

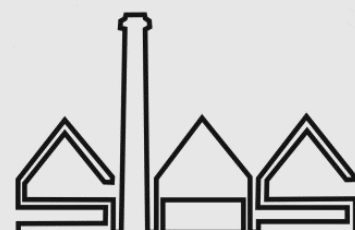
ISSN 0954-7029

**Somerset Industrial Archæological Society**

# **BULLETIN**

## **No. 149**

**April 2022**



**Charity Number 1185669**



*The breaching of Dulverton Weir by the river Barle in December 2012 had far-reaching consequences.*

**Contents include:**

**Wool and Water – an enduring partnership**

**Lindy Head**

**Water and Upton Bridge Farm over the years**

**Tim Walford**

**The history, structure and condition of Dulverton Weir**

**Peter Romain**

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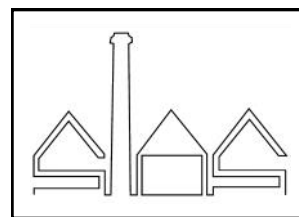
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# **Wool and Water**

## **an enduring partnership in Exmoor and the surrounding area**

### **An Overview**

In this modern era, we are familiar with the concept of electric power generated by water. Our predecessors were no less ingenious when they used waterpower more directly as the energy source in industrial processes such as milling, metal working, wool processing and paper production. Even the most forward-looking current plans for wave power have their precursor in tide mills. A leat, which is a Westcountry term for a mill stream, is a man-made water channel diverting water (usually from a river), which enables a factory or mill owner to easily control the volume and rate of flow of water to machinery. At a more rudimentary level, earth-bank leats are still used in field systems to control seasonal flow of irrigation and mediaeval farmers knew of the benefits to grass growth in flooding water meadows every spring. There is evidence that Dulverton Leat was used to irrigate the area now forming the caravan park with some of the caravan pitches still prone to becoming muddy.

Coupled with water as a source of power is of course the use of water for transport. Exmoor and the surrounding area was served by the ports of Dunster (until it silted up in the fifteenth century), Minehead and Bridgwater to the north and Exeter to the south, were all involved in woollen trading to the near continent. In Tudor times, Exeter was the third most important city in England after London and Norwich, and it has the oldest surviving ship canal in England, built in the fifteenth century so that cargoes could be loaded directly on to ships in Exeter rather than on the coast at Topsham.

It may be useful to remind ourselves of some of the occupations connected with the industry in the past that have now almost fallen out of use:- a clothier is a person or company making cloth; a draper is a wholesaler or retailer of cloth (mainly for clothing); a mercer is a dealer in fabrics especially the finer ones, and a haberdasher is a seller of small items for dressmaking such as scissors, ribbon, buttons etc.

Some occupation-related surnames are: Walker (worker in the scouring process); Fuller (worker in the fulling process); Tucker (a Westcountry term for a Fuller); Weaver, and Dyer.

### **Wool and Prosperity**

In the UK, the wool industry is a very old one. The wealth of many abbeys was based on wool. In late mediaeval times, there was an expansion in the number of merchants trading in the export of wool to mainland Europe. The increased wealth gave rise to the foundation of prosperous towns with magnificent churches, including those in Tiverton and Cullompton. St. Peter's church in Tiverton records the achievements of John Greenway<sup>1</sup>, which are carved in the Greenway Chapel and church porch, built in 1517. He exported cloth to France, the Netherlands and Spain in several craft, depicted variously as a ship with three large sails and seven oarsmen; another as a boat having one large and two small sails and a helmsman; and yet another as more barge-like with five oarsmen. In the church of St. Andrew at Cullompton, an early fifteenth century chapel funded by John Lane<sup>2</sup>, a cloth merchant, has emblems including ships, and the angels in the aisle hold other symbols of his trade such as cloth shears and teasel frames and in Dulverton in 1532, the church had a chapel dedicated to St. Blaize, the patron saint of wool- combers. As always, the real money was made by the middlemen (traders and merchants), not by those growing and processing the wool. The merchants tended to live in the towns surrounding the moor rather than on the moor itself and one can still see evidence of this in the difference between housing stock surviving from this period on and off the moor. Most of old Dulverton and Exford, for example, is made up of small workmen's cottages, but travel a short distance to say Bampton, Wiveliscombe or Tiverton and you can see from the housing stock that there was more money about in these places. It was only when the Victorians 'discovered' Exmoor that larger more substantial houses started to be built in significant numbers on Exmoor.

### **Spinning and Weaving**

Prior to mediaeval times, spinning was done in the grease in the homesteads and farmhouses of Exmoor and the hinterland of Exeter by women and children, using the easily transportable distaff and spindle.

In the 12th century, the invention of the Great Wheel as a spinning machine (at which the spinner stood), enabled those with enough space to be more productive.

Weaving took place in the villages such as Brushford (where in 1621 a man's will showed that he owned a loom, and in 1626 another owned two looms), and Exebridge (where there was a weaver's shop)<sup>3</sup> as well as Exeter itself. This system of spinners and weavers as out-workers persisted from late mediaeval times until its decline in the early 18<sup>th</sup> century and then its disappearance under the increased pressure of mechanisation as part of the Industrial Revolution later that century.



*Tracy Miles demonstrating spinning at Dunster Yarn Market 2018 on a replica mediaeval Great Wheel built by Trevor Miles.*

**Photograph: Lindy Head**

Even as late as 1705, the work of spinning was to be provided for poor people in South Molton, subsequent to which the Bluecoat Charity School was founded, the name referring to the colour of their uniform.

A wooden-framed weaving loom had warp (vertical) threads and weft (horizontal) threads delivered by a shuttle. This would have made an open-textured, loose weave cloth, called kersey, perhaps a bit rough, similar to Harris Tweed nowadays. If a higher quality cloth was required it went through a fulling process where the fibres of the cloth were consolidated and meshed in order to transform it into a thicker, smoother finished product which would fetch a far better price. Fulling had been the first part of cloth making to become mechanised, with two mills being established in 1185 by the Knights Templar in Yorkshire and Gloucestershire.

### **Fulling**

In the fulling mill the first stage in the process was to 'scour' the cloth in a bath of hot water, soap and soda by trampling on it, (hence the surname Walker) to remove the sheep's natural grease. At a later stage the take-up of dye would be inhibited if the grease (lanolin) was not removed. Then, as nowadays during scouring, the temperature of the water was critical to starting this process. Next the cloth was squeezed and, following on from this, pounded (in troughs) beneath large water-driven mallets called fulling-stocks, the process being repeated several times with the contents of the troughs changing each time. The first trough usually contained human urine to soften and clean, and a subsequent trough might contain fullers earth, a form of dry powdered clay, to absorb dark stains and more grease. Together, the urine, clay and pounding would soften, clean and thicken the fibres of the cloth, which could then be rinsed. Such was the size of the industry that in places of low population (such as Dulverton) urine began to have value to processors and poor people could actually sell their urine to the fulling mill to supplement their income, leading to the origins of the rather derogatory epithets of being 'piss poor' or, even worse, 'not having a pot to piss in'.

Fulling stocks were held within a large wooden frame. They consisted of a heavy wooden arm pivoted at the upper end, allowing it to swing downwards in an arc onto the cloth, with a stock like a mallet on the bottom end. The cloth sat in a trough with a curved backboard, and this, combined with a stepped<sup>6</sup> rather than a purely blunt end of the mallet, meant that the cloth could turn gradually, thus ensuring evenly spread beating and avoiding excessive wear in any one place that would have resulted in a damaging hole in the bolt of cloth. Fulling stocks were usually set in pairs, the force for lifting them being delivered by cam shafts attached to gearing driven by the power of the water wheel. The immense skill of the fuller (or tucker as he was sometimes known in the Westcountry) was to judge the incoming variables of water quality, temperature and cloth characteristics and decide how much beating was needed to give the desired quality of end-product.

### **Drying and Finishing**

After fulling (and perhaps dyeing – see below), the cloth would have shrunk considerably, so it was stretched and dried on a tentering frame to ensure that the cloth was evenly tensioned to given dimensions. The tentering frame had the appearance of a long length of post-and-rail fencing in that it consisted of upright posts joined together by a fixed top rail. The bottom parallel rail could be moved up or down according to the width of the bolt of cloth being dried. Every three or four inches there were L-shaped iron tenterhooks pointed at both ends<sup>7</sup>, the top ones being pointed upwards and the bottom ones being pointed downwards. The frames, or racks, were often in a field adjoining the fulling mill, giving rise to names such as "Rack Lane" in Exeter. In Dunster there were tenter frames on Grabbist Hill and on the side of the castle tor<sup>8</sup>, whilst in Dulverton, where tenterhooks may still occasionally be found on the ground, they were at Weir Cleeve atop the hill facing west<sup>9</sup>.

Kersey was a narrow cloth, and broadcloth became more common, especially after the invention of the weaver's flying shuttle by John Kay in 1733. In order to standardise measurements and thus facilitate export, a 1601 Act classified "Dunsters, Bridgwaters and Tauntons" as cloth between 12 and 13 yards long and 1¾ yards wide, weighing 30 pounds<sup>10</sup>. The role of mediaeval alnagers, whose duty was to inspect cloth at fulling mills, apply lead seals (without which the cloth could not be sold) and collect a fee, was updated during Elizabethan times as types of cloth diversified, and was finally abolished in 1699.

Following on from drying, the cloth had its nap raised using an array of teazel heads on a wooden board. Teazels are tall herbaceous biennial plants (*Dipsacus Sativus* rather than the wild teasel *Dipsacus Fullonum*) and have stiff-headed spiny flowers with tiny hooks at the end of each bristle, which, when dried, raise the nap without tearing the fabric as metal would do. It was then the expert job of the shearer to trim the nap to make a smooth cloth using very sharp shears, which could weigh up to 31 pounds. Trimming was usually done over a curved table surface.

## **Dyeing**

Dyeing was often done immediately after the fulling process (before drying) but some dyeing of finished cloth clearly took place away from the fulling mill. Although woad (*Isatis tinctoria*), a very widely used dye plant giving blue, was grown in Somerset, Lincolnshire and East Anglia, there was not nearly enough of it to meet demand in the dyeing of wool, so imports came from Bordeaux, Bayonne and Portugal, via Minehead and Bridgwater to dyers in Taunton<sup>11</sup>. These imports came in “pipes”, barrels of half a tun. During the 17<sup>th</sup> century, indigo was introduced into England by the Dutch East India Company and, by the end of the 19<sup>th</sup> century, that was in its turn supplanted by the newly discovered synthetic indigo<sup>12</sup>. Woad, being a leafy, bulky plant, was better transported in a more compact form, which started by crushing the leaves under huge stone rollers pulled by heavy horses. The pulpy, mustard-smelling mass was then balled by men known as “waddies” and dried on racks. When dry, the balls were crushed to a powder and fermented in a heap until they became a blue clay-like powder which was then packed into barrels. Although indigo was cheaper and gave brighter, clearer blues, it was not as colour fast as woad, so woad was used in a recipe to dye police uniforms until 1932. Until chemical substitutes were found, both woad and indigo suffered from the undesirable side-effect of being highly odorous processes since they used fermented urine. Woad, in conjunction with other plants such as weld (*Reseda luteola*), which gives a yellow, produced a range of colours including several greens such as Saxon, Lincoln and Kendal, depending on which was used as the top or bottom dye. Woad also yields other colours such as pink when the exhaust (i.e. that which remains when the blue has been used up) is used with the mordant alum.

Madder (*Rubia tinctorum*) roots, which give a red dye, were also imported via Bridgwater for the same Taunton merchant, and the discovery of the chemically fixative properties of alum in the late 16<sup>th</sup> century expanded the available colour palette, especially when deposits of alum were discovered on the coast of Yorkshire.

## **Change and innovation**

The greatest age of innovation for textiles started in the 18<sup>th</sup> century with the patenting of the flying shuttle for weaving by John Kay in 1733. James Hargreaves invented the spinning Jenny in 1764, a machine which was unsuitable for people to have in their own homes, hence the move to workshops and factories. Richard Arkwright set up his pioneering water-powered cotton spinning mill in Cromford, Derbyshire in 1770. Although the mechanisation process started in the cotton industry, its principles were quickly copied in the wool industry, the only difference being that fleeces had to be scoured before spinning to prevent the machinery clogging up with grease. When Samuel Crompton devised the spinning mule in 1779, which could operate with 1,000 spindles, progress was unstoppable and the development of coal fired steam power enabled economies of scale not possible from water-power alone. All of this hastened the relocation of the industry to the north of England where there were ready supplies from nearby coal fields, higher population to provide a labour force and sheep rearing country similar to that found on Exmoor to provide the wool.

## **Local wool processing**

### **- in Dulverton**

There are early references to the cloth trade in Dulverton. Robert le Fuller and William le Comber appear in the Exmoor Forest court records of 1270 and a Dulverton Fuller in the 1320s.

As far as we know, Dulverton’s first fulling mill, owned by the Sydenham family who had bought Dulverton Manor<sup>4</sup> in 1568, is recorded as operational in 1638, and by 1654 there were three of them. In 1799 there were nine waterwheels on the leat: four at Town Mills; two at Tangier Mill; two at the woollen factory and one at a Blade Mill.<sup>5</sup>

During the 17<sup>th</sup> and 18<sup>th</sup> centuries, the occupations of wool-comber, weaver, clothier, merchant or mercer are recorded. This does not include farmers or husbandmen who may have had dealings with the wool trade as a minor part of their income. George Peppin of Dulverton, described as a mercer, was well-off enough to buy Slade Farm from Humphrey Sydenham in 1677 and the families became related by marriage. Their descendants, George and Frederick Peppin, emigrated from Old Shute Farm in March 1858 and bought Wanganella Sheep Station, New South Wales. They imported some Saxon Merino rams in 1860 and are famous for the establishment of the Australian Merino breed, with the genetics of their heavily woolled sire “Emperor” now shared around the world. Britain’s increasingly urban population in the 19<sup>th</sup> century, with the



consequent high demand for meat, led to a divergence of production, with Australia concentrating on wool since it could travel better.

Though the wool trades in Dulverton were in gradual decline by the mid 18<sup>th</sup> century, it still supplied coarse woollen cloth and blankets to Tiverton and Crediton, both of which had easier access to Exeter. Tangier Mill was 'in hand' in 1771 by the death of Joan Hill. It was still in existence in 1820 but it was demolished to make way for the building now known as Dulverton Laundry which was built in about 1825 on the same footprint as Tangier. It was purpose-built as a silk and crape mill for the Smith brothers of Hackney, London. It had just one waterwheel producing 10 horsepower to drive newly developed 'power looms'<sup>13</sup> and was weaving silk and making lace by 1840. In 1832 Dulverton was listed in the Edinburgh Encyclopaedia as being a prominent blanket manufacturing town alongside Witney & Leeds, though it is likely that the information was already out-of-date by the time of publication.

#### **- in Exeter**

Exe Island, in the heart of the city of Exeter was a bustling place packed with mills, fulling stocks, cloth drying sheds and racks. The skilled trades were controlled by the Guild of Weavers, Fullers and Shearmen whose chapel, now Tuckers Hall in Exeter, was built in 1471.



*Escutcheon of the Guild of Weavers,  
Tuckers and Shearmen showing  
the tools of their trades*

**Photograph: Lindy Head**

#### **- in South Molton**

In the 12<sup>th</sup> century, South Molton is recorded as having three water powered fulling mills; one of five locations in Devon. Despite having better transport links than Dulverton and being in a more productive, prosperous, farming area at the southern edge of Exmoor, South Molton was not immune to changing times in the wool industry. In 1800, the partnership of Bawden, Cresswell and Bawden opened the first mechanised factory in South Molton. It produced serges for export. Bawden is still a familiar Exmoor name. By 1822/3, South Molton was described as manufacturing not only serges, but longells (an 18-inch-wide type of upholstery fabric), baize, flannels and druggetts. Unfortunately, a new lace and woollen factory which opened in 1824 was destroyed by a fire seen 20 miles away – it was rebuilt in 1828. In 1844 there were three local woollen manufacturers; by 1851 this had reduced to two. In 1866, the Higher and Lower Mole Mills were sold and many jobs were lost before final closure in 1886. The Lower Mill became a corn mill in 1890, and the Higher was taken over by the South Molton Shirt and Collar Company which continued to be operational until 1950.

#### **- in Dunster**

The story of wool and water in Dunster completes the Exmoor triangle of Dulverton, South Molton and Dunster. Dunster is on the River Avill and was, in its heyday, a prosperous woollen town. Two grain mills are listed in the Domesday Survey of 1086 and the first fulling mill belonging to Dunster Manor was recorded in 1279. A further three fulling mills, built before the 15<sup>th</sup> century, are mentioned as located along the Mill Stream at the bottom of West Street.<sup>15</sup> Two workshops and two fulling mills built by John Burnoll in 1682 were reported in 1830 to be ruined and in a state of decay respectively.<sup>16</sup> George Luttrell, who owned Dunster Castle and became the MP for Minehead in 1584, paid for improvements to Minehead Harbour to facilitate the import of fleece from Ireland.

In 1609 he commissioned the building of Dunster Yarn Market, a substantial timber-framed octagonal building which offered shelter to traders and their wares and became famous for its trading success. However, Tudor and Stuart prosperity could not last without taking advantage of the changes in wool industry technology, which Dunster's clothiers did not. In comparison, the mills of the nearby Fox family at Wellington invested in new and more efficient machinery. Thomas Fox bought land and water rights in 1797 to establish Coldharbour Mill at Uffculme as a spinning mill. Eventually there were mills or factories at Cullompton, Culmstock and Chipping Camden as well.<sup>17</sup> The factory in Wellington specialised in flannel (and still does) and that in Cullompton was operational from 1890 to as late as 1977. During World War 1, Fox Bros produced 8,000 miles of khaki cloth for uniforms, and 70,000 pairs of puttees a week.



*Dunster Yarn Market*

### Modern times

After World War Two there was a decline in the use of natural fibres, wool amongst them, in favour of synthetic fibres, which meant that clothes and furnishings became cheaper and more convenient in use. This downward trend accelerated from the 1970s onwards until recently when a new awareness of the environmental threats of microfibres and of carbon footprints has meant there are signs that wool as a fibre may enjoy a revival in fortunes, albeit in more artisan niche uses.

South Molton re-established its connection with wool in 1973. When British Wool (then known as the British Wool Marketing Board) was set up in 1950, its depot for the area was at Wheddon Cross, but it later moved to South Molton where vehicular access was considerably easier.

John Arbon's worsted spinning mill using vintage machinery, was established early in the new millennium in South Molton and is one of a very few artisan mills in the country; it specialises in eclectic mixes of natural fibres for high end brands.

In Dunster, the castle, now owned by the National Trust, still dominates the landscape at one end of the High Street, with Dunster Yarn Market at the other end. Its economy now centres around tourism, and its working watermill with double overshot wheel is in occasional action as an attraction. On some summer Sundays the Yarn Market returns to its original purpose when Exmoor Horn Wool sells its products there, accompanied by sheep shearing demonstrations.

**Lindy Head (Dulverton Weir & Leat Conservation Trust Academic Associate)**

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<sup>6</sup> Reference photographs/diagrams: [Tuckershall.org.uk](http://Tuckershall.org.uk), [Calderdale.gov.uk](http://Calderdale.gov.uk)

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<sup>11</sup> P. Ashford, *Som. Arch. And Natural Hist., Agricultural History Review Vol 58, no 1, 2010*, 167

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<sup>13</sup> With thanks to Peter Romain, Dulverton

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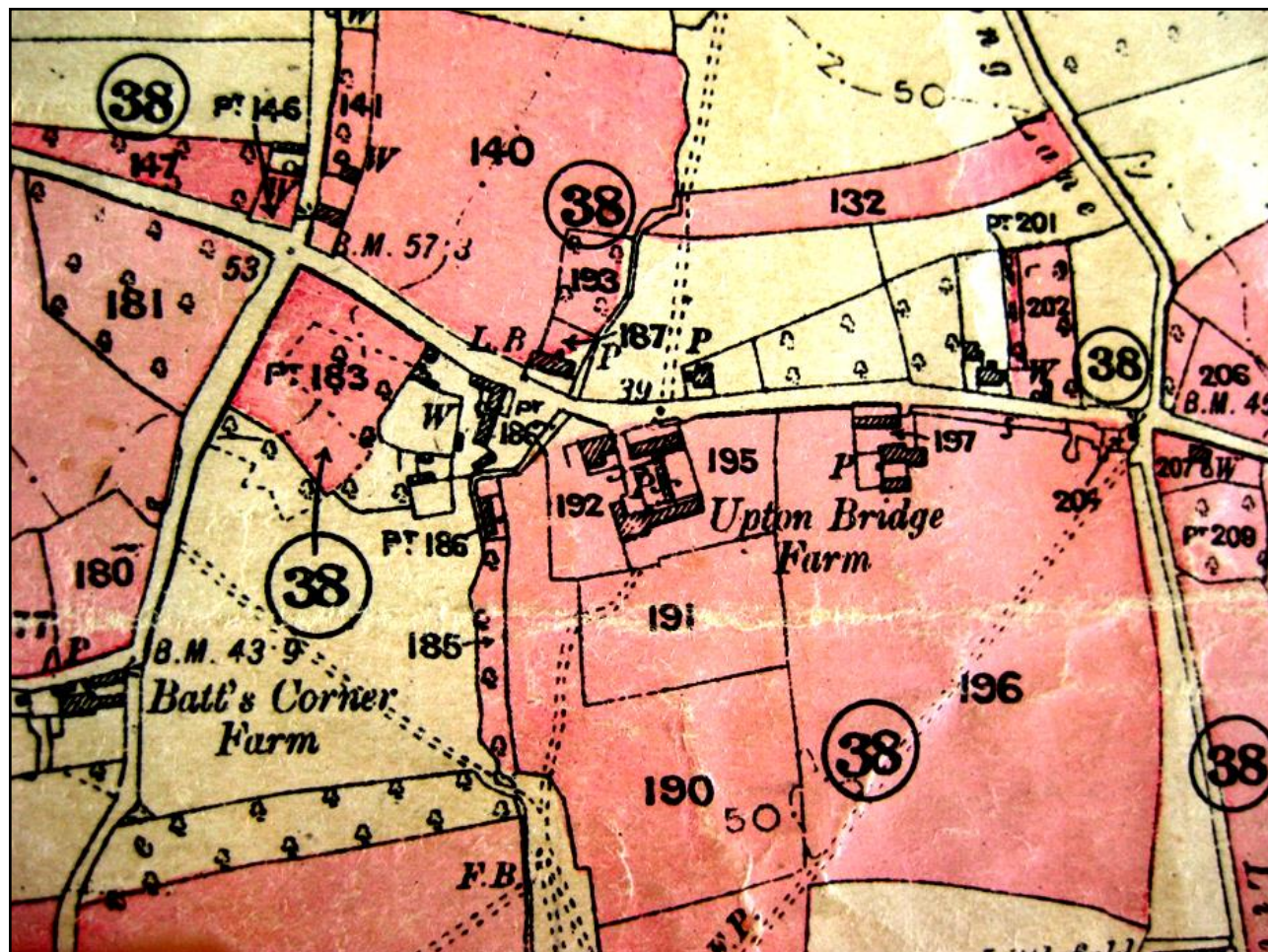


# Water and Upton Bridge Farm Over the Years

This article is the rambling ‘recollections’ of one who has lived there on and off for quite a while! Our son now lives there and runs the farm & shop. I have moved out to a new house 200 yds away.

## Introduction

Upton Bridge Farm, Long Sutton, is a typical mid-Somerset mixed farm on the northern edge of the Levels south-east of Langport. The main farm buildings and house are located about 50 yds from a small stream that flows south for most of year to the River Yeo. Tithe maps from 1840 show many buildings in the immediate area. The farm house is about 35ft above sea level with its land spreading in a generally south-westerly direction down to the Yeo. The higher ground comprises a heavy alkaline clay overlying layers of limestone, some of which has been quarried for the ubiquitous blue building stone and also burnt locally for lime. The flood plain land is typical of the ‘clay moors’ south of Langport. In the early 1800s Upton Bridge Farm was rented by one of the many Cox families in Long Sutton from the Cavendish Estate, which then came into the Devonshire (Chatsworth) Estate by a marriage settlement in the mid 1800s. They had a huge investment programme in Long Sutton, with similar ones in other local parishes during the 1860/70s, resulting in our rebuilt & enlarged pub (now the Devonshire Arms), a new school, at least three major farm house enlargements (all by a Langport architect) with extensive new sets of farm buildings, and many lesser projects. Upton Bridge Farm was one of these. In 1919 the Devonshire Estate decided to sell up (but they still retain the mineral rights) and most farm properties were bought by their sitting tenants; Upton Bridge Farm was rented (and then bought) by one of the Cox families, and it was the death of the new owner’s son, H. T. Cox in 1948, that led to the sale and our arrival in 1949 when I was aged 7. It was then a typical mixed farm of about 250 acres. A milking herd (and beef offspring) was the main activity, with some arable, a few pigs, chickens etc., but no sheep. It remains a mixed farm now, with Devon Red suckler beef and arable as the main activities. The map (*below*) is an extract from the Devonshire Estate sale particulars with lot 38 being Upton Bridge Farm – centred on ST459263. Strictly, Upton Bridge Farm is in Upton, where the division between that hamlet and Long Sutton was historically marked by the outline of a workman’s boot inscribed about double size in the stone north pavement (now long since gone) along the A372 opposite Cratt Buildings. (As a lad, I recall seeing this boot, and its existence was confirmed about 3 years ago by G. W. S. Cox of The Butts, Long Sutton, before his recent death.)





## Drinking water

It is not clear from where this was obtained prior to the Devonshire improvements. During the Summer cattle were out on the Moor drinking from the many ditches, but in winter their needs in the farm sheds were similar to those for humans. There are old stone lined wells at Cratt Buildings (accessible but not used), and another at Vedal House that is in use for our garden; both are over 200 yds from the main farm buildings so are unlikely to have been the original sources for humans or housed livestock. Both wells are only about 10ft

deep and have low summer capacity. Given that the stream fails in dry summers, it is likely that at least another unknown well existed. The 1886 Ordnance Survey map indicates a pump in the midst of the Victorian buildings (also shown in the map) but the exact location of its associated well is unknown, despite much modern groundwork associated with adaption of the Victorian buildings!

I suspect that part of the early Devonshire improvements included the installation of a small water pumping wheel on the west side of the Rag Barton (*left*). This was in an open narrow wheel pit adjacent to where the stream has a stone slab dam raising its level by about 2 ft 6 inches. Rag Barton had its own water facilities comprising a big slab stone tank in the ground (*below*), with a constant trickle of water flowing in and out so that livestock in the yard there could drink from it. The small wheel's existence was also confirmed by G. W. S. Cox and is shown on the 1920 OS map. (Interestingly, there is a similar restored and working water pumping wheel at Charity Farm in Upton which has a larger head and is installed in a stone underground chamber. It was visited by SIAS in about 2005.) In our case, I think the water pump fed two large galvanised 200g tanks installed on rolled steel joists in the roof of Upton Bridge Farm. We found





some buried evidence (2-inch iron pipes) that these tanks also fed troughs for wintered livestock as well as catering for human needs. The tanks were vulnerable to birds or vermin falling in and, on their removal in 1980, I discovered the tank outlet pipe filter (*right*) made of lead!



I think the stream was not a reliable water source, so I suspect efforts were also made to use other local sources. There used to be a small building on the south-west end of the farmhouse known as the pump house; it contained a large water boiler (with fire/flue) in one corner and had two hand pumps. One drew water from a well 50 yards away (*via* an iron pipe) on the other west side of the stream in the garden of neighbouring Little Upton Bridge Farm; this is fed by an all-year-round spring. I think the pipework from this hand pump led to the upstairs tanks and was the emergency supply in dry times! There was also a sizeable internal pump with a cast iron trough that I wished to relocate in 1985 when the room was repurposed. Since its water source was unknown, I had to investigate! It turned out to be a (presumed large) brick roofed underground cistern near the back door which I think is fed by the roof drains on that side of the house; this arrangement is known of locally for larger houses. (I already knew the water from the front roofs was fed direct to the stream, but what happened to the rear roof



water was unknown.) The pump and trough (*left*) (probably cast by Lane of Langport) was relocated and fitted with a new wooden piston. It could be made to work with considerable priming and hard work!

I suspect that when the Devonshire Estate installed a public supply in Long Sutton from about 1900 onwards the opportunity was taken to feed this locally derived mains pressurized water direct to our roof tanks for domestic use and by a separate small lead pipe threading through the roadside trees to our main livestock trough. By 1980, the 2-inch cast iron supply pipe in the A372 highway was suffering many bursts so I insisted on being

able to draw from either side of its normally shut zone valve right outside the house; this would have been installed when Langport Rural District Council took over the local facilities with a feed through Upton from a new reservoir near High Ham, supplied by a source at Sutton Poyntz. The tree roots and our ancient rusting iron pipes caused me many leak problems, eventually making it necessary to install new plastic pipes everywhere by 1990! A major new water supply main was installed progressively from Wimbleball reservoir in the 1960s, running across our land to Yeovil but this began to suffer soil corrosion and has, since 2005, been replaced by a larger 750mm diameter one along very roughly the same route.

I am uncertain about early domestic hot water provision apart from the 'boiler' mentioned above. By 1979, when I came back to the farm, the AGA boiler installed by my parents (probably in the 1950s) had been converted to oil and was heating a poorly lagged tank in the kitchen (using a cold feed from the two large tanks in roof), with extensive hot secondary flow/return iron pipework (now recycled into field gates) to the main bathroom a long way off in the front of the house; this was very inefficient and I had replaced it all by 1981 with copper pipework and a gas boiler (that is still working in 2021!).

In about 2005 we drilled a borehole to provide water for the cattle instead of the increasingly expensive mains water. This is about 100ft deep and has never failed to meet our needs except when the pump switch rusted hard on and burnt out the motor – I was glad to be able to arrange the mains as an emergency alternative with a little plumbing work! I had also revised the farm and house pipework so that borehole 'grey' water could be used to flush the house's busiest loos – but my wife forbade that since it smelt of rotten eggs!

## Foul Water

The farm house has a two-adult-plus-child smart outside privy which was quite elaborate. It had a deep large pit with a ventilation pipe built into the wall that vented to the draughty roof space above the main 'room' ceiling. There was also a small undercover lobby space - no doubt for hanging up your raincoat when darting out from the house! The pit was deep so that it could be flushed by the stream by raising its levels with bay boards against a decorative bridge; the flushing pipe ran from the walled section of the stream beside the front lawn. The outfall of the deep tank was via a stone culvert running away west for about 75yds to the stream below Rag Barton. The original very upright roof of the privy had collapsed by 1982 so when reroofing we gave it a gentler 35° slope more in keeping with the other roofs. (*below*)



There was also a single seater privy behind the farm buildings (near the storm water culvert) but only its roof line was visible in 1950 (and still is!) - presumably for use by the farm workers.

I think that a conventional WC had been installed not long before our arrival and this discharged into the existing privy outfall culvert. Mains drainage eventually came to Long Sutton in the 1960s with it all being sent across our fields by a 6in asbestos pipe to a works at Langport. We are unlucky enough to also have a small subsidiary pumping station which feeds the main via a smaller pipe right past our cattle sheds. We had one burst in this pipe that nearly flooded the sheds and also several bursts in the large main in one particular field – about the only evidence later was a crop of tomato plants each time! Most of the big main was replaced in 2020 with a new and much tougher plastic one that was installed by directional drilling (instead of trenching) from pits dug every 200 yds or so, by a machine call a Ditch Witch!

## Storm Water Drainage

Our section of the A372 was turnpiked long before the Victorian improvements; that was possibly when the first serious efforts were made to direct the local highway surface water from the low area near Upton Bridge Farm to the stream. A large stone culvert, about 200yds long, was constructed in a south-westerly direction from near the farm gate/A372 then curving round to the west, originally into an open ditch on the south side of the house orchard. This culvert was extended by my Father in about 1955 with large pipes right to the stream. This culvert must pre-date the Victorian buildings that are now above it - it remains vital for disposal of highway storm water and that from the extensive old and new farm buildings. This supposition is mostly confirmed by the 1840 Tithe Map which does not show most of the buildings that now cover its route – it would definitely not be allowed nowadays!



## Farm Drainage

Much of the higher ground has had in-field drainage installed in different eras. The oldest used multiple large stone slabs laid almost vertically in long trenches so as to be below cultivation depth. Later came clay tile drains of 2 to 4in diameter and latterly 3 to 4in diameter perforated plastic pipe. Given deep roots and the normally slow speed of the trickling water in them they are prone to blockages, and it is not easy to keep them working! Down on the Moor, we pay drainage rates based on land areas to an Internal Drainage Board, whose job is to maintain the network of secondary ditches that are not the responsibility of the Environment Agency, who look after 'main river'. The tertiary ditches remain the farmer's responsibility. Major changes took place after 1836 when an Act was passed for the barge navigation of the River Yeo past our land towards Long Load and Ilchester. The scheme involved raising the river level above Langport by 2-3 ft with a lock; that would have made it impossible for the many small streams to discharge directly into the river. Parliament insisted that the local landowners' interests should be protected and I. K. Brunel himself was appointed to devise a scheme! This resulted in the digging of a new major ditch over about 4 miles to Langport which became known as the Long Sutton Catchwater because it caught all the water off the higher ground and took it towards Langport and into the Parrett below the new lock. This arrangement is still partially used but instead of the long journey to Langport (now without its lock) there are several electric pumping stations that lift the major winter flood waters back into the river when the river flows are low enough to take the extra volume. In the last few years there has also been a marked and long overdue increase in main river maintenance work as a result of the very extensive flooding.

We have dug two environmental water features - a small pond near the Rag Barton and a small lake in the flood plain that is topped up by the usual winter flooding of the Yeo valley. I had hoped that the clay soil would hold the water in the lake sufficiently through the Summer to maintain a 4 ft depth but seepage and evaporation allows it to often drop to only 3ft. I contemplated a solar-powered pump from a nearby field with a 10ft well until I worked out how much water might be needed – much beyond the well's ability! During the extensive floods of 2014 the banks of this Lake were the only grassland above the water level for our cattle on the Moor!



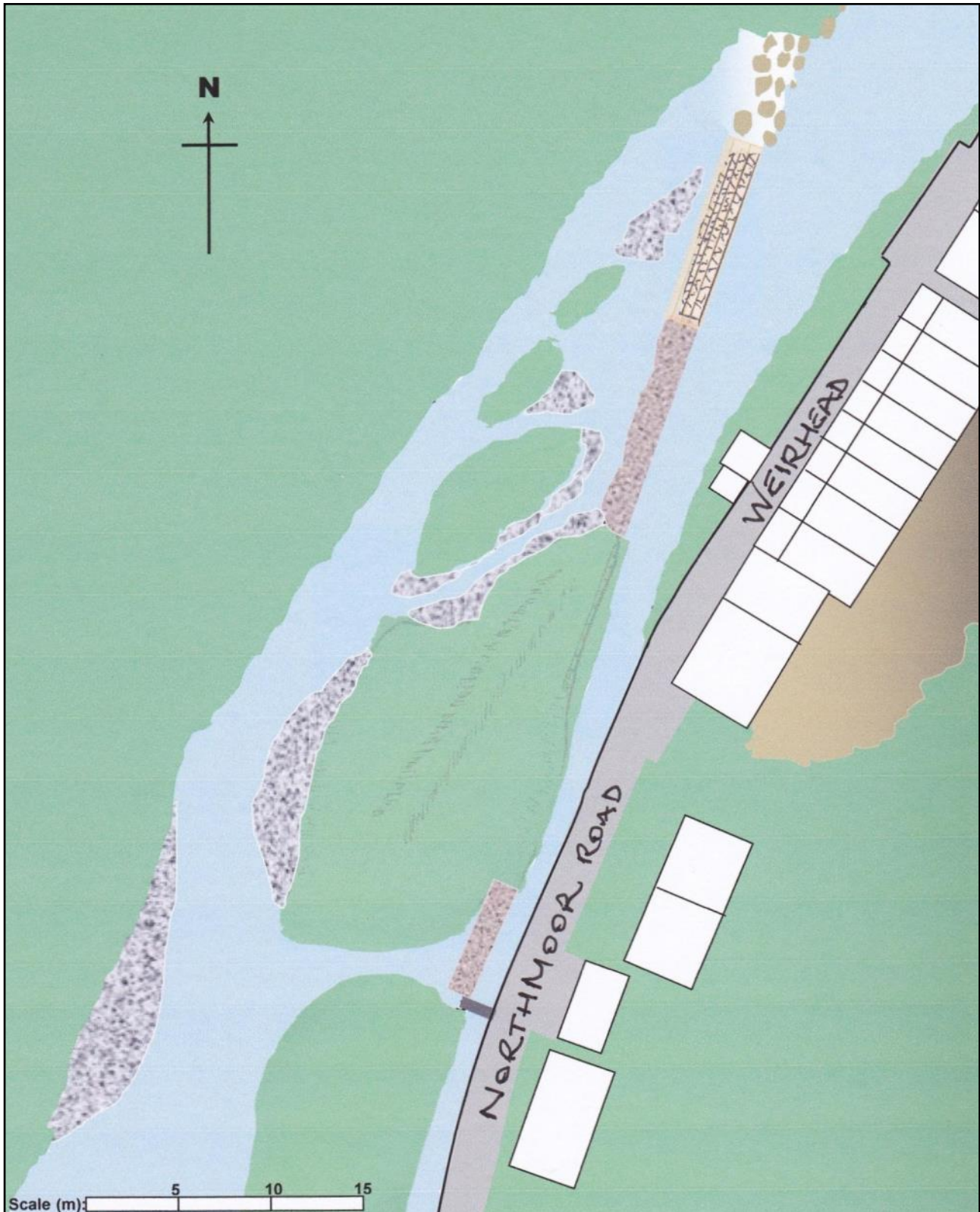
So it is a fitting end of this note to reflect that I. K. Brunel probably signed off the plans for our local small stone bridge (*above*) that was part of his catchwater scheme!

**Tim Walford.**



# Dulverton Weir

Based on a report by Dulverton Weir and Leat Conservation Group  
on the history, structure and condition of Dulverton Weir



*2015 plan of the weir*

## Background

In December 2012 the River Barle flooded, not only causing damage to some properties but also causing two breaches to the crest of the weir, most probably from impact by trees washed down the river. No immediate remedial action was taken with the result that, over a short period of time, the breaches enlarged due to the water flow washing out the exposed substructure of the weir. An attempt to temporarily stop up the breaches using sand-filled ‘dumpy bags’ resulted in failure as the river simply washed them away.

In August 2014 a further temporary repair was made using rock-filled gabion baskets. In the process, the contractors removed a quantity of oak stakes from the structure of the ancient part of the weir. On seeing this happen, a small group of local residents ‘rescued’ the stakes.

At times of low water some of the stakes had been visible so the presence of the stakes in the weir had been known to Dulverton residents for years. On recovering the stakes, the residents were concerned that archaeology had possibly been damaged. They were therefore interested to know the age of the stakes, so they took them for Dendrochronological Analysis (tree-ring dating).

Whilst waiting for the dating results they began to research the history of the weir which revealed that, in fact, the weir was part of an extensive Urban Watermill Landscape. A survey by English Heritage (Gathercole, 2003) indicates that a water mill in Dulverton dates back to at least 1331. The existence of a mill implies the existence of a leat and a weir to feed it. In 1568 there were at least 6 mills in the Dulverton area (Gathercole 2003) and DWLCG have found evidence of 9 waterwheels powered by the leat together with an industrial history that goes back to the 14<sup>th</sup> century or before.

There was at least one mill recorded in 1331 so it is reasonable to deduce that there has been a weir at the site for 700 years or possibly more. The remaining ancient structure of the weir is not inconsistent with the style of weirs of Norman date, although the style alone does not preclude it from being of Anglo-Saxon, later-medieval, or even post-medieval construction. In any case, it seems clear that this is a multi-period monument, repaired many times over the last thousand years by people who were masters of their craft, keeping the basic form and integrity of the original while doubtless replacing many of the component parts.

On learning that the test results showed the stakes were over 200 years old it became apparent that this weir is actually something very special. It is not only an ancient structure and heritage asset, but the ingenuity of the design represents a forgotten craft. Incredibly, it is not protected. It is not even included in the Dulverton Conservation Area.

Consequently, the Dulverton Weir and Leat Conservation Group was formed with the ambition of ensuring that the weir is properly restored, protected and maintained along with the leat.

## Description

Dulverton is the southern gateway to Exmoor National Park. The small town stands between the rivers Barle and Exe, which converge a mile down the valley. The weir is located on the river Barle on the upstream side of Dulverton. The Dulverton mill leat starts at Weir Head, where it leaves the river Barle to flow south through the western side of the town before re-joining the river south of Dulverton bridge.

Dulverton Weir diagonally crosses the river Barle in broadly a north/south axis, in a slight ‘crescent’ shape with the inside of the crescent facing upstream. The current visible structure is 65 metres long. The southern (downstream) end consists of a 26.7 metre section constructed of stakes and rounded stones faced with flat larger stones.

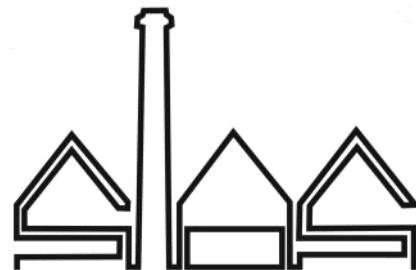
The middle part of the weir consists of a 22-metre-long section which was repaired in sandstone in two phases in 1993 and 2000. The northern end of weir (upstream) consists of a 16-metre-long section made up of large rocks that serves as a fish pass and which has been placed and replaced sporadically over the last 20 years.

A further 48 metres of structure exists downstream of the weir in a ‘feeder’ leat with facing stones placed where the bank was raised to contain and funnel the head of water through a sluice and down into the town. Adjacent to the sluice is a 7-metre-long side weir.

An additional 16 metres existed upstream of the current weir (now buried in the riverbank) which is identifiable in a 1930’s photograph (*page 13*) showing that the weir started much further upstream than can be seen today. There are identifiable stones from this section still in the bank. In 2012, after extensive flooding, more stakes were visible in the bank further upstream than the 1930’s photograph shows. These have now disappeared from sight once more under shingle. It is therefore likely that the entire weir structure was at least 130 metres long. There are residents who recall being able to walk the full length of the weir but having to jump the last three feet where there had previously been a gap in the weir to provide a fish pass.



# SOMERSET INDUSTRIAL ARCHÆOLOGICAL SOCIETY



## SIAS Summer Programme 2022

### May 4<sup>th</sup> (Wednesday)

**Afternoon visit to Chaffcombe** to see the re-erected waterwheel and governor from Sunshine Cider Mills. Meet 14.00 at the anglers car park on Chaffcombe Road by the Reservoir, TA20 1RR, GR: ST342103 for a fossick led by Peter Daniel looking at the original site of the wheel and at canal, railway, WWII stopline, milling, and waste management industrial archaeology. Then by car to Chaffcombe village to see the restored and re-erected waterwheel. Suggested donation to charity for wheel visit - £5.

### May 24<sup>th</sup> (Tuesday)

**Evening visit and talk by Richard Fox looking at the Basins and watercourses serving Fox Brothers Tonedale works in Wellington.** Meet 18.30 in the Wellington Leisure Centre/Rugby Club car park TA21 8LL, GR: ST132207. Walk to Westford and back (stout footwear required) followed by cup of tea provided by Wellington Basins Volunteer Group at their containers by the basin during which Richard will provide some more information about the history of woollen manufacture in the area. Suggested donation for tea - £5.

### June 13<sup>th</sup> (Monday)

**Evening visit to Bishops Lydeard Mill and Rural Life Museum**, restored by SIAS members Charlie & Yvonne Back. Meet 18.30 at the mill for a tour followed by a chance to socialise over tea and biscuits. Suggested donation to charity - £5. The mill is located at Mill Lane, Bishops Lydeard, TA4 3LN, GR: ST170291. There is some parking at the mill but those that are willing to walk may prefer to park elsewhere in the village or in Millers Way and approach through the rear gate.

### June 17<sup>th</sup>-19<sup>th</sup>

#### **AIA Weekend Liverpool**

For further details see: <https://industrial-archaeology.org/conferences/annual-conference>

### June 27<sup>th</sup> (Monday)

**Evening fossick to Nether Stowey** led by Peter Daniel. Meet 18.30 in car park by the Thomas Poole Library, Castle St, Nether Stowey, TA5 1LN, GR: ST190397. We will be looking at Thomas Poole's tannery, mills, malhouses, turnpike features, etc.

### July 6<sup>th</sup> (Wednesday)

**All day visit to lead mining sites on the Mendips, particularly in the Charterhouse area.** Joint visit with IASDA led by Geoff Fitton & Peter Daniel. Meet 11.00 at the Blackmoor Reserve car park GR: ST505557 (if full, additional parking is likely to be available at the private car park adjacent to the Charterhouse Centre GR: ST502557). Bring packed lunch. Stout footwear required. Numbers limited. Please car-share if possible.

### July 26<sup>th</sup> (Tuesday)

**All day visit to brassworking sites near Bristol.** This is a follow up visit to our talk by Tony Coverdale about Saltford Brass Mill. The Brass Mill is at The Shallows, Saltford, Bristol, BS31 3EX, GR: ST687670. Meet 10.30 at the Shallows car park just to the north of the mill. No entrance fee, but suggested donation of £5. Bring packed lunch or use local pubs/cafes. Afternoon visit to Kingswood Heritage Museum based in the 18<sup>th</sup> century brassworks of William Champion together with a number of other features including the windmill tower and ornamental garden. The museum is at Tower Lane, Warmley, South Gloucestershire, BS30 8XT, GR: ST667728. Meet 14.00 at the museum. Entrance fee - £4. Free parking at the museum.

### September 3<sup>rd</sup> (Saturday)

**SIAS @ 50 Celebration** at Westonzoyland Pumping Station Museum, TA7 0LS, GR: ST341329. An afternoon to celebrate 50 years of SIAS, starting at 14.30. Timetable to be finalised, but will include displays, a chance to tour the museum and its facilities, a glass of prosecco, a cream tea, a short talk by Peter Daniel on how SIAS has developed over the years, a raffle and presentations. It will also be an opportunity to see the proposed (or possibly partially completed) new SIAS/WET Archive facilities. There will be a small charge to cover catering costs. *Further details to follow.*

### September 20<sup>th</sup> (Tuesday)

**All day visit to Stroudwater Textiles Museums at Nailsworth**, Gloucestershire. This is a follow up visit after Ian Mackintosh's talk to us via zoom in June last year. We will visit both Gigg Mill and Dunkirk Mill, including a 1km walk to and from Dunkirk Mill alongside mill ponds and along the old railway line. Precise parking and timing arrangements will depend on numbers booking and will be notified in due course. Bring picnic lunch or use local hostelrys. Price - £7 per head. For further information see <https://www.stroudtextiletrust.org.uk>. Limited parking is available at Dunkirk Mill for those unable to walk that far.

### October 1<sup>st</sup> or 8<sup>th</sup> (Saturday) *Date to be confirmed.*

**Afternoon visit to Westford Pumping Station, Payton Road, Westford, Wellington**, TA21 0DT, GR: ST123204. The pumping station was sold by Wessex Water and has been bought by Marcus Vile, who is restoring it and will be using it as his workshop. It is intended that one of the 1935 Ruston diesel engines will be run for the visit. Plus an optional short walk to see the exterior of the two water towers of 1885 and 1935 in Rockwell Green.

**Two other possible visits are under discussion but have not been confirmed (Hinkley Point and Tone Works) – if arranged, details will be emailed to members and placed on the website.**

**Note:** Members should indicate the visits in which they intend to participate by e-mail or on the enclosed slip. If you have any queries on the programme, transport problems, etc., please contact Peter Daniel (contact details below). Email responses are preferable since it makes it easier to contact members as required.

**Visitors** are welcome but where numbers are limited members will receive first preference. Visitors fee: £3 each. Except in the event of illness preventing you from attending, you will be expected to pay for any trip on which you have booked a place where numbers are limited.

#### **Field Officer contact details:**

Peter Daniel,  
New Inn House,  
Week St. Mary,  
Holsworthy.  
EX22 6UZ  
Email: [peter.daniel51@btinternet.com](mailto:peter.daniel51@btinternet.com)  
Telephone: 01288 341653 or 07763 374003

### **FIELDWORK**

At the moment we are waiting for dates on a couple of possible fieldwork projects but nothing is confirmed at present. The website [www.sias.me.uk](http://www.sias.me.uk) will be kept up to date with any details.

**Peter Daniel**

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## **In the Headlines 100 Years Ago**

### **Western Gazette April 1922**

*Yeovil felt the full force of the gale on Good Friday and Saturday. In some of the higher parts of the town the wind shrieked and howled and at times it was almost impossible to hear oneself speak indoors (especially in some of the Councils new houses). Slates and tiles were hurtled off roofs and many people were astonished to find the roofs of their sheds in their freshly sown onion plots on Saturday morning!*

## SIAS AGM

On Monday, 28<sup>th</sup> March, after two years of on-line meetings, the 2022 AGM was held 'live' at Silver Street Baptist Church Hall in Taunton. Twenty-four members attended and eighteen tendered their apologies. Mary Miles was re-elected as Chair, Geoff Fitton as Secretary and Barbara Cooper as Treasurer. The other committee members are Alan Cockett, Chris Cooper, Peter Daniel, Iain Miles and Geoff Roughton. After the formal business was completed, the evening ended with an enjoyable quiz compiled by Peter Burnett, Barbara and Chris Cooper. With no manipulation of the scores, the winners were your Chair, Mary, and her husband Iain!

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## Obituaries

### Richard Willey

Richard was born in Drayton and went to Richard Huish Grammar School. He was a Trading Standards Officer in the county for 34 years. All these things conspired to give him a love of Somerset, the countryside, and history. He was a keen supporter of wassail at Drayton, and amassed a large collection of historic weights and measures. He was also very interested in transport and had a collection of books on buses, trains, cars and planes. As a lad he started playing in Langport church band on borrowed instruments, moving on to Jazz. He was a popular sousaphone player, playing not only in the Downtown Galmington Syncopaters with Des Bacon, but in many different band line-ups all over the country and abroad including Ireland, Holland and France – he played at Bude Jazz Festival for 30 years. In all this he was supported by his wife Juliet, who remembers the early band practices held at their home while their two boys slept upstairs! He was a founder member of SIAS and indeed our first Field Officer.

**Compiled by Mary Miles from information supplied by Juliet Willey**

### Roger Thorne (1940 – 2021)

SIAS was sorry to hear of the death of Roger Thorne who used to be a member and regular attendee at meetings when we met at North Town School. He talked to us at a members evening about his early recollections of the industries of Barnstaple where he grew up. He was a Chartered Engineer who started work with British Railways and later worked for Devon County Council. He was a Methodist Local Preacher and had a lifelong interest in Chapels and wrote extensively about those of the south-west. He had also been a JP and previous President of the Devonshire Association.

**Peter Daniel**

### Brian Whiteside

I regret to report the death on the 18<sup>th</sup> February of Brian Whiteside, a founder member of SIAS. He was a very keen member and attended meetings and visits frequently. I first met Brian in 1967 when we both joined the County Surveyors Department where he worked on many important road schemes for the County. He had several interests, namely, he was a Freemason, a member of Taunton Probus, an accomplished skittler and a very keen member of CAMRA. I fondly remember when CAMRA had a beer festival with the West Somerset Railway, he would be serving behind the bar at Minehead station.

**Geoff Weyman**

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## More on Double-Roman Pantiles

*At the excellent on-line talk on March 14<sup>th</sup> by Michael Batt about tiles made in Bridgwater that are found in Brittany, I mentioned that my house, built in 1998, has a pantiled roof of reclaimed double-Roman tiles. The ridge tiles are Redland and probably not of any interest, but the rest were made in Burnham. In the SIAS fossick of a few years ago around Milborne Port I noticed the roof of the workshop down by the stream also had a pantile roof.*

**Geoff Ward**



## Request from Historic England

Dear SIAS,

I am carrying out research on the waterways connected with the Fox Brothers' factories at Wellington for Historic England. I'm looking at the watercourses linked to Tonedale Mill and Tone Works, including features such as the weirs, sluices, footbridges etc. The aim is to find out more about their development, the dates of the surviving features and the routes of culverted channels, as well as understanding how each feature functioned as part of the wider system. The study will be used to help inform Historic England's advice in ongoing discussions about future management of the water features and ensure that their significance is properly understood. The impact of the mills upstream is important, so Brian Murless's work on Westford Mills and Prowse's Mill has been very helpful indeed.

The earlier history of watercourses around Wellington seems vague, though there appear to have been several watermills and a stream called the 'Bolybrooke' which flowed through Wellington town in medieval times but it doesn't seem to have had any connection with the Fox Brothers enterprise. A local historian, R. L. Thorne, wrote some informative papers up until the 1970s. One of these mentioned the iron footbridges which cross the waterways near the mills having been made by the blacksmith at Tonedale Mill.. I was told about work carried out by the Wellington Local History Society, but I've heard that they didn't do any study of the watercourses. I was wondering whether you might know about it, also whether you have published any papers or books that might be relevant or whether experts among your members might be willing to share their knowledge with me?

Many thanks for your help

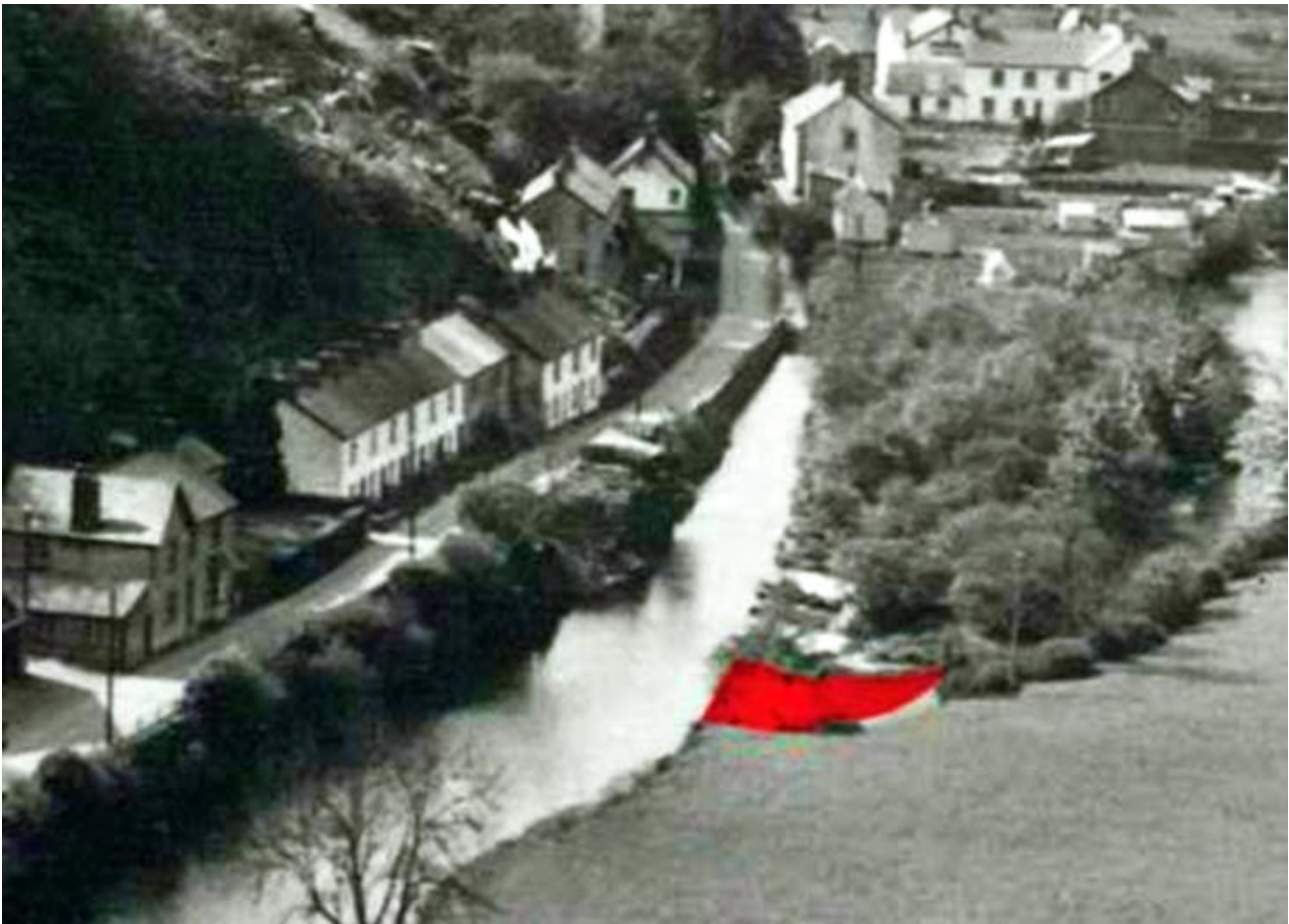
Nicky Smith (Archaeological Investigator - National Policy and Evidence - Historic England)

Nicky.Smith@HistoricEngland.org.uk

01793 414902

07776 164498





*1930's photograph showing that the weir started much further upstream than can be seen today.*

### Ownership

The weir and northern section of the mill leat were originally in the ownership of Town Mills. After milling ceased in 1972 and the subsequent redevelopment to residential accommodation, there was no commercial benefit to Town Mills in continuing ownership, and the liability for maintenance of the weir and leat would have rested with the residents' management company. Consequently, in 1999, West Somerset District Council agreed to take ownership. *(The Plan of H.M. Land Registry Title ST 185806 is shown on page 14)*

The following covenant operates on the owner:

*The Transferee on behalf of itself and successors in title hereby covenants with the Transferor and its successors in title for the benefit of the Transferors retained land shown edged green (sic) on the attached plan to keep the Property hereby transferred in good repair and condition and not to impede the flow of water along the leat and to maintain an adequate flow of water along the Leat.*

### Oak Stakes

Measured tree-ring series from thirteen stakes recovered from Dulverton Weir were matched together to form an 87-year site chronology spanning the years 1717 to 1803.

Two stakes, probably from the same tree, were identified to have been felled around 1784, suggesting a phase of construction or repair around this time. Three other stakes, identified as having been felled around 1803, together with consistent felling-date ranges produced from all the other stakes, provided strong evidence that a further major phase of construction or repair of the weir occurred around 1803.

While these results identified two likely phases of construction or repair, weirs are often periodically damaged by floods and therefore the stake dates may not necessarily be as old as the weir itself. Additional analysis of stakes from other parts of the weir may identify other earlier phases of construction or repair.









*The full cohort of stakes recovered from the weir*



*Thirteen sub-sections of stakes that underwent dendrochronological analysis*

### **Ancient Structure**

It is widely recognised that the technology of water-powered mills was introduced to England by the Normans following the Conquest in 1066. By the time of the Domesday survey, just 20 years later, there were already around 6000 watermills recorded. All of these mills will have been dependent on the management or adaptation of watercourses for their power source so there was a proliferation of weir construction at that time.

The ancient (original) structure of Dulverton weir appears to have been built in a style that is typical of the Norman period. At first sight, the weir might appear to be a very simple structure. However, closer inspection reveals that the people that built this weir knew exactly what they were doing and clearly had experience.



The materials are local stone and timber stakes. The design comprises five elements with each element supporting the others. These are:

- The “toe” of the weir - a step cut in the riverbed for the structure to compress against.
- Oak stakes – hammered into holes drilled into the rock bed of the weir to prevent horizontal slippage.
- Facing stones – large flat stones laid on edge across the upstream face of the weir to prevent seepage.
- Substructure – large random sized stones laid from the toe going forwards to support the stakes horizontally and the glacis stones vertically.
- The glacis – rounded edge stones laid from the toe going forwards to form a slope from the crest of the weir down to the toe (approximate angle 20°).

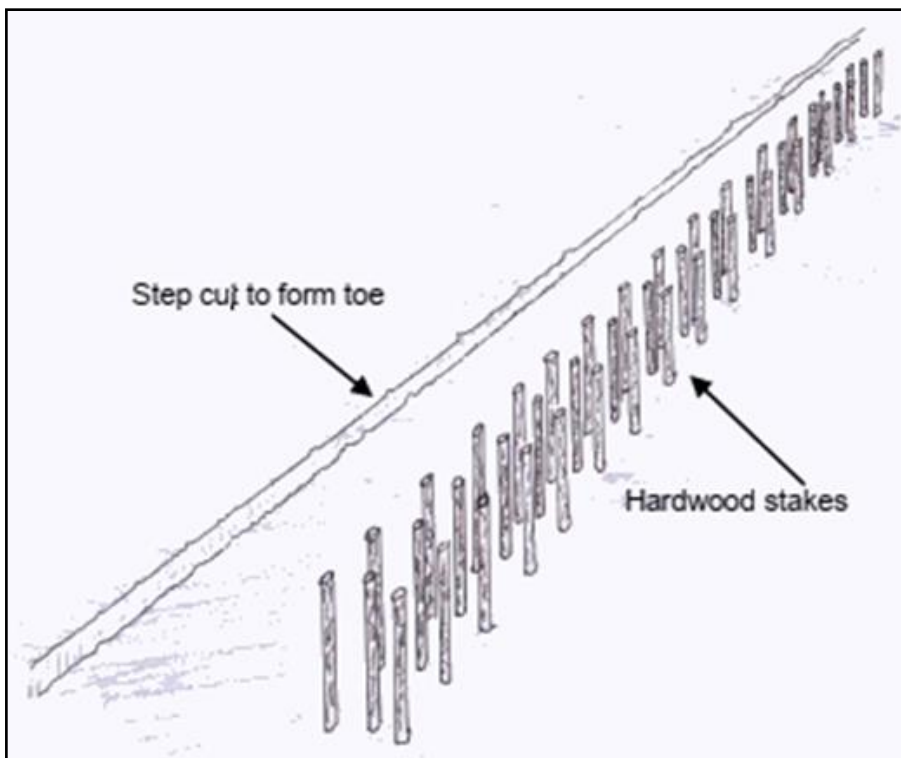


*Flat stones at the “toe”*



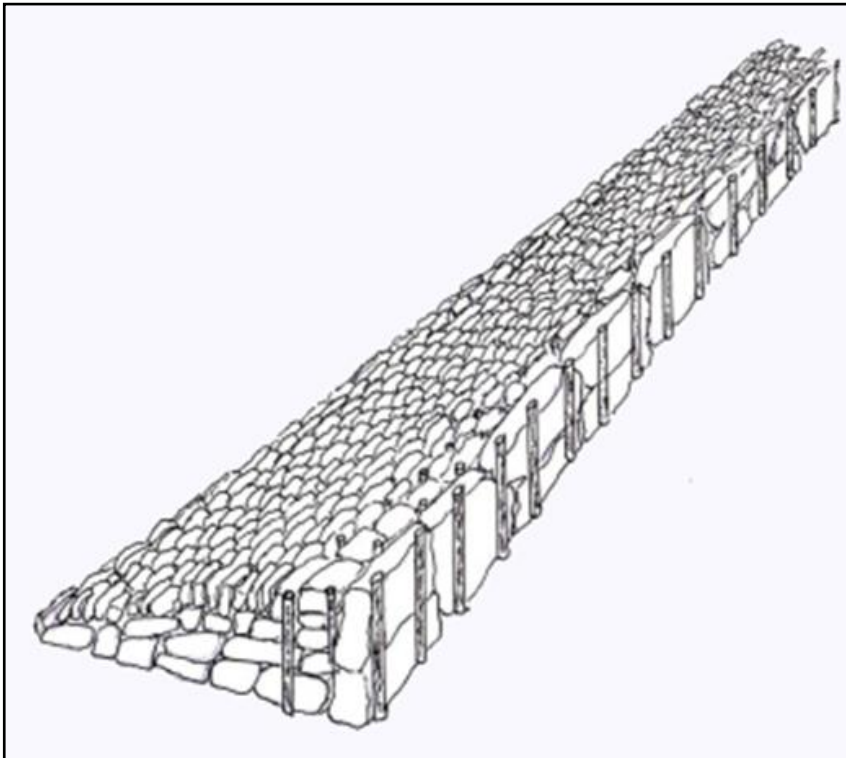
*Rounded stones of the “glacis”*

#### How the weir was built.



The site was prepared by excavating the ground to form the weir pool and the level bed of the weir. A step was cut in the edge of the riverbed to form the toe of the weir.

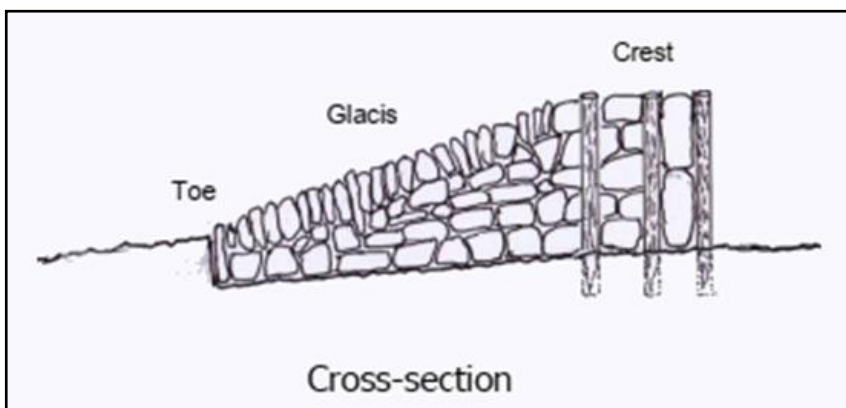
Holes were drilled in the rock to accommodate at least 3 rows of hardwood stakes about 600mm apart



Between the first two rows of stakes, large flat stones were laid on edge across the face of the weir to prevent seepage.

From the toe going forwards, the substructure was laid to provide lateral support behind the facing stones and to form the 'crest' of the weir.

Above the substructure, the 'glacis' was formed by laying rounded stones on their thinnest edge, similar to a dry-stone wall but at an angle of approximately 20° to the horizontal.



Under pressure from the water, the resulting structure is always in compression against the toe and is therefore resistant to displacement of stones by the water flow. In effect, the pressure squeezes the stones against each other, holding them in place. As the rate of flow increases, the weir gets stronger.

### Flow characteristics and the Weir

The river Barle can be a fairly gentle clear-running river but it can also be a raging torrent. The water level can rise by a metre in an hour and flooding occurs typically at least once in a decade. Incredibly, the ancient structure of the weir can withstand the relentless force of the water while modern designs and materials fail.



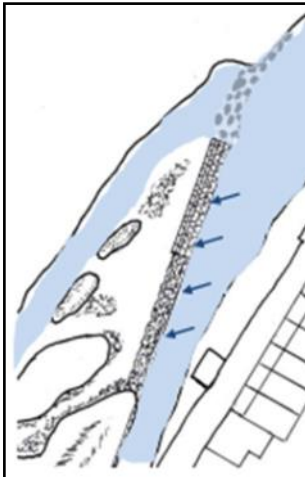
*Left:  
The river can be a picture of rural tranquillity with cows drinking from the gentle flow in the weir pool.*



*Right:  
The river in spate turns brown with peat washed down from the hills of Exmoor*



The weir is subjected to four different types of force according to the rate of flow:



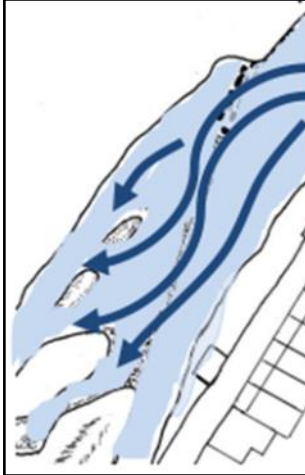
#### Low flow

The weir simply needs to contain the water in the weir pool. Large stones at the face of the weir are to prevent seepage that, in time, could wash out stones at the foot of glacis, weakening the structure.



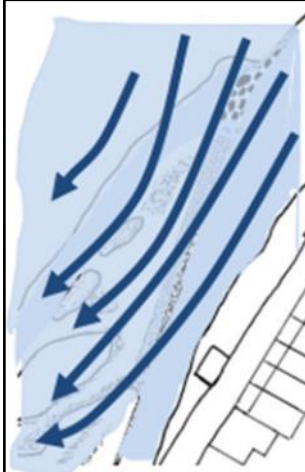
#### Moderate flow

Water spills over the crest and is let down gently over the glacis to rejoin the main stream of the river. If the glacis has stones missing, water can enter the substructure and will eventually wash away some of the glacis.



#### In spate

The upper water is a longitudinal force. The rounded stones of the glacis ease the passage of the water. Lower down, the face of the weir is under enormous load. This compresses the structure but the stones grip against each other making the whole structure stronger.



#### In flood

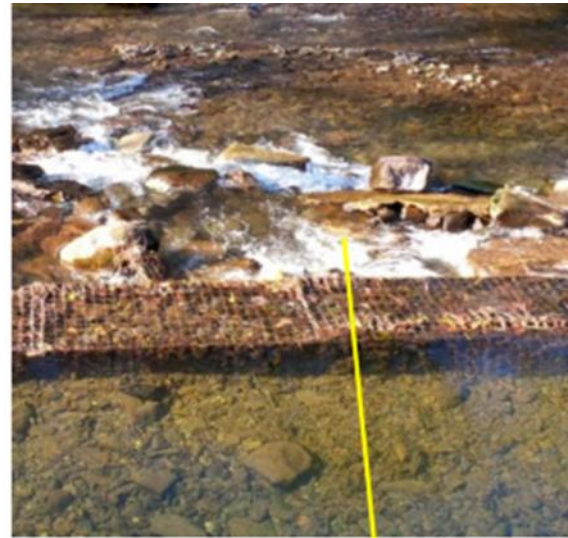
As in spate, the pressure makes the structure stronger. Wooden stakes at the face of the weir keep the facing stones located. The structure can withstand the flow but is prone to being struck by trees washed down which will damage the crest.

## Condition of the Ancient Structure

**Southern end of weir (3.7m)**  
*Ancient structure still intact including original 'glacis'*



**Large breach from December 2012 (6.7m)**  
*Water has washed through the gabions and the breach has returned but some original substructure remains below*



**Small breach from December 2012 (3.2m)**  
*Water has washed through the gabions and the breach has returned but some original substructure remains below*



**Concrete skimmed section from earlier repair (13.1m)**  
*Structure probably still largely intact below concrete*

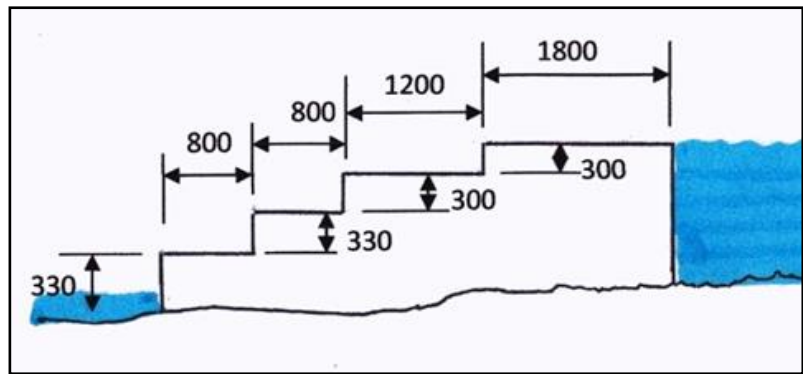


## The Masonry Stepped Weir - First Section

Date of construction: 1995

Length: 12.7 metres

The first section of stepped masonry weir was constructed in the late 20<sup>th</sup> century to replace damaged original structure. The material was yellow sandstone, cut mainly in triangular blocks. The joints were filled with mortar. Later patchwork was done using concrete. It is not a solid masonry structure; the core was filled with stones from the riverbed.



*Cross section dimensions (in millimetres)*

This section of weir is in poor condition for the following reasons:

- Stones are missing from the crest.
- Seepage through the joints of the remaining crest stones will eventually wash out the joints.
- The void in the core makes the structure inherently weak.
- There are reports from canoeists of canoes getting 'pinned' under the masonry by the fish pass which suggests that the footing has been eroded.



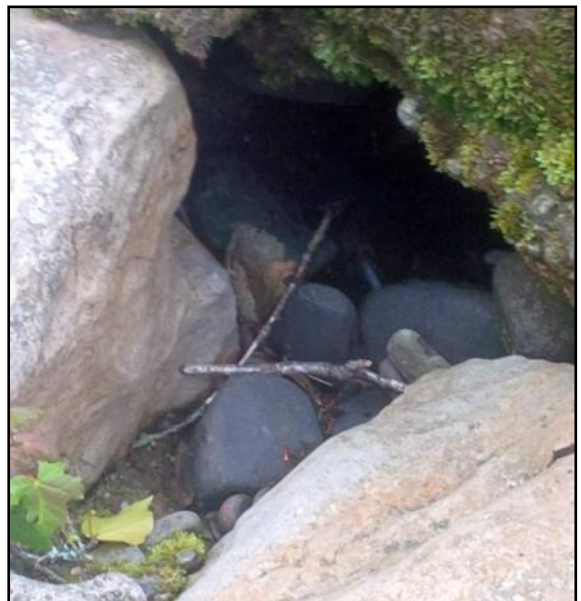
*View from upstream*



*View from downstream*



*Crest of the weir showing that stones from the front face have been washed away leaving the rest of the structure vulnerable to seepage and further damage. The wet patches behind the crest show that seepage is already present.*



*View from the stepped side of the weir showing a void in the core where some of the river stone infill has been washed away.*



A further problem is that the crest of the masonry section is higher than the rest of the weir. It is the last part to get wet when the river level rises. Two photographs, (*below*) taken at the same time in October 2008, show the masonry part dry while water flows over the original structure to the left. This concentrates the flow over the original section, rather than spreading the load across the whole of the weir. Further evidence is the vegetation growing on the crest.



### **The Masonry Stepped Weir - Second Section**

Date of construction: 2000

Length: 9.5 metres

The second section of masonry stepped weir was constructed in 2000 to remedy a breach of the original structure. It was built to replicate the adjacent section.



*2000 works in progress – damming of the weir pool*



*2000 works in progress - removal of the original structure and clearance of the bed of the weir*



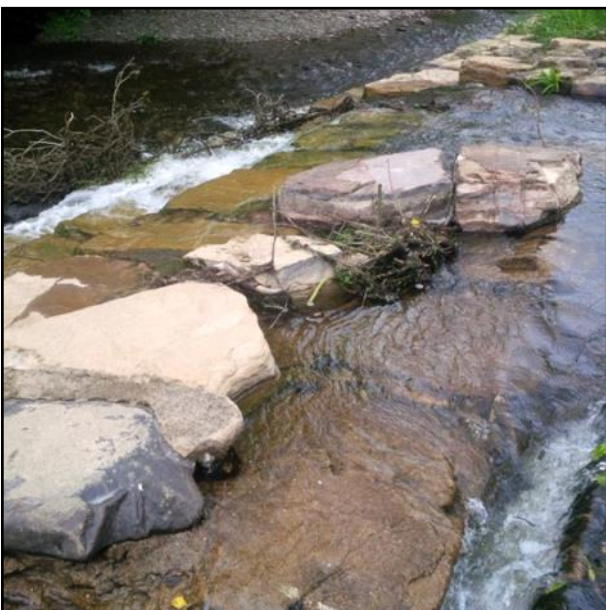


*2000 works in progress – substructure of ‘dumpy bags’ containing dry concrete mix*

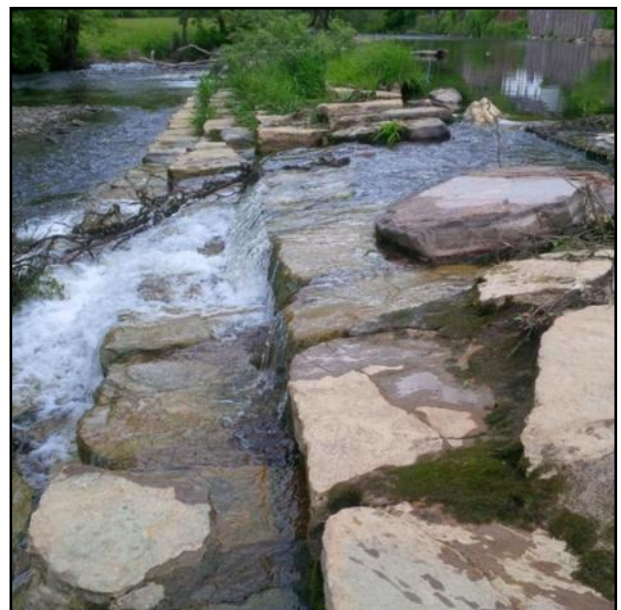


*The second section of masonry stepped weir in 2008*

Photographs taken in the present day (*below*) show the distressed state of this part of the weir.



*Stones are washed away from the crest*



*A new breach has formed*

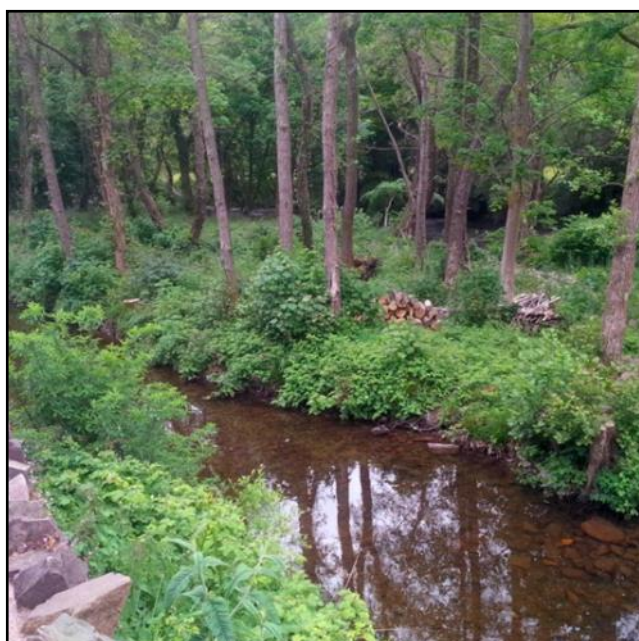
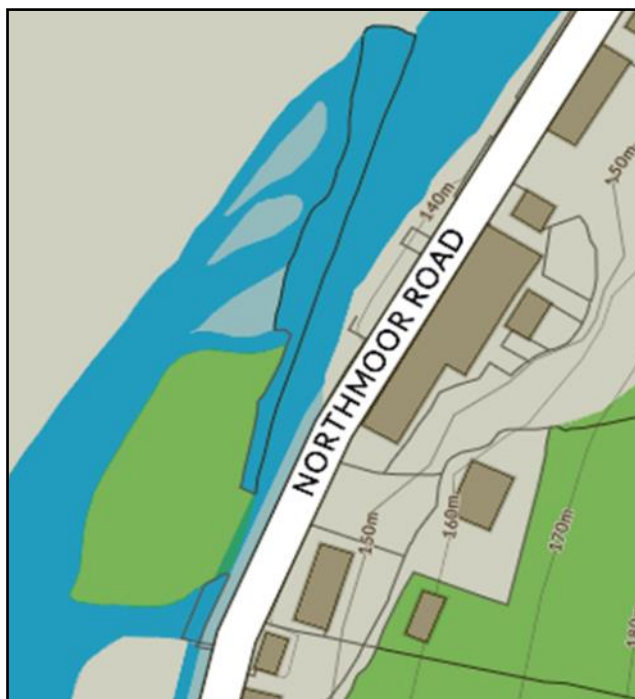
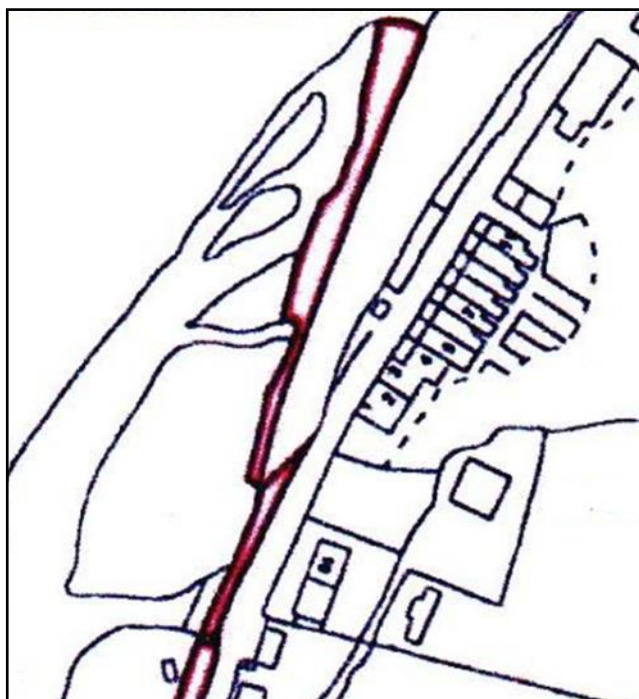


## The Island



The island would have been formed in the 12<sup>th</sup> to 13<sup>th</sup> Century when the leat channel was excavated as part of the original construction of the weir and leat. It is approximately 50 metres x 23 metres. It has quite a dense covering of trees and ground vegetation and is essentially a wild landscape that provides a habitat for a variety of wildlife.

It is evident from Ordnance Survey maps and the Land Registry Title Plan (*below*) that about half of the east bank of the island was also part of the weir, as shown on the plan (*left*) by the red line. The plan also shows the dried-up channel almost bisecting the island with a green line. In the 1990s the leat channel was dredged, and the spoil dumped on the east bank of the island. There is a strong likelihood that beneath the spoil will be found evidence of a continuation of the ancient structure of the weir.



*The island viewed from Northmoor Road*



*The dried-up channel across the island*





*1930s postcard entitled “Weir Stakes and Cleeve”*

In the foreground a channel can be seen flowing into the island. An elderly resident recalled that many people in Dulverton referred to the weir as “The Stakes”

#### **Rock Weir and Fish Pass**



*The Fish Pass*

Date of construction: 1993

Length: 16.0 metres

What we know today as the fish pass was built in 1993 to remedy the collapse of a section of the original structure of the weir that had caused the water level to be too low to feed the leat, thereby preventing the Dulverton Laundry from extracting water. The fish pass comprises a number of boulders laid roughly along the bed of the original weir. The work was carried out by local contractor, John Pugsley, who sourced the boulders from the riverbed.

#### **Sluice Side Weir**



*The sluice side weir*

Date of construction: 2012

Length: 7 metres

The side weir is the final part of the weir before water passes through the sluice into the leat. Previously reconstructed when the sluice was rebuilt around 1999, the side weir had become damaged over time resulting in the need for remedial works by 2011. A first attempt failed due to the use of non-waterproof cement, so the present structure is a second reconstruction done in 2012. It has no historical value other than marking the fact that there has always been a side weir adjacent to the sluice.

## Gabions



*The newly finished gabions*

Date of construction: August 2014  
Length: 34.0 metres

By the beginning of 2014, West Somerset District Council had been unable to arrange repairs to the breached weir. The water level in the weir pool was so low that the leat was dry. As a temporary solution, they decided to install a line of rock-filled gabion baskets along the upstream face of the weir in order to raise the water level sufficiently to feed the leat. The work was carried out in August 2014 by local contractors C. J. Lynch. It was while clearing the line for the gabions that around 45 oak stakes were removed from the front of the weir together with a number of the flat facing stones that had remained in position. An estimated 25

tonnes of stone were brought in from outside the area to fill the gabion baskets. The stone was dropped in the gabions by mechanical shovel and the breach was filled with dumped stone from the riverbed. After closing the baskets, the gabions were topped off with scalpings.

The first time that the river level rose above the gabions, the scalpings were washed away. Without a waterproof barrier or membrane, the gabions are porous, so water passes through, washing away the dumped stone in the breach. Ultimately, the gabion baskets will need to be removed to facilitate permanent repairs to the weir. It is unlikely that the stone can be removed mechanically; it will need to be done by hand.

## The Future

The history of the weir and mill leat goes back more than 700 years. The system is regarded as “one of the best-preserved urban watermill landscapes of medieval origin in England”. Dulverton Weir is one of the last remaining examples of the ancient craft of weir building that goes back a thousand years. It is damaged but it can be restored and preserved. If it is not restored, it will be lost forever. There is widespread support for the Dulverton Weir and Leat Conservation Trust to succeed in restoring this historic monument of local, national and international importance.

**Peter Romain (trustee of the Dulverton Weir & Leat Conservation Trust)**

*Dulverton Weir and Leat Conservation Trust is a Charitable Incorporated Organisation.*

*Registered Charity No. 1167729*

*Website: [www.dulvertonweir.org.uk](http://www.dulvertonweir.org.uk)*



## Canal Lift at Firepool, Taunton

Chris Webster at SHER has provided a photograph of the excavated front wall arch of the Taunton Lift. I visited the site, armed with a bundle of plans, maps and photos. The contractors, Willmott Dixon, expressed a lot of interest and invited me to look around. All that was visible was part of the front wall. I am now awaiting a copy of the report from Cotswold Archaeology, who had already left the site, before making further comment.

**Denis Dodd**





## Railway and Factory Recollections

A further tale from the pen of Iain Miles

### Our Dialect

To me, it would be great to go back 75 or 80 years and just listen to people talking in our work places. Sadly, dialect words are fast going, regional names for tools seem to have gone and although, to a point, you can still tell which part of the country someone comes from, the younger generation have been forced into a BBC estuarial sort of accent.

Accent does rub off on to people though. The Minehead office had a wonderful supervisor working there called Frank. He had come over as a GI, met a local girl, married and stayed here. Frank, apparently, had come from the Bronx and twenty years of working here had produced a wonderful Westcountry accent like no other! - perhaps similar to some of the American coastal accents from further down the East Coast, where the first settlements had been, but still with the Bronx drawl.

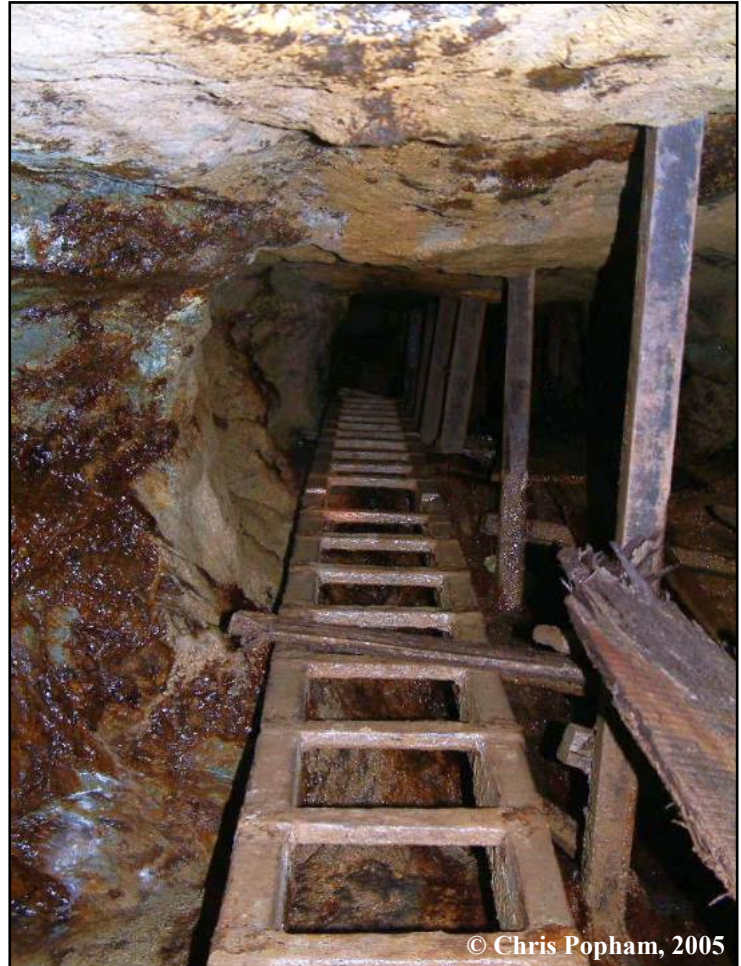
Fifty years ago people writing genuinely in dialect were sadly regarded as quaint. A complaint letter came into our Minehead depot concerning main-layers on an Exmoor job. It was from a farmer or his wife and it had to be read in a West Somerset accent! It was badly typed and it finished, I quote:

**“... morso, yer boys was rud to me. Thy saide us was rud to they but they was proper stoopid. Us told him ware the pipe shuld be by the house. I nawed he must have nawd cus twas he wat put the meater up my passage bak along.”**

## In the Headlines 150 Years Ago

1<sup>st</sup> -7<sup>th</sup> February, 1872

*An inquest was held on Tuesday last on the body of a miner who lost his life last week while descending one of the Ore mines on the Brendon Hills, some of which are 250 feet deep and which the men ascend and descend by means of a ladder, which are necessitated to be placed almost perpendicular. The deceased who was accompanied by another workman some way further down the ladder, by some means lost his hold and was precipitated to the bottom of the pit, death being instantaneous. His mate hearing something above him crack, with great presence of mind got as close as he could to the side of the pit and says he heard a ‘whiz’ pass by, which was the body of his fellow workman. During the inquest, some of the jury expressed in strong language their disapproval of the manner by which the men went in and out the pits and recommended an adjournment of the inquest for a government inspector to visit the mines and report thereon in order to prevent future calamities. The inquest was accordingly adjourned.*



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