1e. St Ann's Mill (SE 2645 3521) – Plan 5

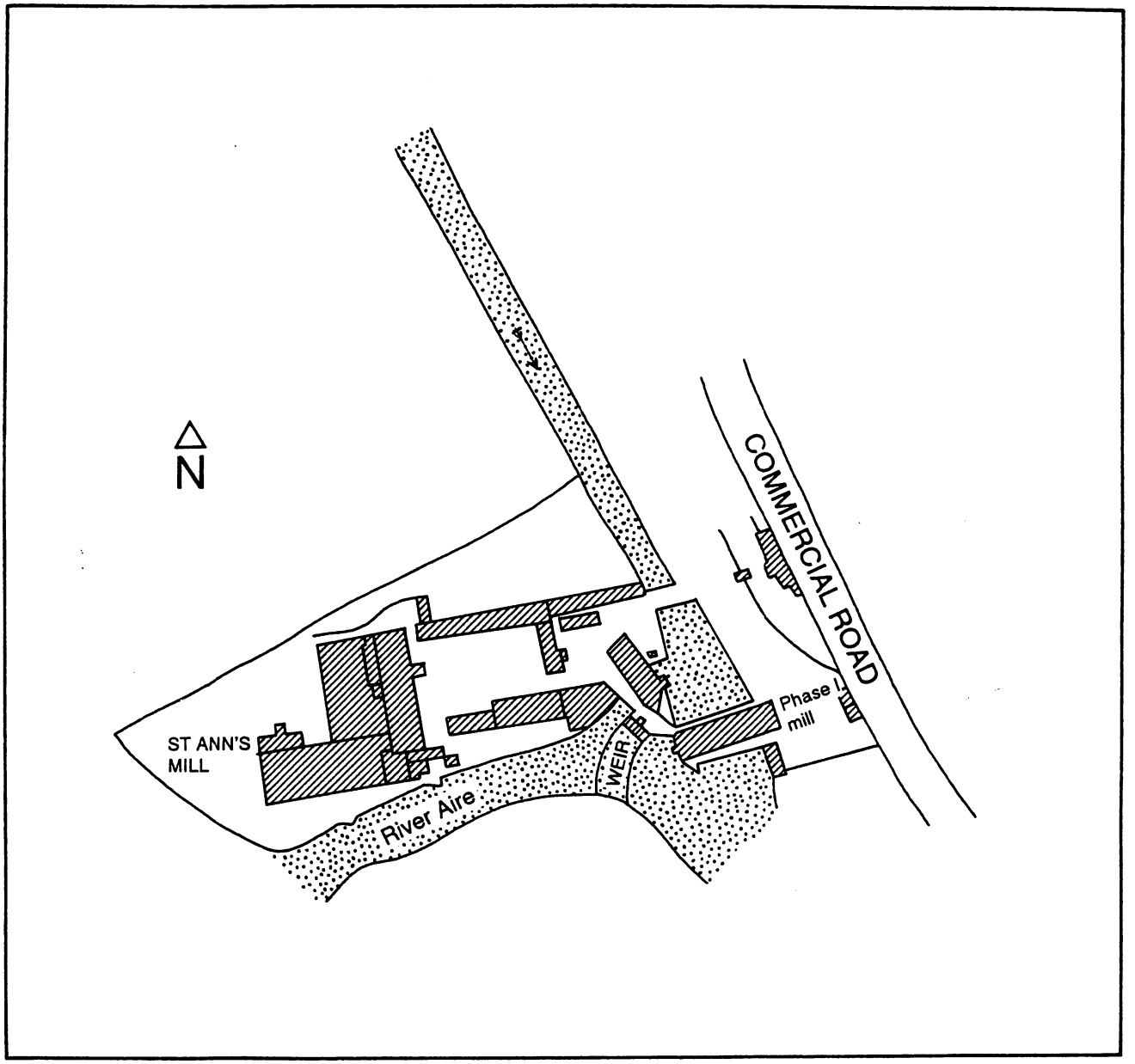
St Ann's or St Anne's Mill is a multi-phase complex which straddles the Kirkstall Mill Race at its confluence with the River Aire. The site is currently in multiple occupancy and serves as a mixture of light industrial/warehousing premises. St Ann's is not mentioned by name in the directory of 1826, but a reference to John Wood, scribbling and fulling miller, may refer to the occupant of this mill. By 1857, the premises had been taken over by J. and E.D. Padgett and Co., woollen manufacturers and merchants, the firm which were to occupy the mill until 1894 (Leeds Local History Library Corres. LH/Burgess, 23/8/1984). St Ann's Mills were still being used for cloth manufacture, albeit in multiple occupancy, at the time of their sale to the Leeds and District Worsted Dyers and Finishers Association in 1920.

The earliest cartographic evidence for a watermill on the site is the Thomas Jefferys map, surveyed in 1771/2. The map scale is small, and its representation of mills symbolic, so the precise location of the mill as derived from this map may not be totally reliable. Nevertheless, it appears to indicate a watermill in this general area but in a position considerably to the north of the confluence of the Kirkstall Mill Race and the River Aire, at approximately SE 3643 3524.

This watermill seems also to appear on the Tuke map of 1781, again in a position well above the confluence of the mill race and the river. As noted in the section of this report concerning Abbey Mills (see above), the Tuke map cannot be considered reliable. In this instance, internal comparisons and comparison of the Tuke map with earlier and later maps suggests that in fact the surveyor has mistaken the bend in the river at SE 2708 3476 for a similar bend further upstream; the result has been that the Kirkstall Mill Race is shown on the Tuke map at approximately twice its actual length. Although this degree of inaccuracy must cast severe doubts on the reliability of other details on the map, it may still be possible to attach some significance to the fact that, once again, the mill is shown some distance above the confluence of the race and the river, rather than at or below it.

The shape of the mill on the Tuke map is identical with that used for both Abbey Mills and Savins Mill: a rectangular structure over the mill race with an extension or wing running parallel to the race. If the Jefferys and Tuke maps are correct in placing a watermill on the line of the leat rather than at its confluence with the river, it may be possible to identify a small area of rubble walling currently visible on the west side of the leat at SE 26476 35240 with this presumed early fulling mill. This masonry, although forming the foundation of a building which was probably constructed in the late 1820s, is markedly different from the fabric of the superstructure of that building **[40]**.

A dam (or weir) is marked at the edge of Jonathan Taylor's 1812 map of Bramley, along with a mill, slightly upstream on the Headingley-cum-Burley side of the river, which is schematically depicted as one half of a hollow square. Although unlabelled, these are obviously intended to depict features of the St Ann's mill site. However, the earliest map on which buildings are shown which can be related with any certainty to structures or foundations currently visible on the site is the Thorpe map of 1822. Subsequent maps reflect a pattern of gradual infill, demolition and redevelopment that continued well into the 20th century.



Plan 5. *St Ann's Mill – SE 2645 3521, 1:2500 (derived from WRRD 1920 66 1258 456).*

There are three major features, or groups of features, still extant which can be positively identified with structures on the 1822 map. The first is the bridge which carries the entrance road to the site over the leat at SE 2643 3524. The second is the mill building, now of three storeys, with central clock tower, which sustained major fire damage in the 1980s (SE 2633 3520). The third consists of the group of features centred at SE 2644 3519, comprising a watermill (now represented only by foundations at SE 2646 3519) and related water management features. The remains of an engine house contained within this last group, although not positively identifiable on the Thorpe map, probably pre-dates its publication. Although all of the features detailed are present on site by 1822, examination of the masonry demonstrates at least two distinct phases of development which had taken place prior to that date. These can be tentatively identified as follows.

Phase 1 probably dates from the late 18th or very early 19th century and encompasses the water-powered mill at SE 2646 3519, and the water management system associated with that mill. It is characterised by the large punch-dressed rectangular gritstone blocks with occasional margin dressing, which comprise the basic fabric of the features in this phase.

The principal feature of the system, the mill, is located at the very end of the Kirkstall Mill Race. It served as a fulling mill, and may have superseded the hypothesised earlier mill located further upstream. The fabric of the mill foundation has been detailed above. The remains of the superstructure consist of smaller punch-dressed gritstone blocks. The upper courses of the wall at the western end of the structure have recently been rebuilt.

The mill is transected by two parallel water courses, carried below segmental arches through the body of the mill **[41]**. The westernmost and larger of the two races is clearly a wheel race. Demolition of the superstructure of the mill has exposed the remains of the wheel pit, which formerly contained a breastshot wheel **[42]**. The massive rectangular blocks visible on either side of the pit would have supported the axle bearings of the waterwheel **[43, 44]**. A single curved sheet of cast iron, built into the masonry of the wheel pit at its northern side, formed the breast of the wheel **[45]**. This is a fitting which, by partially enclosing the upstream side of the wheel, maintained the weight of water in the wheel buckets for as long as possible, thereby improving the mechanism's efficiency. The remains of rivets along the upper edge of this breast suggest that it is not preserved to its full height. There is evidence, in the form of two cast-iron flanges bolted onto the race wall and fitting against the back of the breast, for a shuttle or sluice system designed to permit regulation of water-flow onto the wheel **[46]**. A slot which runs almost the width of the wheel pit at the base of the breast appears to be original, and implies that water was admitted at the base of the breast as well as at its top.

Of the second and parallel watercourse, to the east, nothing is visible except the external arches. The complex water management system related to the mill would seem to obviate the need for a overflow or bypass channel through the mill itself (see below), and this may therefore be the remains of a second wheel race, or may alternatively relate to a period of use pre-dating the perfection of the present system.

Water was supplied to the mill primarily from the Kirkstall Mill Race. However, this source appears to have been supplemented from the Aire by means of a short length of leat at SE 26425 35205 **[47]**, which is taken off the river above a large weir at SE 2642 3517. The

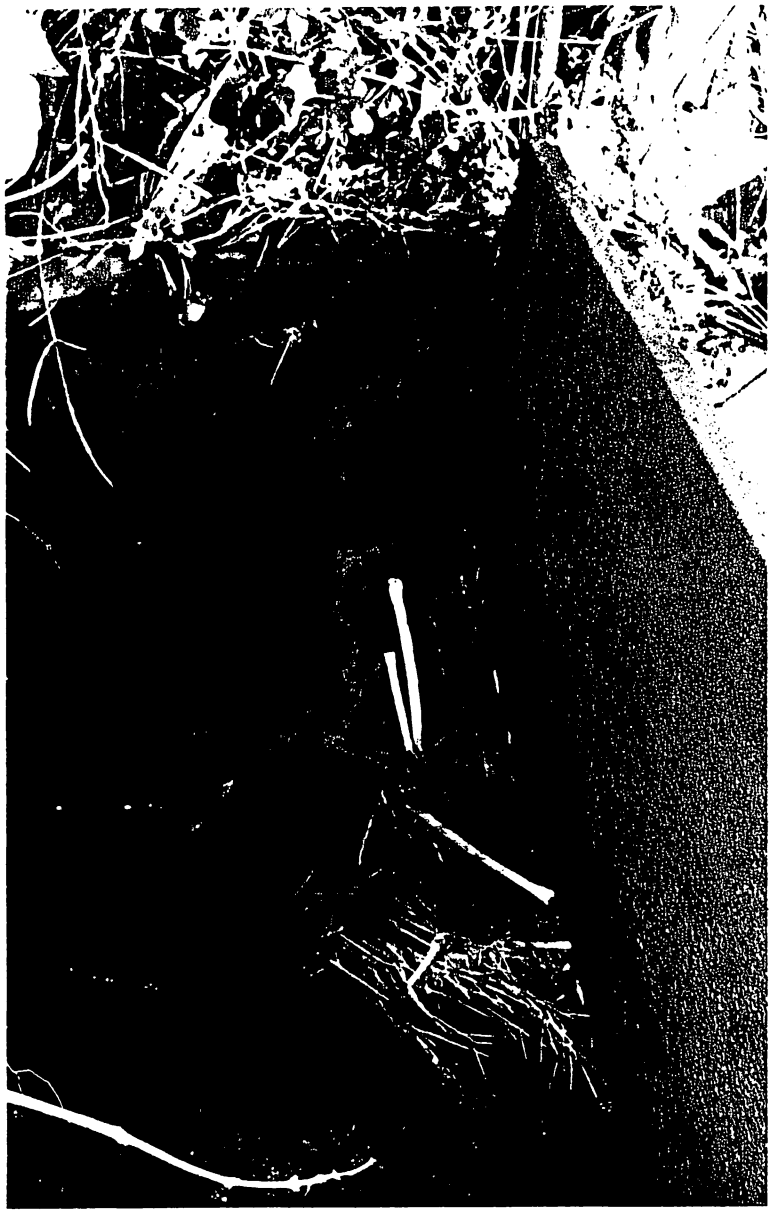
41. St Ann's Mill, watercourses through the body of the mill – looking north.

42. St Ann's Mill, wheel pit – looking south.

43. St Ann's Mill, east face of wheel pit.

44. St Ann's Mill, west face of wheel pit.

45. St Ann's Mill, cast-iron breast within wheel pit – looking north.



46. St Ann's Mill, shuttle flange behind iron breast – looking east.

47. St Ann's Mill, secondary leat entering main flow of Kirkstall Mill Race – looking ~~east~~ west?

lining of this leat consists of punch-dressed rectangular gritstone blocks, some of which are margin dressed. The small, squared gritstone blocks which constitute the upper courses of this lining at its north-east side are probably rebuilding related to the construction of the late 19th-century structure which now spans the leat. The leat was originally crossed, between its north bank and the east end of the weir, by a single-span bridge which is still intact although largely obscured by the later structure. The west face of this bridge, with the exception of the parapet, is constructed of punch-dressed rectangular gritstone blocks. The western parapet, and the remainder of the bridge, is constructed of margin-dressed rectangular gritstone blocks. The parapet on the east side of the bridge is low, and retains some of its coping stones; the western parapet is much taller, and retains the ends of iron fastening rods for coping stones, which have been removed. The masonry forming both parapets is bound together with iron straps, sealed into the stonework with lead. The disparity between the finish of the western and eastern sides of the bridge, and the staggered parapet heights, may indicate that the bridge was considered by its builders to be at least partly ornamental in nature, and that it was probably intended to be viewed from the east.

The eastern end of the river weir is anchored on what is effectively an island formed by this leat and the overflow channel to the south (see below). The west face of the island is revetted with large punch-dressed rectangular gritstone blocks, irregularly coursed **[48]**. This revetment is surmounted by several courses of smaller gritstone blocks, which may represent the remains of a contemporary structure. The weir curves into the flow of the river, and has an oblique air-face **[49]**. Air-face and curb appear to be constructed of rectangular masonry blocks. The river bank at the west end of the weir is revetted with large punch-dressed rectangular gritstone blocks, irregularly coursed **[50, 51]**. Some of the blocks appear to be margin dressed. This revetment is mirrored on the east side of the river by a mole separating the main flow of the river and that part of the Kirkstall Mill Race which acts as the tail race of the fulling mill **[52, 53]**. This mole is constructed in two sections, first, a shoulder of masonry abutting and projecting southward from the south-west corner of the mill building, and secondly a long, narrow wall projecting from this shoulder into the flow of the river. The masonry of the wall resembles that of the weir revetment on the west side of the river. The stonework is bound together with iron strapping, sealed with lead **[54]**. The masonry of the shoulder is of a similar fabric, but the blocks are slightly smaller and do not appear to be strap-bound.

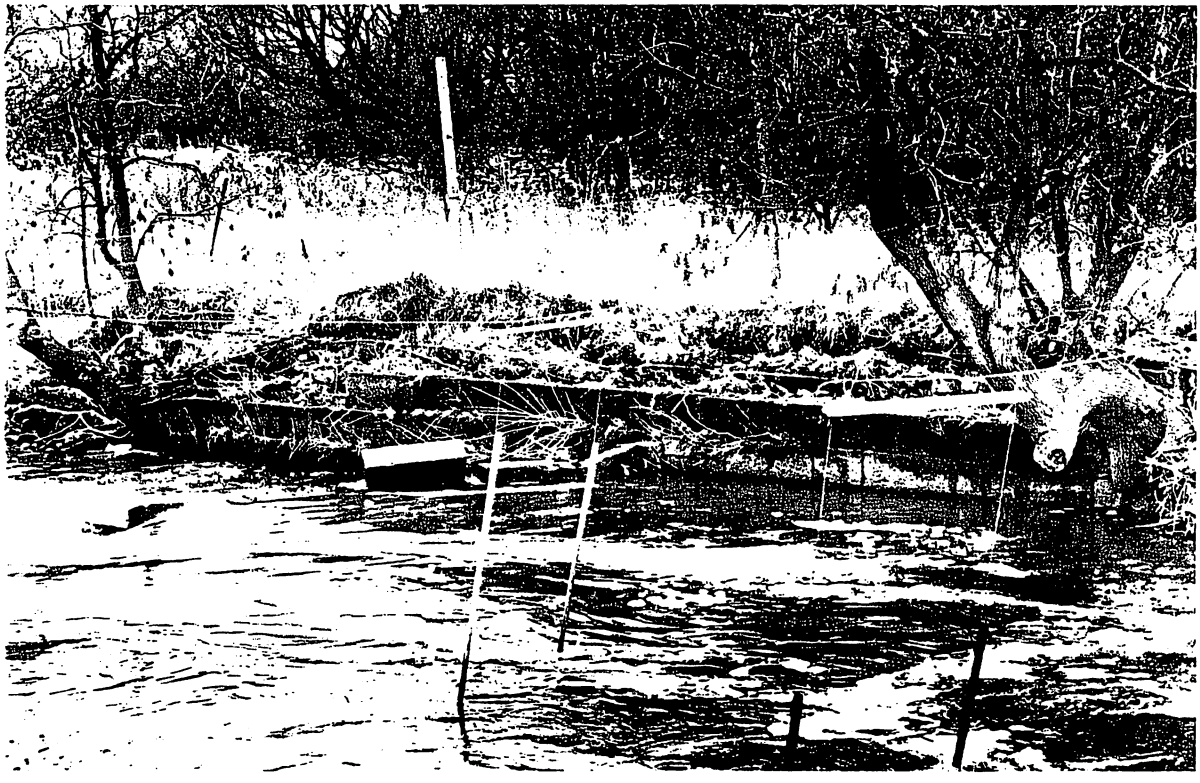
Surplus or flood water was taken off the augmented flow of the mill race and returned to the river before it reached the mill by means of a second, smaller weir within the line of the race at SE 2644 3520 **[55]**. This weir has a vertical air-face, but depth of water renders it impossible to determine the fabric of the structure. The channel immediately below the weir is lined with large rectangular gritstone blocks, and crossed by a single-span bridge which runs from the north-west corner of the mill building to the east end of the river weir. The fabric of the bridge resembles that of the fulling mill. The east face of the bridge parapet is pierced by a slit, the sill of which is composed of a single large rectangular gritstone block. The purpose of this slit, which is now blocked, is unclear.

There is a possibility that the river weir, with its attendant features, although belonging to broadly the same phase as the mill building itself may in fact be the second weir constructed on the St Ann's site. Comparison of the Taylor map of 1812 with later maps and with the actual topography of the site suggests that the weir depicted on that map may not be the

48. *St Ann's Mill, revetment at east end of river weir – looking north. Note massive internal masonry of engine house surmounting revetment.*

49. *St Ann's Mill, river weir – looking north-west.*

50. St Ann's Mill, revetment of bank at west end of river weir – looking west.



51. St Ann's Mill, revetment of river bank below weir – looking west.

52. *St Ann's Mill, mole separating tail race and River Aire – looking east.*

53. *St Ann's Mill, mole separating tail race and River Aire – looking north-west.*

54. *St Ann's Mill, detail of masonry of mole – looking south.*

55. *St Ann's Mill – weir across outlet from mill race, and bridge across outlet – looking north.*

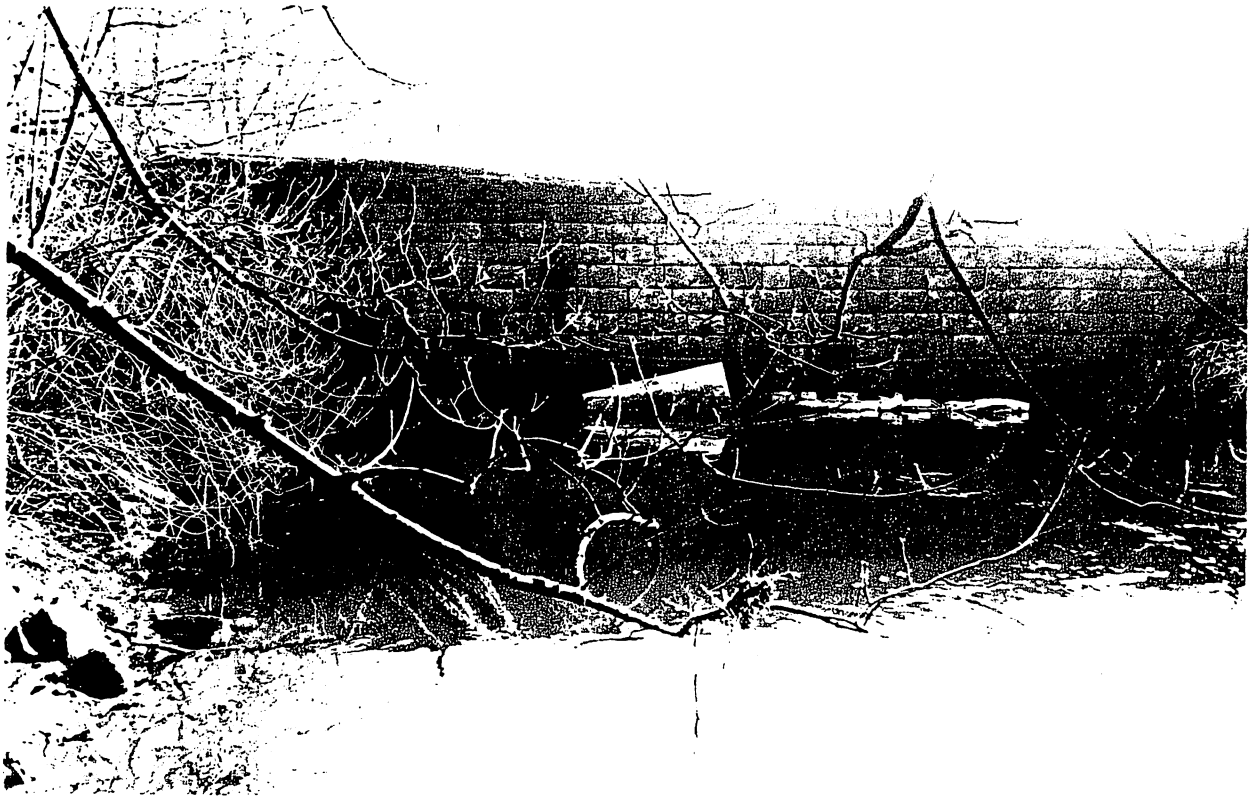
present weir, but an earlier weir, located at approximately SE 2644 3517. There is some support for this theory in an evident break in slope on the river bed, downstream from the line of the present weir, which may represent the demolished remains of an earlier weir. Perhaps the original arrangement of the water supply to the fulling mill consisted of the tail end of the Kirkstall Mill Race augmented by water taken from above a river weir; but then the flow having proved too strong for its intended purpose, the weir was reconstructed slightly upstream to allow room for construction of the present outflow channel.

In addition to the features located at the south end of the Kirkstall Mill Race, the lower courses of the bridge which spans the race at SE 2643 3524 may tentatively be included in Phase 1. The voussoirs of this two-span bridge are gritstone blocks; the spandrels on the upstream side of the bridge comprise large rectangular gritstone blocks and smaller gritstone blocks **[56]**. The remains of a wall visible on the east bank of the leat on the upstream side of the bridge, of similar fabric, may also date to this phase **[57]**.

Phase 2 dates from the early 19th century, and encompasses the construction of the third mill building on the site, at SE 2633 3520. This structure, which does not appear to be related to any of the water management features on the site, lies outside the direct scope of this report. However, a second structure, probably of the same phase, is located on the island formed by the secondary leat and the outflow into the river (SE 26425 35187) **[58]**. This rectangular structure, consisting of a facade of coursed sandstone rubble over a substructure of massive rectangular gritstone blocks, comprises the remains of an engine house which formerly contained a single-cylinder beam engine. Superficial examination of the building revealed the remains of cylinder bolts, crank pit and flywheel pit. The gritstone blocks visible in the western facade of the building would have supported the drive shaft, which projected out into what is now an empty, open area between the two water channels. There is no immediate evidence for related features such as boiler and chimney. Neither is there anything to indicate the nature of the machinery powered by the engine, although it may be significant that the structure is referred to locally as the 'pumphouse'. Although the survival of engine houses of the early 19th century which are attached to mills is not uncommon, the position of this example is unusual. This fact, and the uncertainty concerning its function, render it worthy of study. The engine which occupied this engine house may have been the one listed as belonging to John Wood under 'Steam engines employed in the Woollen Cloth Manufacture at Leeds' in a catalogue of Leeds steam engines compiled by William Lindley in March 1824 (Brotherton MS 18). The manufacturer of the 20hp steam engine is given as Hird Dawson and Co.

Masonry similar to that which forms the facade of the engine house is used in the spandrels of the south side of the main site bridge at SE 2643 3524 **[59]**, and a similar material has been used to revet the eastern bank of the Kirkstall Mill Race to the south of that bridge **[60]**.

The superstructure of the bridge from the apex of the arches to deck level is constructed of rock-faced gritstone blocks, and may represent a later 19th-century rebuild. Similarly, there are a few features which are readily apparent within the fabric of the Phase 1 fulling mill indicative of later alteration, notably an iron pipe, now capped, which may have served as the cold water inlet for a steam engine **[61]**, and a substructure of wrought iron or steel I-beams which span the western wheel pit on its north side, providing support for a floor



56. *St Ann's Mill, bridge spanning Kirkstall Mill Race above St Ann's Mill – looking south.*

57. *St Ann's Mill, remains of wall north of bridge – looking east.*

58. St Ann's Mill, engine house – looking north.

59. St Ann's Mill, bridge spanning Kirkstall Mill Race above St Ann's Mill – looking north.

of stone flags [62]. The mill building appears to have been extant until at least the 1920s. There is cartographic evidence for structures on the east bank of the leat which may have been ancillary to its use. These comprise a small rectangular building to the south at SE 2648 3518, which first appears on the Enclosure Award map of 1834, and a longer rectangular structure to the north at SE 2646 3521, which first appears on the 1st edition 6" OS map of 1847-48, but which had been demolished by the 1920s.

Present Condition

Although the bridge over the Kirkstall Mill Race at SE 2643 3524 appears to be in a generally good state of repair, the lack of coping stones on the south side of the bridge at deck level has resulted in the establishment of vegetation, including small saplings. Intrusive plant growth also poses a threat to the continued stability of the revetment of the east bank of the leat to the south of the bridge (where substantial tree growth is now present), and to the masonry on the west bank of the leat to the north of the bridge. The short length of wall visible on the east bank of the leat to the north of the bridge has suffered partial removal of its facing stones and exposure of the wall core.

The weir across the river at SE 2642 3517 appears substantially intact. However, there are indications of percolation through the air-face of the weir which may be evidence of structural weakness. The revetment relating to this weir along the west bank of the River Aire has partially collapsed, and well-established tree growth within the fabric of the revetment wall is causing further structural damage. The revetment of the island at the eastern end of the weir appears generally stable.

The lining of the water inlet from the river to the Kirkstall Mill Race at SE 25425 35205 is in a partial state of collapse, particularly marked at the confluence of the channel and the mill race. There is substantial intrusive plant growth in this area. Except for the missing coping stones noted above, the bridge related to this channel appears to be in a stable condition.

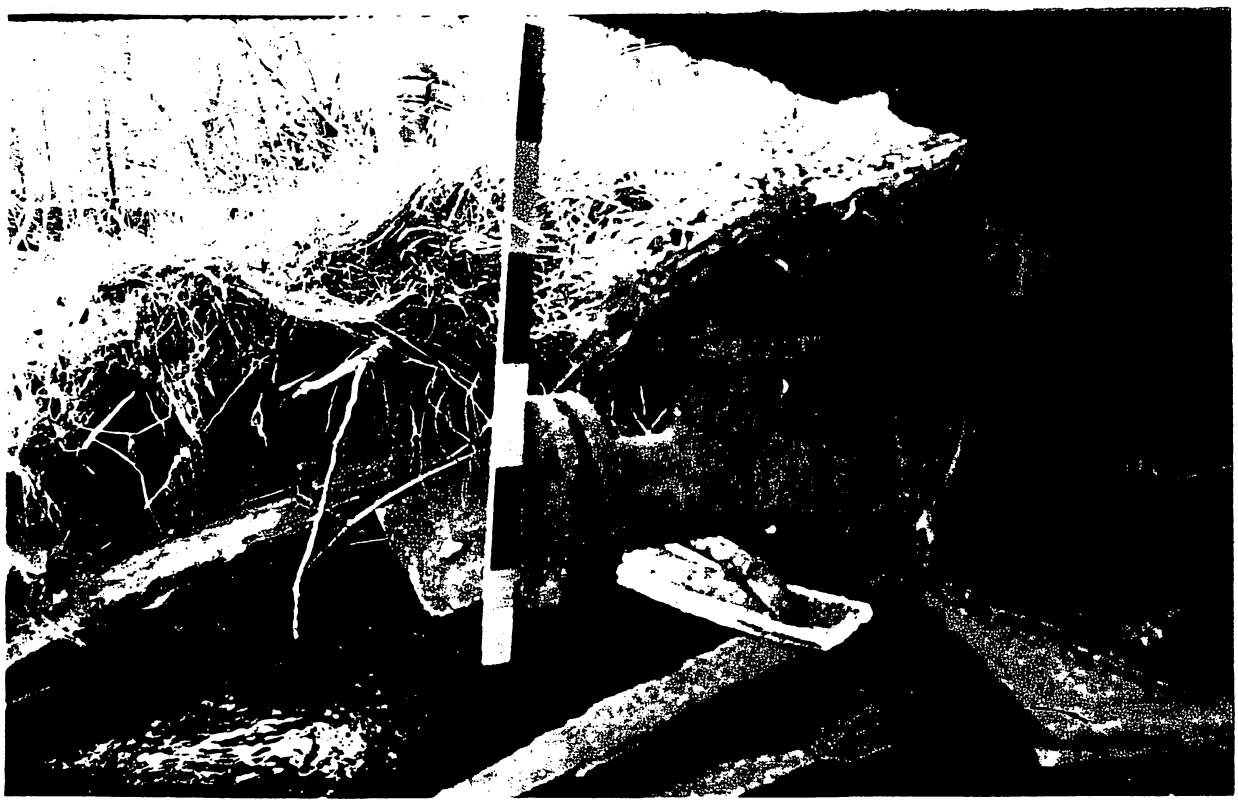
The engine house at SE 26425 35187 has been partially demolished. The exposed wall cores and the rubble which fills the interior of the building and slopes down towards the south-west corner of the weir revetment appears to be largely grassed over. There is, however, some sapling growth within the northern end of the building. The area of the island to the east of the engine house, currently used for storage, is partially overgrown, with substantial tree growth at its eastern end.

It is not possible to assess the structural condition of the weir which forms an overflow from the mill race to the river (SE 2644 3520), due to the complete submersion of the feature.

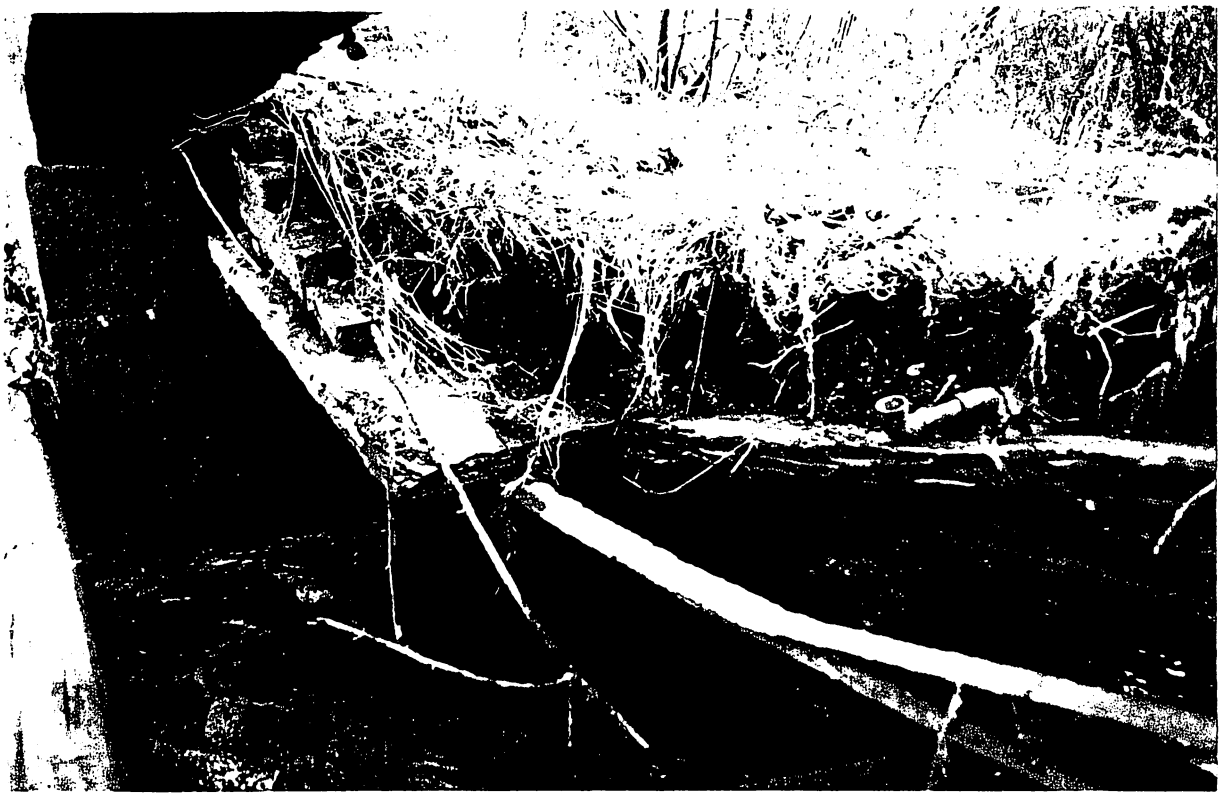
The bridge over this weir is in a state of partial collapse, with what appears to be substantial damage to the deck, although the feature is largely obscured by scrap iron and undergrowth. There is intrusive tree growth at the southern end of the bridge.

The area of the Phase 1 mill sustains substantial sapling growth which may be causing structural damage to the unexposed water course [63]. The exposed water course is

60. St Ann's Mill, revetment of leat bank below bridge – looking east.



61. St Ann's Mill, cold-water inlet – looking south.



62. *St Ann's Mill, partially collapsed substructure of floor spanning wheel race – looking south-east.*

63. *St Ann's Mill, showing tree growth within mill building – looking west.*

partially filled with rubble, a proportion of which appears to have fallen from the sides of the wheel pit, which are loosened by tree growth. The I- beams which support the stone flags spanning the north end of the water course are badly deteriorated, and the floor has begun to sag at this point. The south face of the mill is badly overgrown.

The masonry mole to the south of the fulling mill has been colonised by saplings and now supports several mature trees, the roots of which are causing structural damage.

Recommendations

All intrusive vegetation should be eradicated and a structural survey made to determine the actual state of the masonry on the site; the masonry should then be conserved to the degree required to render it stable. All masonry should be surveyed and a drawn archaeological record made in advance of any conservation work. Any ground disturbance to the area of the Phase 1 mill site or to the island at the east end of the river weir should be attended by a programme of archaeological recording. The debris should be removed from the interior of the engine house, and a thorough archaeological record made of the structure with a view to determining details of engine size, type and function. To this end, care should be taken to ensure that the record includes those elements of debris which appear to be displaced structural elements of the engine house.