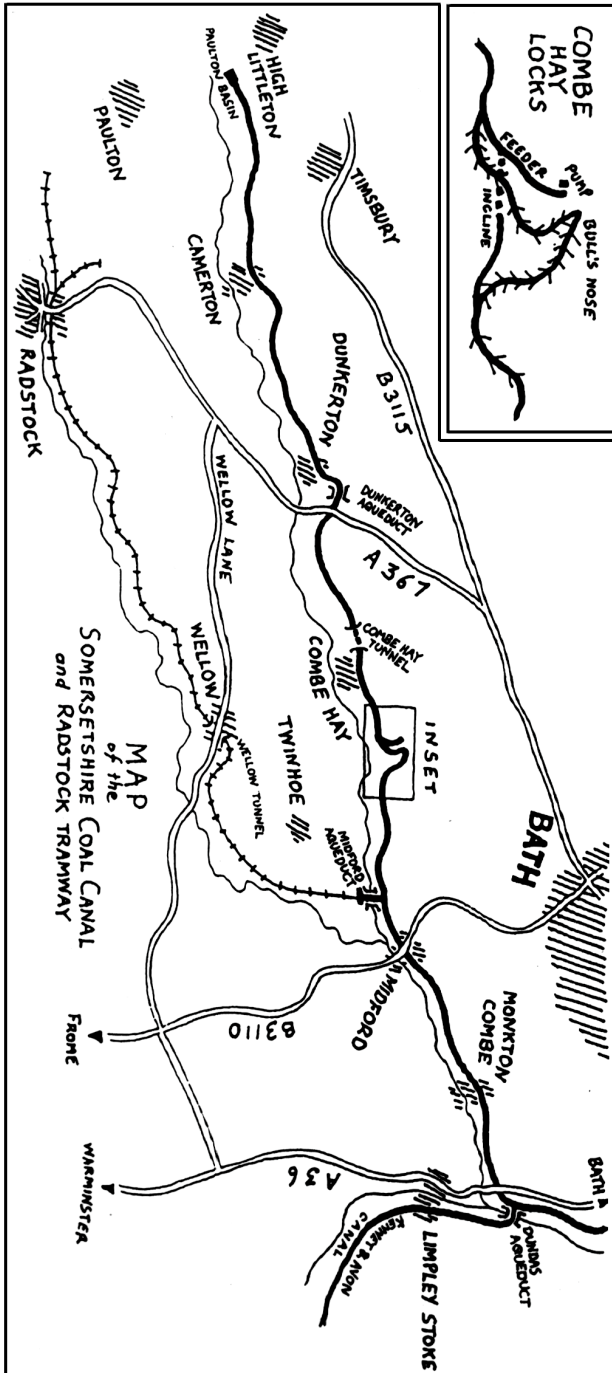


WEIGH-HOUSE

THE MAGAZINE OF THE
SOMERSETSHIRE COAL CANAL SOCIETY



Website: <http://www.coalcanal.org>



Nº 78

APRIL 2020

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The Somersetshire Coal Canal Society was founded in 1992 to:

'FOCUS AN INTEREST ON THE PAST, PRESENT AND
FUTURE OF THE OLD SOMERSETSHIRE COAL CANAL'

The Society became a registered charity in 1995 and now has the
Objects:

- 1) To advance the education of the general public in the history of the Somersetshire Coal Canal
- 2) The preservation and restoration of the Somersetshire Coal Canal and its structures for the benefit of the public

Registered Charity N^o 1047303

Registered under the Data Protection Act 1984 N^o A2697068

Affiliated to the Inland Waterways Association N^o 0005276

Inland Revenue reference code for tax purposes: CAD72QG

MEMBERSHIP

Membership Application Forms are available from
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and on the Society Website: <http://www.coalcanal.org>

The Editor welcomes letters, articles, photographs *etc* for inclusion in
WEIGH-HOUSE and will try to include them in full, but reserves the right to shorten
them if necessary. Author's guidelines are available at:

<http://www.coalcanal.org/wh/guidelines.htm>.

Please send articles and correspondence to:

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THE VIEWS AND OPINIONS EXPRESSED IN THIS MAGAZINE DO NOT
NECESSARILY REPRESENT OR CONVEY THOSE OF THE SOCIETY

Sunday 4th October —10:00

WORK PARTY — Location to be advised

For further details please contact: *Mark Sherrey* ☎ 07973 918467

Sunday 18th October —10:00

WALK — COMBE HAY to MIDFORD

Meet: Opposite Bridge Farm, Combe Hay. BA2 7EE.

For further details please contact: *Adrian Tuddenham* ☎ 01225 3359746

Thursday 22nd October— 19:30

SOCIAL EVENING — THE CANAL, RAILWAYS AND COLLIERIES OF CAMERTON AND DUNKERTON

by Roger Halse

Meet: The Radstock Working Men’s Club.

For further details please see website or contact: *Steve Page* ☎ 01761 433418

Sunday 1st November —10:00

WORK PARTY — Location to be advised

For further details please contact: *Mark Sherrey* ☎ 07973 918467

Sunday 15th November —10:00

WALK — MIDFORD to MONKTON COMBE

Meet: Twinhoe Lane, Midford.

For further details please contact: *Derrick Hunt* ☎ 07986 972984

Thursday 26th November— 19:30

SOCIAL EVENING — WILLIAM SMITH’S EARLY CAREER IN SOMERSET

by Peter Wigley

Meet: The Radstock Working Men’s Club.

For further details please see website or contact: *Steve Page* ☎ 01761 433418

Sunday 6th December —10:00

WORK PARTY — Location to be advised

For further details please contact: *Mark Sherrey* ☎ 07973 918467

— 2021 —

Sunday 3rd January —10:00

WORK PARTY — Location to be advised

For further details please contact: *Mark Sherrey* ☎ 07973 918467

Sunday 7th February —10:00

WORK PARTY — Location to be advised

For further details please contact: *Mark Sherrey* ☎ 07973 918467

Sunday 21st February —10:00

WALK — DUNDAS - MONKTON COMBE - DUNDAS

Meet: Canal Visitors’ Centre, Brassknocker Basin.

For further details please contact: *Adrian Tuddenham* ☎ 01225 3359746

WEIGH - HOUSE N^o 78

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EDITOR’S NOTES

John Sutcliffe was an experienced down-to-earth engineer who didn’t hesitate to speak out when he felt that other, better-established engineers, had got something wrong or missed the point of what they were trying to achieve. He was obviously a very important figure in the early development of the S.C.C., but very little is known of him as a person and we don’t even know what he looked like. Mike Clarke’s article on his research into Sutcliff describes a book which gives us some insight into the man himself and the clear way in which he thought, unfettered by such niceties as politeness or deference.

Small changes take place along the route of the S.C.C. all the time, but recently the site around Camerton New Pit has undergone some major changes and may soon be due for some more. We report on this in our centre pages. Weigh-House doesn’t usually publish anything particularly dramatic, but the article by Sheila Hetreed about the goings-on at Paulton Basin should get a few pulses racing!

ADRIAN TUDDENHAM

CHAIRMAN'S NOTES

As I write these notes, our inland navigations have been affected by winter floods as never before and the Covid-19 pandemic stalks the land — it would be easy to feel apocalyptic and to write accordingly, but other than our minds being focused on immediate management of the situation, there is much in the present situation that favours a bright future for the Coal Canal.

Let's start with the flooding: the received wisdom is that the rainfall that leads to flooding will get worse over the coming decades – new developments must now allow for 70% more water in flood conditions than was the case recently. Those navigations most affected are rivers and canals adjacent to or part of rivers. Apparently the Thames has been on 'red boards' (strong stream) almost all Winter and at 'Figure of Three' locks on the Calder and Hebble Navigation, the River Calder flooded into the canal and swept most of the bottom lock away. That damage that will take twelve months or more to repair.

Covid-19 is leading to a policy of 'social distancing', ie not getting too close and personal in large crowds. It is also notable that viruses such as Covid-19 and the common cold spread less easily in summer because we spend more time outdoors, not just because summer is warmer. The *Waterspace Study* in 2018 identified several miles of waterway suited to leisure use in Bath and North East Somerset — however all but about four of those miles were river navigation potentially subject to being unreliable due to floods and the damage resulting from these floods — the Coal Canal can provide ten more miles of canal. When we are on a boat or on a canal towpath we are often, by default, 'social distancing' (indeed peace and quiet is why many of us do it) and we are outdoors — noted for being a healthier place to be both physically and mentally. Thus the coal canal has the potential to provide a reliable and much needed outdoor leisure resource – one available without disruption to floods and one that keeps the local population healthier all year round - what are we waiting for?

PATRICK MOSS

ANNUAL GENERAL MEETING

The next Annual General Meeting of the Somersetshire Coal Canal Society which was due to be held on Tuesday 9th June 2020 at the Radstock Museum, Waterloo Road, Radstock, BA3 3EP commencing 7.30 pm has been POSTPONED to a date yet to be decided.

This is permitted under our Constitution and all members will be given at least 21 days notice of the new date, when it has been agreed by the Committee.

WALKS REARRANGED

Due to weather conditions earlier this year we have had to rearrange our programme of walks, The walks which were to have taken place in February and March have been re-scheduled to April and May; this has allowed us to fit one extra walk into our annual programme. We would not normally cancel an event merely because of bad weather, but it is not safe to walk through ancient woodland in violent storms capable of bringing down trees, nor to climb steep slopes that have been turned into mud slides by constant rain.

The changes have been listed in our *Diary Dates* on Page 21 but before travelling to any event, check with our website, on social media or by telephone to make sure it has not been cancelled.

DATES FOR YOUR DIARY — 2020

ALL EVENTS CANCELLED

In line with Government advice on measures to combat Covid-19 (the Corona Virus) ALL the events listed here have been cancelled or postponed at the time of going to press. If circumstances change we may be able to reinstate some of them later, please check with the website or telephone one of the contact numbers given below for the latest information:

Website: <http://www.coalcanal.org>

Sunday 5th April —10:00

WORK PARTY — Location to be advised

For further details please contact: *Mark Sherrey* ☎ 07973 918467

Sunday 19th April —10:00

WALK — COMBE HAY TUNNEL TO ENGINE WOOD

Meet: Top end of The Avenue, Combe Hay.

For further details please contact: *Derrick Hunt* ☎ 07986 972984

Sunday 3rd May —10:00

WORK PARTY — Location to be advised

For further details please contact: *Mark Sherrey* ☎ 07973 918467

Sunday 10th May —10:00

VISIT — COMBE HAY LOCK FLIGHT *

Meet: Layby opposite Bridge Farm BA2 7EE

For further details please contact: *Derrick Hunt* ☎ 07986 972984

Sunday 7th June —10:00

WORK PARTY — Location to be advised

For further details please contact: *Mark Sherrey* ☎ 07973 918467

Tuesday 9th June — 19:30

ANNUAL GENERAL MEETING 2020

Meet: Radstock Museum

For further details please contact: *Patrick Moss* ☎ 07736 859882

Sunday 5th July —10:00

WORK PARTY — Location to be advised

For further details please contact: *Mark Sherrey* ☎ 07973 918467

Sunday 2nd August —10:00

WORK PARTY — Location to be advised

For further details please contact: *Mark Sherrey* ☎ 07973 918467

Sunday 6th September —10:00

WORK PARTY — Location to be advised

For further details please contact: *Mark Sherrey* ☎ 07973 918467

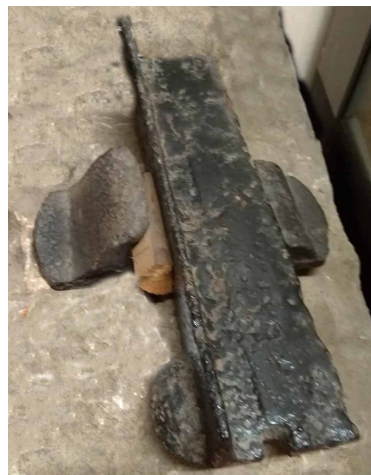
DEAN FOREST RAILWAY MUSEUM

The Dean Forest Railway Museum at Norchard contain a number of interesting relics of the previous tramway, these include a wagon wheel and a length of plateway. It is interesting to compare their artefacts with those used on the tramways connecting the mines to the S.C.C.

Tramways were a vital part of the transport network, without which the canals could never have been viable but they are often overlooked in the enthusiasm which canals generate. We don't have any tramway or plateway artefacts from the S.C.C. on display (although we do have some in storage); the Dean Forset Railway Centre is only one place where plateways are on display, there must be many others. Can readers add to the list of museums where plateways can be studied?



DEAN FOREST WHEEL



DEAN FOREST PLATEWAY AND CHAIR

MEMBERS' EVENINGS

The list of *Dates for your Diary* on the opposite page includes a good selection of topics to be covered by guest speakers at our Social Evenings up to the end of this year. We still have vacant slots for speakers in 2021 and would like to make sure we fill them with subjects of particular interest to our members. To save us guessing (and potentially getting it wrong) it would be helpful if members let Derrick Hunt know of particularly good speakers and subjects they have come across elsewhere, which they feel would be interesting to other members.

Suggestions for topics which we could cover — or cover again if there was something you regretted missing — are also welcome, although in this case we can't guarantee to find an appropriate speaker every time. Don't feel that your suggestions have to be confined only to the S.C.C., in the past we have covered such diverse topics as "Walking" paddle steamers and brass mills — and everyone has agreed they were fascinating. Please tell us what you want.

DONATIONS

The Society wishes to express its thanks to the following for their generous donations:

Mr. G. Quartley

NEW MEMBERS

The Society welcomes the following new members:

| | |
|-------------------|---------|
| Mr. J. Gillingham | Canada |
| Ms. T. Gulliford | Salford |

FROM THE MEMBERSHIP SECRETARY

Thank you to those who have already renewed their membership for 2020. It is possible to renew *via* the website, using your membership number, or cheques can be posted to me (address inside front cover of Weigh-House). The sooner you do this, the fewer reminders I have to send out later in the year. Don't forget to let me know if you move house or change your email address, or if you would prefer to receive Weigh-House electronically in future. If I have your e-mail address, I can inform you of last-minute changes to our programme.

STEVE PAGE

NEW RESOURCE FOR WATERWAYS CAMPAIGNERS

A new resource has been launched by the Inland Waterways Association to help influence planners and policy-makers by demonstrating the value of inland waterways across the UK. It is entitled "The Value of Inland Waterways - a literature review" and is available online at:-

https://waterways.org.uk/iwa_publications/pdfs/valueinlandwaterways

It brings together previously written reports and studies in order to evidence the many benefits that waterways can bring to an area. This report is worth reading by all those interested in canals and particularly those involved in restoration schemes such as the S.C.C.S..

In my view it is a high quality report and incorporates "Action Points" for the IWA to pursue. However, it does not include the potential for water supply and flood alleviation, readers may be reassured to know that we are contacting the author to suggest that these items be added.

DERRICK HUNT

NAVYING NOTES

I'm pleased to say that the number of volunteers turning up at our work parties is increasing, with ages ranging from veterans of some of our earliest restorations right through to Leo, our youngest.

We have had a slow start to year as regards work parties. Mother nature has not been kind to us however we have managed to clear the area around the patch of ground adjacent to the drydock and in doing so we have found the foundations of the old buildings that occupied the site.

On the subject of weather, we like many other canal societies, have had to deal with an abundance of water due to two named storms. The last one storm Dennis has been quite a challenge. Any excess water from the Intake normally flows quite happily over the Weir into the Dry Dock but as the Cam was in full flood, the floodwater backed up into the Dry Dock basin. The level in Paulton Basin was so high that the bund near Terminus Bridge was in danger of overtopping, so the team was called out on a dark and stormy night to deal with the situation. We shut off the inlet, opened the overflow pipe to the leaky section and removed a quantity of stones that someone had placed on the weir crest, which were obstructing the overflow. This dropped the levels safely and for the first time in a while we had a very full canal. Other sections of the canal also played their part in water management as they started to fill up and reduce some local flooding. Hopefully we will see calmer weather in the coming months that will allow us to continue with the work of preservation and allow us to start the work of fixing the leaks near Paulton. It's my hope that we can work on other sections of the canal as the year progresses. We are always looking for new members of the society to help with our work, so if you have any Saturdays or Sundays free and would like to help us on the work parties, please get in touch:

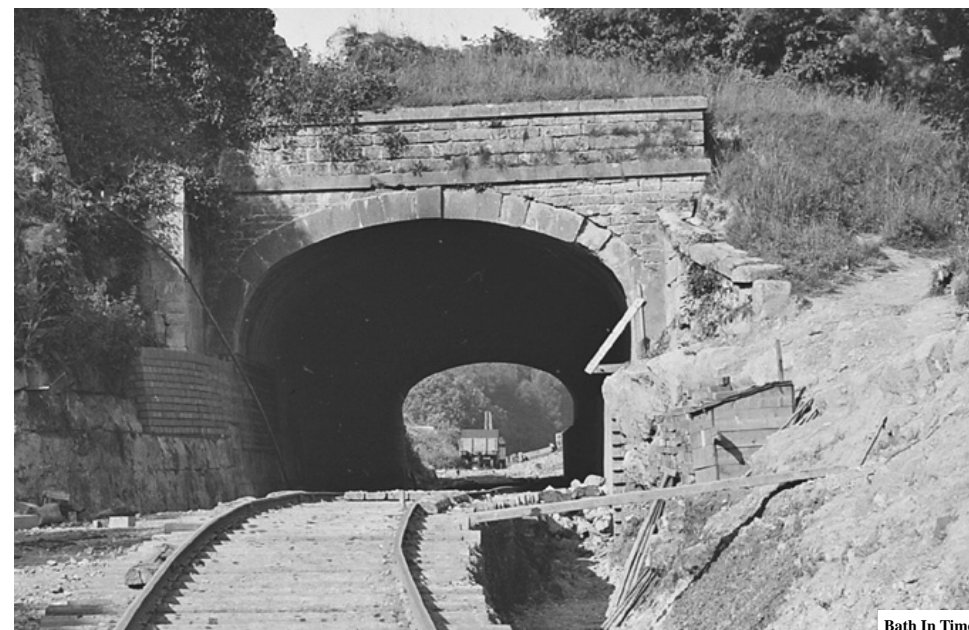
E-mail: mark@coalcanal.com

MARK SHERREY



Picture: Mark Sherry

THE 'DRY' DOCK FLOODED BY HIGH WATER LEVELS IN THE CAM BROOK



Bath In Time

Fig 28 — THE WESTERN PORTAL OF COMBE HAY TUNNEL DURING CONVERSION TO RAILWAY USE

The contractor's locomotives were relatively small; the top of a Manning-Wardle cab only came up as high as the base of a normal locomotive's funnel, so they were able to use the tunnel before the floor had been lowered. *Fig 28* shows that the floor was not completely lowered until fairly late in the construction process and it also illustrates the sort of gradients that were considered normal for a contractor's locomotive. When that picture was taken, the stone canal portal had not yet been built over, and it is interesting to note that there appears to be a pipe on the left of the entrance, which was probably the water supply for the contractor's camp at the other end of the tunnel.

Unfortunately it appears that George Love Dafnis did not take any photographs of the railway construction further west than this area, so he left us no record of how the massive viaduct across The Hollow at Dunkerton was constructed or how the materials to build it were brought in. That section of the work may well have been supplied from a rail connection at Camerton, although it is clear from *Fig 28* that the contractor's railway also continued in that direction.

The knowledge that the contractor's railway covered a much wider area than just the direct route of the Camerton to Limpley Stoke railway line has made possible an interpretation of some of the structures along the line of the S.C.C. which was previously lacking. As 'lost' photographs of the Cam Valley still come to light occasionally, it is to be hoped that even those previously thought to be of little value will be carefully examined for unexpected clues in the future.

ADRIAN TUDDENHAM

The author acknowledges his gratitude to Steve Page, Roger Halse and Henry Davis for their assistance in preparation of this article and to the 'Bath in Time' website for their generosity in allowing the free use of their copyright photographs.

During the construction phase, the area East of Combe Hay Tunnel was the centre of the contractor's activities, with wooden huts housing temporary offices, stores and probably sleeping accommodation for some of the men. Despite the use of steam navvies, there was still plenty of work for labourers to do and the steam navvies required a team of sixteen men to operate each of them.



Fig 26 — VIEW OF THE CONTRACTOR'S DÉPÔT LOOKING EASTWARDS FROM THE PARAPET OF COMBE HAY TUNNEL

Among the interesting items lying about in *Fig 26* is a curved object on the bank to the left of the two men. From its curved shape and general appearance, it appears to be wooden centring, which would be used to build an arch. The 'refuges' in the nearby tunnel have arched headers, but these are only a small sector of a circle, whereas the object in the picture subtends nearly 180°. The only other small archway near this site is Combe Hay Aqueduct, which shows signs of having been extended when the railway was built, so this centring was probably used for that purpose.

Lightweight temporary track is still in place in *Figs 24 & 26*, but it is on the alignment that would later be used by the main line shown in *Fig 27*. It seems likely that the temporary track only deviated from the main line where there was a need to move supplies past a section that took time to complete, such as an embankment or cutting, in order to expedite the construction of something that needed imported materials, such as a brick-built bridge.

The reconstruction of Combe Hay Tunnel is interesting, it would have been impossible to operate a steam navvy inside the canal tunnel, so human navvies would have been used instead. New brick parapets were built in front of the existing stone one, a brick lining was added, with refuges through which the old canal construction can be seen, and the floor was lowered to give more headroom for the main line locomotives.



Fig 27 — COMBE HAY HALT, WHICH EVENTUALLY OCCUPIED THE SITE ABOVE

JOHN SUTCLIFFE (1780 - 1816)

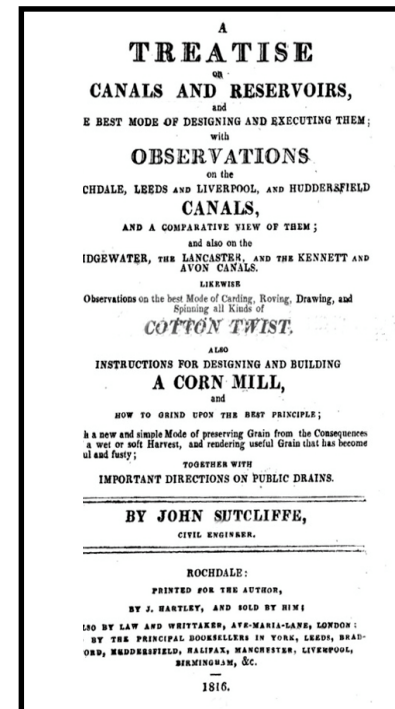
John Sutcliffe was appointed Engineer of the Somersetshire Coal Canal from August 1794 to November 1795 in circumstances which have never been fully understood. Sutcliffe came to notice as a canal engineer in 1793, being employed by the opposition to both the Barnsley Canal and the Rochdale Canal. He was in London when the Barnsley Canal Bill was being presented on behalf of the opposition and the Calder & Hebble Navigation.

When he was involved with the Rochdale Canal Bill, he appeared as an expert witness for the local mill owners with regard to the canal's water supply. He gave evidence to the Parliamentary Committee in London on February 17/18 and 20/21, longer than any other witness, including engineers such as Rennie, Jessop or Outram, which suggests a wide knowledge of water. As a result of the committee's deliberations, engineers from both sides, canal and mill, were authorised to meet to make arrangements over the canal's water supply. John Sutcliffe and Thomas Bradley, both of Halifax, were appointed to look at the Lancashire end of the canal, with William Sutcliffe, of Fieldhead, Halifax, and James Drury, of Little Green, Middleton appointed for Yorkshire side. One of the Rochdale Canal committee wrote:

I hope Rennie will be on his guard what he says to Sutcliffe since if we cannot agree, with the millowners, I think it is very probable that he will be employed as their witness against us.

Despite this warning, Rennie seems to have got on the wrong side of Sutcliffe, who subsequently wrote *A Treatise on Canals and Reservoirs*, published in 1816, but which had probably written some years earlier. The book is very critical of how canals were built at the time, as well as looking at some aspects of textile engineering. (You can download a copy *via* Google Books) History is usually written by the 'victors', for canals, the successful canal engineers writing about how good they were to advertise for further employment. Sutcliffe's book is rather different in that he was pretty critical of the then current engineering standards found on canals, particularly with regard to water. The book is, to some extent, aimed at the works of the John Rennie, who in his younger days can be seen as over-confident regarding water supplies to his canal projects.

Sutcliffe is quite a difficult person to research, given the number of people with this surname around Calderdale. What is known is that he was a millwright from Halifax, whose family, including brother William, were owners of local mills. John was responsible for Marshall's Mill in Leeds, and also worked on other mills for two of the largest late-18th century woollen businesses there. Halifax was an important centre for early civil engineering, particularly canals, Smeaton having trained Halifax-born John Longbotham, who went on to be engineer for the Leeds & Liverpool Canal.



Left: THE TITLE PAGE OF SUTCLIFFE'S BOOK

There was also the Crosley family, William Crosley being closely involved with the construction of the Rochdale and other canals, and his son following in his footsteps, while Brindley took on Whitworth as his associate when working on the Calder & Hebble Navigation.

With regard to the Somersetshire Coal Canal, the book includes an appendix with details of a 'hydrostatic' locks:

A friend of mine, a member of a canal committee of no small magnitude, informs me, that an ingenious gentleman of Birmingham, (but with his name I am not favoured) has got a patent for making an hydrostatic lock, which will require but a very small quantity of water to pass from a lower to a higher level; but at the same time acknowledges he does not understand the plan; and states the patentee's estimate for building a lock of seven feet rise at £2,000.

Was this Robert Weldon's invention, though for a lower fall, or perhaps Mr Woodhouse's design for Tardebigge?

Asked about a comparative estimate, Sutcliffe goes on to compare locks and lifts for a 30 mile long broad canal, 6 feet deep with a rise/fall of 500 feet. For this, Sutcliffe thought 4.75 acres of reservoir, 15 feet deep would supply one mile of canal carrying 350 tons per day for 40 weeks per year, which makes collectively 130 acres. (Note: it should be 150 acres) If half were built on common ground at £10 per acre, and the rest on enclosed ground at £65 per acre, plus £5 for fencing, this makes a total of £5,200. Then £200 per acre was needed for the construction, which makes £36,000, giving a total cost for a reservoir of £41,200. Added to this were 83 six-foot-rise locks at £120 per foot, costing £60,000, making the total cost £101,200. To this could be added £20,000 extra for a pumping engine to supply the summit from one reservoir, giving a total of £121,200.

He thought hydrostatic locks, such as Congreve's, would cost £2,000 each at a minimum. With seven foot rise, 71 such locks were needed, making £142,000. A man was required to look after each at 31s 6d per week or £81-18s per annum, which multiplied by 71 is £5,814-18s-0d, which at 5% capital is £119,000. Add to this the cost of annual maintenance of £1,500, or £30,000 at 5%, plus £10,301-5s-0d for a quarter of the water required for locks. He estimated that, including maintenance, the total capital requirement for hydrostatic locks was £291,000, over twice that needed for conventional locks.

The book also looks in depth at the water supply to the Rochdale Canal, and states that Jessop and Rennie proposed that a 60 acre reservoir, on average 15 feet deep, would be able to supply the canal. However, the actual number of reservoirs built originally was five:

| | | | |
|----------------|-----------|--------------|-------------------------|
| Hollingworth | 130 acres | 10 feet deep | 1,573,000 tons of water |
| Blackstonedage | 50 acres | 15 feet deep | 907,500 tons of water |
| White-holme | 92 acres | 13 feet deep | 1,447,160 tons of water |
| Chelburn | 16 acres | 15 feet deep | 290,400 tons of water |
| Light-hazzles | 30 acres | 6 feet deep | 217,800 tons of water |

This gave a total supply of 4,435,860 tons of water. He used tons of water as the basis for his calculations probably because that was the best unit for calculating supplies to mills where power output needed to be calculated. Canal engineers more often used lock-fulls, a measure directly linked to usage on a particular canal, and probably more expressive than the current use of litres.

The "back drive" of Caisson House, shown in Fig 22, is known to have been built by the G.W.R., ostensibly to compensate the owners of Caisson House for the loss of their previous access to the road along the route of the Inclined Plane. That route was severed by the railway, although pedestrian access was still maintained by means of a small level crossing. Once again, we could have an example of making a virtue of necessity, because this splendid ramped drive may have been left over from the construction works and 'generously' donated to Caisson House to save the cost of removing it. Rough and ready measurements with a home-made clinometer show that the slope of the back drive is approximately 1:20, the same as the maximum working gradient of a Manning-Wardle locomotive, and there is a gently-curved level communicating platform at the top where it adjoins the railway line close to Lock 8.

The towpath from Lock 8 to Lock 2 does not show the repeated level-and-ramp profile that is common to most lock flights and is still to be found between Lock 1 and Lock 2; it rises gradually in the manner of the towpath shown in Fig 20 (WH 77)–. This suggests that, although the contractor's railway may have communicated with the main line at Lock 8, it probably also continued up the lock flight in the direction of Farmer's Bridge. One possible explanation for this is the size of the cutting below Locks 1 to 4, which would have required a great deal of work by the steam navy and may not have been finished until quite late in the proceedings. This cutting posed a dilemma, because if the contractor's railway had tried to follow the towpath as far as Lock 1, it would have been perilously close to the unstable top edge of the excavation in the region of Lock 2, where the towpath has been cut away to half its normal width, with a drop to the railway about 50ft below.

One of the mysteries of Lock 3 has been some railway-type engineering brickwork which was used to reinforce the tops of the walls about half way along the structure. Although the canal company occasionally patched up decayed load-bearing structures with brick towards the end of the canal's life, it would not have needed to use good quality (and expensive) engineering brick to replace worn capping stones that bore very little load other than their own weight. Could this be reinforcement that allowed the contractor's railway to cross the lock at this point, so as to avoid the unstable edge of the cutting a little further on? If it did cross at this point, it would need to cross the canal again to get back on the correct side for Farmer's Bridge.

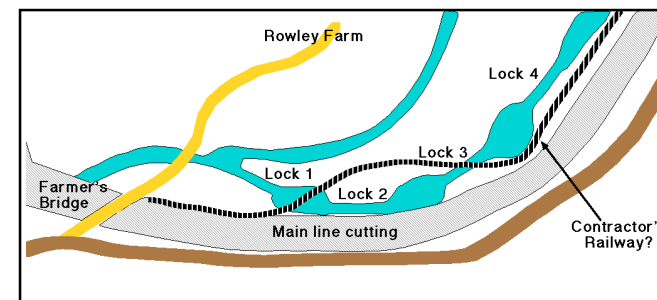


Fig 25 — A POSSIBLE ROUTE FOR THE CONTRACTOR'S RAILWAY NEAR THE UPPER LOCKS

Once again this could be the solution to another puzzle: the pound between Locks 1 & 2 has a section of its embankment wall cut through in the direction of Farmer's Bridge and a ramp into the field on the opposite side. If the contractor's railway had crossed the canal at this point, these are the sorts of alterations we might expect to see.

From Lock 1 to Combe Hay Tunnel there is very little surviving evidence of the contractor's railway — indeed, there is very little surviving evidence of the main line either. The massive cutting on the West side of Farmer's Bridge has been filled in and only the parapets are visible of the three-arched bridge which once spanned it. The rather grandly-named Combe Hay Aqueduct is still in place, if you know where to find it, but the clever design of a stone slab-covered trough, which allowed a stream to share the tunnel with a footpath, has become blocked, to the detriment of both stream and travellers alike. At Combe Hay Tunnel, the cuttings both sides have been infilled, leaving just short ramps down to trackbed level through the tunnel.

Against the theory is the fact that there simply isn't enough room for a railway track between locks 17, 18 & 19 and the road; also the presence of a stone-built staithe on the hillside above Lock 19 would make a very steep slope necessary over the short distance of track to the towpath at Lock 20. For a while, these facts seemed to rule out the possibility of a route along the hillside, but a thorough search of the area when the vegetation was at its lowest ebb revealed that the ground which carries the road had been re-sculpted at some time. An almost-level alignment can be seen gradually emerging from beneath the road on the downhill side as one walks eastwards. There is also a note on one of the G.W.R. plans to the effect that they would bear the expense of improving the road as part of their planning permission, so it begins to look as though they had made a virtue out of the necessity of moving the road to make space for the contractor's railway and then replacing it afterwards. The steep slope down to Lock 20, at the eastern end of the alignment, would be potentially hazardous for a locomotive braking laden wagons, but most of the heavy traffic was in the uphill direction and a short slope could be overcome by taking a run at it. There would be a need for some precaution such as a check rail and some reinforcement over that section — and *Fig 21* shows precisely that.



Fig 23 — SPIRAL BRICKWORK IN THE SKEWED ARCH OF MILLER'S BRIDGE

Further possible evidence comes from the way Miller's Bridge is constructed: the line of the archway is not at right angles to the line of the embankment above it, the arch is skewed. This shows up very clearly as a spiral pattern in the brickwork. Obviously more skill was needed to construct a skewed arch than a right-angled one, so why would the G.W.R. have specified something that was more difficult and expensive to build than the standard item? The answer may lie in the design of the locomotives, some of which had minimum turning radii of 100 ft, which would be a stupendously sharp curve in ordinary main line railway practice, but is quite tricky to fit into a country lane. By skewing the bridge arch, a more gentle curve would be required to take the contractor's railway through it from the awkward approaches each side — if indeed the contractor's railway did run through the arch.

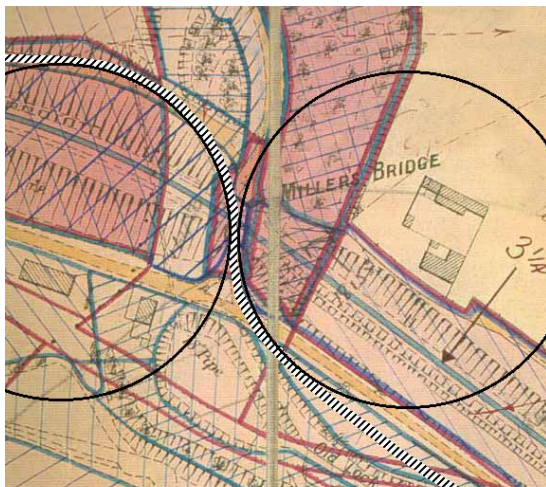


Fig 24 — A SMALL PORTION OF THE G.W.R. MAP OF THE MILLER'S BRIDGE AREA WITH TWO APPROX. 100ft RADIUS CIRCLES SUPERIMPOSED TO TOUCH THE BRIDGE ABUTMENTS AND DEMONSTRATE THE CURVATURE REQUIRED TO TAKE THE CONTRACTOR'S RAILWAY THROUGH THE ARCH

| Estimate for finishing the Dunkerton Canal with Locks and a Steam Engine | | | |
|---------------------------------------------------------------------------------------------------------------------------------------|---------|----|---|
| | £ | s | d |
| Digging the Canal to the lower Level including the Lock Pits | 1,550 | 0 | 0 |
| Puddling the Pools with the Head and Tail of the Locks | 430 | 0 | 0 |
| Making a small unbantment and culvert | 86 | 10 | 0 |
| Building 130 feet of Lockage, at £85 per foot | 11,050 | 0 | 0 |
| Making three Occupation Bridges, at £75 | 225 | 0 | 0 |
| Fencing off the towing-path and graveling it, at 2d. per yard | 220 | 0 | 0 |
| Finishing the Canal from the Bason to the Junction | 745 | 10 | 0 |
| Cutting a Draw from the tail of the last Lock to the Engine pit, two feet wide, three feet high, and arching it over where necessary | 564 | 10 | 0 |
| Sinking the Engine pit 30 [yards and] walling it where necessary, and one of the Caisson pits will serve for it, as far as it is sunk | 65 | 0 | 0 |
| Building a Steam Engine | 1,155 | 6 | 0 |
| Building a small warehouse [at the head of the Canal] | 600 | 0 | 0 |
| | £16,691 | 16 | 0 |

**JOHN SUTCLIFFE'S REPORT OF 26 May 1800
ON THE COST OF COMPLETING THE COMBE HAY LOCK FLIGHT**

Traffic on the Rochdale was anticipated to be 10 boats per day of 35 tons, making 350 tons per day, and at 240 days per annum (presumably omitting Sundays, holidays and closure for drought or frost) gave an annual total of 84,000 tons carried. Reservoirs were expected to fill with water twice per year, giving 8,871,720 tons of water or 26,170 lock-fulls. This suggested there were 106 tons of water per ton of goods carried. A lock 81.5 feet by 15 feet by 10 feet requires 340 tons of water. For a boat passing along the canal, two lock-fulls are required to pass a summit, with a further three lock-fulls allowed for leakage, soakage, evaporation etc. Thus, with a 35 ton average cargo, 9.5 tons of lockage water were required in ascending or descending a lock, so 48.5 tons of water were needed for every ton of cargo, say 50 tons as some boats return light. He estimated that this was about half of the water available, questioning as to why the canal was short of water and where had it gone. He thought that evaporation of 0.5 inches per day in summer was equal to 577,170 cubic feet or 47 lock-fulls.

Sutcliffe's book was one of the earliest descriptions of canal engineering in English, and that alone should make it important. That it was critical of the current standards and of the financial implications makes it even more important for those interested in early canal promotion and construction. It is interesting to note how few English language books on canal engineering there were in the eighteenth century, with early engineers relying upon Belidor's *Architechture Hydraulique*, published in France in 1754. The first major English language work was the section on canals in *Rees' Cyclopedia* of 1819, though the section was written earlier.

Besides his work opposing the Rochdale Canal and as Engineer for the Somersetshire Coal Canal, Sutcliffe's only other involvement with navigable waterways was to report upon the proposed canal through Hexham, between Carlisle to Newcastle, in 1796/7. In the south west, he was also consulted on the Axe drainage scheme of 1801. It is surprising how little we know about him, given that his was one of the few voices suggesting caution during the Canal Mania. His views certainly deserve more consideration today when discussing canal history, and it would be interesting to discover more about why he became Engineer to, and why he left, the Somersetshire Coal Canal.

MIKE CLARKE

LOVE, VIOLENCE, AGGRESSION AND FAMILY LIFE ON THE TIMSBURY AND PAULTON BASINS

The Somersetshire Coal Canal basins are a haven of beauty, peace and tranquility for the many locals and visitors who walk around the ponds daily in sun, rain, gale winds, ice and snow.

There is always something of interest to see and hear, whether it is the ducks at spring time, pursuing the perfect partner or the tiny chicks that emerge soon after, zig zagging across the water, completely ignoring their mothers intermittent “quacks”. Often, you can catch a glimpse of the coy moor hens and coots as they “beep” in panic, being impossible to approach, as the very sight of a human sends them literally skittering across the surface of the water, as they head for cover. These expert divers can vanish before your very eyes and reappear at a distance, like a game of ‘trick the human’. Also in spring, the pool frogs emerge, their croaking audible from a great distance. If you keep perfectly still, you can glimpse them dancing across the surface, selecting a partner and grabbing them by the waist as though dancing in a frenetic ceilidh. The males literally ‘blow their own trumpets’ as they bellow an orchestra of “burps” from their bubble gum cheeks.

Whenever I approach the basins, I scan the length of the ponds to locate the resident pair of Mute swans. They are usually side by side, sometimes in or often out of the water, bending their long necks low to sift through the water with their beaks for their staple greenery diet, or grooming their pure white plumage.

However, life on the ponds is not always serene and predictable. There appears to be something amiss with our largest majestic residents. For the past 2 years, they have not nested and therefore there have been no signets. It is the ongoing topic of conversation amongst the regulars as to why this is; we all have our theories.

One theory is that they are in fact now two males, another that they are siblings from a past brood. Last spring they were joined by a young adult, still sporting the off white plumage of his youth. This



shy stranger took residence in the brook and then settled for quite a while in a nearby pond, then took off. Already this year, we have had an adult stranger - followed by another who briefly took over the pond space, while the original pair (or are they?) kept to themselves on the banks. The first pair took flight but returned a few days later, apparently unperturbed by the interloper.

So, why such a dramatic title to this article?

The left-hand rail has a second piece of rail running parallel with it. If this were part of a set of points it would be tapered and matched with another piece on the opposite rail; there is no sign of that, so it is most likely to be some sort of reinforcement or a check rail to prevent the locomotive derailling on a sharp curve. From that we can deduce that the track probably curves sharply behind the camera — but which way? The check rail is always on the inside rail of a bend, so the curve was uphill to the North, towards the main line.

The nearest two structures that would have needed major supplies of building materials are Bisham’s Bridge and Miller’s Bridge, which both lie to the North of the track shown in *Fig 21*, so it is reasonable to suppose that the contractor’s railway led towards them in some way. The main line is considerably higher up the hillside than the contractor’s railway at this point.

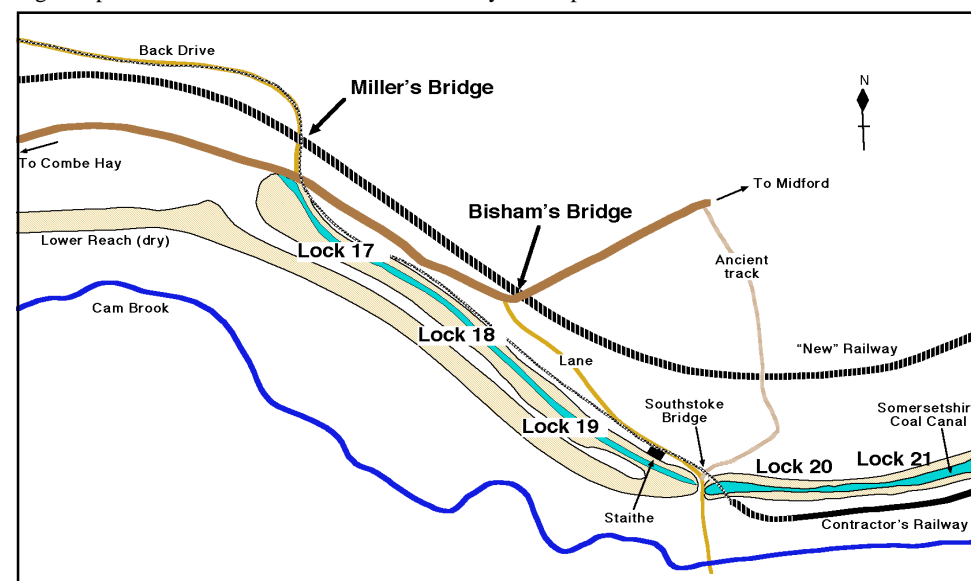


Fig 22 — SKETCH MAP OF THE LOWER LOCKS AND POSSIBLE ROUTE OF THE CONTRACTOR'S RAILWAY

Typically a contractors’ locomotive like the Manning-Wardle Type Q would be expected to draw 40 tons up a maximum gradient of 1:20 at 9.5 m.p.h., so this would limit gradients on the temporary railway to no steeper than that. The laneway leading from Southstoke Bridge up to to Bisham Bridge is a bit steeper than that in places, so it would make sense to avoid that slope and bring materials to the Bisham Bridge site along the level main line track from a westerly direction. That would mean that Miller’s Bridge, which carries the main line over the back drive of Caission House, would have to be constructed first; the hillside is too steep for any other direct connection to the main line between those two bridges. More materials would be needed even further West for the construction of Farmer’s Bridge just below Lock 1, so it would make sense to bring the contractor’s railway from Southstoke Bridge up to the level of the main line at some point between Miller’s Bridge and Farmer’s Bridge, thereby supplying materials to all three bridges. The connection to the main line would be most economically located near Lock 8, because that is where the natural land level coincides with the line level.

The dotted line on the map (*Fig 22*) shows a possible course for the contractor’s railway from Southstoke Bridge to main line near Lock 8 — but is this theory supported by any evidence? →

THE CONTRACTOR'S RAILWAY — Part 3

*The course of the contractor's railway between Lock 22 and Lock 1 is not obvious and there is a noticeable lack of direct written and photographic evidence. There was, however, plenty of evidence on the ground to give a clear indication of where it could **not** have run, which narrowed down the possibilities. This has allowed the search for evidence to be concentrated in the most likely areas and has helped with the interpretation of a number of features in that area which we felt were not fully explained by our knowledge of the Canal.*

As far as we know, the most westwards photograph in the Midford series taken by George Love Dafnis was at Lock 20 or thereabouts, looking towards Upper Midford. It shows the derelict lock and the contractor's railway on the built-up towpath.



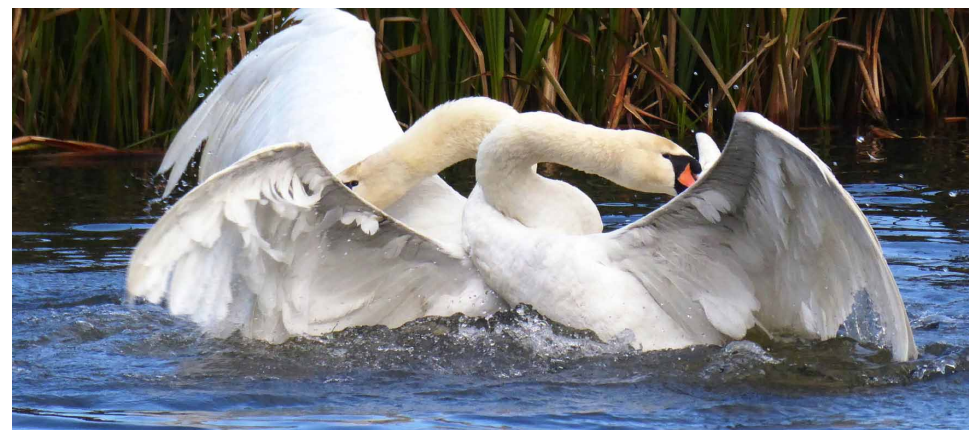
Fig 21 — THE CONTRACTOR'S RAILWAY AT LOCK 20 or 21

In the distance can be seen one of the Manning-Wardle locomotives, this time obviously at work and blowing steam from its safety valve; to the left of that is the remains of another lock, so the lock nearest the camera must be either Lock 20 or Lock 21. The track is fairly typical for a temporary contractor's railway and that explains why it was no disadvantage for the locomotives to be incapable of high speeds. The baulks of timber against the rails are a puzzle: they may have been there to aid the crossing of vehicles, such as carts or wheelbarrows, but it seems much more likely that they were intended to anchor the track against severe side forces. Something unusual was obviously going on in the trackwork behind the camera.

We are all used to seeing the resident swans spending a good deal of their time side by side, sometimes mirroring each other's movements, stretching their necks, snorting, loudly flapping their wings and rubbing their necks against each other with what one could believe could be deep affection. They may turn to face each other and create perfect 'heart' silhouettes. They are always impeccably dressed and exquisitely groomed, their dense white plumage reflecting the sun.

It was a cold afternoon last November when an event took place that caused the other basin occupants to scatter. The swans had a full blown fight! By the time I arrived, they had already drawn blood. They pursued each other from one side of the basin to the other, followed each other in and out of the water several times and continued the assault, pinning each other down, winding their necks around each other and using those strong beaks to great effect on each other's plumage. It was really vicious and prolonged, with no let up in the voracity of the pursuit.

One swan held the other under the water by their neck for sustained periods. The sheer size of their wingspans made the flapping and thrashing of the wings on the water very dramatic as they thudded and whooshed through the air. I managed to capture their battles on camera, as they changed location, documenting the writhing shapes that they made as they wrapped themselves around each other, gripped, pecked, broke free and then grabbed each other again, twisting and turning, splashing and thrashing, there was no let up or reprieve for at least 45 minutes.



Returning next day, not sure as to what I would find, there was just one rather muddy and slightly untidy swan, licking their wounds (or the swan equivalent). The other swan was concealed in the rushes in the newer section towards Radford Farm. It looked for all the world as though the pair were sulking- or taking a safe refuge from each other. I was glad that they only seemed to have ruffled feathers — it could have been so much worse.

Since then, they are usually back to normal, side by side and appearing to be good companions.

Does anyone out there know why they behaved like this? Or the reasons that they haven't mated and bred for the last 2 seasons? The Coal Canal has a Facebook Page, it would be great to see a debate. There's a challenge for you.

SHELAGH HETREED

Text and pictures ©Shelagh Hetreed February 2020

CHANGES AT CAMERTON NEW PIT

Those of us who remember Mike Chapman's guided tours around the site of Camerton New Pit will be astonished at the changes that have taken place there recently. Where Mike had waded in the general direction of an impenetrable tangle of brambles and said "It's in there somewhere" the site has now been cleared, not only of undergrowth but of some sizeable trees that were making the structures unsafe. Artefacts we could only imagine from Mike's descriptions are now in plain view and it is easy to see their relationships with each other and understand their purpose.

As the photographs show, pithead area is now open to view and partly fenced off. The site is the responsibility of the Coal Authority, which has a statutory duty under the Mines and Quarries Act to prevent access and ensure the site is safe. Andy Hoskins, the engineer in charge, explained that the reason why action was needed was because there appeared to have been two minor collapses recently. This put the stability of the shaft caps in doubt, so the site was fenced off and cleared to allow a survey to take place.

When the results of the survey are known, there may have to be further work on the site. It is probable the shaft caps will need rebuilding, but the stability of the retaining wall may also be in doubt, which would make that job more difficult. There is no intention to do any more work than is absolutely necessary for safety and the historic nature of the site is well understood.

Purely coincidentally, there are two other obvious changes nearby: the old canteen, which had been used as a dwelling, has been demolished to allow a much larger house to be built on the site — and the bridge over the haulage way, which took coal up to the land sales depot at Meadgate, near the top of Red Hill, is being rebuilt.



Above: THE SITE OF THE PITHEAD AT CAMERTON NEW PIT
Fencing panels cover the site of the shaft.
The four blocks were the anchorages for the headgear

Below: THE VIEW FROM BELOW
Access to the lower deck of the cage was through the right-hand tunnel



**THE BRIDGE OVER THE HAULAGE WAY
IN THE PROCESS OF BEING REBUILT**

