THE MIDLAND WIND AND WATER MILLS GROUP

(affiliated to the Society for the Protection of Ancient Buildings)

This Journal is published by the Midland Wind and Water Mills Group, which is concerned with the study of the history and technology of mills, and, in principle, with their preservation and restoration. Its area is the region loosely defined as the Midlands, especially the central counties of Staffordshire, Worcestershire and Warwickshire.

The Group, which functions as an autonomous society, holds monthly indoor meetings, with talks and discussions, during the winter, and arranges several tours to mills during the spring and summer. Members periodically receive a Newsletter and the Journal, and can purchase other publications at preferential prices.

For further particulars, please contact the Hon. Secretary, John Bedington, 188 Merrivale Road, Smethwick, West Midlands, B66 4EA.

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Wind and Water Mills

The Occasional Journal of the Midland Wind and Water Mills Group

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Number 2

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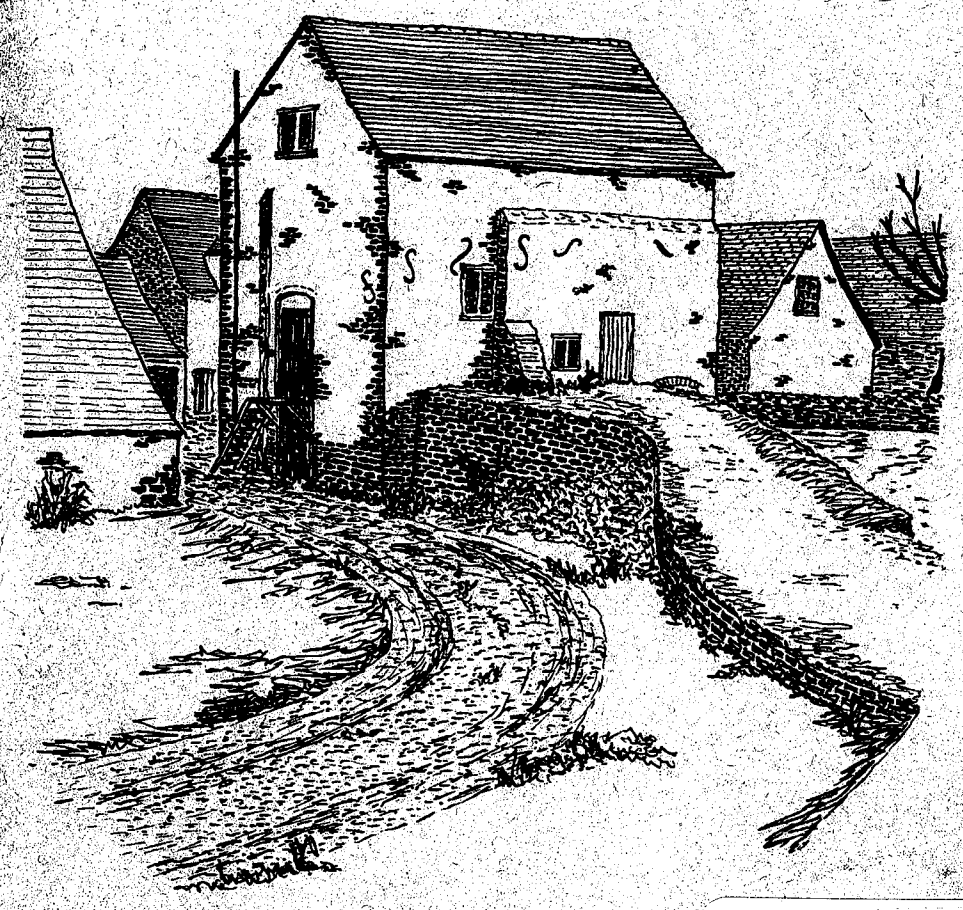

Cover Drawing: Town Mill, Bromsgrove c.1883
see p.13 Watermills in Bromsgrove

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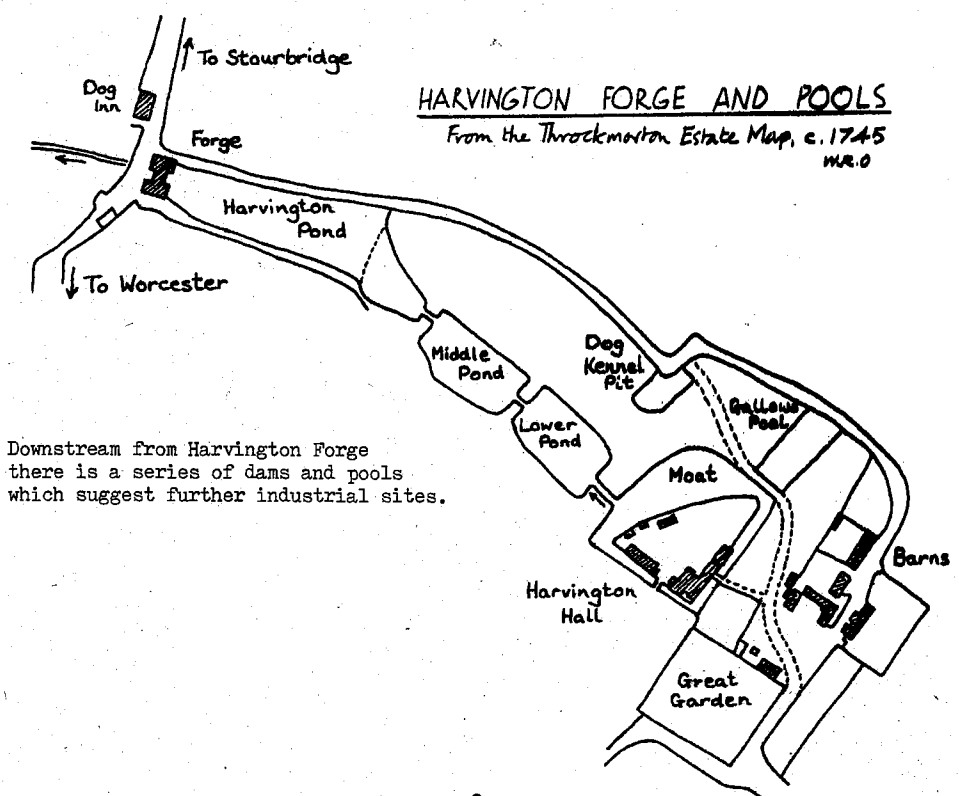
The editors will be pleased to consider contributions of articles and drawings for inclusion in future issues.

MORE MILLS ON THE BELNE BROOK
by H.W. GWILLIAM

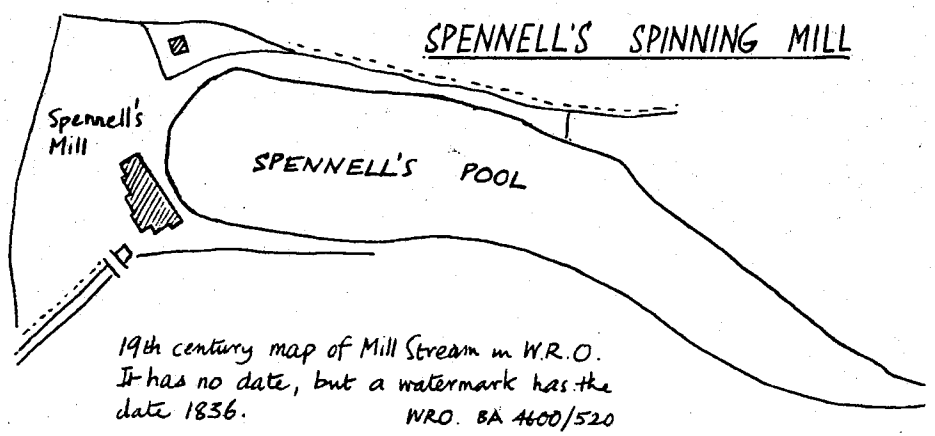
In Wind and Water Mills, No. 1, Summer 1980, the late H.E.S. Simmons (pp.34-44) describes 21 watermill sites on the Belne Brook in North Worcestershire, and Jonathan Briggs and Gordon Tucker (pp.30-34) bring this up to 24. I would like to draw attention to two more sites, one almost certain and the other quite certain, although there is now little evidence on the ground of either mill. They are Harvington Forge at grid reference SO 873747, on a small tributary of the Belne Brook, and Spennell's Spinning Mill at SO 843752 on a branch of the main brook where, near Kidderminster, it has two courses. On the southern branch, Spennell's Corn Mill was shown by Briggs and Tucker; on the northern branch they showed the large pond (Spennell's Pool), but not the spinning mill for which it provided the water-power.



Downstream from Harvington Forge there is a series of dams and pools which suggest further industrial sites.

HARVINGTON FORGE

On the main A456 road to Hagley, almost opposite the Dog Inn, there is a low, one-storey building, which was until fairly recently, a shoeing-smithy. It stands on the site, and is part of a larger iron-working forge which certainly was operating in 1745. All knowledge of it appears to have been lost, but behind the building is a great depression, once part of Harvington Mill Pond, and all around, in gardens, in parts of walls, are numbers of round grindstones of various sizes, all bearing witness to the days when it was a scythe mill. The present occupant of the building told me that having no knowledge of the building's previous use, he tried to make a pit in which to repair cars, and found below the floor a great chamber with huge oak beams. It was without doubt, the wheel chamber of the water-driven forge.



SPENNELL'S SPINNING MILL

The Spinning Mill was quite a substantial affair and was burnt down in 1880. In reporting the fire in 1880, the Kidderminster Shuttle stated that it had been standing 'more than half-a-century', which would date the building around 1828. A Sale notice of May 22, 1850, gives the description as: 'Four stories high, 80ft by 24ft, with a large reservoir and a waterwheel 20ft in diameter by 9ft broad.' The occupier in 1850 was given as J. & G. Humphries. Also in the sale was the Farm and a Cornmill with pool and House.

In the 1860's the mill was occupied by Messrs. S. Broome & Son, but by 1870, Messrs. Crabtree Bros., who also worked Hoobrook Mill, were in occupation. They appear to have failed soon after that date and for a while the mill was tenantless. In 1880, a new tenant, a Mr. Beaumont of Halifax, had begun manufacturing cotton 'bump', but in June of 1880 the building was destroyed by fire. (A description of the fire follows later).

A Description of Spennell's Tapestry Mill in the Kidderminster Shuttle
12 October 1872

'These reflections have been suggested by the discovery we made a few days ago of the very complete and comprehensive Tapestry Works which Messrs. Crabtree Bros. have been running for about two years. We have long known and respected the Messrs. Crabtree for their many excellent personal and business qualities both as spinners at the Hoobrook Mill, and Rug Makers in Mill Street. But we are ashamed to confess that it was not till one fine day last week that we discovered how largely they were enjoyed in the Tapestry trade, in which they were preparing to make still further extensions.'

'...We came to Spennell's Pool ...and began to survey the well-known mill, formerly occupied by Messrs. S. Broome & Son, which looks almost like some old Norman Chateau, with its three storeys of countless windows, and the quaint continental looking 'dormers' along the roof ... we found here ...all the work of dyeing, printing, steaming, weaving and every conceivable operation connected with the production of Tapestry going on with a remarkable order and celerity; while the girls who were setting and the men who were weaving bore a brighter and more animated look than is often found in the depressing atmosphere of a town shed, where you see nothing but blank walls, and the heat comes down with the light upon the weary head from the roof. Nothing could be a more delightful contrast to the prison like conditions of a modern weaving 'shed' than the cheerful rural surroundings which meet the eye of the workmen of Spennell's.'

Whether Messrs. Crabtree over-reached themselves in 'further extensions' is not known, but the firm failed soon afterwards. The mill was not to last for long however, for eight years after the above account was written the mill was completely destroyed.

The Destruction of Spennell's Mill by Fire, a description from the Kidderminster Shuttle of 26 June 1880.

'On Wednesday morning, Spennell's Spinning Mills were destroyed by fire, and all that remains of the building which has for more than half-a-century stood near the well-known pool are the two gable ends, portions of the north and south walls, a portion of the engine house, and some of the outbuildings. These mills were for some years used for the manufacture of Tapestry Carpets, being carried on by Messrs. Crabtree Bros. up to the time of their failure. Then the premises became tenantless and remained in that unprofitable state until the commencement of the present year, when Mr. Beaumont, of Halifax, a manufacturer of cotton bump, accepted a lease of the mills. He at once laid down a large quantity of machinery valued at £2,000, which he brought with him from Yorkshire, and in a short time everything was ready for the production of the 'bump'. This was a new industry introduced into the town, the material hitherto having been obtained from Yorkshire, and it was hoped thus to find employment for some of the surplus hands in the town. Mr. Beaumont, who carried on the works under the style of Beaumont & Company, very soon established a good connection, and at the time the fire broke out all the machinery was in full work. The building was five storeys high and of considerable length.'

'About eleven o'clock on Wednesday morning, one of Mr. Beaumont's sons was at work near a machine used for opening cotton waste, and discovered that some of the material was on fire. It was conjectured that among the waste must have been hidden either a lucifer match or some scraps of iron, and that passing through the machine a spark was produced which ignited the inflamable material. An alarm was at once raised, and buckets of water were poured upon the waste; but the room containing it became so densely filled with smoke that it was impossible to enter. A wooden funnel reaching from the bottom to the top of the building, and used for throwing waste from the upper to the lower rooms, became ignited, and within five minutes the flames were seen issuing out of the upper windows and roof, and soon afterwards the flooring, together with the roof of the buildings fell to the ground with a terrible crash. It was then painfully evident that any attempt to save either any of the stock, machinery, or the main building, would be futile. In the meantime a messenger had been despatched to the police station for the Fire Brigade. The gong was sounded and instantly the

news spread that Spennell's Mills were on fire. The members of the brigade assembled very quickly and the steam fire-engine was hurried to the scene, under the command of Lieutenant Wright. Seeing the utter hopelessness of any attempt to save the mills, the brigade directed their efforts towards saving the engine house, boiler house, and shedding; the men continuing to play upon the building for more than three hours. Some of the firemen had narrow ecsapes of their lives. They were engaged near the main building, directing the streams of water, when a large portion of the south wall fell, the men just having time to run sufficiently for to escape falling debris. Again and again, portions of the wall fell in..'

'The total loss sustained is estimated at between £4,000 and £5,000. The property which belonged to Mrs. Perrins, of Spennell's House was insured; but we regret to say that neither the stock nor the machinery, belonging to Mr. Beaumont, estimated at £3,000, are insured, and he now declares himself to be a ruined man!'

WATERMILLS OF THE RIVER SALWARPE AND ITS TRIBUTARIES
PART 1. WATERMILLS IN BROMSGROVE
by J. D. BRIGGS

This account deals with the watermills of the upper reaches of the River Salwarpe system, namely the Battlefield Brook and the Spadesbourne Brook in North Worcestershire. These streams rise in the Lickey Hills and flow southwards through Bromsgrove to join and become the River Salwarpe just before entering Stoke Prior. All the mills described are in Bromsgrove Parish except for Wildmoor Mill which is in Belbroughton.

The mills are numbered here in downstream direction, first down the Battlefield Brook, then down the Spadesbourne; see Fig. 2. The mills and their synonyms are given in the following list:

1 Chadwich Mill
2 'Chadwich Old Mill'
3 Wildmoor Mill
4 Fockbury Mill
5 Whitford Mill
6 Cotton Mill (Cotton Factory, Lower Mill, Buck House)
7 Crows Mill (Ashborough Mill)
8 Townsend Mill (Vales Mill)
9 Crabmill
10 Blackmore Mill (Strand Mill)
11 'Hedges Mill'
12 Town Mill (Bromsgrove Mill, Kings Mill, Lower Mill)
13 Moat Mill (Charford Mill)
14 Lint Mill (Charford Mill)

The locations of these mills are shown on the map of the area; see Fig 1.

Since there were mills in Bromsgrove in the Domesday Survey, and doubtless sites that have been lost, it is certain that the total number of mill sites exceeds the fourteen listed above. All are now disused, and are dismantled or demolished with the exception of Townsend Mill which, although derelict, still contains all its machinery.

In the 18th and early 19th centuries these mills were not all corn or saw mills - some were concerned with textile manufacture and needle and fish-hook making.

The Bromsgrove Needle Industry was actually based in Stoke Prior at Fish-house Mill and Church Mill and is not dealt with here. It has long gone from Bromsgrove though neighbouring Redditch is a world-famous centre for needle and fish-hook manufacture.

The textile industry (mainly woollen and linen goods) however, has completely disappeared from the neighbourhood, though lint continued to be produced at Lint Mill until the middle of this century. The last linen manufacturer was Mr. Haines in the 1840's while wool-combing and worsted making continued until the turn of the century.

The importance of these industries to Bromsgrove's economy is shown by this extract from a poem by John Crane in the early 19th century.

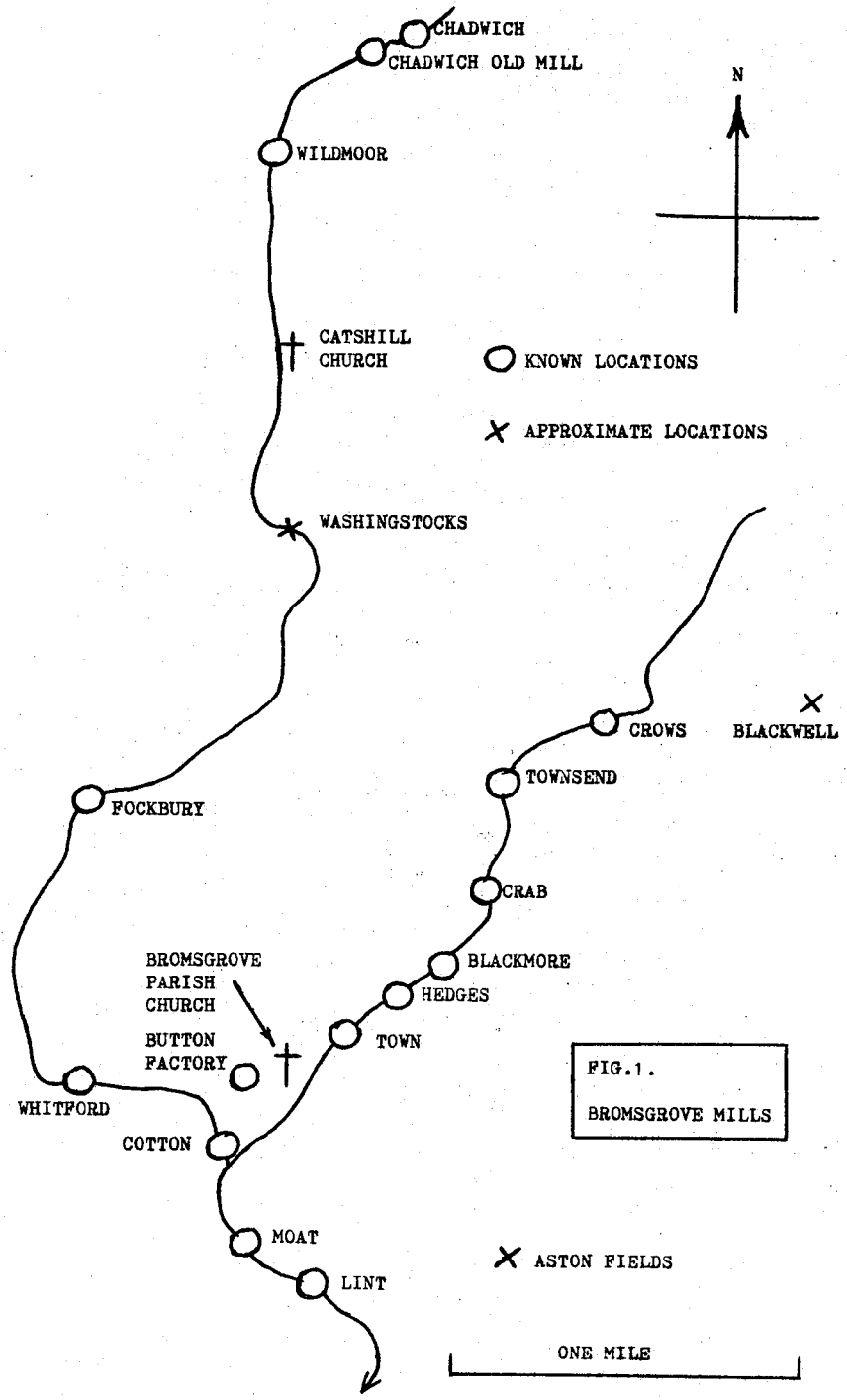


FIG.1.
BROMSGROVE MILLS

FIG.2.
MILLS AND WATERCOURSES IN
BROMSGROVE

The Loyal, Ingenious and Flourishing
Town of Bromsgrove

The nails and needles that are made
For lines, and fish-hooks famous good
This is the town and neighbourhood.
Crank motions turn the money in
Our water goes to card and spin
At combing wool is getting on
Will work the stocking frames anon
Cloth spread upon the bleaching ground
Flax growing all the country round
Some spun by steam and some by hand
No better yarn in all England
Before all others sure to sell
The Bromsgrove flaxen wears so well
What linen cloth comes up to ours?
Who else weaves landscapes, birds and flowers?
Before all others sure to sell
The Bromsgrove flaxen wears so well
Machines are often made to wash
Machinery begins to thrash...

Crane's claim that Bromsgrove linen sold 'before all others' is borne out by another source which says that fashionable ladies used to ask specifically for Bromsgrove linen in London Drapers shops!

The main mills involved in the textile trade were Lint Mill, Cotton Mill and the Button Factory.

The watercourses and ponds.

These are illustrated in an idealized form in Fig. 2. The large pool for Cotton Mill is particularly interesting. No details of the watercourse arrangements at mills 2, 9 and 11 are known. The arrangements at mills 8 and 10 are those of the present day. The storage pools at mill 4 are from a plan dated 1877. The tailrace at mill 3 is from the 2nd edition 6-inch O.S. map. All the other watercourse arrangements are as on the Tithe Map of 1840.

Other Bromsgrove Mills

These are mills of which either little is known or which were definitely not water powered. They too are marked on the area map. (Fig. 1.)

Washingstocks

There must once have been a fulling mill here because of the name (in Washingstocks Farm at grid reference SO 958730), but there seem to be few references to it.

Astonfields Mill

This was a large steam powered flour mill, without water power, owned by Mr. Finney. It burned down in 1883 causing £5,000 damage.

The Button Factory, Willow Road, Bromsgrove. SO 955709

Though never water powered, this was a 'cotton' mill until bankruptcy in 1810. The Sanders family then bought the mill and it became the Button Factory. In 1822 Mr. Sanders invented and patented a factory process for making cloth-covered buttons. At least in later years the cloth concerned was not of Bromsgrove origin.

At the turn of the century the factory came into the hands of the present owners, the Nicholls family.

In 1915 a fire in the north end of the mill created enough rubble to fill the pool (used in cloth manufacturing) in front of the mill. Another fire in 1958 destroyed the south end. Both ends are now rebuilt, retaining the original and possibly very old central part. The building is still very much as it must have been built - long and very narrow.

The factory is now run by the second Mr. Nicholls and his son. They produce metal badges.

Blackwell Mill

There was a planning application to build a flour mill and bakery in Blackwell in the 1900's. It was not to be water powered.

The Watermills

1. Chadwich Mill, Wildmoor Lane, Wildmoor. SO 767965

Now a private house, this was once a corn mill attached to Chadwich Mill Farm. It is a small building and was driven by a small pool. The pool is now derelict and empty though part of the retaining dam still exists. Since the mill became disused the stream has changed its course to the centre of the pool.

The building was first converted to a house in the early 1930's by a Mr. Chandler. The present owner, Mr. Rooker, has gutted and is rebuilding the interior. In doing so he has discovered traces of the sack hoist equipment and trapdoor sites but otherwise no sign of the building's former use. He thinks that the wheel was in place in about 1920.

The mill is shown on the 1840 tithe map.

2. 'Chadwich Old Mill', SO 766964

Just downstream from Chadwich Mill is the possible site of another mill. It was marked 'Bone Mill' on the 1st-edition one-inch O.S. map (1831), and H.E.S. Simmons recorded in 1944 that the small mill of red brick was still standing, devoid of all machinery, opposite 'The Royal Oak'. There is nothing there now.

3. Wildmoor Mill, Mill Lane, Wildmoor. SO 958752

Wildmoor Mill is notable for its remarkably long embanked leat. As can be seen from the watercourse plan (Fig. 2) the millpond is about ¼mile from the mill-building while the leat is very straight and uniformly made throughout this distance.

In 1840 Turtons of Kidderminster put in an 18ft. diameter, 3ft. 6in. wide wheel. It was overshot and cost £70. The mill is now empty of machinery and forms part of the buildings of a pig farm. The mill building and the adjacent farmhouse are both whitewashed and well-kept.

4. Fockbury Mill, Fockbury Mill Lane, Fockbury. SO 949723

The mill at Fockbury is still standing but is empty of machinery - this having been removed to Townsend Mill sometime between 1925 and 1945. Some sack hoist equipment, the garners and a modern roller mill are all that were left in place.

The mill is a small, two storey building with low ceilings. The walls are of brick with numerous ties. It looks quite old.

On one side of the building a painted outline shows where a small extension stood prior to 1965. The brickwork suggests that the whole mill was once single storied.

Apart from some use as a saw mill in the 1870's, Fockbury Mill has always been a corn mill.

The mill pond was rather small and was above road level. Although now filled in with air-raid shelter rubble its outline and retaining walls are still visible. Prior to the building of the M5 motorway the stream still passed nearby but is now on the other side of this road. The tailrace used to run under one corner of the millhouse and through the garden - its stone-walled channel is still traceable. The leat had two sluice gates, which are also gone, and there was a quarter-acre storage pool in the water meadow adjoining the leat.

Most of the machinery was wooden, including the large enclosed overshot wheel.

The names of the millers are known from 1825 to the 1870's when William Ince was miller. He advertised the mill as a 'corn, steam and saw mill' - the present building is so small that any steam engine must have been housed outside - perhaps in the now demolished extension.

The mill was bought by the Crawford family in 1926 and the house, which is also very old, is occupied now by Mrs. Crawford.

5. Whitford Mill, Whitford Lane, Bromsgrove. SO 947706

This was the first mill on the Battlefield Brook upstream of the Cotton Factory. The buildings and pool have now gone, the mill being pulled down in about 1936.

It was a corn mill, four storeys high, with three pairs of stones.

Before 1905 the farmhouse associated with the mill was adjacent to it, and the last miller, Mr. Lammas, used the mill for oat and chaff milling for farm use. The present farmhouse is across the road from the mill site.

The wheel was of the pitchback type and 14ft. diameter. In 1840 the then miller, Mr. Isiah Godfrey, had a wider wheel put in by Turtons of Kidderminster. This was also 14ft. diameter but 3in. wider than the original (which was 5ft. 3in. wide). This new wheel was to give the stones a speed of 102.5 revolutions per minute. The cost of such a wheel in 1840 was £75.

In 1886, Robert Summers of Tanworth-in-Arden surveyed the mill machinery in order to carry out renovations. Amongst the jobs Summers intended to do there were replacing the crown wheel, moving the smutter, putting in elevators to the smutter, putting in a new exhaust fan for the 3 pairs of stones and changing the drive to the silk dressing machine. Ironically it was a Mr. Summers who pulled the building down in 1936.

The old farmhouse was left standing and two garages were built adjacent to it. These were used by a Mr. Bridgewater for storing enamel-ware - this was probably the site's last commercial use.

The house was demolished and a bungalow built on the site in 1961. The garden of this bungalow stands on the site of the mill pool.

6. Cotton Mill, Watt Close, Bromsgrove. SO 954703

Above the junction of the Spadesbourne and Battlefield Brooks, and primarily on the latter, although also connected to the former, there was a large mill known as the 'Cotton Factory'. It probably never produced cotton as such but the name may have been used loosely to describe linen.

The mill's position was at the end of what is now Watt Close ('Water Close'). As a textile factory it dated at least from Elizabeth I's time when it was amongst those mills licensed for cloth manufacture.

Throughout the eighteenth and into the nineteenth century it was producing linen, but by 1825, when the local linen trade declined, it had become a worsted mill. At this time it was powered by a water wheel 20ft. diameter by 12ft. wide which was driven by the enormous 'Cotton Pool'. This pool, in what is now Sanders Park, covered about seven acres and besides power would have supplied water for manufacturing processes. Apparently it was very popular amongst fishermen and ice-skaters until it was drained in 1865. A rather small, concrete-edged pool remains in the park.

During the time between 1825 and 1840 the factory actually closed, only to start work again by 1850 as a worsted manufactory and wool stapling establishment under the management of a Mr. Harrison. During its idle period the Cotton Mill was used as a Boys Sunday School and then a Cholera Hospital.

However in 1892, after four years of standing idle, it was pulled down and Mr. B. Sanders built a swimming pool for the Grammar School on the site.

The Sanders family owned much of the land in the immediate vicinity at that time:- Mr. T.T. Sanders owned the mill in 1865, and Mr. Benjamin Sanders from the 1880's onwards. Though apparently unsuccessful here they did well at the nearby Button Factory.

7. Crows Mill, Crows Mill Lane, Lickey End. SO 971723

Of the mill sites in Bromsgrove, Crows Mill is probably the most picturesque. From the lane only the mill pool can be seen with the roofless ivy-covered mill beyond. However, when the grounds are entered, it becomes apparent that the mill stands in a large, well-kept garden adjacent to a half-timbered and thatched cottage.

The mill is a very old, small building of brick and stone. It has two low floors and a shallow attic and as the site is very old (a Roman road runs under the lawn) it may be one of the mills recorded in 1086.

Its last use was as a grist mill in 1917 but some machinery remains. In 1944 when Simmons visited here all the machinery appears to have been in place, but now the main shaft and associated gearing have either gone or are buried in the extensive rubble on the mill floor. The waterwheel was in a separate compartment at the northern end of the mill. It was overshot, iron with wooden buckets and

12ft. in diameter. The pentrough and shaft remain but the wheel was broken up for scrap in the 1950's.

The floors are all missing and it is possible to see the garners from below. The stones still exist but of the three pairs only one remains in place on a piece of the first floor. They are all French stones of 4ft. diameter..

The walls of the mill are extensively tied and seem quite stable.

Vandalism of the feeder pipe for the pool has resulted in a low water level at present but otherwise the pool is in good condition. It has been dredged at least twice this century - once by German prisoners of war.

The mill and cottage are owned by Dr. K. Fooks who moved there in 1949.

8. Townsend Mill, Birmingham Road, Bromsgrove. SO 967720

The only complete mill remaining in Bromsgrove, this mill building is now derelict and roofless. Apart from a reference to its once being a needle mill, it has always been a corn mill and continued to work by water power until the late 1940's. The wheel then needed repair so electric power was installed. The last miller, Jabez Bridgman, retired in 1955.

The mill remained in quite good condition until the late 1960's and since then, although listed, the building has gradually deteriorated, with the roof becoming tileless by 1976 and the front gable being demolished as unsafe in 1978. At present there are some plans for restoration. All the machinery still exists although a lot has been displaced by the gable demolition. The pool is at present dry.

Simmons described the machinery in 1945 and it is presumably more or less the same as then.

List of machinery (after Simmons)

Wheel in pit below ground floor, all iron overshot 17ft.x 4ft., 2ft. 9in. round naves, 2 sets of 8 ribbed arms 7½in. tapering to 6in., with cross traces, 9in. rim, 10in. round shaft. Made by White of Redditch.
Pit wheel c. 12ft. diameter, 5ft. wallower, 10ft. iron spur, 17in. nuts on 2½in. round spindles with square tapers. Lever and chain device for disengaging screw tentering. Three pairs of stones, all 4ft., two French, one Peak. On stone floor upright shaft is 9½in. tapering to 8½in. below crown wheel, then 7in. Crown wheel 6ft., 6-arm in two sections, wooden teeth. Gardner screen and Bentall crusher. The pentrough bears the inscription 'J & H. Davy 1875'. The stones are by Handley.

The mill had been in the Bridgman family for about 80 years when in 1955 the Hanger Motor Company bought it. Mr. Bridgman died in 1965, 10 years after retirement. At the age of fifteen he started work there with his mother, after his father - another Mr. Jabez Bridgman - died at the turn of the century.

Mr. Bridgman Senior used to grind flour but after his death the mill produced sharps and other animal fodder.

9. Crabmill, Birmingham Road, Bromsgrove. SO 965714

This is a Georgian-fronted Public House with no sign of a watermill.

Some records of a mill here exist for the first half of the 19th century but it is not shown as such on the 1840 Tithe plan.

It may possibly have been a cider press.

10. Blackmore Mill, Birmingham Road, Bromsgrove. SO 963712

In 1840 Blackmore Mill was owned by Blackmore Farm and was a corn mill. Since then it has had many different owners and has been used for many different industries.

The building then (1840) was considerably smaller than the present one (of which the main part was built in 1880). Corn milling continued here to 1896 but with several ownership changes.

In 1859 James Parry was miller here and in 1868 he entered into partnership with John Clapton. Clapton was a sawyer and Parry had a batch grinding business. By 1870 Clapton was also a 'cowkeeper and beerseller' based at the 'Old Water Mill'- presumably an inn. Whether this was connected at any time with the Crabmill Inn upstream is not known. In 1873 Mrs. Clapton came into the Clapton side of the business. However, in 1875 Parry was 'Milkseller, Miller and Sawyer'. Although Clapton seems to have been the more enterprising, Parry came off best in the end.

In 1880 Mr. William Llewellin, Miller and Flour Dealer, rebuilt the mill and added a steam engine.

The building today is more or less the same as it was then. Subsequently the mill was worked by two other millers before, in 1896, the Tower Manufacturing Company converted the building into a nail factory.

A year later the building was a cycle factory run by the Lillie Cycle Company. By 1903 though, the mill changed hands again - this time for the better. Worcestershi Model Laundry Ltd. were successful here for the next 60 years.

William Weaver Ltd. bought the premises in 1967 and after letting it to other companies (including an enterprising fibreglass firm) moved in as Weaver Engineering Ltd.

No mill machinery of any sort remains, a free-standing chimney with WL 1880 inscribed is still there and most of the pool exists, though it is now dry - its inlet has been blocked to prevent flooding of the building.

11. 'Hedges Mill', The Strand, Bromsgrove. SO 962710

This was a waterwheel set in the Spadesbourne Brook just downstream of Blackmore Mill. Mr. William Hedges used it to pump water to his house (which was adjacent) and also to power some light machinery - he was an engineer by trade. The stream is now paved over at the site and a sweet shop stands adjacent.

Hedges died in the early 1920's.

12. Town Mill, Mill Lane, Bromsgrove. SO 709960

Probably one of the mills mentioned in the Domesday Book, this mill was one of Bromsgrove's oldest landmarks when it was demolished in 1883. It was part of the Manor of Bromsgrove until, in 1612, James I kept it as the 'Kynges Mill' and presented the rest of the Manor to Grobham and Howe. Old records say that the mill was derelict by 1620.

This mill is sometimes confused with Cotton Mill - both seem to have had Royal connections and both were called the 'Lower Mill'.

Town Mill was a corn mill throughout its life, a saw mill being added in the 1860's. There are few records of its machinery save that in 1819 the wooden waterwheel was replaced by an iron one - the new wheel was 7ft. wide and 8ft. 6in. diameter.

In 1879 the Bromsgrove Local Board bought the mill from the Ecclesiastical Commissioners in order to build a new road (Market Street). Mr. Milton, who was the miller, moved to Moat Mills. Market Street was built in 1883 and it is interestin that it now forms part of Bromsgrove's 'inner bypass'.

The pool - sometimes called 'Cuttle Pool' - was filled in and the 'hovel industries' to the rear of the High Street spread onto its site. The site is now a supermarket. Mill Lane which joined the High Street and Market Street is now pedestrianized.

13. Moat Mill, Charford Road, Charford. SO 955698

This mill stood immediately upstream from Lint Mill. However, apart from its use in the First World War by the Lint Mill, there is no evidence that the mill was ever concerned with textiles. It was a corn mill until 1913 after which it was used for oat rolling.

The watercourse arrangements here were very unusual. A moat, probably much more ancient than the mill, was used as the mill pond. This pond was also interesting botanically, receiving many mentions amongst water-plant records in Amplett and Reas Botany of Worcestershire (1909). However, this fascinating pool was filled in early in the 1900's, thus sealing the fate of both waterweeds and mill.

The mill itself was demolished in the early 1920's leaving the attached granary and farmstead to suffer the same fate in 1959.

Moat Mill must have been a very interesting mill when at work. There were two waterwheels, one overshot, the other undershot. Their diameters were 10ft. and 12ft. though I do not know which was which. Between them they drove five pairs of stones.

Considering the interest of the mill it is curious that at least two millers came here as a second choice: Mr. Milton from Town Mill came in 1880 prior to the latter's demolition and Mr. Finney from Aston Fields Mill came here in 1888 when his own premises burnt down.

The whole site is now under a small bungalow estate; Moat Mill Lane - a footpath

is all that there is to commemorate it.

14. Lint Mill, Charford Road, Charford. SO 958697

This was the lowest mill in Bromsgrove and was situated below the junction of the two brooks. It has now completely gone; South Bromsgrove High School is on the site. All that remains is a small pool.

The site is adjacent to the site of Moat Mill and there is a 14th century reference to a mill at one of these sites.

Lint Mill was closely associated with the textile industry. From 1827 it was a corn and worsted mill with a 15ft. diameter breast-shot wheel. At this time it was quite a large mill (108ft. long). From 1850 it was a corn mill only, but in the late 1870's it was converted to a boracic lint mill by Mr. William Garnett Taylor. It was to remain as such until about 1950. The mill was a well-known local landmark until its demolition.

Garnett Taylor was very successful and the mill supplied lint for both the Boer War and the First World War (at this time Moat Mill was annexed for extra space). Numerous planning applications were made and approved between 1905 and 1918 varying in content from a new Bleaching House to a new septic tank.

During the last half century of this mill's working life it was owned and run by Southall Brothers. They replaced the water power with some other form of power early this century, the waterwheel having gone before 1939. When Simmons visited the mill in 1944 it was running on electric power and before that on gas. The reason for this mill's closure has not been ascertained.

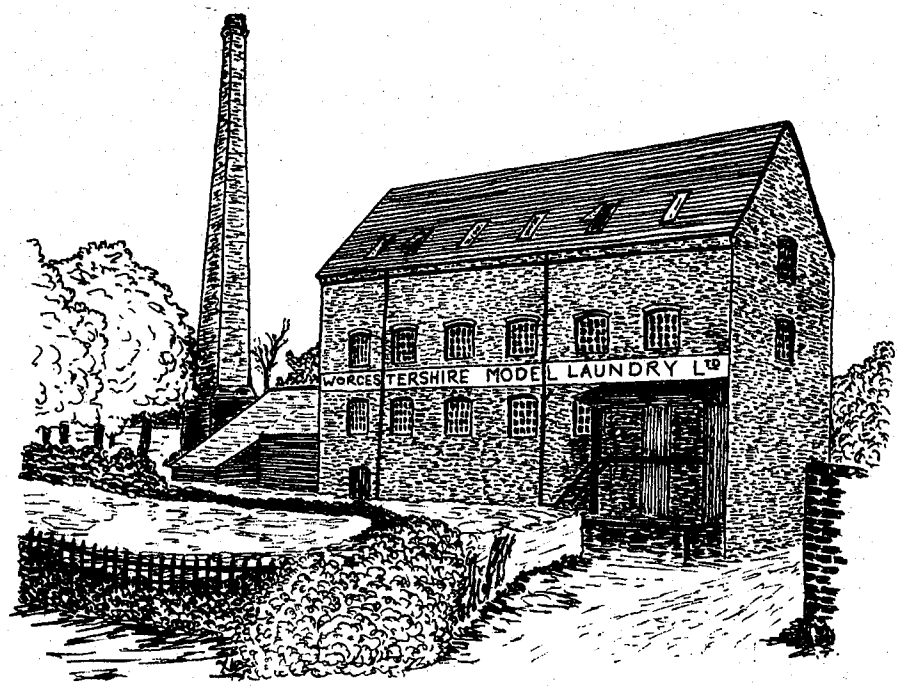
References and Acknowledgments

Much of the material comes from a survey of Bromsgrove mills which I carried out in 1976, and from notes made by H.E.S. Simmons in 1944/45, now filed in the Science Museum Library, and extracted by Dr. Gordon Tucker. Subsequent research for the Salwarpe Mills Survey being undertaken by Dr. Tucker and myself has produced much information. Mr. R.B. Brotherton has been extremely generous in allowing me to use information he collected over many years. I am grateful also to Mr. D.T.N. Booth for information about work done by the millwrights Turtons of Kidderminster and Summers of Tanworth-in-Arden, and to various mill owners for much other information.

My original survey was based mainly on information extracted from Palmers Directories of Bromsgrove and scrap-books by the Cotton Brothers in Birmingham Reference Library.

Since then, apart from the sources mentioned above, material has come from the Tithe Plans of 1840, various maps of Worcestershire and miscellaneous records in the Worcester Record Office.

FOCKBURY MILL



BLACKMORE MILL

WINDMILL GOVERNORS
by WILF. FOREMAN

In 1657, while impatiently awaiting the emergence of the quartz crystal, Christian Huygens evolved a rotary governor to improve the time-keeping of the clocks he made. There was not much scope for wider application for the only other mechanisms in use were those driven by wind and water power, and the usefulness there was not immediately obvious. True, there was a need of constant adjustment to the tenter of the millstones, and this Stanley Freese says was delegated to small boys - one wonders if their concentration was any better than that of their colleague, the one who couldn't set the temse*on fire.

If Patent Records can be relied upon they show that it was well over a century later when efforts were made to bring some control to windmill performance, firstly by Andrew Meikle's spring sail[1] (1772) followed by Thomas Mead postulating the use of rotary governors in 1787.

Could it be that an improved standard in the quality of life was creating a demand for better quality flour, culminating in the happy acceptance of the super fine stuff from the roller mills?

In 1788 James Watt applied the rotary governor to the throttle of his famous steam engines but obviously he was only adapting a system which already existed, and it is quite certain that he was not the inventor, as is widely held.

There are two types of rotary governor; the LAG, which was almost certainly the one used in the first clock application, and the so-called[2] CENTRIFUGAL. However well the spring sail coped, and whatever improvements were achieved with the 1807 William Cubitt patent sail, it was important to the quality of the meal to maintain a reasonably constant grinding speed and this the centrifugal governor showed itself well able to do, as will be explained later. The lag governor found favour in some areas for reasons not immediately obvious. Hammond, a Sussex miller, surely hoped to achieve the ultimate when he applied the action of centrifugal governors as a further control to the striking chain with his 'patent sweep governor' in 1873. Martin Brunnarius explains the arrangement in Windmills of Sussex but he is not enthusiastic about its action.

Both lag and centrifugal governors consist of a central upright supporting spindle which has a rotational movement imparted from the rotating movement which is to be governed, and both rely on the behaviour of hanging weights. The base of the supporting spindle sits in a simple foot step bearing brass and the top is usually located in a hole in a wood bearer, though sometimes brass is used.

The top of the lag governor spindle carries a horizontal member, at each end of which there is a hanging arm, pivotted on the axis of the cross member with a substantial weight secured to the bottom end. In use, any sudden rise in speed will cause the weights to be left behind (to lag) and the inevitable movement of a short lever set at right angles to the pivotted end of the hanging arm will be transmitted by devious linkages to the required point of control. The centrifugal governor (Fig. 1) has a short top member carrying two hanging arms, each with a weight, which are pivotted at right angles to the axis of the top member and in this situation the weights will 'fly out' when influenced by a greater rotational speed, being constrained by the arms on which the weights hang (in effect radius arms) - most of us have swung a weight on a cord and will appreciate

*A temse was a sieve used to produce fine flour - Eds.

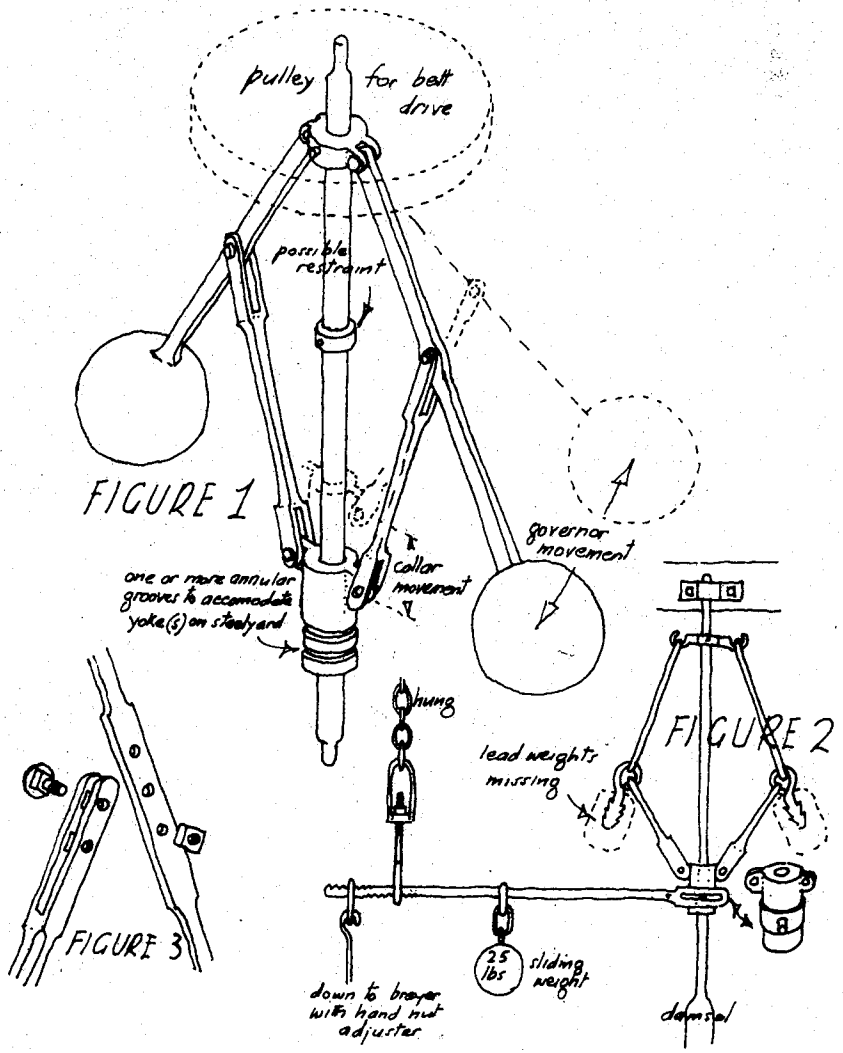


FIGURE 1

FIGURE 2

FIGURE 3

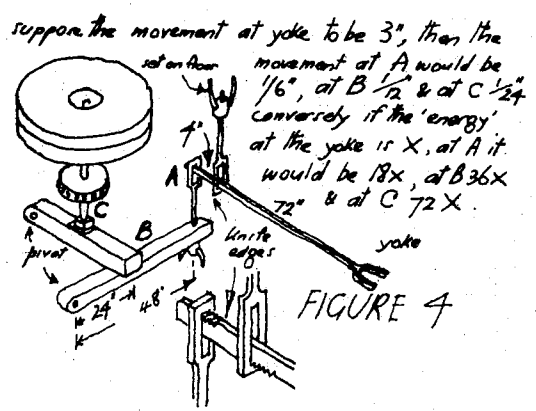


FIGURE 4

the action. The mid-point on the radius arms is connected by pivotted restraining arms to a moveable collar near the base of the central spindle, the collar having deep annular grooves in which the yokes of the steelyard are accomodated and any increase or decrease in speed will raise or lower the collar whose movement will, like the lag, be usefully transmitted elsewhere.

A first examination of a governor set-up will reveal whether the drive, normally by belt, is above or below the stones, and whether it is from a pulley on the main upright shaft or from the stone spindle (or quant). If the latter then the individual spindle is governed, if the former all the stone spindles will be controlled by one governor.

If surviving examples are a guide, the governors were often of blacksmith-made concept, though those which came later in mills equipped with iron gear were more carefully made. Unfortunately, when a windmill restoration is attempted, interesting items such as sack hoists and governors are often overlooked. Thurlow Mill in Suffolk is a prime example where both the neglected hoist and governor are unusual, the spindle of the latter being in common with the damsel, with a very short steelyard. Figure 2 shows a reconstruction.

There seems to be a conspiracy of silence regarding the governor and its precise action in all the recognised mill books. Ill-informed, I have discussed the subject with many people, all variously informed, and now I dare (an upstart draughtsman) to speculate upon it - the real point of this article being to arouse an interest in those intriguing bits of mill machinery which are so often ignored. The confusion through incompletion and/or missing parts should offer a challenge to the determined researcher and when making notes - (I hope you do) - likely bits and pieces lying around should be measured and sketched in the hope of fitting them in somewhere.

It is not easy to explain to a person who did not do his physics homework from whence the strange 'power' of the centrifugal governor comes. At rest the bob weights are inert, useless; as soon as the mill sails start to turn so will the weights, and now they possess an energy[3] which can be put to a useful purpose. The heavier the weights and/or the greater their speed, then the potential for useful work is greater, increasing out of all proportion to the speed of rotation.

The millwright had to avoid excessively heavy weights, for there is only so much the rather crude governor frame would stand, and the same argument would apply to excessively high turning speeds. We must not be patronising about 'rule of thumb' but give some respect to the widely-held theories as evidenced by the range of weights and speeds put to use, and wonder at the calculations which decided how best to control a certain weight of runner, and what happened as the runner wore down. Some governor frames (strangely not all) would seem to make provision for changes by providing alternative pivot holes (Fig 3), while the weighing machine type sliding weight on the steelyard at Thurlow would provide a very critical adjuster. Some governors have a fixed restraint on the central spindle to limit the rise of the collar, the use of which so far escapes me, but I do appreciate that where the brickwork or masonry has been scooped out it is to ensure that the fully extended weights do not foul the structure, and sometimes you will see adjacent woodwork suitably relieved too.

The Oxford English Dictionary somewhat confuses the understanding by stating that governors perform 'regardless of load'. Whilst this is true of the Watt application, and similarly when the volume of water admitted to a waterwheel or turbine is governed, it is not true of windmill practice, where the work being done is the final arbiter.

In practice the miller, having assessed the probable wind strength for the day and set his sails to suit, will set the mill going. When the runner stone reaches its working speed it will tend to rise slightly, the miller can now adjust the tenter by means of the hand nuts to the knife edges and from then on the governor takes over, a fine 'balance' being preserved between governor and runner.

Figure 4 shows the series of levers which provide the links between the two. If the movement of the governor collar is traced through the steelyard to the brayer and thence to the bridge tree carrying the stone spindle, it can be seen

that any increase in sail speed will lower the runner fractionally. Thus there will be an added resistance to motion due to the added friction between stones and grain; more energy will be needed to turn the runner and so the impatient sails will be curbed. At a decrease in sail speed the reverse of these movements will take place.

The actual wind condition just dealt with was a gust. However many gusts there are, both types of governor will continue to respond in the way described, but in the event of a sudden rise in wind speed, to a new sustained level, the two types will behave differently. The lag, responding as it does to acceleration, would control the initial rise, then 'catch up' on itself and exercise no further control, maybe even permitting the mill to run away if the miller did not apply his own control. With the centrifugal, the bob weights would fly out at the initial rise and stay out so long as the wind speed persisted, thus the stones would remain 'shut down'. No doubt the miller would be unhappy with these grinding conditions and would sensibly reef his commons or adjust his striking weights to suit the new situation. If at any time he was not happy with the quality of the meal he could adjust the tenter by means of the normal hand screws, not exactly over-riding the governor but giving a new set of conditions for the governor to control.

David Pearce, a member of the Thelnetham consortium, has been my mentor on theoretical matters, supplying both the formula quoted and a diagram which illustrates the control exercised by the two types of governor.

Notes

1 The spring sail was not a governor but an arrangement to enable the windmill sails to cope with violent gusts of fluctuating winds.

2 Not properly scientific, but let that pass.

3 'Centrifugal' force is given by the following formula:

$$\frac{\text{ball weight in pounds} \times \text{rad. of rotation in feet} \times \text{rpm}^2}{2918} = \text{force in pounds}$$

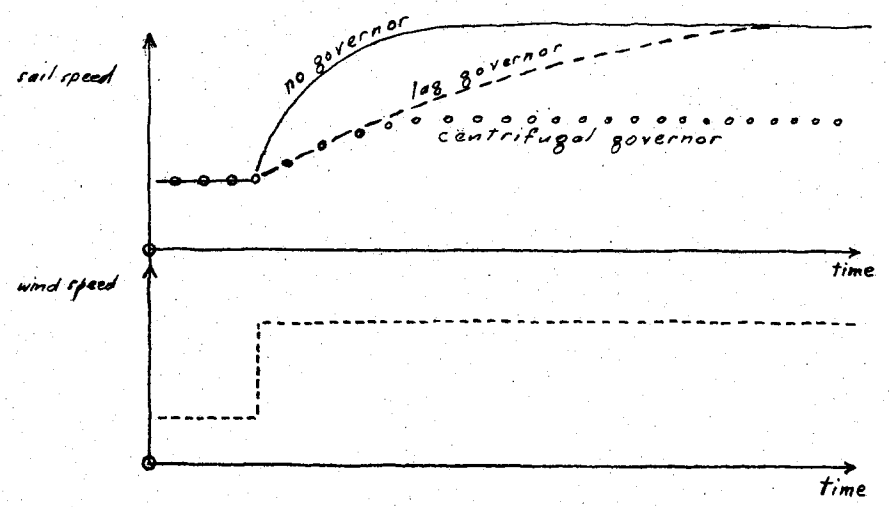


Diagram to show the effect of a sudden rise in wind speed to a new sustained level, with and without the control of rotary governors.

MILLS AND FORGES ON THE WANNERTON BROOK IN NORTH WORCESTERSHIRE

by H.W. GWILLIAM

The five mile range of the Clent Hills stretches from Wychbury Hill to Wasely Hill. This area has seen many changes in the county borders, parts having been at times in Worcestershire, Staffordshire and Shropshire. In 1832, an Act of Parliament transferred Clent from Staffordshire to Worcestershire. The Clent district thus returned to Worcestershire after 800 years.

The stream that eventually becomes the Wannerton Brook rises on the Clent Hills and runs between the Four Stones Hill and the Walton Hill, above Clent Church. (See map.) The stream was used from medieval times to power cornmills, and, later on, ironworks, for by the 16th and 17th centuries the chief trades in Clent village were scythe-making and nail making. Usually the scythe-smith was a farmer as well, but some families specialised early on scythe making. One, Waldron of Clent, died in 1541, leaving a hearth to each of his four sons, and the widow to receive the benefit of a blade mill. He left 650 scythes valued at £53, and a total estate of £120. A great sum in those days.

In 1790 Thomas Waldron, whose works on the Belne Brook at Belbroughton were flourishing, still had control of the family works at Clent, and moved his scythe-smiths to his main works at Belbroughton which had a better water supply. Waldron appears to have had other works downstream on the Wannerton Brook, for about 1790 he built the dam above the church to create Clatterbach Pool, and so harnessed the stream to provide a better water supply for their use.

In 1827 Clatterbach Pool burst its dam. The pool was two acres in extent and very deep. The damage done throughout the valley was tremendous. Waldron's forges and a 34ft. diameter wheel were swept away. Only quick action by warning mills and forges further down saved greater damage. Hurcott Paper Mill especially, being very vulnerable in its position above the stream, was saved by warnings and the opening of all the floodgates and sluices.

The mills on the Wannerton Brook will now be discussed in order, working downstream from Clent, and taking the mills on each tributary stream before continuing down the main brook. Much of the information was gleaned by the author from documentary and field research before the papers of the late H.E.S. Simmons became available for study at the Science Museum Library. Recently Dr. Gordon Tucker has made available his notes on these mills abstracted from the Simmons papers, and these have been incorporated into the descriptions below.

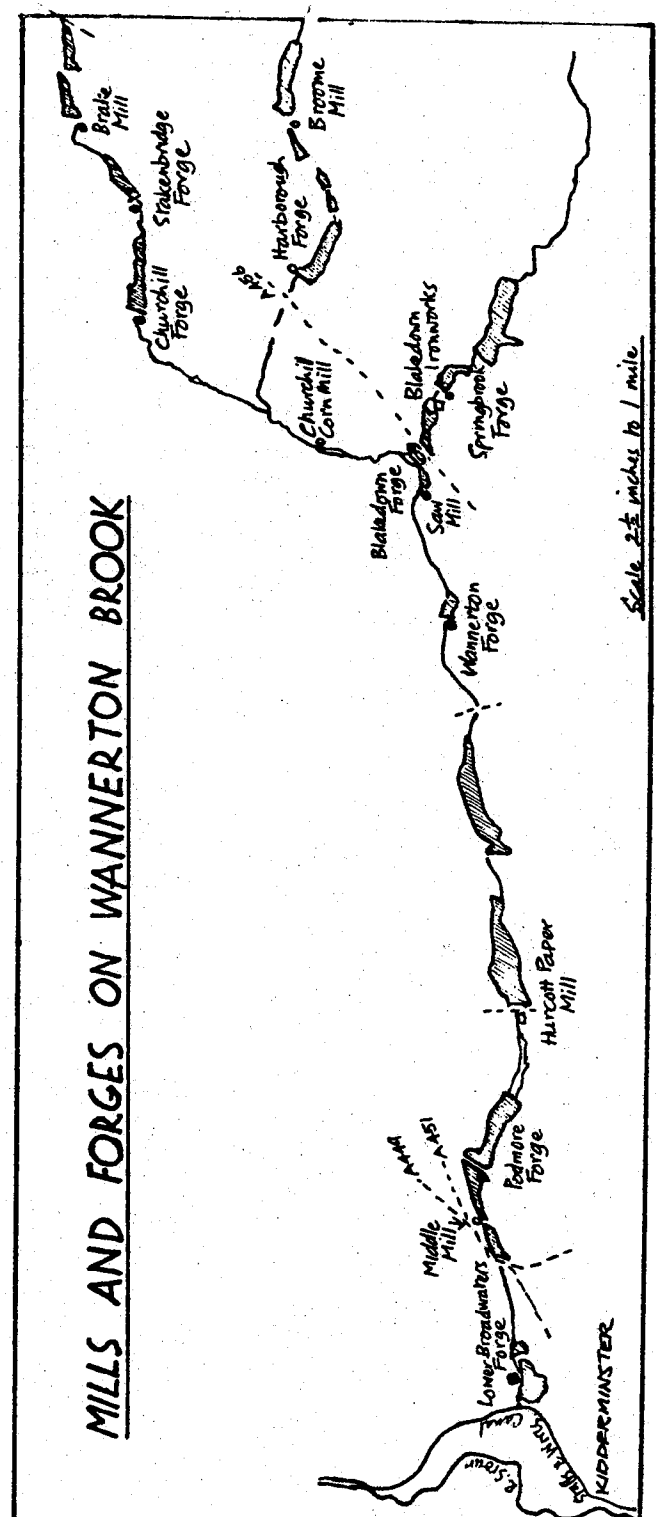
Early mill at Clent

Simmons records that Mr. Edward Moore of Middle Forge, Belbroughton, had heard people speak of an earlier mill at Clent, standing above the one next listed below, in what is known as "The Glen". It was supposed to have been washed away many years ago.

Clent Mill SO 931796

Simmons referred to this as Spout Mill, but this name may possibly pertain to the mill at Hagley (see below). A less ambiguous name is Vine Mill.

The old mill dam and pond (the latter rather derelict) still remain immediately above the Vine Inn, north of the village of Clent. The mill was adjacent to the inn. Simmons stated that built on to the watermill was a small steam mill and



bakery. The waterwheel was overshot, 20ft. diameter by 3ft. wide, and, with nearly all the machinery, was removed in about 1930. There were two pairs of stones, north and south; the one pair remaining in 1945 were peak stones, 3ft. 10in. diameter.

Millers: Thomas Wyatt 1835, using watermill; Thomas Pearson had both water and steam mills in 1849; Thomas Smith in the 1860's. From 1884-92 William Green had both, but in 1892 Charles Aldridge took the steam mill, and in 1896 William Green at the watermill was followed by George Keen, who was the last to use the watermill, which soon closed down. Aldridge continued to use the steam mill up to 1928-9 when it ceased.

Mill Site at Oldmill Farm, Clent SO 922792

John Amphlett in his Short History of Clent (1890) p.40, mentions an early mill at this site: 'At what time a mill was established at Clent is doubtful, but the name of Oldmill Farm gives us a clue to where one was situated in comparatively recent times. But in 1740 this mill had disappeared, and probably it had vanished long before that date, for there is no trace now of a millpool at Oldmill ... It is not improbable that the mill was early moved up the stream, perhaps to where the Vine-mill now stands, where the water could be more easily pounded up.' On O.S. maps, the farm is now called Oldnall.

Hagley Mill SO 900797

This is shown on the first edition one-inch O.S. map of c.1830 as Spout Mill. Simmons inspected the site in 1945 and reported that a possible mill building stood at the rear of a cottage adjacent to the north side of the Cross Keys Inn. Nothing else is known of this mill.

Brake Mill (Corn Mill) SO 892798

According to Simmons, this was shown as Broke Mill in 1821, but was Brake Mill on the first edition one-inch O.S. map.

The building stands below the dam which takes the road to the farm. Structurally it is sound, but has been gutted of all machinery. It is built of brick, dating from about 1780, but has a date stone of 1830 when presumably, some restoration was made. A new overshot waterwheel, 11ft. 4in. diameter by 5ft. 4in. wide, was installed in August 1831. This wheel has now gone, but the wheel chamber is in good condition. The tenant, Mr. Preece, now uses the building as a cowshed, and gave the information that it had one pair of stones, which are imbedded in the concrete floor, but it is more probable that there were two pairs of stones.

Millers: 1820 George Colebatch. 1864 George Jones. 1892-1908 James Williams.

Stakenbridge Forge SO 887796

This was a substantial ironworks, but by 1968, all traces of the forge buildings had gone. The dam, along which runs the public road, still has two wooden sluice gates. The pool has largely silted up, and alongside it runs the railway embankment. What history is known of the forge is as follows:

The Bache family (which later moved to Churchill Forge) held Stakenbridge until 1787, and possibly continued to do so after that date, but in that year William Bache married Penelope Willetts of Churchill Forge, and the two businesses were amalgamated.

In 1870, during the Franco-Prussian War, it is believed that gun barrels were made here, as, in addition to the tradition mentioned, rifling tools were later found in the building.

As with other bladesmiths, the iron trade was carried on with farming, and usually took second place. In 1840, John Bache, of Churchill and Stakenbridge, was listed in a directory as farmer and spade and shovel maker.

Simmons visited Stakenbridge Forge in 1945 when he found it standing but disused. His description was roughly as follows. At the south end of the extensive Stakenbridge Pool and against the west side of the railway bridge stands the Forge, a small building the roof of which is below road level, with the addition of several later buildings nearly all used in the former manufacture of shovels,

spades, forks etc. The original builder in c.1750 was said to be a member of the Bache family, who still owned it in 1945; but it ceased working in 1917 when the goodwill passed to Messrs. Brades. There were two wheels, one outside at the east, and one inside against the north wall. Both were overshot, the former 9ft. diam. by 5ft. wide, fed by an 18 inch pipe coming alongside the wheel to a pentrough in front of it; 10 inch rim, two sets of wooden arms 4½in. X 3½in.; 18in. wooden shaft, with toothed nut between outer nave and the bearing, driving a 4in. iron shaft which passed at ground level to the adjacent building where a 6ft. X 4in. face iron wheel drove a 10in. nut and shaft. Inside the forge, the watershaft turned a two-piece pit wheel 7ft. 6in. by 5½in. face which in 1945 engaged a 1ft. 10in. nut to drive a 3½in. square shaft and an 8ft. X 1ft. 10in. six-armed and double-sided belt wheel in a pit, conveying power to an oat-crusher. The inner waterwheel was 9ft. diam. by 16in. wide, with 9in. rim, and two sets of six arms, driving a 5ft. X 2in. face wheel geared to a 6in. nut and 3½in. square shaft with a belt drive to an oat-crusher mounted below the ceiling.

Churchill Forge SO 883796

Within one mile of Churchill there were ten water-driven mills and forges, and one windmill. Within living memory nine were in working order. Some have a long history dating back to Saxon days. Churchill Forge is now the last remaining water driven forge in Worcestershire, and was still making ladles for the non-ferrous metal industries until about ten years ago.

The earliest mention of Churchill Forge is in a charter, now in the Birmingham Library, of the reign of Henry III. It gives details of a gift, by Robert de Hurcott to Hugh Drugel of Churchill, with the advowson of the church and mill, in 1238. Robert paid 20 shillings for the mill to Robert, Lord of Haggeley, and a yearly rent of six and eight pence to the Prior of Dudley for the mill of Churchill. In a document of 1368, the mill is mentioned, and at the end of the 16th century a blade mill and pool is listed.

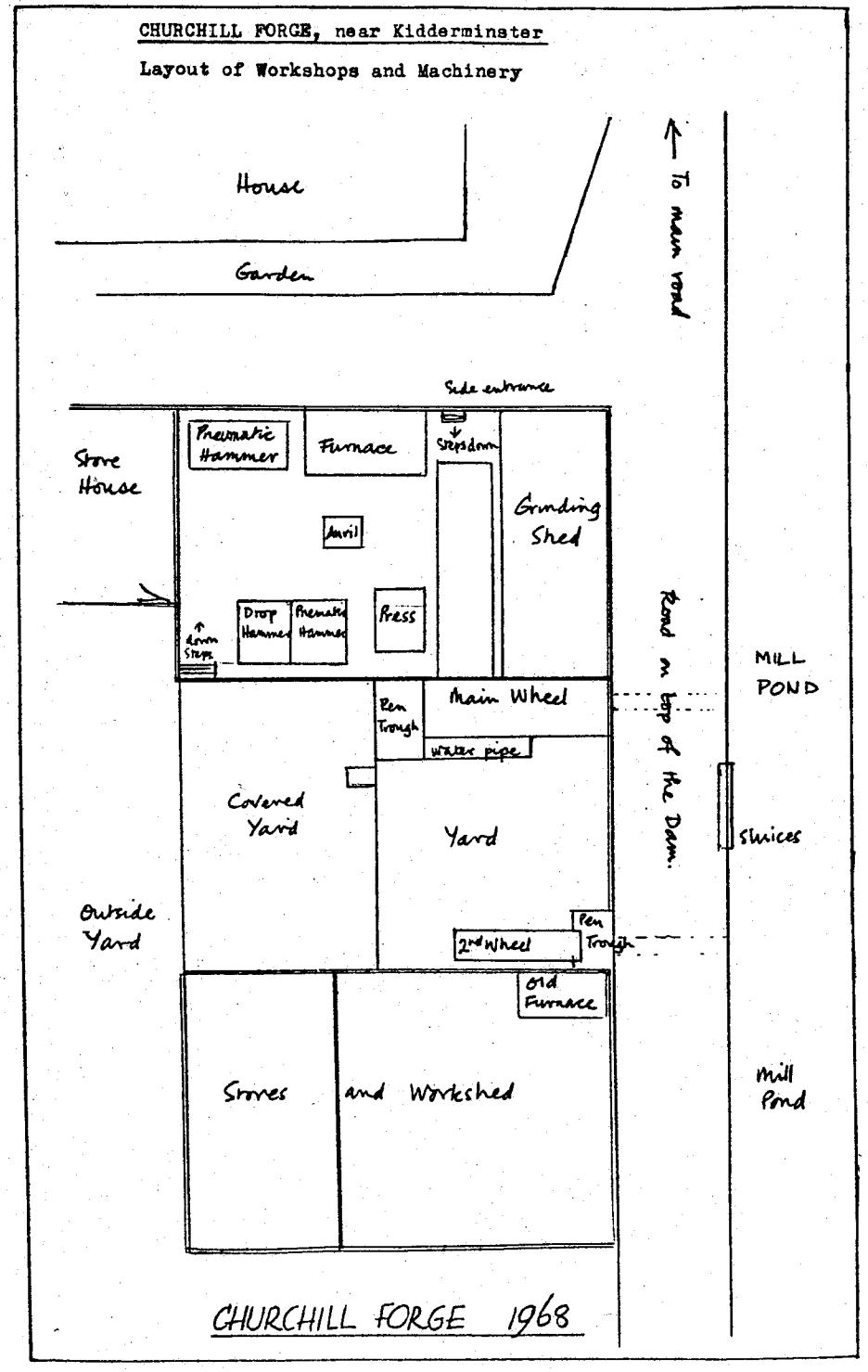
The old Churchill family of Willetts had Churchill Forge in the 18th century, and the Bache family had Stakenbridge Forge. In 1787 William Bache married Penelope Willetts, and the two businesses amalgamated under William Bache, who was buried at Churchill in 1830. His son Henry continued in the business, and at his death, his wife, Lydia, ran the forge until 1870. Their two sons, William and Thomas, continued in the business until they died; William in 1899, and Thomas in 1914. It was Thomas who carried 400 tons of stone from the station to surface Mill Lane. Throughout, the Bache business had a very high reputation. The freehold of the mill and pool was purchased from Viscount Cobham by Claude Bache in 1948. Claude Bache died in 1970, and since then the forge has been more or less idle.

The accompanying plan of Churchill Forge, as in 1968, shows the general layout. The following details are based mainly on Simmons' notes of 1945. The main waterwheel, for the forge proper, is overshot, 15ft. diam. by 5ft. wide, with a 15in. rim, a 3ft. 9in. nave with the addition of a 7ft. outer ring, the 16 oaken arms are 9½in. X 6in., and 3ft. long, bolted into deep sockets. The sole is wood, the buckets of iron. The iron shaft is 12-sided, 3ft. across, with its bearing mounted on a heavy iron stand. The wheel is fed by an 18 inch pipe to a pentrough slightly in front of the wheel. An eccentric block on the outer end of the watershaft works a rod which operates shears for heavy work. There are two cam rings, although the original tilt hammers have been removed. There are now some more modern machines as shown in the author's plan.

The second waterwheel, the 'fan wheel', is 16ft. diam. by 2ft. 3in. wide, high-breast, with iron sole and buckets, with seven arms each side (and thus very unusual), tapering from 5 to 4in. The feed is by a tall pentrough tapered to the contour of the wheel. The octagonal wooden shaft is 18in. across, driving an 8ft. pit wheel to work the bellows and a shaft for the belt-driven grindstone. This drive was replaced functionally (although left in situ) by an electric motor which drove a blower.

The flow of water from the pentrough to the main wheel is controlled by a long pole inside the forge. In this way the water in the pond is drawn off only whilst work is in progress, and there has rarely been any shortage.

The blanks for the spade blades were obtained from Sheffield, where they were



stamped out of steel rolled from old scrap railway lines. At Churchill they were heated in a furnace, then placed one at a time on the die of a large gravity drop-hammer, the lift of which was powered by the waterwheel. As the hammer was raised the operator released the catch and the hammer head descended onto the spade blade, stamping it into the shape of the die. The shaped blade was taken with tongs to the anvil, where the partly rounded socket was formed into shape with a hand-hammer. As the blade reached the correct temperature, judged by eye on its changing colour, it was quenched in a bucket of water, and laid aside until a batch was ready for handling. Grinding, in a different shed but still powered by the waterwheel, followed, then polishing, greasing and labelling.

The raw material for the ladles was iron bar one inch thick by four inches wide. This was cut to size without noise or fuss by the primitive looking cold shears, which was linked by a long bar to an eccentric cam on the waterwheel shaft, as mentioned above. The heated metal blanks were formed under the hammer or press, and were stamped into the shape of the die. Hand forging upon the anvil removed any distortions and added minor shaping not possible to achieve with the dies.

Broome Mill SO 892788

This corn mill stood at the west end of Windmill Pool, but only the miller's house and stable now remain. It was shown on the 1st edition one-inch O.S. map of c.1830, but was 'disused' on the six-inch O.S. map of 1884; although still standing in 1913 (Victoria County History), by 1945 it had been 'demolished many years ago' (Simmons). The pond is now derelict.

Simmons inspected the site in 1945 and reported that the wheel-pit remained; it had been on the west side of the mill. The iron pentrough had been fed by a 16in. pipe then still protruding from the bank. The wheel had been overshot, about 15 to 16ft. in diameter and about 4ft. wide.

Harborough Mill SO 884788

An advertisement in the Birmingham Gazette for 24 Feb. 1817 read thus: 'To be let. An Overshot Water Mill and pool of water of 12 acres, which has been used and occupied by Mr. Jas. Pitman for the last 20 years for dressing leather, situated at Harborough in the parish of Hagley'. A mill or forge is marked at the end of the series of pools at Harborough Hall on a Tithe Map for Hagley of unknown date but thought to be of the 18th century (Worcs. County Record Office). There is a piece of ground just north of the Hall which looks very much like the site of a water-powered industry.

Churchill Corn Mill SO 877787

This is a three-storey brick building, which had an overshot wheel about 10ft. diam. by 4ft. wide, and, according to an advertisement of 22 Feb. 1830 in the Birmingham Gazette, had two pairs of stones. It was shown on the 1st edition one-inch O.S. map of c.1830 as 'Mill'. It ceased working about 1924, and in 1942 was converted into a residence comprising the two upper floors, with the ground floor as garage, etc.

Millers were: 1830, Michael Wood; 1860-72, Mrs. Sarah Eaton; 1876, John Wilson; 1880-1916, John William Wilson; 1921, John Wilson; 1924, John Arthur Wilson.

Blakedown Iron Works SO 879782

Bradley's Forge or Blakedown Ironworks was worked from the waters of Ladies Pool. The Forge site lay below the dam which formed a small pool fed by a leat from Ladies Pool, and alongside the larger pool called Wheatmill Pool (local people say the pool should be called Forge Pool).

The Ironworks was of considerable size. It appears to have been founded in 1856, and at one time employed 150 men, making mostly axles for Cape Wagons, and for Australia, and a lighter type for Bavaria. The works was sold for breaking up in September 1913. A photograph taken at the demolition shows a large brick chimney and a long iron boiler, showing that it had alternative sources of power, water and steam. The ironworks stood very close to the much older Springbrook

Forge. Springbrook House, close by, was probably the residence of the manager of Bradley's works.

Springbrook Forge SO 879782

This site is adjacent to Bradley's Forge (see above). That Springbrook Forge was in existence long before Bradley's Ironworks is proved by notices in the London Gazette, 23 Nov. and 11 Dec. 1827, announcing that the owner, William Christopher of Blakedown, had become bankrupt. The sale notice followed on Jan. 8, 1828: 'To be sold under Command of the Bankruptcy order...also that plating forge called Springbrook Forge...together with two pools of water, called Spring Brook Pool and Wheat Mill Pool...' It was situated on the southernmost branch of Wannerton Brook, being fed from a leat from Ladies Pool and Wheatmill Pool. Like the next mill down (Blakedown Mill) it was engaged in the scythe trade. A part of the forge buildings remains and against it is the 18ft. overshot wheel, which has been left, or re-erected, as a landscape feature.

Blakedown Scythe Mill and Foundry SO 876783

The Scythe Mill stood below the level of the road at the corner of the Birmingham road (A456) and Churchill Lane. It had a 6ft. wide overshot iron wheel, fed by water from the three pools, (Lady Pool, Middle Pool and Swan Pool) by way of a brick tunnel under the Birmingham road. A photograph exists showing a small factory-type chimney stack. The mill was demolished in 1920 to widen the road.

It was referred to in an advertisement in the Birmingham Gazette for 16 Jan. 1832 as 'that well-known Scythe Mill called Blakedown Mill situated in the parish of Hagley...upon the main turnpike road from Stourbridge to Kidderminster'.

Blakedown Saw Mill and Forge SO 875783

Part of the building remains and is now a private garage and store, part of a riding establishment (1969). The wheelchamber is complete with its pentrough sluices, but the water supply has been lost through a break in the wall of the stream higher up. It was last used as a saw mill in 1950, and the iron overshot wheel, built by G. Turton of Kidderminster in 1861, was taken out in 1951. The saw mill made gates, ladders, wheelbarrows, etc. Earlier, it was an iron mill, especially making axle heads for wagons. Masses of iron slag lie about in the garden, with some crucibles made of plumbago.

Wannerton Forge SO 869782

Wannerton Forge stands at the west end of the pool near Wannerton Farm. The building is in good condition, but the waterwheel has gone. In 1969 the forge building was used as a store and a pumping house. The interior has been partitioned off, but the hearth is still there, and the internal driving wheels are still in position. The owner did not know it had once been a forge. It must have been used for that purpose in the 19th century, for there is no indication of its original purpose on the 1902 O.S. 25 inch map.

Hurcott Paper Mill SO 852778

Hurcott Mill was one of the oldest paper mills in the country, and still working through the 1960's. Indeed, it may be the oldest for there is a possibility that it was established before John Spilman's well-known mill at Dartford, Kent, began work in 1588. This possibility arises from two pieces of evidence. The first is that in 1601, in reply to a letter from the Lords of the Council on the subject of Spilman's rights in respect to the collection of rags for paper making, the Lord Mayor and Aldermen of the City of London stated that Spilman's Mill was not the first paper mill in England, in that before his time there were paper mills at Osterley (Middlesex), at Cambridge, in Worcestershire, and elsewhere. The second piece of evidence, which supports that this Worcestershire paper mill might have been at Hurcott is that the Paper Mill House there is mentioned in 1630, and this is the earliest known reference to any Worcestershire paper mill by name. The only other available evidence about Hurcott Paper Mill during the 17th century is in the parish registers which record the burial of Robert Gough, August 20, 1663, 'who dyed at Hurcoate Paper Myll'.

Most of the master paper makers at Hurcott from 1715 on have now been identified. In that year, Richard Heath, paper maker of Kidderminster took an apprentice James Simmons, and the name Heath appears in a watermark of 1743. His successor, Charles Heath, who insured the paper mill in 1756, probably worked it until his death in 1764/65. William Mainwaring insured the mill in 1769. About 1786 it was in the possession of Harriet Lea, and in 1790.

In 1790, the Gloucester Journal of 26 April, advertised it as 'a very eligible paper mill, where a very extensive business has been carried on for more than 50 years.' The advertisement gives much interesting information about the mill, which was then in full work and had a well-established trade. Its equipment included two engines, two vats, four iron presses, and a wood screw. There were very convenient warehouses, spacious drying rooms, a rag house four storeys high, two large rooms with stoves for finished paper, and two sols with stoves. The accomodation included seven tenements for the workmen. The power was developed by an overshot waterwheel fed from a pool 12 acres in area. It was claimed that there was sufficient water in the driest season, that there was no possibility of being flooded, and there was exceedingly good soft water.

It appears that as a result of this advertisement, the Hurcott Paper Mill was taken over by John and Thomas Holl, stationers of Worcester. In 1791, they advertised for a 'Foreman and Manager in a paper mill in Worcestershire'. Their joint tenure of the mill did not last long however, for in 1792, a notice appeared that the partnership between John and Thomas Holl, paper manufacturers, stationers etc. of Worcester, was dissolved. (London Gazette, 21 June, 1792). It was declared that the manufactory would be carried on by John Holl, but he was declared bankrupt in 1793, and the advertisement for a sale in 1793 states that an aqueduct had been made 'at considerable expense by the late occupier'.

The Paper Mill proprietors from then on were as follows:

1788 Robert Vaughan Brooke, stationer of 139 Cheapside, London. In 1803 Robert Vaughan Brooke insured the mill for £500. He was declared bankrupt in 1806.

1806-1818 During and after R.V. Brooke's bankruptcy the mill was worked by Thomas Garmston & Co., papermakers of Worcester.

1826-1852 The mill was taken over by Thomas James. Two beating engines were at work at Hurcott in 1851.

1860-1880 Thomas James was making superfine paper with four vats.

1880's At Thomas James's death the paper mill closed for some years, the buildings became dilapidated, and were partially dismantled.

1889 A new company was formed to revive the handmade paper manufacture at Hurcott, based on some Birmingham gentlemen associated with the bookbinding and paper trades, with Mr. N. Nicholls as managing director. New buildings were erected though still using water power from an overshot waterwheel, with a reserve of steam power.

1900 The Mill was being worked by the Hurcott Paper Mills Ltd.

1905 Hurcott Paper Mill was worked by Trasswell & Adie Ltd. (The practical man being John B. Trasswell). The old watermarks of Thomas James, Hurcott Mills, and Thomas James were purchased back from a London firm, and handmade paper was made as of old.

1910 The Mill was producing hand-made account books, writing paper, loan and bank notes, cheque and fine printing papers from the best linen and cotton rags only.

1912 1st June, Hurcott Paper Mill was put up for sale. It was purchased from Lord Dudley later in the year by L.S. Dixon, a paper making firm from Liverpool.

1915 The firm was advertising special loft-dried papers and boards.

1918 After 1918 the mill stopped producing paper and manufactured dry flongs (boards used for casting curved typesheets in newspaper printing). These were sent all over the world. About this time the manager's house, which was very damp, and reputed to have been used as a vicarage, was rebuilt by Dixon's on higher ground.

1962 Dixon's were still in possession.

1974 Paper making had ceased for some time, and the mill had been used as a furniture store. On the 7th March, 1974, a great fire destroyed the building, and tragically, two Worcester firemen were killed while fighting the fire.

Podmore Forge or Mill SO 844780

This forgemill appears to have been called Podmore Mill from John Podmore, or Pedmore, who had a forge and saw-making works here in the early 18th century. It seems to have been out of production in the early decades of the 19th century, then to have been converted to corn-milling, and by 1900, to have been used to shred rags as a Flock Mill.

In 1945 Simmons recorded: 'Used water from Hurcott Pool forms Podmore Pool almost as soon as it leaves Hurcott Paper Mill, at the west end of which, and approached by a pleasant tree lined bank dividing this and Broadwaters Pool, stands Podmore Mill, a small and old three floor brick structure built partly down the bank. In 1812, known as Podmore Mill, it was empty and on the market, the owner being Addenbrooke of Wollaston. Eventually it became a paper mill but has not been used for many years and has no machinery. The wheel was outside at the north end, being 11ft. diam. and possibly 10 to 12ft. wide, low breast.'

What is known of its history is as follows:

c.1705 John Podmore bought large quantities of saw irons from the Warmington and Street (Cheshire) Forges.
1812 Known as Podmore Mill, was empty and on the market.
1821 Marked as 'Forge' on maps.
1840 Converted to corn milling and occupied by Richard Brewster. (Directory of Millers).
1859 Used as a paper mill. Marked as such on 1884 6 inch O.S. map.
1902 Marked as 'Flock Mill' on 1902 25 inch O.S. map, as is Lower Broadwaters Mill.

Broadwaters Middle Mill SO 842780

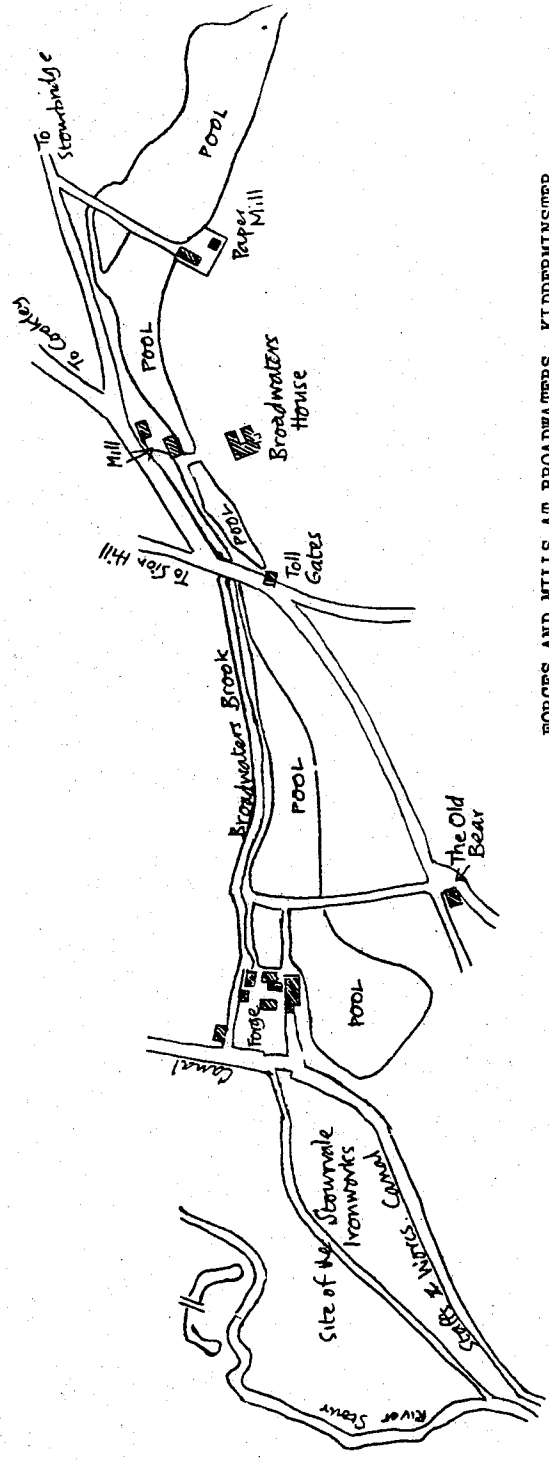
At Broadwaters, until the 17th century, the district was a huge morass; a chain of pools strung together by Wannerton Brook. The marsh was crossed at Broadwaters on a firm and rocky bottom, and this was the only crossing place. From the 13th century at least, the pools were harnessed for mills at the Lower Pool, and at the crossing or Middle Pool. Middle Mill was sometimes called Upton Mill, but the little information available often refers just to Broadwaters Mills. To add to the difficulty of indentification, their use changed on a number of occasions, from corn or fulling mills, to iron forges, and to paper and flock mills. Information available at the moment suggests the following:

Upton Mill, Broadwaters, was a mill in 1243, and was in use for 500 odd years as a fulling mill for the cloth trade of Kidderminster. In 1746 it was converted by Thomas Smart of Halesowen into a cornmill, then in 1753 into an iron forge by John Humfrey of Stourbridge. It is uncertain whether the conversion was of Middle Mill, but the Lower Forge had been used for ironworks for centuries, and it seems unlikely to have been in need of conversion. In 1759 John Humfrey got into trouble for raising the mill pound to the great inconvenience of people, and was fined by the Court Baron of Wolverley.

If Middle Mill was the one converted to an ironmill by John Humfrey in 1753, then by the 1830's it had gone out of production. It was probably destroyed, for a cornmill was built on the site in 1847. A 'To Let' notice of 1850 refers to a 'recently erected and substantially built Water Corn Mill'. Simmons' notes of 1945 give the following details:

Mid Cities Herald 13 June, 1850. 'To be let....that recently erected and substantially built Water Corn Mill with dressing and smut machines, wheat and flour elevators, apparatus for five pairs of stones, situated at Broadwaters... Apply to Mr. Jennings on the premises'. In about 1890, it was given up as a flour mill. It lay idle for a time, and was then used by a laundry firm. In 1937 the Town Council demolished most of the mill, leaving part as a garden shelter.

Broadwaters Mill stood alongside the main road just west of the Wolverhampton and Stourbridge fork. There were two overshot wheels side by side at the west end, each 9ft. 6in. wide by 12ft. diam. working on one long shaft. Three pairs of stones at the west end were driven by a spur gear on an upright shaft. Two pairs alongside the south wall at the east end were driven from a shaft turned by a face gear connected to a second pitwheel.



FORGES AND MILLS AT BROADWATERS, KIDDERMINSTER

From a plan of Kidderminster made by John Broadfield, 1859.

Wannerton Brook is here called Broadwaters Brook. The Paper Mill is usually known as Podmore Mill, and on the 1902 O.S. Map it is called the Flock Mill. Near Broadwaters House is Broadwaters Corn Mill and Forge. Lower Broadwaters Forge is near the canal, and was used for ironmaking until the 1890's, then it became a saddle-flock mill, and was last used in the 1920's. The Stourvale Ironworks was not founded until 1867 and did not exist when this map was made.

Millers: 1820 Abraham Godfrey. 1835-51 Richard Brewster. 1854 E. Blundell. 1860 W.H. Blundell & Co. 1870-80 Daniel W. Goodwin (also at New Mill, Kidderminster, and Town Mill, Kidderminster). 1888 W. Davis.

Lower Broadwaters Forge SO 834779

The Forge known as Broadwaters Sheet Iron and Tin Plate Works of Messrs. Hatton & Co. continued until 1888, then part of the building was used by a saddle flock manufacturer for a while, but eventually the site was cleared except for a large factory-type chimney 60-70 feet high, standing out on an arm into the pool, which gives the pool its local name of 'Stack Pool'.

References to Lower Broadwaters Forge are as follows:

1570 'Edward Blount of Kidderminster made the pool to turn the wheels at Lower Broadwaters Forge'. (R.L. Downes, Thesis in Worcester Records Office.)

c.1643 'Records exist of one Crane, manufacturing blades for Royalists in Civil War at Broadwaters'. (Birmingham Archaeological Society Transactions, Vol. 66, 1945).

1774 In the Foley Scapbook (W.R.O.) the Forge is described in a sale in February of that year, as 'a slitting and plating ironworks'.

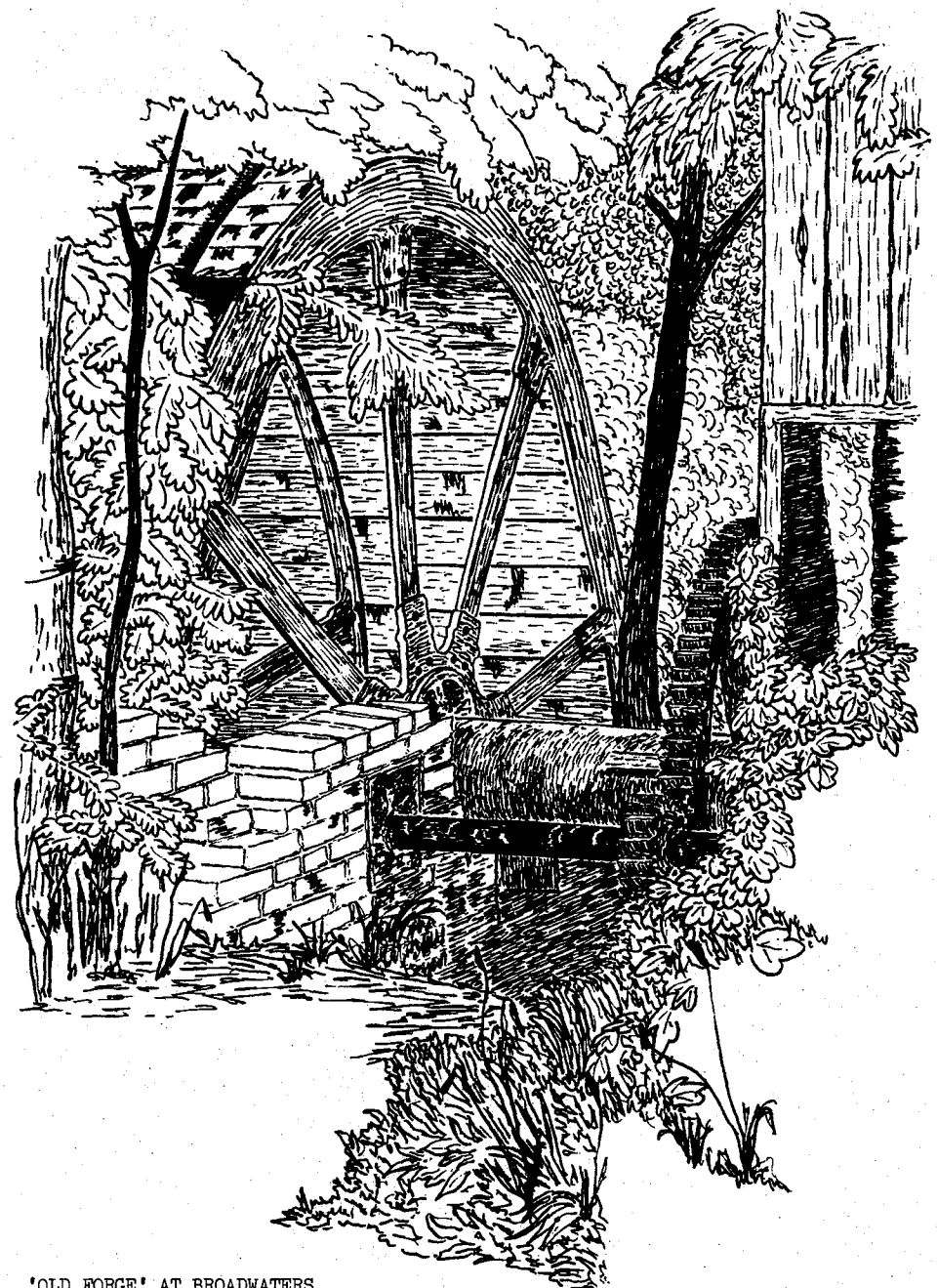
1822 Pigot's Directory for Worcestershire 1822, in the Kidderminster section lists two ironmongers, Edward Addenbrooke at Broadwaters Forge, and David Humphries at Middle Forge, and Richard Brewster as a corn miller at Podmore Mill.

1825 At a sale in February 1825, in the Foley Scapbook, the ironworks are described as two forges: 'A Finers Forge, with two cast-iron Waterwheels, one working a stamping hammer; the other driving machinery to blow three fineries, and occasionally to work a Corn Mill; also a Hammerman's Forge, with Cast-iron Waterwheel, driving powerful Machinery for working a Shingling Hammer, and a train of Rolls for rolling Bar Iron; Reservoirs, Dwelling House, Workshops, Charcoal Yards, Wharf on Bank of Staffs. & Worcs. Canal, and a newly built Dwelling House.'

1837 The Birmingham Herald of June 1, 1837, gives the following information in a sale notice: 'To be sold by auction. The Rolling and Slitting Mill called Broadwaters Lower Mill. Water wheel 18ft. X 9ft. 10in., with a head and fall of 14ft. 8in.

1859 'At Broadwaters, extensive works for the manufacture of sheet-iron and tin-plate. Proprietors Messrs. Banks & Morgan, who are also proprietors of the Falling Sands Works in the parish of Kidderminster.' (History & Topography of Worcs. 1859). In the same directory, John Morgan is recorded as an 'Annealler of tin plates at Broadwaters.'

Occasionally, letters to the Kidderminster Shuttle refer to the Broadwaters Forges, but rarely, if ever, specify which forge, or whether corn or flockmill. For example, a cutting from the above paper (date unknown) stated that in 1839 'Old Broadwaters Tin Plate Forge was started by Messrs. Thompson, Hatton & Co. of Bilston'. This must refer to the taking over of one of the old forges, most probably the Lower Forge. Another letter to the Shuttle of 18 August, 1950, from E.H. Brooks, gave information that the firm of Crowther & Morgan at Broadwaters ceased trading in January 1891, and the works were demolished in 1893. This must refer to the Lower Forge.



'OLD FORGE' AT BROADWATERS
from an undated photograph

ROBERT SUMMERS, MILLWRIGHT OF TANWORTH-IN-ARDEN, AND THE RECONSTRUCTION OF WOLVERTON MILL, BUCKINGHAMSHIRE, 1868-77

by D.T.N. BOOTH

In the second half of the nineteenth century the town of Wolverton expanded rapidly. Situated on the route of the London and North Western Railway it had been chosen as the site of the main railway workshops for that company. The consequent growth in population naturally put considerable strain on all the local food suppliers, not least the millers at Wolverton Mill. In 1868 the landlords, the Trustees of the Radcliffe Estate, agreed to re-equip the mill to serve this extra demand. They could not possibly have foreseen how troublesome the next nine years would be for all concerned.

The 'contract' for this work, eventually totalling over two thousand pounds, was awarded to Robert Summers, a millwright from Tanworth-in-Arden in Warwickshire. Although Summers had established a sound reputation in Warwickshire, he would at first seem a most unlikely choice when there were undoubtably other millwrights much closer at hand. However, Summers had the right 'contacts' and would seem to have had no competition for the job.

Robert Summers' millwrighting business had its origins in a small blacksmith's forge established in c.1814 by his father, Robert Summers Senior. The forge prospered sufficiently for a small foundry and workshops to be built in 1828-9. Although some mill machinery was repaired in the 1830's, the real break into millwrighting did not occur until about 1840. By this date Robert Summers Junior had learned the trade and set out as a jobbing millwright. He was then twenty-one years old and newly married to Mary Jones, daughter of the local miller. Perhaps Robert acquired his lasting interest in mills while courting Mary. The first years of their marriage must have been very trying for, apart from some work at Tanworth Mill, Robert was away from home for long periods, only returning for the occasional week-end. He was soon in great demand and millers, such as George Lowe of Sheepy Mills in Leicestershire, often required him to stay at their mills until work was completed or he would not be paid. However, these difficult years did establish his reputation and enabled him to capture his first major 'contract', the maintenance of all the mills on the estates of James Taylor of Strensham in Worcestershire. Summers refitted Sarehole Mill in 1851, and made major alterations to Trittiford Mill shortly afterwards, both being part of Taylor's Yardley Estate. It may well be that the success of this major contract brought Summers to the notice of Charles Couchman, land agent for several large estates in Warwickshire and elsewhere - including the Radcliffe Estate at Wolverton.

Charles Couchman seems to have been greatly interested in the use of water power. In 1852 he had a large pitch-back wheel installed at Temple House Farm, Temple Balsall in Warwickshire, where he was the tenant farmer. The wheel drove one pair of stones and much farm machinery in adjacent buildings. This may have been erected by Summers who certainly extended and improved the drive in later years. In 1861 Couchman approved the installation of a new waterwheel at Blyth Mill on the Dugdale Estate near Coleshill, it being designed and erected by Summers. Thus, when asked to find a millwright to carry out the alterations to Wolverton Mill, Couchman naturally turned to Robert Summers.

Summers put in his first estimate in May 1868.

I Robert Summers of Tanworth in the County of Warwick will hereby agree with C.Couchman Esq., of 27 Temple Row Birmingham for the undermentioned machinery and millwork proposed to be put in and done at Wolverton Flour Mill, now in the occupation of Mr. E. Read.

Specification

For a new iron pillow plate and holding down bolts and nuts and pedestal and brass to inside end of water wheel shaft.

For a new nave keyed into wallow that works into the present pit wheel. Also a new wrought iron intermediate shaft turned from end to end with a collared journal. Also 2 plummer blocks bored and fitted with bolts and nuts.

For a new pair of intermediate spur wheels one a mortice wheel turned with wood cogs and the other a iron toothed wheel turned pitched and trimmed bored and keyed upon shafting.

For a new wrought iron main driving horizontal shaft turned from end to end with collared journal. Also 5 plummer blocks and brasses with iron caps bored and turned to fit shafting. Also a wall box to receive one end of the said shaft.

For 3 cast standards and 6 columns fixed upon the standards and 6 forked brackets fixed upon the columns. Also 3 cones to receive and support the bedstones fitted and bolted together. Also 7 set screws and nuts to each cone to adjust the bedstones.

For 3 iron mortice bevel driving wheels turned and geared with wood cogs keyed and hung upon main shafting. Also 3 iron stone pinions turned pitched and trimmed. Also 3 conical slip boxes bored out and keyed upon the stone spindles.

For 3 wrought iron stone spindles with steel necks and toes and pivots turned from end to end. Also 3 sets of centre irons with steel driving pins and plates fitted up with sliding dies. Also 3 iron bushes turned and bored with brasses fitted in and bored to spindle necks with collars screwed into the top of bushes turned and bored. Also wedges, screws, collars, stays, pins and thumb screws. Also 3 collars and bolts and nuts to fix the bushes in the bedstones.

For 3 centre lifts bored and turned with set pins to adjust the toe of the stone spindles. Also 3 new toe brasses bored and turned to fit the spindle toes. Also 6 screws, nuts and 3 spanners and levers to adjust the runner stones.

For 3 sets of screws rings and rods and hand wheels to take the stone pinions out of gear.

For 6 holding down bolts and nuts and plates and cotters to fix standards to masonry work.

For a new wrought iron upright shaft turned from end to end fitted up with face coupling bored and turned with bolts and nuts to continue from bottom floor to under side garner floor. Also a cast standard and pedestal and brass with set pins to the toe of upright shaft. Also 2 plummer blocks and brasses to support upright shaft at the stone floor and the floor above. Also iron frame carriage and plummer block and brasses fixed under garner floor to support top end of upright shaft.

For a iron bevil mortice wheel turned and geared with wood cogs and hung upon main driving shaft. Also iron pinions turned pitched and trimmed bored and keyed on upright shaft to give motion to the said upright shaft.

For a iron bevil mortice wheel turned and geared with wood cogs and keyed and hung at the top of upright shaft. Also 2 iron pinions to work in the same turned pitched and trimmed and bored and keyed on and to give motion to the longitudinal and transverse shafts.

For a wrought iron longitudinal horizontal shaft fixed under garner floors fitted up with coupling turned and bored and bolts and nuts. Also 1 hanging carriage and brasses at wheel end. Also 2 hangers and brasses to support middle part of said shaft. Also 1 wall box, plummer block and brasses to carry wall end of shaft.

For a transverse horizontal shaft with hanging carriage and brasses. Also wall box and plummer block and brasses. Also iron pulley turned and bored and hung upon this shaft to drive the dressing machine.

For a short horizontal shaft with 2 iron pulleys to drive said shaft with 2 hangers and brasses bored and fitted with bolts and nuts.

For a pulley to drive sack tackle turned and bored and hung upon short horizontal shaft. Also a sack tackle with iron shafting and a large pulley and carriages and brasses with 2 chain rollers 1 to use in the mill and the other to unload the waggons with etc. Also with friction pulley levers etc.

For a new bolter with iron shaft and springs to carry the cloth with iron bridge trees to adjust with screws with feeding hopper and 2 driving pulleys.

For a new flour dressing machine with iron case lined with wood with a 16 in. revolving cylinder with external brushes to clean the wire. The wire to be fixed in the cylinder with springs to carry 7 sheets of wire. Also a silent feeding apparatus with shafting and pulley.

For a new pair of French stones 4 feet diameter faced and furrowed and put to work.

For a set of meal creepers and elevators with cams, shafts, and pulleys to drive the same to conduct the meal from the stones into the garner over dressing machine.

For 3 new stone cases with iron hoppers and silent feeding pipes and cones and levers and screws.

The whole of the before named work shall be done in a strong substantial and most workmanlike manner to the entire satisfaction of my employers for the sum of six hundred and seventeen pounds and take to the old materials and my employers to find all leather banding pay for carriage to and from my shop to the mill do all brick and masonry work and floors garners etc. Also all sleeves lines bolting cloth, net and wire and brushes to dressing machine.

Robert Summers

Tanworth May 6th 1868

Additional Work to Order	£	s	d
One pair Derbyshire	15	0	0
One pair French stones & faced & furrowed etc.	30	0	0
Shaft continued across new room from crown wheel & hanging & wall box etc.	8	10	0
New grindstone iron frame new spindle and 2 chairs 1½ dia. and 4 pins			

This was subsequently approved and work commenced in about November of the same year. Slow progress provoked the following letter from Mr. Aveline, the estate builder.

Wolverton Mill
Stoney Stratford
December 24th 1868
Dear Sir

I am very sorry I am obliged to write to inform you respecting the mens work. Pray come and see to them. I will say no more. What am I to do respecting the wages. Let me know by Saturday by a telegram if no other way, as they are making short time over
Yours truly
F.Aveline
They are bad
Your work sent up good

This was shortly followed by a sharp reminder from Charles Couchman:

Wolverton January 5th 1869
Dear Sir

I came here this morning to look at the mill works - partly in consequence of hearing that your men were neglecting their work and was very sorry to find the mill shut up and no work going on. I must request you to see me in Birmingham on Thursday. For at whatever inconvenience and trouble it may cost, I must attend, by yourself or by someone on whom reliance can be placed, to the completion

of the mill without further delay.
Yours faithfully
Charles Couchman

Despite this 'threat' work continued into March 1869 when Summers received this letter from one of his millwrights.

March 3rd 1869
Sir

I wright to inform you that we have nearly gone on as fure as we can we have got the upright shafts fixhed and all wright and shall have both the hother tow conected to it by Fryday night tonight.
The beed stonies are all fixied and radey to have the runers put down aney time and we canot go on much ferther till we get the other shaft.

i herd from Mr Avling today that Mr Couchman is coming on Fryday so i write to ask you shold like to bee hear and see him as he can see the mill aging if not if we must come home on Saturday.
for we shall have done all we can by that time
E.Robinson
from Stoney Stratford

More delays followed, and more threats from Couchman. The main problem seems to have been the slow progress Summers' men were making without his supervision. However, it would appear from the above letter that this was not entirely their fault. Considerable ill-feeling seems to have been generated, to the extent that one millwright, Fred. Johnson, walked out. A letter from Charles Hyde, assistant to the miller Edward Read, shows the state of the mill, and hints at problems ahead.

High Street
Stoney Stratford
April 29th 1869
Mr Summers

Sir I have sent them tops to Briminghim in a letter box. as for Fread he never came to work untill Satuarday so I had two days to take for, I here that he is gorn to work at the station but I don't know how true it is. Mr Couchman was at the mill on Tuesday I was grinding when he came to the mill. Is cleared out and I told him in a bout a fortnight he seamed quite pleased we had made a start and sed he thought it work well I hope sir you will come as soon as possible can Mr Read seams to begin to get a littil uneasy a dressing some flour I told him we could not dress any untill you came again with the straps.
Yours respecty
Chas Hyde

Disaster struck at the beginning of May.

Temple Balsall Birmingham May 4th 1869
Dear Sir

Mr Read writes from Wolverton "we are standing still not being able to work" "the large water wheel - the stone that the shaft lays on has given way and partly brought the wall down through the wheel not being hung straight" This must be attended to immediately and I wish you to tell me exactly when the remainder of the work will be finished.
Yours faithfully
Charles Couchman

Repairs were soon effected, but doubts were beginning to grow concerning the ability of the main waterwheel to drive all the machinery on that side of the mill. Edward Read expressed his concern at the end of May, 1869.

Calverton
May 29 1869
Dr Sir
We have the mill full of meal and want to commence dressing shall you be up early next week with the other plant or will you come up to start us. I don't think the large wheel will scarcely drive the dressing machine we put two pair of stones on her today and she scarcely moves them fast enough to do any amt. of work an answer will oblige
Yours truly
Edward Read
Mr Summers

After visiting the mill Summers wrote to Couchman.

Tanworth June 5 1869
Sir
I beg to inform you that I went to Wolverton last Tuesday on purpose to start the flour machine when I am sorry to say that fears I have lately entertained as regards the water wheel were realised. When I got there we soon started the machine and I soon found out the water wheel would not drive it. I felt quite at a loss to know what to suggest. However by making enquiries I found that there are some boards which are usually put on the weir in the summer months. We put them on and when the water got up to the proper head we started again. The while the water was rising I took the machine all to pieces to see nothing was amiss in that and properly adjusted the brushes and put it together again when we started again it would drive it but it is all it would do. The machine went very well indeed which I knew it would do as I consider it as good a machine as ever I made. I consider them (as others do that have tried them) that they are second to none. Sometime after we had started I suggested we should put a little more water on and a little more feed on the machine when we put more water on the wheel it nearly stopped it which is such a thing I never saw before under any circumstances this thing at once convinced me the water wheel was good for nothing - and that is just what it is. Of course the more water is drawn upon a wheel the more power you would suppose it would drive but such is not the case, for the wheel will not transmit the power if all the water in the dam were loosed upon it at once - for it has not the power and is not capable of receiving the power. I consider when the machine is up to full speed and work it will take from 7 to 8 h.p. to drive it this is the maximum a wheel of such dimensions and so little power I never saw before. If it had power enough I find it sadly too weak. When the full head of water is on the plate that goes across under the shut springs and gets in contact with the wheel it did not do this till the wheel boards were put on. That is sufficient to prove that part is too weak also. I can alter the shut to give the wheel a little more power which I purpose doing when I go there again but it will not do any good without having a new wheel. You will have as good a lot of machinery in that mill as any mill you can find and well got up and properly constructed for the work. But the main thing is defficient that is the motive power. This is work constructed and done by the late tenant Mr Barter. Of course this is not a pleasant thing for me to communicate to you as it must be the same with you as with myself a very great disappointment but still it could not possibly have been obviated.
It requires a wheel very similar to the one I put in at Blyth Mill in 1861 there is but about 14 or 16" more fall. I beg to say when I see you over at Wolverton I will explain these things to you
I am sir
Your very obt servt
Robt Summers
C.Couchman Esq

No immediate decision was made about the waterwheel, and repairs to the shut made some improvement. However it was still not capable of driving the flour machine at its correct speed. Other work continued, including the fitting of a

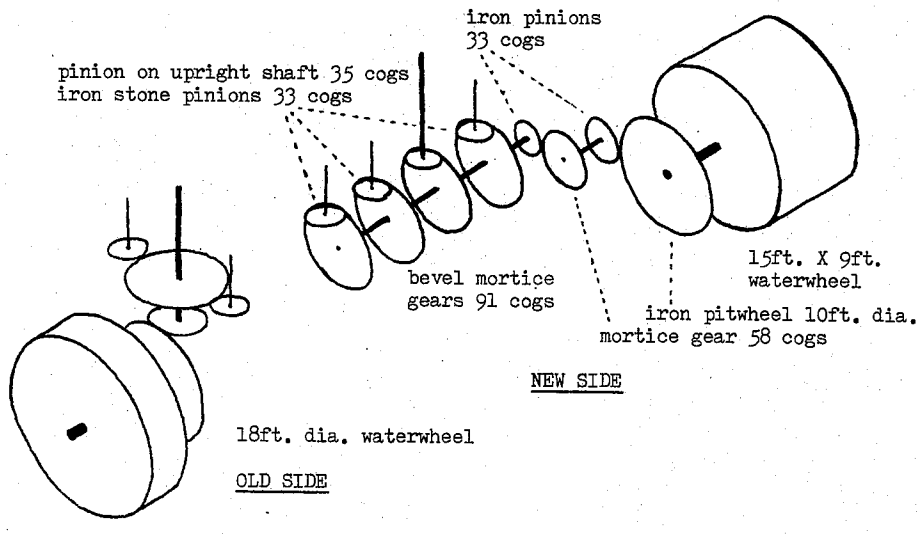
smutter with its exhaust fan, and two sets of creepers. All this worked satisfactorily and by early July the millwrights had started erecting a new bolter. Edward Read wrote to Summers on the 15th July.

From Edward Read
Wolverton Mills
Nr Stoney Stratford, Bucks

July 15th 1869
To Mr Summers
Tanworth

Dr Sir
Your men will be at a stand in a day or two can you come up and bring the cloth for bolter and I wish to see you as we must have some more speed on the dressing machine it takes 7 hours to dress 25 sacks flour do you think of having the new wheel of less diameter to have better fall behind.
Yours truly
Edward Read

Obviously the owners had accepted that a new wheel was required. Read must have discussed the matter with Couchman, suggesting that a wheel of smaller diameter would be better suited to the site. The old wheel was about 18ft. diameter, whereas they proposed the new one should be 15ft. diameter. Summers had considerable doubts about the thinking behind this, and continued to advocate an adaptation of his successful design at Blyth Mill which was only 2in. smaller in diameter than the old wheel. Somewhat surprisingly Couchman favoured Read's suggestion and the Trustees duly approved the fitting of a new 15ft. diameter wheel. Perhaps a lower financial outlay was one of the deciding factors.
The new wheel was installed in November 1869, coinciding with the arrival of a new miller, J.G.V. Field Johnson. Right from the start he proved to be a most difficult man to please, constantly complaining about the slow progress in completing the wheel. No doubt he was most anxious to show his ability to make the mill a profitable concern, and was frustrated by being limited to using only the secondary wheel and its two pairs of stones.
When the new wheel was finally completed, Summers prepared inventories of all the machinery in the mill, customary practice at the start of a new tenancy. Dated 27th November, 1869 these show that the 'new side' now included a 15ft. diameter by 9ft. wide waterwheel with thirty buckets, driving a horizontal shaft through an intermediate gearing stage.



It must have been a considerable relief to Robert Summers to feel that a most difficult job had at last been completed. For nearly a year all seems to have gone smoothly. However, in the autumn of 1870, Field Johnson complained bitterly to Couchman about Summers' workmanship. He was unable to operate the new machinery satisfactorily, notably the flour dressing machine which had broken down. After visiting the mill Summers wrote to Couchman.

... I consider the machine was broken from some accident most likely by one of the Brushes getting loose I am only surprised the damage was not more serious it is put right and goes and does its work well and if kept clean with the bearings attentively lubricated with good oil it will work well and easy for the quantity and manner of the work it does.

Mr Johnson has not sufficient strength to work his mill Mr Hyde the Miller is often away from the mill attending the markets 2 or 3 days a week during his absence the mill is in the sole charge of his son a mere youth. if this system of management is continued something more serious will and must inevitably occur

I think it not right or safe to leave the mill in charge of such a youth. I got the information from the boy by asking him a few questions neither his Father or Mr Johnson know anything about it that I have done so. The same information may be got by others if the Boy was asked the questions by himself. Any practicle man would at once see that it is not safe right or reasonable for a Mill like that to be worked in this manner and expect things to go on straight forward. Then if anything is amiss Mr Johnson (without ascertaining any cause) immediately writes and says things are broken by excessive friction just as he had before stated when at the same time if he would give himself the trouble to examine he would find the things gummed up with bad oil the same as I found the Machine when I took it to pieces.

I noticed another place Mr Johnson will I presume have occasion to write about soon that has been neglected and that is immediately over the Crown wheel in the same floor as the Machine stands in I mean the brasses at the ends of the Longitudinal and Transverse shafting They were scarcely worn at all the last time I was there but now the Brasses to the Transverse shaft are nearly worn out I did not say anything to anyone about it for I should like you to see the state they are in which if you had the caps and top brasses removed they would be found in a bad state and no doubt the brass impregnated in to the bearing surface of the shafting .....

By the end of November some of these difficulties had been resolved, though Summers felt he had been subjected to much un-deserved criticism.

Stoney Stratford November 25th 1870
Dear wife

I think of getting to Hampton station in the morning at 10.56 if I don't come by that they must wait till the next which will be about 1 o'clock. Mr. Couchman has been over and gone away perfectly satisfied so I have got through this ordeal of trouble as far as that goes. He asked me when he came what was the matter when I said I did not know I wanted to know from him or the party that had given him the information so he asked the miller how everything went and he said very well. I told him I had not broached the subject so he could not say I had said or done anything to get them to say I had induced them or him to say anything only what he thought. I commenced and opened my mind pretty freely and wished them to have anyone that was competent to overlook it and I would abide by the consequence. I considered they had injured me both morally and meritally and no doubt otherwise too and it would serve them right to make them pay for it but still I must console myself by finding things thus far pleasant. They have made a good job of the river it takes all the water away from the wheels very near a foot or it ought for it cost £349 some odd shillings. I hope you are getting on well at home and hope you are better and all the rest none the worse but better than when I left. I should like one glass of William's punch I daresay there are some that had one glass too much .....

For the next three and a half years Summers was able to forget Wolverton Mill and the problems it had brought him. There was certainly no shortage of work. In 1871 he completed major alterations at Hurst Mill, Kings Norton near Birmingham for Aaron Jones, his brother-in-law, and at Alvechurch Mill. In 1872 he entirely renewed the gearing and machinery in Blyth Mill on the Dugdale Estate near Coleshill. This estate was managed by Charles Couchman who obviously still trusted Summers' ability despite Field Johnson's complaints.

Sadly the peace was not to last, and one can only imagine Summers' despair when the following telegram arrived in February 1874.

From Mr Field Johnson
The Mills
Wolverton

To Mr Summers
Tanworth
Hockley Heath

15/2/74

Dressing machine has smashed up inside same as before arms broken fault of feeder come up directly very busy

Other work prevented Summers from starting repairs to the machine until the beginning of March. He took this opportunity to introduce one of his sons, Alfred, then aged fifteen, to the rigours of the trade of millwrighting. With the vitriolic nature of Field Johnson to contend with, it was very much a case of throwing him in at the deep end. By this time Robert Summers must have been looking for a successor from amongst his six sons. The eldest, William, had helped in the business for some years but after a series of disagreements with his father left to become landlord of the Bell Inn at Tanworth. His second son, Robert, to whom the following letters were addressed, helped with the office work but was in no way mechanically minded. Hubert, the third son, had served his apprenticeship at Wootten Wawen and Kings Norton Mills, but eventually established himself as a baker in Kings Norton village. Thus the continued success of the business seemed to rest squarely on young Alfred's shoulders.

Stoney Stratford
Bucks
March 4 1874
Dear Son Robert

You will be glad to know we arrived here all right punctually at the time specified viz: 12.20 at Wolverton to the minute. Mr Johnson sent a heavy horse and cart to meet us Wheeler loaded the things in that and came to the mill but in consequence of me writing to old Pinfold about getting us lodgings he works for Mr Aveline (the estate builder) so when he heard from me he told him I was coming so he very good naturedly came to meet me with his trap. Mr Johnson and him are not good friends so he did not take us out of the road down to the mill. I have come to my former lodgings viz: Mrs Gardners near the post office where you can direct to me, the young man is out of his time as an apprentice here and is gone to America so Alfred will not have him for a companion. Alfred has just patronised the knight of the scissors comb and brush. We came here and had a mutton chop for dinner and have now had tea with toast and it is nearly ½ past 7 o'clock. Mr Johnson was not at home he was gone to Winslow market. We put the hopper together and got the old one out. I find there is one piece belonging not come. I wish Humphrey and Tom were obliged to carry it here and walk all the way each one having one end in his teeth. I think it would be a means of curing them of their gross carelesness. It is a piece where the slide goes in a stretcher I may term it. I have had another made. I shall write again tomorrow night. I hope Lock got home alright with the coal. Perhaps you there as named will be off to Brum in the morning. I hope you are all going on well and I hope your mother is better and my poor lad too.
With kind love to you all
I remain your
affectionate and loving father
R. Summers

Stoney Stratford
March 5 1874
Dear Son Robert

It has been a fine day which you and Sarah Ann would duly appreciate if you went to Birmingham. If you have done so I shall not have a letter in the morning which I shall be disappointed without. I had a letter from Mr Couchman this morning. He is coming here to see me at 11.30 a.m. so I think I shall come home tomorrow when you can meet me at 7 o'clock at Knowle or rather send. Perhaps Lock will come or Mumford. I hope you are getting on as well as you can and hope your mother and Albie are better and all the rest well. We are getting on pretty tidy up to the present. I have not had anything the matter particular yet and hope I shall not while I am here. Alfred seems all right. I think he likes it at present but how he will when I leave him I don't know. He will manage well enough if he can get up in the morning. I hope the cow pigs and poultry are all being attended to as well without us together with the old pony. Now must conclude with kind love to all.

I remain your
affectionate father
R. Summers

Couchman's visit was to tell Summers that Field Johnson had asked the Trustees to sanction extra machinery, which included two more pairs of stones, and that this would necessitate major alterations to the waterwheel. Summers duly prepared the following estimate.

I Robert Summers of Tanworth in the County of Warwick will hereby agree with C. Couchman Esqr of Temple Balsall in the said County of Warwick for the undermentioned new machinery and alterations of Machinery proposed to be done at Wolverton Mill Stoney Stratford Bucks:

Specification

For lengthening 18 arms of the water wheel and 18 new segments fitted up and part new buckets and converting the present buckets also new joint strips, angle plates, rivets and screw pins and making the water wheel 18 feet diameter and 9 feet wide.

For one new double mortice spur wheel in 2 parts and bolted together geared with about 206 cogs in 2½ pitch 7 inch face and 13ft 7 3/4 diameter Also an iron pinion to work in the same with 33 iron teeth in turned pitched and trimmed to hang upon main horizontal shaft.

For machinery for 2 pairs of stones viz: 2 standards, 4 columns, 4 forked brackets, 2 cones with set pins lock nuts, bolts, 4 holding down bolts, nuts and plates Also 2 spindles 2 centre lifts with levers, screws and spanners. Also 2 sets of raising screws rings and rods to take the stone pinions out of gear. Also 2 bushes collars, pins and brasses also 2 sets of centre irons, 2 stone cases hoppers etc. one with silent feed and one to feed with a damsel also 2 screws and hand wheels to regulate the feed

For lengthening the main horizontal shaft and new bright face coupling and altering the present shaft and 2 new plummer blocks caps and brasses

For collaring and altering the present upright shaft and part new shaft 3 inches diameter and new bright face coupling also 3 hanging brackets and bolts and nuts to fix them Also 2 wall boxes and this shaft to be placed transversely in the machine floor

For one iron pulley 8 feet diameter 10 inch face in 2 parts and bolted together and turned and slotted to hang upon the main horizontal shaft also a pulley 2ft 2inches diameter double flanged turned bored and slotted to hang upon the 3 inch transverse shaft

For lengthening the present longitudinal shafting Also one bright face coupling Also 2 hanging brackets, brasses and pins Also a pair of mitre wheels

One skeleton turned and bored geared and slotted and one iron teeth turned pitched and trimmed bored and slotted one of them to be hung upon the 3 inch shafting and one on the 2 1/4 shafting to give motion to the latter

For 2 pulleys 2ft 6inches diameter 6 inch face bored, turned and keyed upon

shafting one on the 3 inch shaft and one on the 2 1/4 transverse shaft to give motion to the latter which drives the smutter &c

For extra lengths of wheat and meal creepers with spindles, carriages and boxes

For 2 pair of iron bevil wheels to drive the stones the large wheels turned slotted and geared 91 cogs in each and the 2 pinions iron teeth turned pitched and trimmed Also 2 conical slip boxes turned, bored and slotted and hung upon the stone spindles and the 2 pinions bored and fitted on the 2 conical boxes

The whole of the before named work shall be done in a strong substantial and most workmanlike manner to the entire satisfaction of C.Couchman Esqr for the sum of Five hundred and sixty five pounds and the old materials exclusive of carriage, erecting, masonary work beams and floors

Robert Summers
March 18th 1874

How Summers must have wished that Couchman had listened to him instead of Edward Read back in the autumn of 1869. If an 18ft. diameter wheel had been installed then much of this expense would have been saved. In the meantime repairs to the flour machine were completed and at last it worked well, dressing twenty sacks on the first morning of use.

No firm decision was made about the waterwheel and machinery at this time. It is quite possible that the Trustees were reluctant to lay out such a large sum of money. Another problem was the miller, Field Johnson. He truly was a most determined man with very definite views about what he wanted in the mill. Some of these views he expressed most clearly in a letter to Summers.

Memorandum

From
J.G.V. Field Johnson
The Mills, Wolverton
Near Stony Stratford

Sep 10 1875
To Mr. Summers

Dear Sir

I sent Mr Couchman an illustrated book of Turbines - there are no wheels like them for power and Economy of water. A friend of mine has displaced two breast wheels in Canada and substituted Turbines and with about the same water as our wheel is now using and a 9ft head. He grinds 36 bushels wheat per hour and dresses at the same time besides running Smut Machine (which cleans 70 bushels an hour) Middlings Purifier Bran Duster and Flour Packer. They grind 12 bushels an hour on each pair stones and run them about 180 per minute. I trust you will endevour to make all things from the most modern and improved priciples and that we may be able to use our water power to the best advantage - there is great need of new flood gates which should be done at same time - as the present ones have been in 30 years and are getting very rotten indeed. Please mention to Mr Couchman I want a Middlings Purifier and Bran Duster. Don't forget these things.

Yours truly
J.G.V. Field Johnson

Neither Summers nor Couchman seemed very impressed by all this, and eventually the Trustees agreed to Summers' estimate of March 1874. The main wheel was to be enlarged and two extra pairs of stones added. When this was completed the old secondary wheel and its machinery was to be removed to make room for further auxilliary machinery. However, Field Johnson repeatedly delayed the start of these alterations, perhaps hoping to persuade the Trustees to finance his rather grandiose schemes.

It was not until the 20th June 1876 that Alfred Summers arrived at Wolverton and began dismantling the main wheel and primary drive. This proved a lengthy task not being completed until the middle of August. Progress had been delayed by the death of Alfred's mother late in July, when all work ceased for a few days. The task of lengthening the arms of the waterwheel began late in August and occupied the time of five millwrights, six days a week, until the middle of

October. Surviving time sheets show that the work-force consisted of Alfred Summers aided by Samuel Harris, senior millwright, Thomas Perks, carpenter and pattern maker, John Osborne and John Chidney, millwright. On October 23rd they were joined by Edward Wheeler, another millwright, and these six remained at the mill until December 23rd. Throughout this time they lodged in Wolverton, returning home for the occasional weekend, when they would leave the mill late on Saturday and return on Sunday evening.

This reconstruction of the waterwheel took rather longer than expected, partly because it was soon realised that although simply lengthening the arms, fitting new rim segments and buckets would give the required size of wheel, it would not have the rigidity to withstand continued use. Therefore Summers incorporated eighteen stays to brace the arms and twenty-four diagonal stays across the wheel. This involved fitting many sockets on the naves and rim segments to receive these stays. At the same time it was decided to increase the size of the pitwheel from 206 to 220 cogs. By Christmas of 1876 the wheel was complete and the main horizontal shaft had been extended to allow for the extra pairs of stones. However, much work remained to be done on the stones themselves and the auxilliary drives.

It is amazing that Field Johnson had managed to restrain his temper over such a long period, seemingly totally out of character. It must have been a most frustrating time for him. For six months he had only the secondary wheel in use, and as a consequence his income must have declined considerably. However, on January 6th 1877, he returned to form. The age of the letter and the ill-temper of its author have made some words illegible, but it is not difficult to fill in the gaps!

The Mills
Wolverton
Jan. 6 1877

Dear Sir,

I will say Aveline and yourself have been the bane of my existence during the past seven years and had I nothing to do with either I should be a richer and happier man.

The water was off the road on Sunday night and continued down until Wednesday night when it rose again but went down again yesterday.

..... that the ....has been a very trying time about and as to the stank I don't see that it hindered you one bit or need not have done so. Neither of the former stanks would have stood 12 hours against the water we have had the past 3 weeks. Neither were they intended by ..... to be more than temporary as both he and I understood that you were going to put floodgates immediately as in your letter to me on October 1875 you say if I will let Aveline ..... the old ..... and put the gates in ..... I have been more insulted and annoyed during the time I have had this mill than all the rest of my life by a hundred times over. Not by my own seeking but by a man who is employed by Mr. Couchman and who endeavours to make people believe Mr. Couchman employed me.

I have told Mr. C. this as plainly as I tell it you and yet it is allowed to continue. Last evening I was at the "George" at Stratford transacting business and Aveline came in ..... drink making great ..... out of one room but ..... and he immediately followed and made still greater noise. He never spoke to me but nearly the whole of his conversation was directed at me - talking about millers and he had shot a wild duck close up to Johnson's Mill and all such stuff intended to annoy. This thing goes on every time he meets me in a public house which only occurs on market night. If he addressed me I could defend myself but his conversation is addressed to other persons who know that it is intended for me. Mr. C. can stop it all

Yours truly
J.G. Field Johnson

Mr Summers

I have been in contact with good ..... who has been used to Blacks exhaust silks - and has worked both in steam and water mills - but it is useless me

engaging good man if we are not to have silks and other things which are common to most mills at present time.

What I complain about is that you seem so much longer over this work than other people, for instance Rogers commenced ....., silks, exhaust, elevators, creepers etc. and has been at work several months.

A few days later he followed up with this brief note.

The Mills, Wolverton
Jan 11 1877

I think some person should be here to see that your men are at work or otherwise -

J.G.V. Field Johnson

Field Johnson must have made his complaint to Couchman, who immediately contacted Summers. Although this letter has not survived, it would appear that Couchman accepted the accusations and attacked Summers' work most vehemently. Summers' reply is a rather saddening attempt to justify himself.

Sir,

I did not return from Wolverton till late on Tuesday night and have been out every day since till today or else I should have written before in consequence of your intimations and observations made to me on Tuesday last. I have no other course to pursue in vindication of my character. I think it quite conclusive that the unpleasant remarks did not emanate from your own ideas in as much as other parties have made similar statements to the Men.

What you felt disposed to prefer against me you have not the slightest foundation for doing - you make it appear as if I was using old materials that are worthless and putting them in - in lieu of new ones I ought to find. This I emphatically deny. I will only refer you to the specification to prove it to be false. I know you would not send me to a place to estimate for work with instructions to throw out materials equal in every respect to new. It does not seem reasonable that I should or you wish me to do so. That was perfectly understood in this job especially in the water wheel.

Then again you say I have driven you into short days in the winter - this is Mr Johnson's fault. I was as well prepared to commence last March as I was at the end of June but this Mr. Johnson hindered me from doing and I have his letters to prove it. I knew it was wrong to defer it but still I had no alternative only to submit to his wishes. As far as this is concerned will make no difference as my Men are making the full time charged. (better time than any Men on the Estate ever make or ever have made at this time of year). They never lose any time in drinking they are all steady Men.

Then again Mr. Johnson takes upon himself and presumes to judge and compare with other work which is a thing he knows nothing about. However I should say so from his observations. He talks about places fitted up in such a time etc. - not taking into consideration the different circumstances of the attending work. He knows or ought to know we were compelled to stop before we could fit the water wheel up. We had to take it out and bring parts to my shop and fit them up with the new which we did. Then had (after fitting it up here) commenced to erect. Then he says (as I believe him to be your author) that I am doing work at the Mill which I ought to have done at Tanworth which if he had got the slightest sense or knew anything at all about it he would know it was a total impossibility and never contemplated by me nor I never dreamt it would be by anyone else.

Mr. Johnson should be more cautious how he writes to give you information. The way I understood you I consider it is nothing short of a deformation of character. It shows me up to be a dishonest Man or in plainer words a downright rogue one not worthy of your confidence which I shall defy any one to prove. The contents of his letter I should like to see, and if it is as I suspect, I shall give him a chance to try, if he has worded it so as to make himself amenable. It would be far less trouble for me to find an appropriate and not less unenviable name for hime. I have felt myself unnerved since it very much upset me altogether for the whole of Tuesday. I had a very particular job to do that day, that was to

fix the work that conducts the water on the wheel - and it was with the utmost difficulty I got thro it. When I have work of such importance to see to I don't like to converse with anyone as it often interferes with carrying out work to the best advantage. This all thinking men know. Then what effect do anyone suppose it would have upon a person receiving as I did (from an employer who I had always endeavoured to serve to the best of my ability) such an amount of undeserved censure. I feel it most acutely and find it most discouraging.

Mr. J. has made several intimations to me of different things he wants and wishes me to ask or lay it before you. This much I shall decline to do in future for him. What I feel myself compelled to ask about I shall but nothing further.

Before starting the mill we shall want a large Band to drive the overhead shafting. This was understood from the first but I thought it best to name it again. The work is taken out by this. Where I find brasses worn out I suppose they must be renewed. I also wish you would make up your mind about the trough for the large pit wheel to work in as I know there must be one. The Builder and Bricklayer says it is quite impossible to keep the water out. You will see all my reasons and the damage you will be liable to in a former letter. I am serving your interest by pressing this. It is not machinery only a protection.

I am Sir,
Your obedt. Servant,
R. Summers

Summers was obviously deeply hurt by Couchman's comments - not so much about the long delay in completing the job as he felt he could account for that, but that the quality of his work was being questioned. This was the first time Couchman had doubted Summers' ability as a millwright. Nevertheless work continued and the mill neared completion by mid-February. The relationship between Summers and Field Johnson would appear to have improved somewhat - much to everyone's surprise.

Stoney Stratford
Bucks
Feby 19th
1877
Dr Son Robert

I got here all right just after 2 p.m. at the station. I had my tea at the mill and then came up here to write this letter and one to W.J.S. I shall not come home until Wednesday. Mr Johnson wants me to go with him and look at an engine tomorrow afternoon one that he wants the Trustees to buy but I know Mr. Couchman will not do it as he had written to him about he told me at the office this morning about it before I left B,ham this part I have not informed Mr. J. of I don't know when or which way I shall come as I have got to see Mr. C. when I go back to let him know about the accts he did not give me the cheque to pay Franklin but found more bills which I have to see to and he wishes me to call as I come back.

I forget to tell S Sparkes to damp the horses chaff just tell him Mrs Gardener tells me that Alfred has been very poorly with a bad cold but he is now better with his usual retinence he said nothing about it but appeared as well as usual however when I saw him and shook hands with him he said he was very well He tells me Ned Wheeler is going to give me notice to leave but Ned has said nothing at present. He is going to New Zealand he will stop and work till just before the ship sails if I wish Tom Perks is tired and wants to go home I think I shall let him do so on or about Saturday or the beginning of the week so the pigs pudding will keep till then I hope as Tom may have a yard or so
With kind love to all
From your affectionate
Father
Robt Summers

From Stoney Stratford
Bucks
Feby 21st 1877

Dr Son Robert

I purpose coming home tomorrow as I said last night so you can tell William I hope you are getting on all right at home. I received yours this morning Poor old Mrs Irons gone at last I dare say If Tom had been at home he would have got the job to make the coffin I went with Mr Johnson this afternoon to see the engine I think nothing of it. When I came back I went in with him and had a hot glass of Whiskey and water and tea when I got into the mill I found a large cross in chalk I suppose placed there in amasement of such an event. However I ordered it scrubbed off. I have been rather middling since tea but am now better. I find Alfred has been very poorly and has had medicine from a druggist and is taking some now and is better.
With kind love
I remain
Your affectionate
Father
R. Summers
P.S.
I paid White this morning and have Franklins bills put right

The job was finally completed on the 24th February 1877, and all the workmen returned to Tanworth. However, the following letter soon took Summers back to Wolverton.

The Mills,
Wolverton
Feb 26th 1877

Dear Sir

Rogers is propagating a story to the effect that the Trustees withdrew their action and that he claims his costs from them. I had letter from Trustees Solrs. to say they stopped action as Rogers in his pleading admitted their right to erect boards during the summer months to the height of 5 inches above the iron flange and as Rogers had only infringed their summer rights they did not think it worthwhile to go on but the winter right was in no way abandoned.

I trust you will endeavour to see Mr. Couchman on Thursday as inform him how matters stand as I think the Trustees ought to have notice of the facts of the case appear in our local paper.

I am firmly under the impression that the matter is not settled but deferred and that Rogers will be troublesome again. I have no doubt he sent his men on Sunday week to see if the boards were erected again. Mr Worley was Rogers' Solr. in the case and he and Aveline went to White and took a mean advantage when in his office to look at his books to see when the mill wheels were taken out.

I cautioned White against giving them any further information. He said he understood that Worley was employed by the Trustees.

We had five pairs going this afternoon and I am pleased to say worked well. I trust you will come up and get the creepers for barley set up as there is tremendous dust and unless we have sacking apparatus it will be impossible to keep the clean unless cased in as before which will be far more expense than the creepers. <u>On no account must you leave until the Bran Duster is put in</u>

While investigating the problem Summers made the following notes.

Information from Mr. White March 14 '77

Mr Worley the Lawyer called upon Mr. White's House re some private business - after which he asked about when began the repairs at the Mill. Mr. W. saying what repairs as he had done several lots of work there and he said the repairs at the mill and Mr. W. said about the middle of July and also he could give the exact dates but Mr. Worley said that was sufficient as it was no great importance.

Mr. White did not know Mr. Worley's object in this conversation nor did he know he was Rogers' lawyer.

About an hour or so after Mr. Aveline came to Mr. White's office apparently on business as regards Mr. White supplying him with some materials and then turned or altered the subject and asked the same questions as Mr. Worley. Mr.

White answering the questions not knowing their object but upon consideration afterwards thought there was something strange about it consequently asked Mr. Johnson if he knew what their object could be.

After he had got this information from Mr. White he said Mr. Worley was going to London the next day on this Estate business but could not be certain whether Mr. Aveline said he was going to London as well. Mr. Aveline told Mr. White that Mr. Worley had cautioned him to be careful in giving his evidence. Then he went on to say he was wrong in stopping the water as injured him and others above the mill and he should speak his mind regardless of the consequences.

According to Mr. Aveline's conversation with Mr. White, Mr Aveline considers Mr. Rogers is in the right in trying to do away with the boards.

Mr. White says these may not be his words but to the same purpose - but his were interspersed with oaths.

Rogers was the tenant of Stoney Stratford Mill, the next mill upstream from Wolverton. The boards put on Wolverton weir must have caused back-watering at Stoney Stratford with a consequent severe loss of power.

A new inventory of the machinery at Wolverton was prepared in May, to include the improvements of the previous year. The waterwheel was now 18ft. diameter by 9ft. wide, driving five pairs of stones, four French and one Peak. The grain was fed through pipes to the hoppers which had 'Bazelskin' covers. Pipes from the stone cases led to an exhaust chest. An extra shaft had been added to the gearing to take a belt drive from a steam engine. Field Johnson had at least succeeded in getting his way in this matter. At the same time the primary drive had been altered to allow the pitwheel to be moved out of mesh with the pinion on the intermediate shaft.

Alfred Summers returned to Wolverton in July 1877 and dismantled the secondary waterwheel and its gearing. He also dismantled the main wheel and took out the axle and pitwheel. Alterations were then made to the shut and the wheel re-positioned. No letters record the purpose of this, but it seems likely that the summer water rights problem had arisen again. If Rogers had been able to prevent the boards being put on the weir at Wolverton, it would be necessary to adjust the feed to the wheel, or even the position of the wheel itself to obtain maximum power in low water conditions.

Robert Summers wrote to Couchman on the 20th August about the outstanding balance of the Wolverton account.

Tanworth Hockley Heath
Augst 20th 1877

Sir

Yours of the 18th duly to hand in reply I beg to state that your letter contains the information which I endeavoured from memory to convey to you last Thursday i.e. £412 the balance due to me. which now leaves £212 " 1s " 2½d exclusive of carriage I have not charged for and my sons last journey and time there, which I hope you will give yourself the trouble to make enquiries about so as I may not be at the loss -

I was under the impression I had not received the £200 on Sep 2nd but I see by my Bank book that £100 was placed to my credit on Sept 6. and I cannot account by any Ledger where else I could receive it from. If it was for £200, I received one in cash and so placed the remaining £100 to my credit. So it runs thus -

		£ s d
1875 Sept 2nd	Cash -	200. 0. 0
Dec 9	"	200. 0. 0
1876 July 13	N.B. see if correct	150. 0. 0
Oct 3	"	100. 0. 0
Dec 21	"	250. 0. 0
1877 "	"	62. 7. 3
Feby 15	"	120. 0. 0
Aug 16	"	200. 0. 0
		1282. 7. 3

	£ s d
Acct -	1504. 8. 5½
Cash received -	1282. 7. 3.
	222. 1. 2½

Then there will be the carriage of the large spur wheel to come in from here to the station which I have not settled for yet simply for the reason the Farmer owes me a lot more money and I cannot get a settling I find I am no better off not apparently than I was before I received the last and I wish you would settle the acct. for more reasons than one which I could explain to you verbally but cannot state if you could I should be glad to hear from you to call on Thursday for the purpose when I will explain all to you.

I am Sir
Your obedt Servt
R Summers

C. Couchman Esq

This account would appear to include all work from 1875, so the cost of the original alterations to the machinery would be additional to this, bringing the total to well over two thousand pounds.

One last task remained, the fitting of a new set of floodgates in November 1877 at a cost of seventy six pounds. This is the last record of work by Summers at Wolverton Mill. As far as is known the mill continued to work until well into this century, though it had been idle for some years before the bulk of the machinery was removed during the Second World War. Although the buildings survive, little remains to illustrate the series of mishaps and disagreements which marred the nine years of its reconstruction.

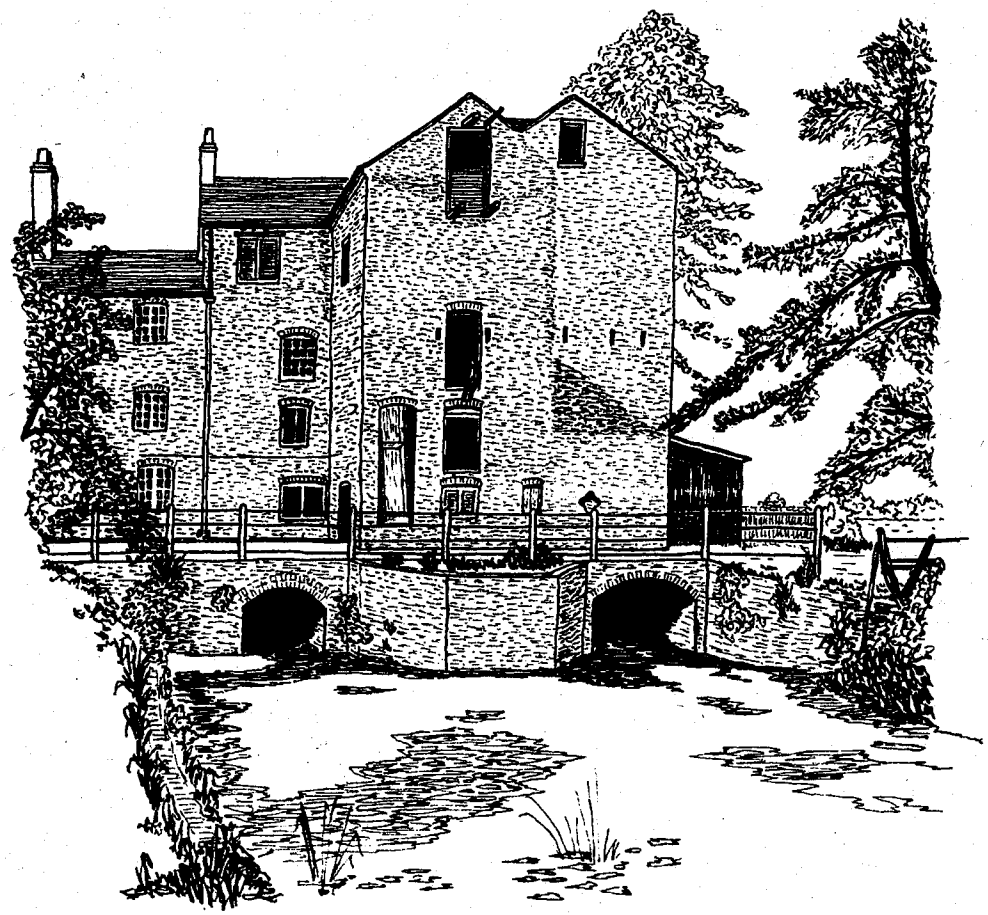
As for the Summers, Robert moved on to other work, now ably assisted by Alfred. Whether the traumatic events at Wolverton coloured his judgement in other mills is hard to say. Certainly he became increasingly against piece-meal replacement of machinery - advising total renewal where necessary repairs were extensive. Whatever the effect, the business thrived until Robert's death in 1890. Alfred Summers then took complete control. Although a gifted engineer, he had little or no business sense. Bills were never paid, accounts never sent out and jobs frequently took many more months than necessary. Orders gradually dwindled and it was fortunate that Alfred's son Norman Summers built up a motor repairs trade which kept some money coming in. Alfred died in 1952, at the age of ninety three, and sadly Norman died the following year. The works was acquired by Leslie Fitch who continued only the motor repairs side of the business.

In 1956 the works was completely modernised, with many of the old buildings being demolished. Until this date a complete record of the firm's history, in the form of letters, accounts and time sheets , is thought to have survived in a store room at the works. However, during the rebuilding, most of these were destroyed, along with a large number of wooden patterns. It is fortunate that a few local people had the presence of mind to rescue handfuls of these papers from the fires. But for their action this information would never have come to light. Also deserving particular mention are those individuals who have given special assistance and encouragement to this research, namely:

John Summers of Cank Farm, Tanworth-in-Arden
Robert Oscar Summers of Kenilworth
Rev. John Jones of Lolworth, Cambridge
The late Reg. Summers

Chronology of Major Alterations

1868-9 New machinery for three pairs of stones to main waterwheel
1869 New main waterwheel, 15ft. diameter by 9ft. wide
1870 River dredged below the mill
1876-7 New machinery for two extra pairs of stones to main waterwheel
Main waterwheel enlarged to 18ft. diameter
Steam engine installed
1877 Main waterwheel repositioned
Secondary waterwheel and machinery removed
New floodgates installed



WOLVERTON MILL