gutter supported the base of simple rafters of a single-pitched roof with a continuous central glazing band, sealed on the underside with fibre-board sheeting.
- 3.6.6 The same deposited plans also show an extension at the eastern end of the 1910 engine house, forming a single bay with a wide central doorway (Plate 77). This appears to have always been a vehicle store (J Thornber *pers comm*), and it is probable that the extant round-headed window within this aperture was moved from the original gable of the engine house. The new gable is rendered, but may also represent a rebuild of the original wall.

3.7 WEAVING SHED

- 3.7.1 A weaving shed was added to the northern side of New Mill in 1853. It was of irregular plan form, narrowing along its western face, where it followed the line of Woone Lane, and also dog-legged around a two-storey, eight bay warehouse block that was incorporated into its south-eastern corner. Both formed a contemporary build, in limestone rubble, similar to that of the earlier mill (Plate 110). The majority of the western external wall of the weaving shed was coarsely rendered (Plate 110), but housed unusual triangular vents, formed of sandstone, and replicating gothic tracery (Plate 111), in the gable of each bay, below the parapet roof. A similar vent survives at the northern end of the east wall, with larger rectangular vents inserted into the adjacent bays, to the north of the warehouse, which was reduced to a single storey height (Plate 112).

- 3.7.2 A relatively recent replacement of the roof and the removal of the original cast-iron columns, has left the weaving shed as only a shell of its original form (Plate 113), but the scar of the saw-toothed, multi-span roof remains visible in the eastern and western walls (Plate 114).



Plate 110: West wall of weaving shed



Plate 111: Triangular vent in weaving shed gable



Plate 112: Reduced warehouse in south-east corner of weaving shed



Plate 113: Interior of remodelled weaving shed



Plate 114: Roof scar for multi-span, saw-toothed roof of weaving shed

- 3.7.3 The warehouse was also removed during the major late-twentieth century remodelling, leaving only a single storey of its southern and eastern walls extant (Plates 112 and 113). The return of the two walls has tooled and rusticated projecting quoins (Plate 112), similar to the later boiler house, as does a large loading door in the south wall (Plate 112). This has a replaced concrete lintel, presumably encasing an I-section steel beam, but is probably an original aperture, despite the quoins being mis-aligned with those of the return, immediately to the east (Plate 112). A man door, flanking its western side, is probably also an original external entrance into the warehouse. A similar-sized loading door in the south wall lies to the north of the eight bay warehouse, and appears to have served the weaving shed. It has flush rubbed quoins, suggesting that it is probably an inserted feature, although a door on its northern side does appear to form an original entrance directly into the weaving shed, possibly affording access to privies, which were probably housed in a narrow structure against Mearley Brook, shown on mapping up to 1912, and probably representing a privy block. This structure, and the two-storey warehouse are depicted in an 'as existing' elevation accompanying the deposited building plans for the proposed extension of 1915 (Plate 115).

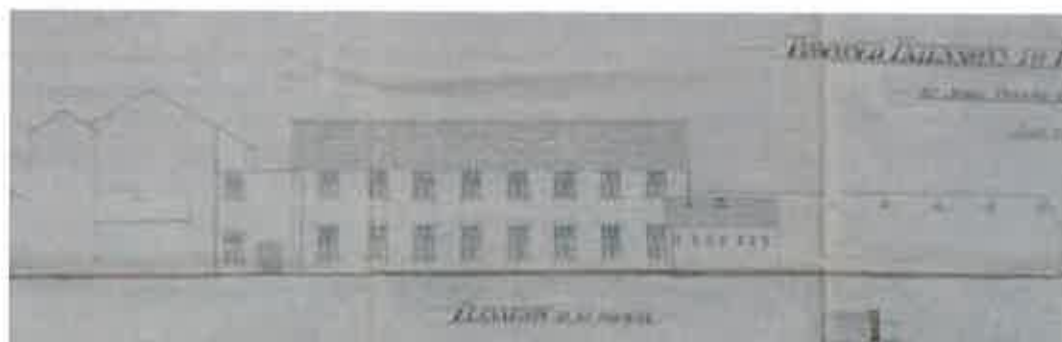


Plate 115: Architects' drawing of the warehouse and weaving shed frontage, dated 1915

- 3.7.4 There is no evidence within the extant fabric to suggest that a proposed extension of 1915 was ever undertaken. The deposited building plans depicted the removal of the warehouse, and the extension of the weaving shed up to Mearley Brook to the east.

- 3.7.5 At its southern end, this would have required the narrowing of the river channel to accommodate the squared end of the shed, and there is no evidence for this in the retaining wall of the river. The drawings do, however, show the two-storey warehouse façade prior to its reduction, and also show the proposed use of New Mill as a warehouse, rather than a spinning block, at ground-floor level at the very least (Plates 6 and 115).
- 3.7.6 Further evidence for the original arrangement of the weaving shed survives in the adjoining wall to New Mill. The majority of the original windows blocked at ground-floor level, during the insertion of the weaving shed, with two of the windows being remodelled into doorways to provide access between the two structures. No evidence for power transmission survives within the weaving shed, suggesting that the main drive shaft was placed along the west wall of the warehouse block, which was removed subsequently. A probable bearing box in this position in the dividing wall between the mill and weaving shed is partially visible on the weaving shed side, although it is almost completely obscured by a late steel stair.

3.8 GATEHOUSE

- 3.8.1 The entrance from Greenacre Street into the Holmes Mill complex is through a steel gateway, containing the name JAMES THORNBUR LTD HOLMES MILL (Plate 116). This presumably replaced an earlier gate across a similar entrance, between the original spinning block and a small gatehouse placed adjacent to Mearley Brook, and depicted from the Ordnance Survey mapping of 1844 (Fig 2). This structure was smaller than that now present, being extended subsequently between 1884 and 1912 to form a dog-legged structure (Fig 3). The present stone-built, single storey gatehouse is rendered externally on all but the riverside elevation (Plate 117), obscuring any joint between the two phases of construction, but detail of the southern two window apertures, is markedly different from those to the north (Plates 117 and 118), strongly suggesting different dates of construction.
- 3.8.2 The earliest gatehouse appears to have comprised three bays, with a doorway, with rubbed sandstone monolithic surround in the narrow southern bay, and with vertical windows with similarly dressed flush lintel and slightly projecting sills in the two bays to the north (Plate 118). The southern bay also has a window in the east wall, with a blocked lower aperture in the bay to the north probably also representing a window, prior to the enlargement of the structure (Plate 118).



Plate 116: Decorative entrance gate



Plate 117: Gatehouse, looking south-east



Plate 118: Remodelled doorway, and original window aperture

- 3.8.3 The extension comprises three bays, with larger vertical windows to each bay in the west wall, with projecting sandstone surrounds (Plate 117). That in the central bay is flanked on its southern side by a full-height doorway, with similar surround, with the original aperture at the southern end of the façade presumably being remodelled into a window at this time. The northern gable has a wide double window, with vertical timber mullion (Plate 117), similar in style to that in the gable of the original spinning block, possibly suggesting a similar date of insertion for the mill window. The extension has a central small square window in the east wall, and a projecting square chimney stack at its north-east corner (Plate 119), demonstrating the inclusion of a fireplace in the large office which comprises the northern two bays.



Plate 119: Rear of gatehouse, with chimney stack at northern end

4. DISCUSSION

4.1 INTRODUCTION

- 4.1.1 The extant Holmes Mill complex represents the well-preserved remains of two multi-phase cotton spinning complexes, which were only latterly amalgamated into single ownership. Both mills have early-nineteenth century Georgian origins, making them the oldest extant textile mills in Clitheroe.

4.2 PHASE 1 - 1823

- 4.2.1 The earliest structure within the site is the 1823 three-storey spinning block fronting Greenacre Street. Few late Georgian mills survive within the county, and this structure is an excellent example of the local style of construction. Whilst earlier mills were typically built to a design similar to that utilised by Richard Arkwright in his late eighteenth-century mills, with width rarely greater than 30', mills erected in the early part of the nineteenth century, particularly in larger towns like Manchester have an increased width (Williams with Farnie 1992, 54f). This allowed the accommodation of larger automated spinning mules of up to 400 or even 500 spindles, placed transversely across the spinning rooms in pairs. Arkwright mills were typically of non-fireproof construction, and with external privy and stair towers, and were generally constructed without internal columns to carry the large-scantling ceiling beams. Whilst several mills constructed in larger centres like Manchester within this period were increasingly being built of fireproof construction, this was not widely taken up, particularly in rural Pennine areas, where the cheap supply of local stone for wall construction, meant brick arches for fireproofing were rarely used until the latter part of the nineteenth century. The area in and around Clitheroe differs from much of Pennine Lancashire, in that the predominant locally quarried stone is limestone, as opposed to sandstone, which was only utilised for dressing and large pads within the walls of the early phases.
- 4.2.2 The earliest columns used within textile mills of the late eighteenth century, were of cruciform section, although cheaper hollow cylindrical columns gained popularity in the early years of the following century, having first been utilised in Salford Twist Mill in 1799 (Giles and Goodall 1992, 67). The fluted columns used within the construction of Holmes Mill are very unusual, with decoration, where present, almost always being reserved for capitals. It is highly likely that the columns were cast in the adjacent foundry, possibly allowing for greater expense to be undertaken in the casting, as savings would have been made in transport, and possibly price.
- 4.2.3 As with many early mills, an external dry-chute privy tower was incorporated within the original fabric, placed against the western gable, and being of typically narrow proportions. The extant timber board seat observed at second-floor level may be replicated on the floor below, and represents a rare survival of such a feature, as early privy towers were often enlarged or demolished because of their cramped size, or fitted with flushing water closets during later phases of usage.

- 4.2.4 It remains unclear whether the raised two-bay block at the eastern end of the mill formed part of the original construction, or represented an early extension. It is stylistically different to the main body of the mill, but its similar rubble construction would have easily been keyed to the earlier structure, and subsequent partial rendering obscures any evidence for a butt joint. The original entrance, in the adjacent bay of the north wall would appear unusual, if the present stairwell was original, as access directly to the upper floors would have more easily been provided from a doorway opposite the stairs, rather than having to use the north-east corner of the main block as a passageway. However, there is no extant evidence for the position of an original stair, or for a power plant. It is possible that an original engine and boiler house were placed in a separate structure, probably attached to the eastern gable, and replaced by a more powerful engine, but this remains pure conjecture.
- 4.2.5 There is also no evidence for the position of the original chimney associated with the first mill. The detailed Ordnance Survey plan of 1844 clearly marks the engine and boiler houses within the mill, but has neither a projection or annotation for an associate chimney. The only one depicted is placed in the position of that now present, with a flue leading from the foundry to the east. It is almost certain that this chimney was used by New Mill, the owners of which bought the chimney from the foundry in 1836, and it appears likely that it was used by all three ventures, possibly leading to both mills, although under separate ownership, being referred to collectively as Holmes Mill.
- 4.2.6 Evidence for the position of single line shaft against the south wall survives within the fabric of the mill, powered by a secondary motion shaft at ground-floor level. Associated cast-iron bearings in the east wall of the spinning block suggest that the upright shaft was placed in this position.
- 4.2.7 The original mill was of non-fireproof construction, which was certainly not uncommon for its date of construction, but it appears to have had a complete lack of any fire-fighting equipment, which is somewhat more unusual. Stand pipes were often included within the central newels of quarter-turn stairwells, but the only extant fire-fighting equipment within the extant structure appears to be of late-nineteenth or early twentieth century date.

4.3 PHASE 2 – c 1830

- 4.3.1 New Mill was constructed under different ownership c 1830, and was of similar construction to the earlier mill, and incorporating many similar design features within the spinning block, including fluted hollow cylindrical cast-iron columns, presumably from the foundry which lay between the two mills. However several differences between the two structures highlight the evolution of textile mill design, even within a relatively short period. Whilst no evidence for a privy tower survives, early mapping suggests that this was placed centrally on the northern side of the mill, being removed during the subsequent addition of a weaving shed.

- 4.3.2 The structure had an external stair tower. Placed against the eastern gable, and of fireproof construction, controlling access to all areas of the mill. The inclusion of a loading loophole within its facade afforded simple access to each floor, although this would have compromised personnel access during loading and unloading operations.
- 4.3.3 The other major change from the original mill to the south was the erection of a detached power plant, comprising large beam engine house and adjacent boiler house, subsequently demolished, and with only a dressed stone impost providing physical evidence for its position.
- 4.3.4 The engine house was offset beyond the end bay of the spinning block, allowing a more efficient use of a secondary motion shaft into the mill, driven directly from a pinion wheel on the flywheel of the engine. The overlap was kept to the minimum distance to achieve this, allowing the inclusion of a window in the end bay, maximising light into the structure. This represents a good example of the evolution of power transmission systems through the nineteenth century, as the understanding of both the loss of power through gearing and linkages, and how the citing of the power plant could reduce its impact, culminating in the highly efficient complexes of the late-nineteenth and early-twentieth centuries.
- 4.3.5 The roof space within New Mill was also designed to be better utilised as a working space than in the original mill. It retains the gearing for what appears to be an original hoist atop the stair tower, and has the majority of an extant floor, which could easily have accommodated spinning mules. Such an arrangement was depicted in an engraving by Thomas Allom at Fishwick Mill, Preston, c 1835 (Plate), with mules laid in longitudinal rows, unlike the floor beneath.
- 4.3.6 Prior to 1844, a projecting hoist tower was also added to the northern side of the original mill. Although adapted for an electrical power supply in the twentieth century, the loophole again retains what appears to be original headgear.

4.4 PHASE 3 – MID-NINETEENTH CENTURY

- 4.4.1 Two major alterations were made to the complex in the mid-nineteenth century, with the rebuilding of the chimney, which was under the ownership of New Mill by this date, and the addition of a weaving shed to New Mill.
- 4.4.2 The chimney appears little different in plan, to that shown previously in 1844, suggesting that its refurbishment may have already been undertaken by this date, with the majority of the extant southern flue probably being of contemporary date. The northern flue, although remodelled for use by the Lancashire boilers of the early-twentieth century changes to the power plant, aligns with the earlier boiler house to the north, and is therefore presumably original to the construction of New Mill, suggesting that the rebuild of the chimney may have even been this early.

- 4.4.3 Although entirely remodelled internally, the weaving shed and associated warehouse still provide physical evidence of an important development within the textile industry in the mid-nineteenth century. With the rise of the power loom after 1822, the ability to mechanise the weaving process into large-scale production made the integration of spinning and weaving within the same complex an attractive proposition to many owners. Initially weaving was carried out in separate mills, but integrated spinning and weaving complexes became common in the mid-nineteenth century (Williams with Farnie 1992, 10). Few weaving sheds of this date survive within the county, and that at Holmes Mill has unique ventilation grills unseen elsewhere.

4.5 PHASE 4 – LATE NINETEENTH AND EARLY TWENTIETH CENTURIES

- 4.5.1 During the late nineteenth century, the original mill closed, and the building was re-used as a technical school. It was probably during this refurbishment that the power plant was removed and replaced with offices, and that the hose-reels for fire fighting were added. The subsequent installation of mains water to each floor, and a central heating system with cast-iron radiators, not only marks an unusual development for such a structure, but also sealed the privy tower, preserving the extant fittings. It also meant that alterations to power systems typically associated with textile mills in this period were not undertaken, and when textile manufacture returned in the mid-twentieth century, the power was all supplied electrically, preserving elements of the power transmission system in their late-nineteenth century form.
- 4.5.2 New Mill remained in textile manufacture, although became focused solely on weaving rather than spinning by the end of the period. Its power plant was refurbished in the early-twentieth century, possibly as a pre-cursor to a failed expansion of the weaving shed, which was presumably stalled by the continuation of World War 1.
- 4.5.3 The extant remains include the Clayton, Goodfellow & Company cross compound horizontal engine, which survives intact, and in its original condition. It is one of only five extant mill engines in Lancashire, the only remaining example of an engine by this important firm, and the only mill engine in the county that has not been restored, representing a unique feature. Not only is the engine completely intact, complete with its secondary motion shaft and rope drum, but many other features within the engine house also survive in a remarkable state of preservation, including valves, maker's plate, and taps for the original gas lighting. The walls of the engine house were not decorated with glazed tiles, as were the great majority of Edwardian engine houses, but was instead finished with painted plaster, with a decorative dado frieze, the majority of which also survives in excellent condition.

- 4.5.4 Although the associated Lancashire boilers have been removed, three flues remain into the reduced-height stone and brick chimney, probably representing at least two phases of boilers and chimney. The documentary sources suggest that only a single Lancashire boiler was installed in the early twentieth century remodelling of the power plant, and whilst the structure was clearly erected to house two boilers, the second boiler was often added at a later date (eg Queen Street Mill, Harle Syke, and Grane Mill, Haslingden (OA North 2014, OA North 2014a)), and the extra flues may simply relate to those of the earlier boiler house to the north, and the foundry occupying the site of the present boiler house.
- 4.5.5 It is, however, unusual that a power plant of this relatively late date did not appear to incorporate an economiser, patented by Green's of Wakefield in 1845, and become increasingly popular in textile mill power plants from the last two decades of the nineteenth century. The saving in fuel efficiency that these simple structures offered, by pre-heating water entering the boiler by up to 200°C, using exhaust gas from the boiler, was significant, so it appears unusual that one was not included within the refurbished Holmes Mill power plant, but no evidence for its likely location was observed.
- 4.5.6 Sections of the power transmission system associated with this new power plant survives within New Mill. This includes the main bearing where it enters the mill from the engine house at ground-floor level, several lengths of *in-situ* line shaft and associated hanger brackets, and a top end bearing in the western gable at second-floor level. These were certainly incorporated into the remodelled power transmission system, but some elements, particularly the larger bearings probably represent earlier, possibly original features that were reused.
- 4.6 PHASE 5 – MID-/LATE TWENTIETH CENTURY**
- 4.6.1 Unusually for the textile industry within the region, not only was manufacture continued in New Mill into the twenty-first century, but also it was recommenced in the original mill 1939. This led to small-scale modernisations within both spinning blocks, the insertion of stud partitions and internal hoist towers, but with the majority of the earlier fabric being retained intact. However, large-scale structural modification were undertaken to the weaving shed and associated warehouse in the second half of the twentieth century, almost certainly prompted by failure within the multi-span roof structure. This and all the internal columns were removed, with the whole structure replaced with a wide-span double pitch roof, which also covered the warehouse, which was demolished, with the exception of the south and east walls, which were reduced to single-storey height.

BIBLIOGRAPHY

PRIMARY SOURCES

Cartographic Sources

Ordnance Survey first edition 25": 1 mile map, published 1844

Ordnance Survey first edition 25": 1 mile map, published 1884

Ordnance Survey second edition 25": 1 mile map, published 1912

SECONDARY SOURCES

Baines, E, 1835, *The History of Cotton Manufacture in Great Britain*, London

English Heritage, 1991 *Management of Archaeological Projects*, 2nd edn, London

English Heritage, 2006 *Understanding Historic Buildings: A Guide to Good Recording Practice*, London

Giles, C, and Goodall, IH, 1992 *Yorkshire Textile Mills 1770 – 1930*, London

Goodbody, AM, 2001 *Clitheroe on Old Picture Postcards*, Settle

OA North, 2010 *Lancashire Textile Mills: Rapid Assessment Survey Final Report*, unpubl rep

OA North, 2014 *Queens Street Mill, Harle Syke: Archaeological Building Investigation*, unpubl rep

OA North, 2014 *Grane Mill, Haslingden: Archaeological Building Investigation*, unpubl rep

Williams, M, with Farnie, DA, 1992 *Cotton mills in Greater Manchester*, Royal Commission on Historical Monuments (England) and Greater Manchester Archaeological Unit, Preston

ILLUSTRATIONS

LIST OF FIGURES

- Figure 1: Site location
- Figure 2: Extract from the Ordnance Survey **": 1 mile map of 1844
- Figure 3: Extract from the Ordnance Survey 25": 1 mile map of 1884
- Figure 4: Extract from the Ordnance Survey 25": 1 mile map of 1912
- Figure 5: Ground-floor plan of Holmes Mill complex
- Figure 6: First-floor plan of Holmes Mill complex
- Figure 7: Second-floor plan of Holmes Mill complex



Figure 1: Site location

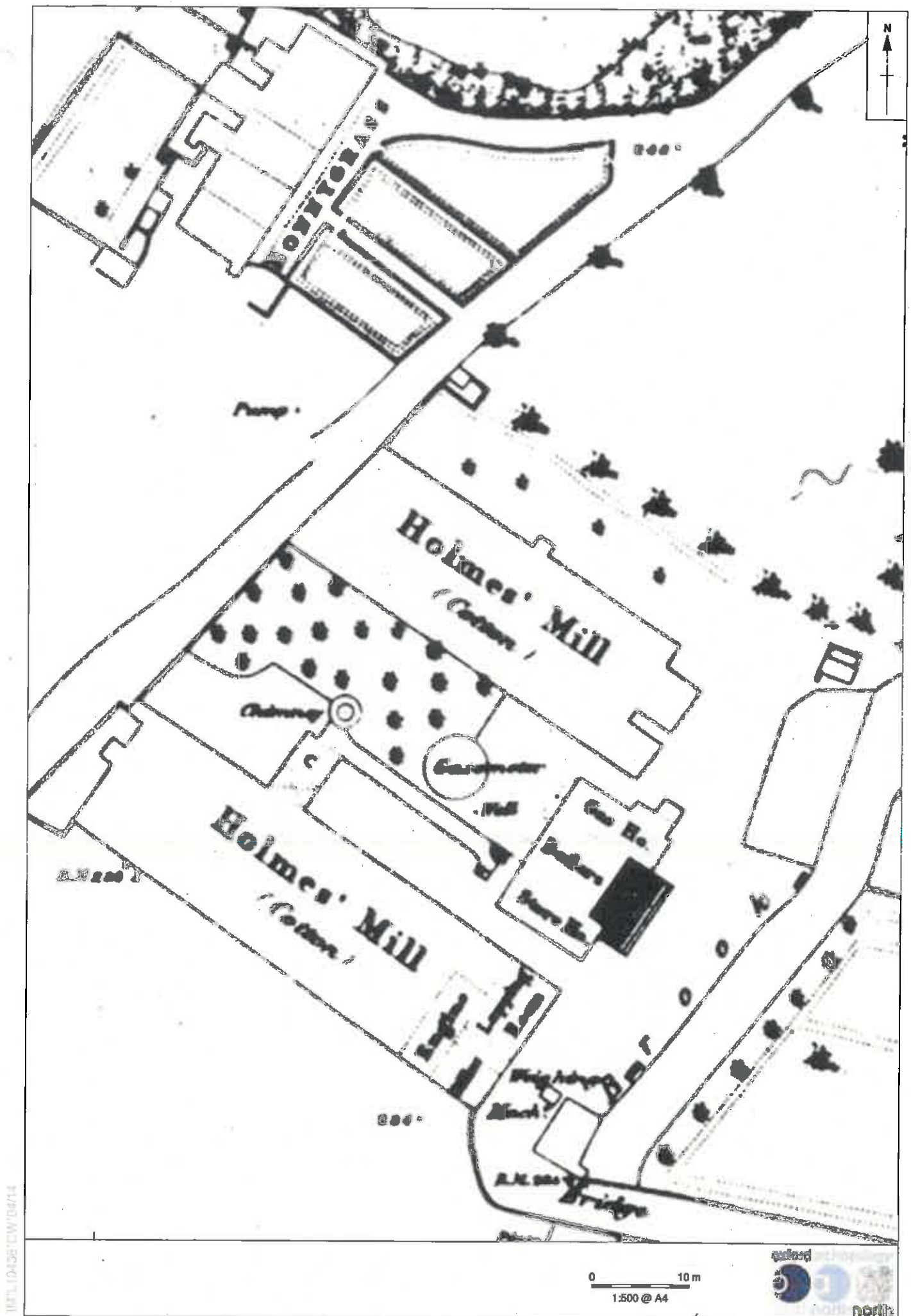
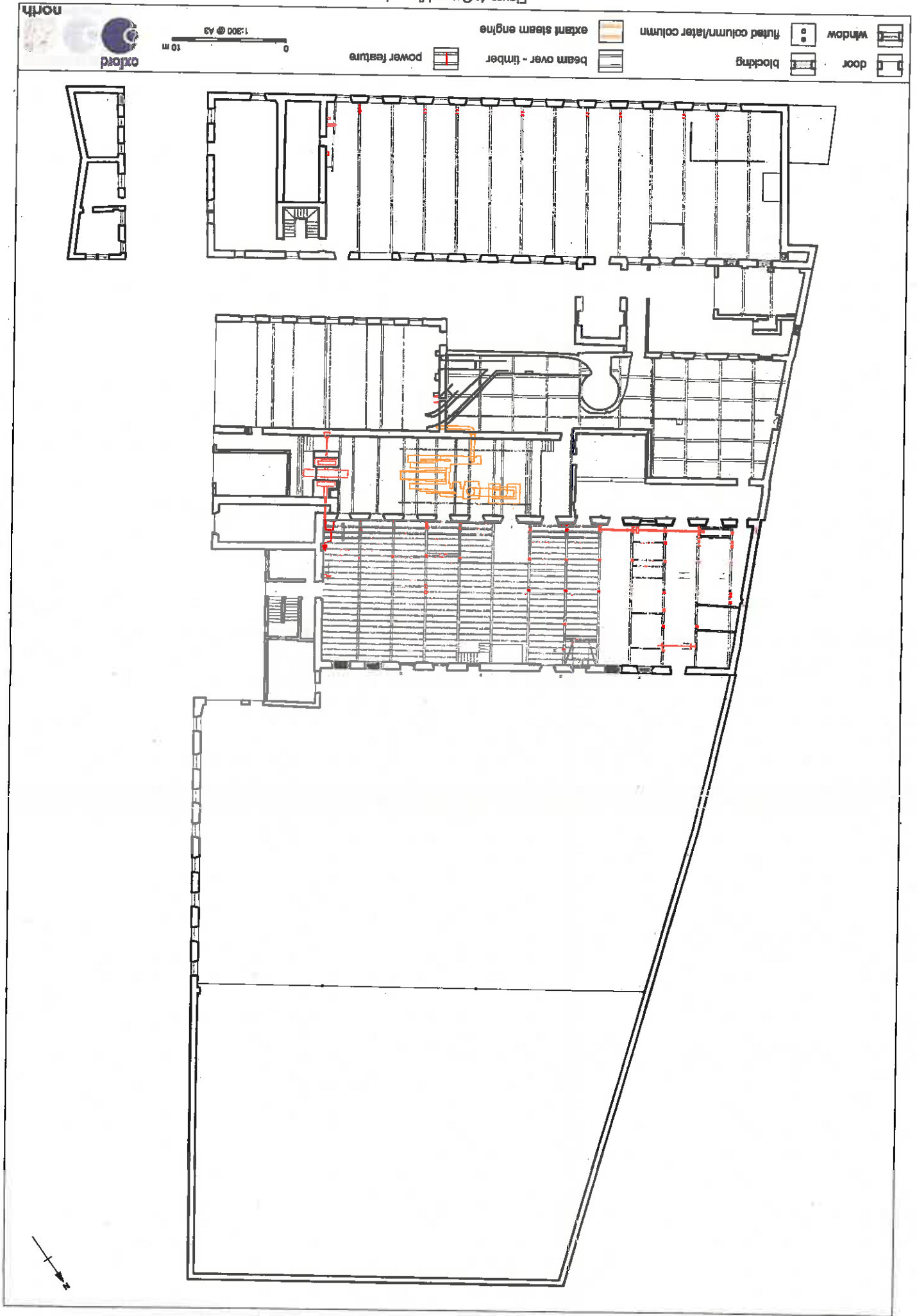


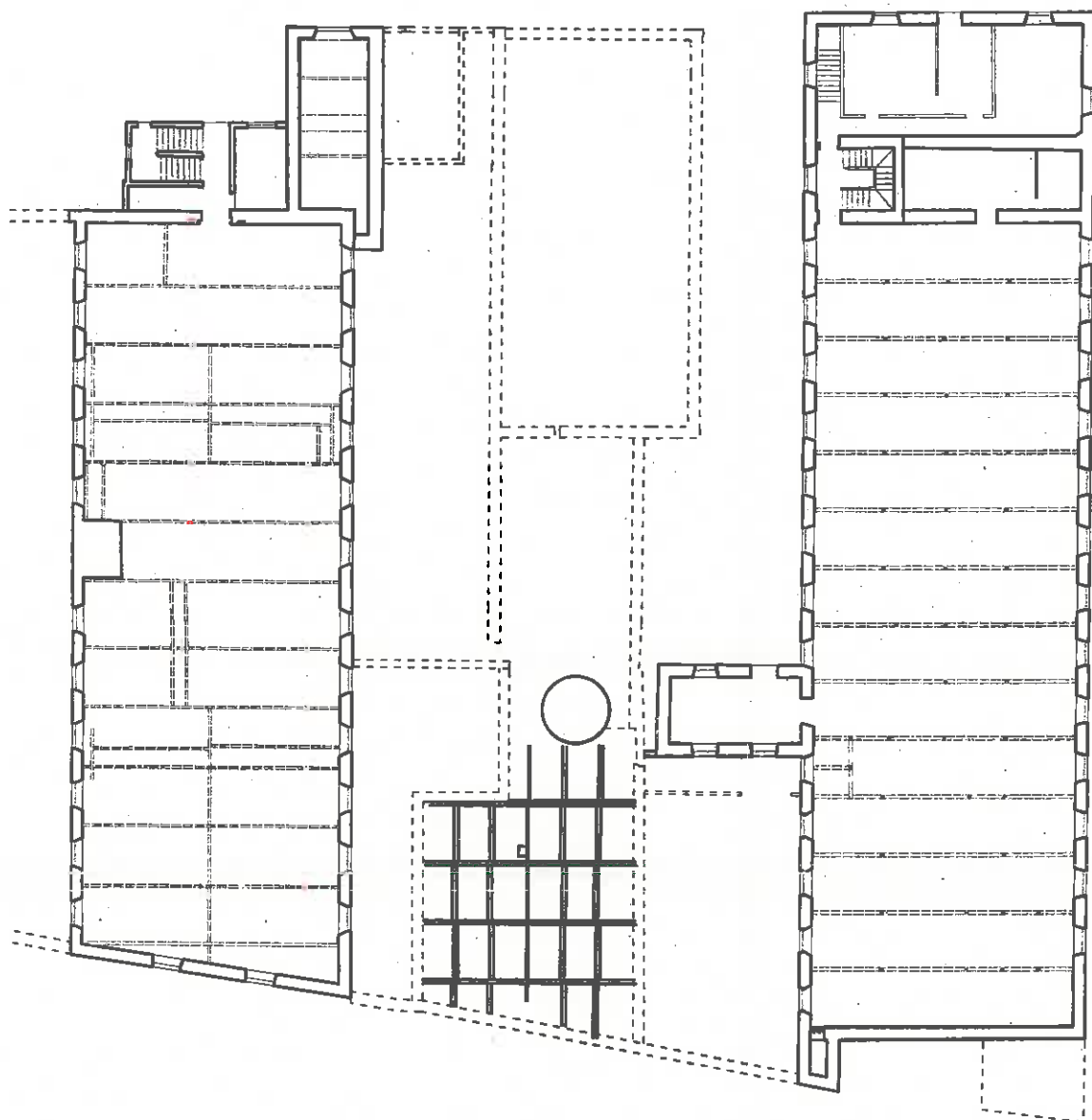
Figure 2: Extract from the Ordnance Survey 25":1 mile map of 1844



Figure 3: Extract from the Ordnance Survey 25:1 mile map of 1912

Figure 4: Ground floor plan



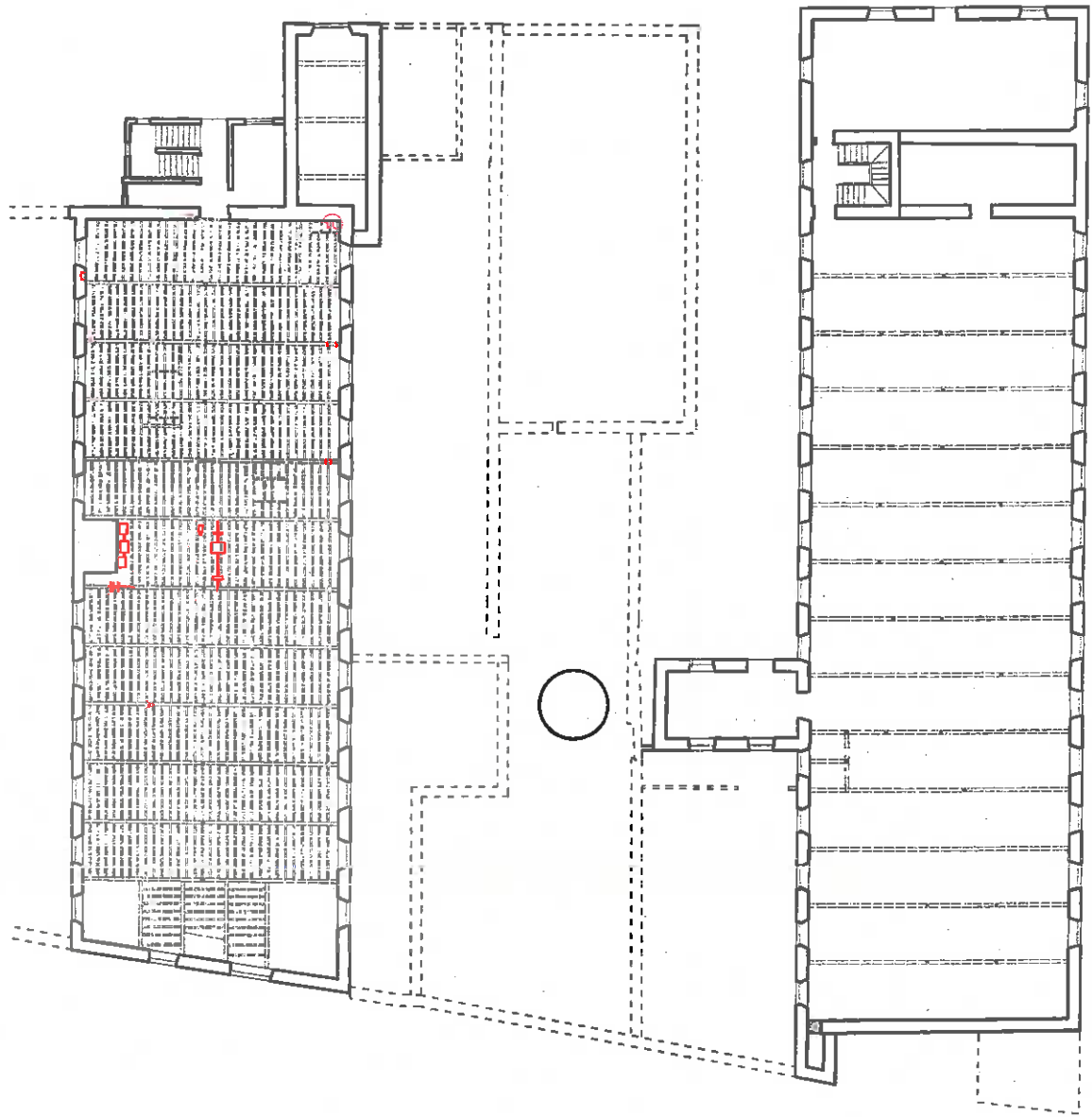


- | | | | | | |
|---|--------|---|------------------------------|---|--------------------|
|  | door |  | blocking |  | beam over - timber |
|  | window |  | fluted column/lateral column |  | power feature |

0 5m
1:250 @ A3



Figure 5: First floor plan



- door
- blocking
- beam over - timber
- window
- fluted column/aster column
- power feature

0 5 m
1:250 @ A3



Figure 8: Second floor plan

