The Somersetshire Coal Canal

An Educational Guide to the History, Geography, Engineering and Archæology of the Somersetshire Coal Canal

Produced by the Somersetshire Coal Canal Society

SCCS/141215

THE GEOGRAPHY OF THE CANAL

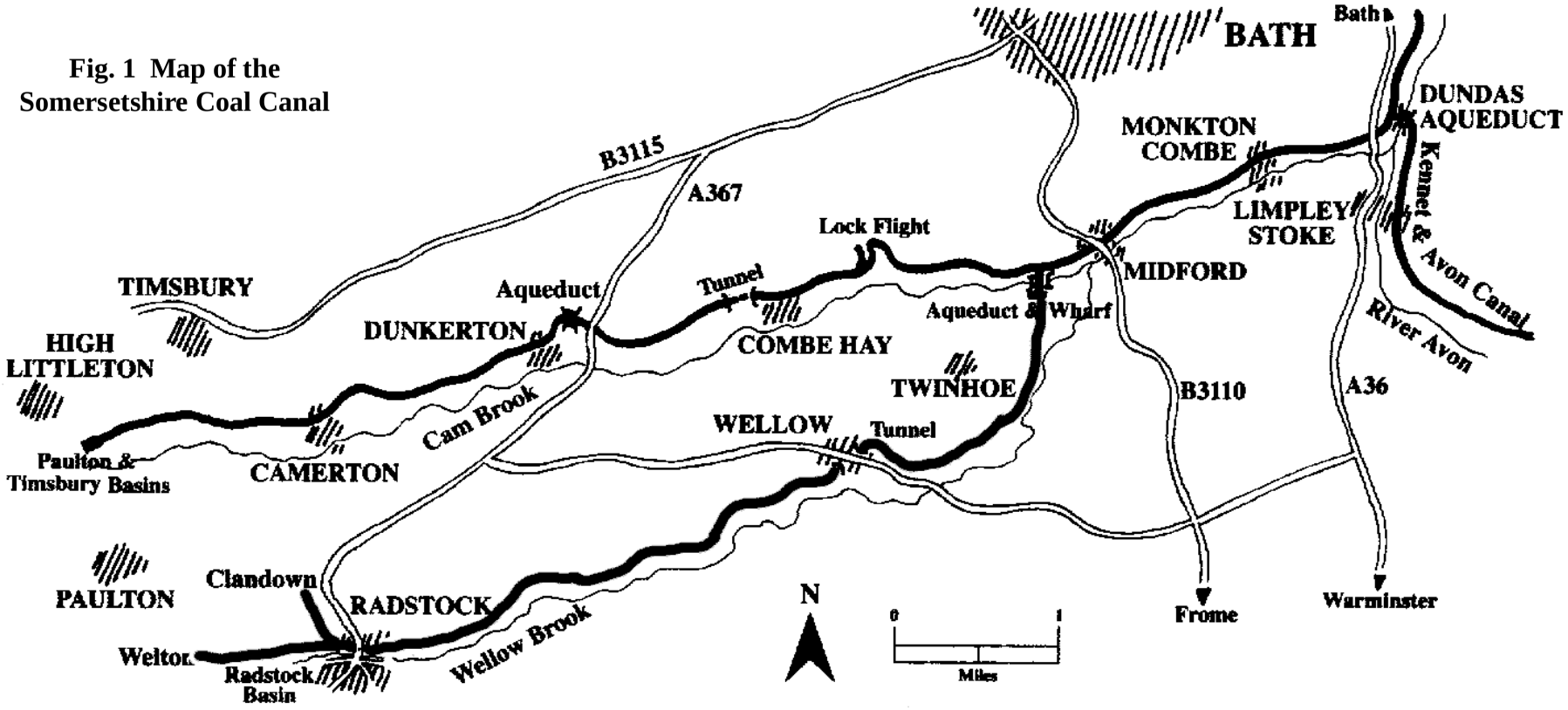
The canal was planned to have two branches:

The Northern Branch Started at **Paulton and Timsbury Basin** and followed the valley of the Cam Brook through **Radford**, **Camerton**, **Dunkerton** and **Combe Hay** to **Midford**

The Southern Branch Started at **Radstock** and followed the valley of the Wellow Brook through **Foxcote**, **Wellow** and **Twinhoe** to **Midford**

They met at **Midford** and continued through **Monkton Combe** to join the Kennet & Avon Canal near **Limpley Stoke**.

Fig. 1 Map of the Somersetshire Coal Canal

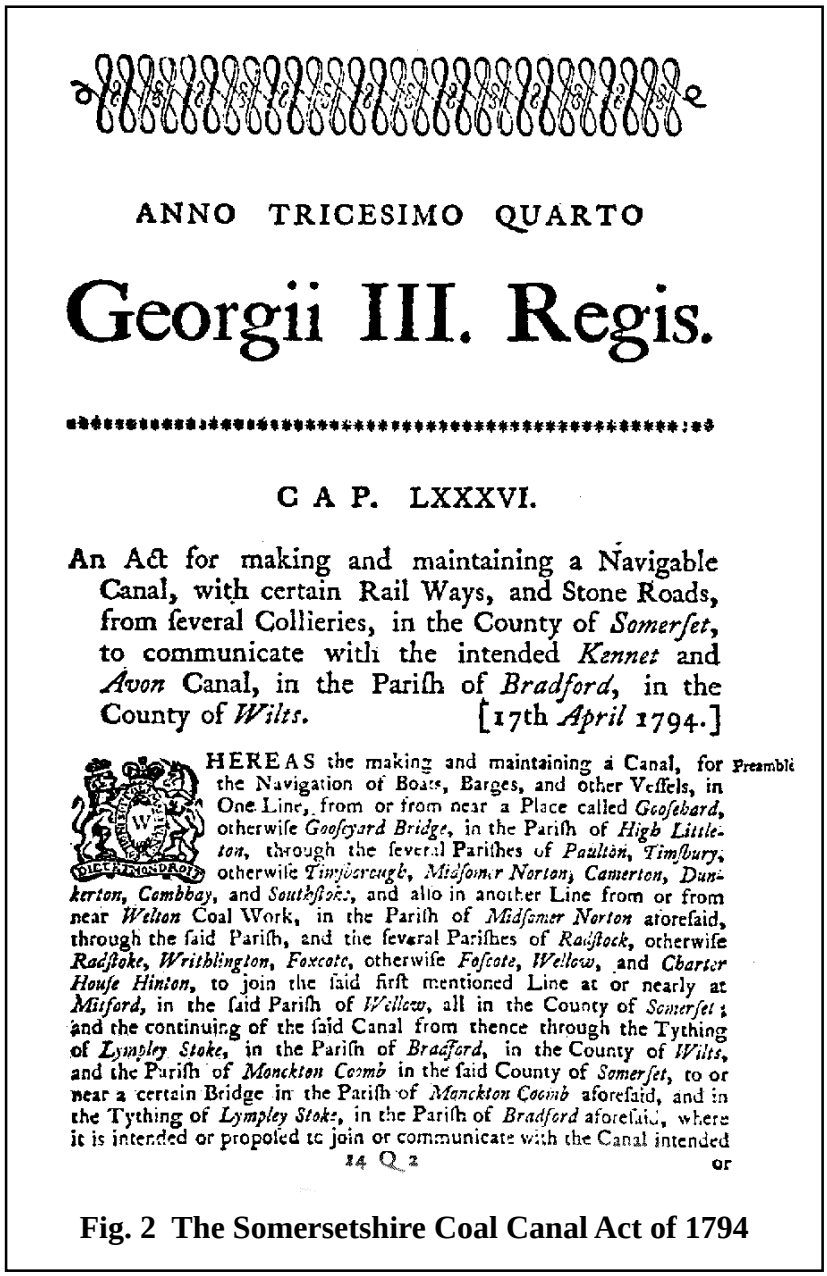


THE HISTORY OF THE SOMERSETSHIRE COALFIELDS

Coal was mined in Somerset as long ago as Roman times and by the 1430s it was being dug in the Kilmersdon district. At first, coal was picked off the surface or dug from shallow pits. Later, better production methods made it possible to mine coal at greater depths. By the end of the seventeenth century, 10,000 tons annually were mined in this area. Coal was found near Radstock in 1763 when a shaft just north of the village struck a viable seam and Upper Radstock pit (later known as Old Pit) was established.
By 1790 there were pits in **Radstock** , **Camerton**, **Dunkerton**, **Foxcote**, **Priston**, **Timsbury** and **Writhlington**, but mining across the whole area suffered from two major disadvantages:

1) The coal seams were very thin making it difficult to work
2) Roads in the area were bad, adding to transport costs and making the coal expensive.

In 1792, a new canal was planned in South Wales, which would allow Welsh coal be brought by boat to Bath and Bristol cheaper than Radstock coal could be delivered by cart or pack horse. The mine owners realised that their mining enterprises would soon collapse in the face of the new competition unless they could reduce their costs.
The cost of production was fixed by the difficulty of working the mines, so they were faced with finding a way to reduce transport costs.
Meetings were held at the Old Down Inn, Chilcompton and The Bell Inn, Radstock, to propose of a canal connecting the mines with the City of Bath.
At the second meeting, a firm resolution was passed which set out the financial basis for undertaking a survey. Several other canals were being considered in the area, so a possible connection to these was also included in the proposal.
John Rennie was appointed surveying engineer and reported that the collieries could be joined by canal to the 'Western Canal' (Later called the Kennet & Avon Canal) at Limpley Stoke for the sum of £80,000
This would not only supply coal more competitively to Bath and Bristol, but would open up new markets across Wiltshire



ANNO TRICESIMO QUARTO

Georgii III. Regis.

CAP. LXXXVI.

An Act for making and maintaining a Navigable Canal, with certain Rail Ways, and Stone Roads, from several Collieries, in the County of *Somerset*, to communicate with the intended *Kennet* and *Avon* Canal, in the Parish of *Bradford*, in the County of *Wilts*. [17th *April* 1794.]

Preamble

WHEREAS the making and maintaining a Canal, for the Navigation of Boats, Barges, and other Vessels, in One Line, from or from near a Place called *Goosehard*, otherwise *Goosyard Bridge*, in the Parish of *High Littleton*, through the several Parishes of *Paulton*, *Timsbury*, otherwise *Timsborough*, *Midsomer Norton*, *Camerton*, *Dunkerton*, *Combbay*, and *Southstoke*, and also in another Line from or from near *Welton* Coal Work, in the Parish of *Midsomer Norton* aforesaid, through the said Parish, and the several Parishes of *Radstock*, otherwise *Radstoke*, *Writhlington*, *Foxcote*, otherwise *Foscote*, *Wellow*, and *Charter House Hinton*, to join the said first mentioned Line at or nearly at *Misford*, in the said Parish of *Wellow*, all in the County of *Somerset*; and the continuing of the said Canal from thence through the Tything of *Lympley Stoke*, in the Parish of *Bradford*, in the County of *Wilts*, and the Parish of *Monckton Coomb* in the said County of *Somerset*, to or near a certain Bridge in the Parish of *Monckton Coomb* aforesaid, and in the Tything of *Lympley Stoke*, in the Parish of *Bradford* aforesaid, where it is intended or proposed to join or communicate with the Canal intended

14 Q 2 or

Fig. 2 The Somersetshire Coal Canal Act of 1794

Dates for the Founding of the Canal Company

31 Dec. 1792	First meeting at Old Down Inn - committee formed
4 Feb. 1793	Second meeting at Old Down Inn - survey agreed
12 Feb 1793	Meeting at The Bell Inn, Radstock
8 Sept. 1793	John Rennie gave his report to the committee
14 Oct. 1793	Report approved and subscriptions sought
1 Feb. 1794	Parliamentary Bill submitted
17 Apr. 1794	Royal assent given for the Act of Parliament

Various routes were proposed; Robert Whitworth and John Sutcliffe, both well respected canal engineers, were called in to advise on the line to be followed. A sub-committee was appointed to tour the canals of northern England to see how canals were constructed there.
John Sutcliffe was appointed Chief Engineer at a salary of One Guinea *per* day.
William Smith was employed to take the levels.

TAKING LEVELS

This was a very important job when a canal was being planned. A length of canal had to be at exactly the same level at each end, otherwise all the water would run to the lower end and pour out over the banks. The canal was built in sections which were joined up in stages as the work progressed. Each one had to be started at exactly the right height to join on to the rest of the canal , which may have still have been miles away at the time.

WILLIAM SMITH AND THE SCIENCE OF GEOLOGY

William Smith had trained as a surveyor and had the knowledge and skills to take levels accurately, but he was also interested in the types of rocks being dug out as the canal progressed and in the fossils they contained.

For a long time, mine owners had been puzzled by a problem which has lost them a lot of money. When they had found a seam of coal, they would often notice that it lay underneath a layer of limestone. - The next time they were looking for coal and found limestone, they would go to great expense digging through it; sometimes they would hit a coal seam but sometimes they wouldn't. A great deal of time and money was wasted in this way.

By examining fossils, William Smith realised that the rocks were layed-down in layers and there were many different types of limestone; one type might overlay coal and another might be many layers away from it. It was the type of fossil found in each layer which enabled him to identify which was which.
He named and numbered the limestone layers according to the fossils they contained and was able to draw up a table of the order the rocks were found in. He was then able to recognise which types of limestone were being dug up and advise mine owners where they stood the best chance of finding coal

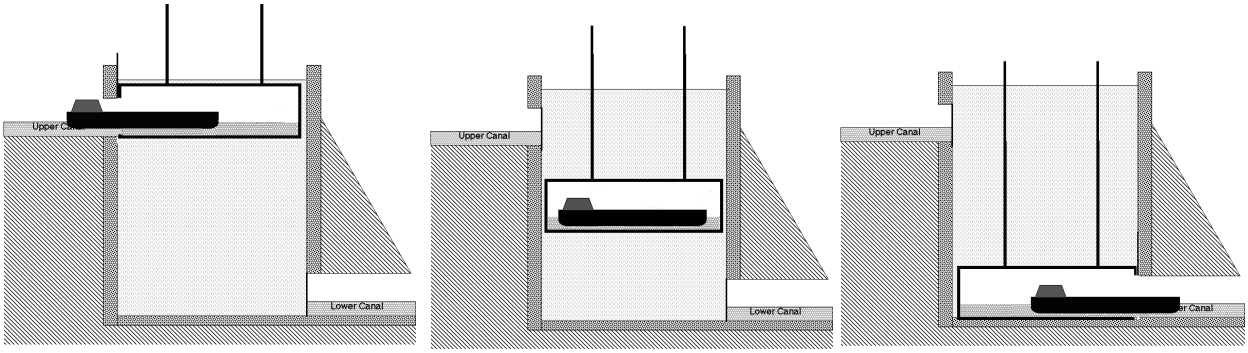
This discovery of the **order of rocks** established the science of Geology which is of great importance nowadays in the search for oil, natural gas and minerals.

PROBLEMS COMPLETING THE NORTHERN BRANCH

The main engineering difficulty with this canal, common to many others, was shortage of water. Common locks would have needed a lot of water for their operation and mill owners along the valleys were not going to allow the canal company to **abstract** water from their streams.
In 1794 the committee has seen a model of Robert Weldon's Hydrostatick Caisson Lock demonstrated in Shropshire and decided that three of these could be used to overcome the difference in levels between the ends of the canal without loss of water.
The entire drop was concentrated at COMBE HAY, and the delay in the completion of the northern branch was mainly due to the problems which were encountered there.

Three ways of overcoming the drop at Combe Hay were tried in succession: a **Caisson Lock**, an **Inclined Plane** and a flight of **Common Locks**, each of which had its good and bad points

1) A CAISSON LOCK The canal barge was floated through an airlock into a box which, itself, floated in a deep stone chamber full of water. The box was sealed and floated free; it could then be raised and lowered, like a submarine, with the minimum of effort.



1. Boat enters box 2. Box sealed - floats down 3. Box opened - boat floats out

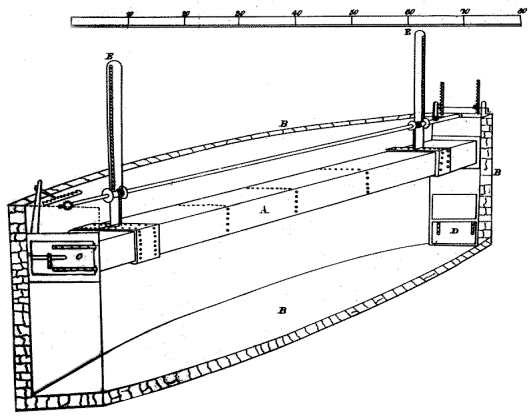
Fig.3 How the 'Hydrostatick Caisson Lock' worked

It was particularly suitable for this canal because, unlike locks, it did not need a large supply of water and was cheaper to build and quicker to operate. This was the first one ever built and there were engineering problems to be overcome, but eventually it worked and was even demonstrated to the Prince of Wales.

Dates for the 'Hydrostatick Caisson Lock'

Sept 1794 Model caisson demonstrated in Shropshire by Robert Weldon
May 1796 Work began on caisson at Combe Hay
Nov. 1797 Caisson worked for the first time
Feb. 1798 - June 1798 Trials and repairs made
Jly. 1798 - Apr. 1799 Successful operation and demonstrations
May 1799 Stonework began to bulge
Jan. 1800 Caisson abandoned

Then the stone chamber walls began to bulge inwards under unexpected geological pressures and the box became jammed. The repairs would have been very expensive, £16,000 or more. By December 1799 the company had already spent a total of £75,167, a lot more than they had allowed in their estimates, and still hadn't completed the canal. The caisson was abandoned.



Drawing of Robert Weldon's 'Hydrostatick Caisson Lock'

Taken from Weldon's patent application, this drawing shows a cut-away view of the 'Hydrostatick Caisson Lock' chamber with both of the canal doors visible. The floating box is shown with two masts with ropes or chains. These ran around pulleys on a shaft which could be turned by an attendant to make the box ascend or descend.

The company was now in financial difficulty and had to start earning money by finding some way of getting the coal past Combe Hay onto the newly built Kennet & Avon and Wilts & Berks Canals. This would give them a market across much of Southern England.
Many suggestions were pressed upon the company for a way of overcoming the drop at Combe Hay. A lock flight was chosen as the preferred option, with an Inclined Plane as a temporary expedient until the money to build the locks could be raised.

2) AN INCLINED PLANE This was a type of railway linking the higher and lower sections of the canal.
Full waggons attached to a rope would run down the hillside on a plateway, the rope simultaneously pulled the empty waggons back up. Although this was a relative cheap solution to build, it was inefficient because cranes were needed to lift the coal, (which had to be packed in boxes to prevent it breaking-up), from the canal barges onto the trucks. This cost money and caused delays.

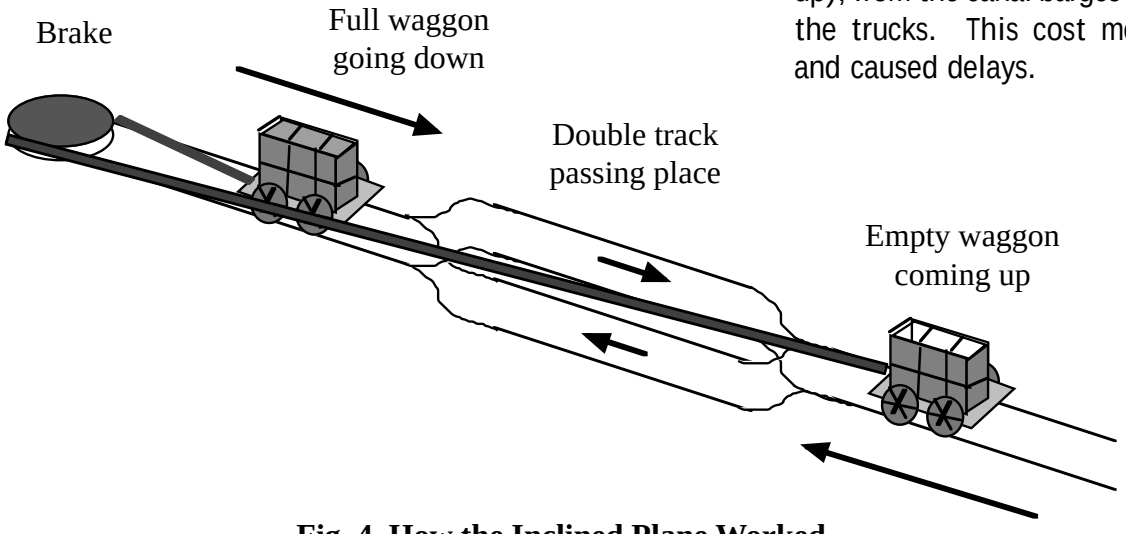


Fig. 4 How the Inclined Plane Worked

Three 'common' locks were built to join the bottom of the inclined plane to the lower canal and they were fed with water from the Cam Brook which was dammed-up and made to flow across the meadows through a leat. These eventually became Locks 20, 21 & 22 when the main flight was completed.

Dates for the Inclined Plane

Oct. 1798 Canal from Paulton had already reached Dunkerton .
Coal from Dunkerton Wharf was carted to Bath, cutting the price from 14^{d} or 15^{d} per cwt to 9^{d} or 10^{d}
Jun. 1800 Decision to build an Inclined Plane
Nov. 1801 Inclined Plane opened, northern branch now complete.
1805 Inclined Plane superseded by lock flight

3) A FLIGHT OF 'COMMON' LOCKS

The 'common' lock is the one we see on almost all canals surviving today. The boat was raised or lowered by letting water into and out of the lock through paddles. This wasted nearly a whole lockfull of water each time a boat went down.

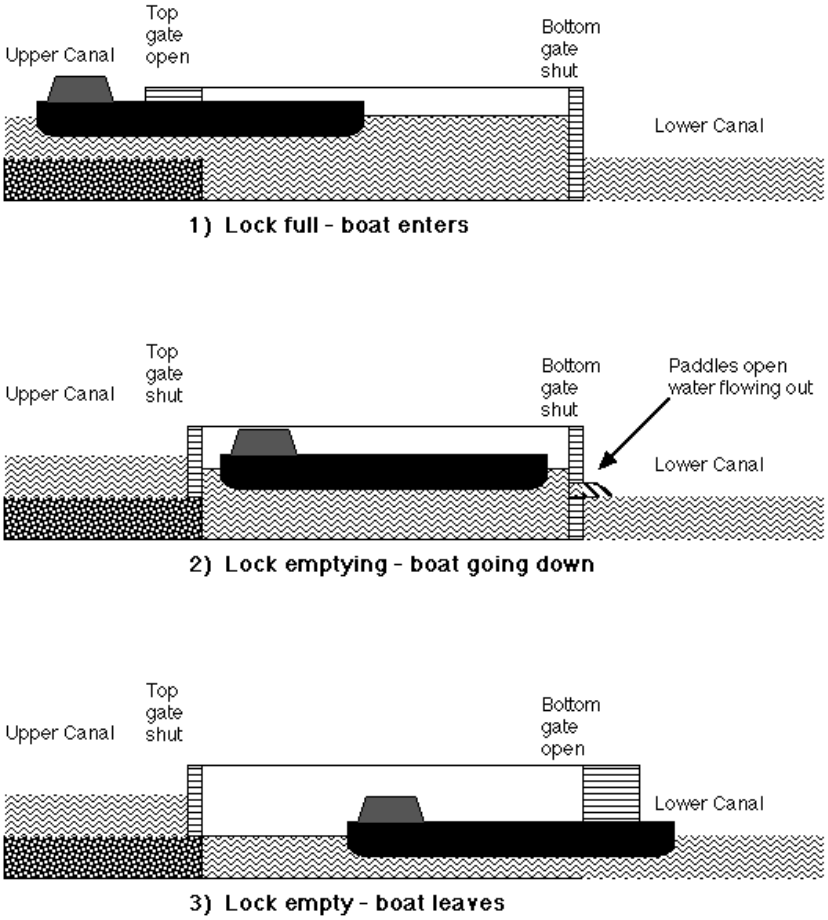


Fig.5 How a 'Common' Lock Works - *going down*

Three 'common' locks had already been built to reach the bottom of the inclined plane, nineteen more were added to complete the flight. (Seventeen more had been planned on the southern branch, but were never built).

The building and running costs were very high but in the end the locks proved to be the most successful solution to the difference in levels, although a pumping engine had to be installed to pump the water they used back up to the top of the flight.

A tunnel was built under the valley in Combe Hay, to take the water from the lower reach to the pump.

Its remains have recently been discovered.

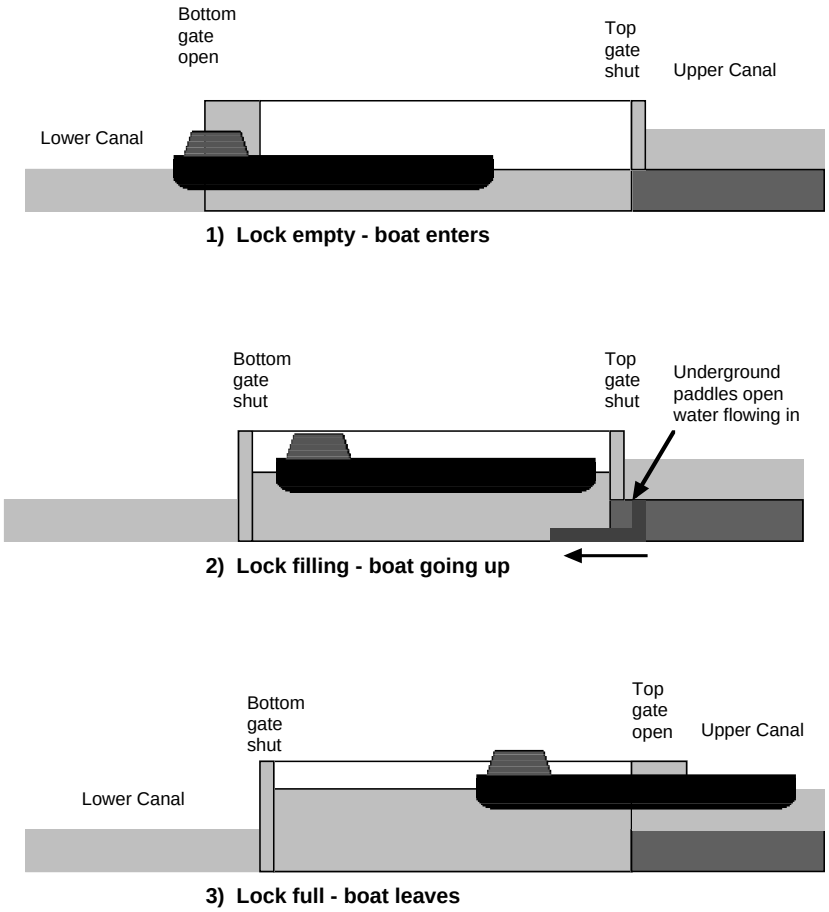


Fig.6 How a 'Common' Lock Works - *going up*

The Combe Hay locks each had a drop in level of about 6 feet (nearly 2 metres) and the boats were 70 feet (21 metres) long and 7 feet (2.1 metres) wide. To minimise the amount of water lost each time the lock was operated, the lock was made to be a close fit to the boat with only about 1 inch (25mm) to spare on each side - even the ends of the stonework were curved to fit the boat.

The locks on the Kennet & Avon Canal were exactly twice as wide as the S.C.C. ones, so two of these narrow boats would fit in them side-by-side and save water there too.

The paddles and underground water channels were made as large as possible so that the locks could be emptied or filled quickly without wasting time. Places where the boat might bump against the lock and damage the stonework were often reinforced with wrought iron plates or a cast iron slab. The careless boatman only damaged his own boat!

Another place where iron rubbing-strips were provided was on the edges of bridge arches, so as to prevent ropes cutting grooves into the stonework.

Dates for the Lock Flight

Feb. 1800 Shareholders asked for an additonal £20,000

Mar. 1802 'Lock Fund' set up by S.C.C., Kennet & Avon canal and Wilts & Berks canal to raise a further £45,000

Nov. 1802 Work on lock flight started

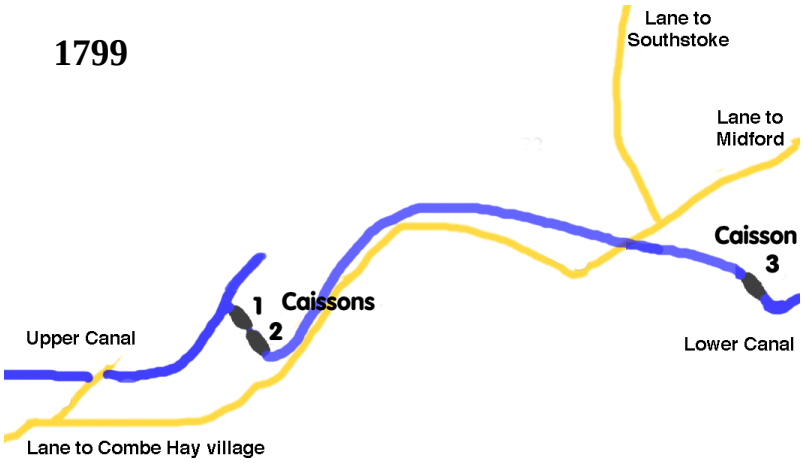
Jun. 1804 Lock 19 completed

Apr. 1805 Lock flight officially opened

Dec. 1805 Pump delivered from Boulton & Watt of Birmingham

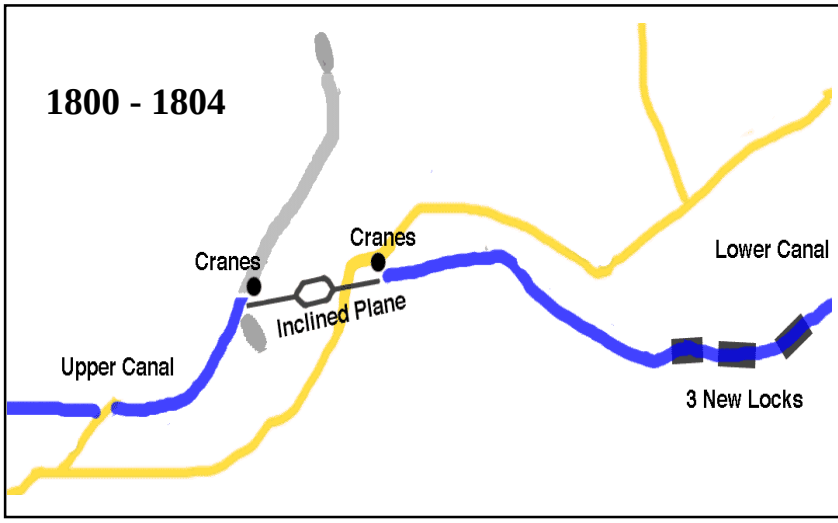
Jan. 1806 Pump began working, locks fully operational.

Aug. 1898 Last boat through the locks



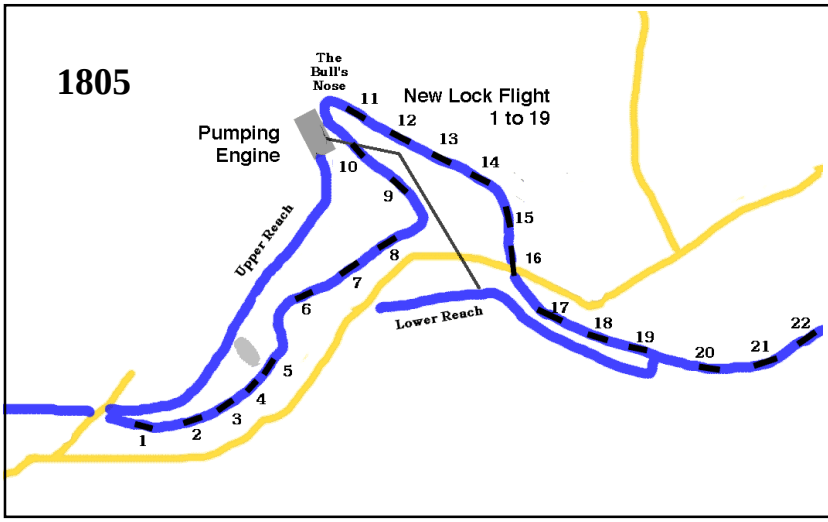
The Vanished Caissons at Combe Hay

We nowknow exactly where the caissons were supposed to be built. One was completed and a start was made on the second; but there is nothing left of them on the surface except two mounds of earth.



Combe Hay with the Inclined Plane

Even today the route of the Inclined Plane can still be traced at Combe Hay.
The top and bottom sections are one track wide, the passing place is buried under a later railway embankment



The Lock Flight at Combe Hay

The locks were numbered from the top downwards.
To gain the extra length needed, the flight had to be wound around the coutours of a side valley.
The pumping engine returned water to the upper reach. The lower reach acted as a supply reservoir

Fig. 7 Overcoming the change in levels at Combe Hay

PROBLEMS ON THE SOUTHERN BRANCH

The southern branch was originally intended to have three caissons down the hillside at Midford, but the experience at Combe Hay made the company decide to complete the drop using 'common' locks instead. Just as on the northern branch, a lock flight would have been beyond the company's resources to finance, so a temporary **plateway** was built instead. Unlike the Combe Hay inclined plane, this plateway allowed the waggons to run down a winding track around the hillside, controlled by a brakeman who walked beside them or rode on them. The empty waggons were towed up the hill again by horses.
The 'temporary' plateway was kept working much longer than the Combe Hay inclined plane, because the replacement locks were never built. Coal from mines in the Radstock area was loaded into a boat and brought as far as Twinhoe, where it was transferred to the plateway waggons. These ran down to Midford where the lock, which was to have been the bottom of the flight, had been converted into a dock. A wharf was built to take the waggons as they arrived and the coal was loaded back into boats which floated across the Cam Brook on an **aqueduct** and joined the main canal. Two more docks with wharfs were built at Midford and a complex layout of plateway 'sidings' installed to cope with all the waggons.

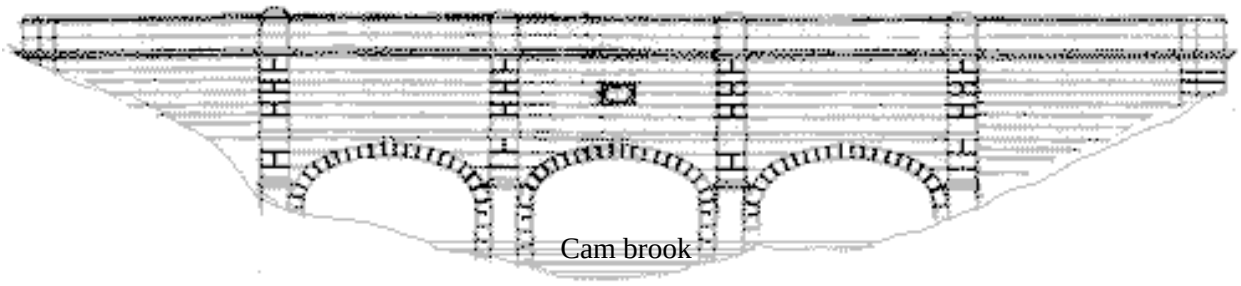


Fig. 8 A Drawing of Midford Aqueduct

There is very little evidence to show how much the southern branch was used, but it is thought that there were problems with the water supply. In areas of fractured limestone, springs could sometimes burst through the clay 'puddle' of the canal during a wet winter, leaving holes through which the canal emptied-out during the following summer. This may have been part of the problem.

By 1815 it had been decided to extend the plateway along the canal towpath all the way from Radstock to Midford. This did away with boats on the southern arm and the coal was carried in trains of nine waggons, pulled by three horses. Most of the track was single line with passing places and if two trains met on a single track section one of them had to back-up; it is said the looser was often decided by a fight.

The very first railway engine in Somerset ran on this plateway. A colliery winding engine was adapted to run on wheels and pull the waggons, but it was so heavy that it kept breaking the cast iron plates. The experiment was abandoned and the engine returned to colliery use.

PLATEWAYS AND RAILWAYS

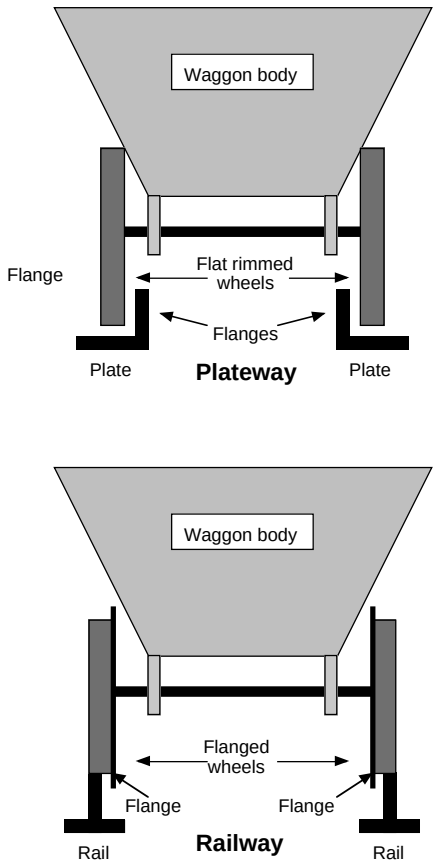
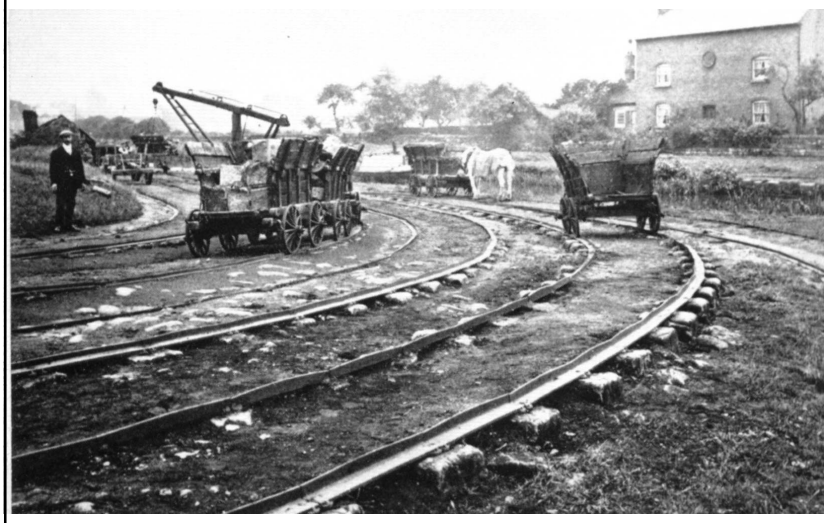


Fig. 9 Plateway and Railway Waggons

Most of the mines were some distance from the canal and the coal had to be taken from the mine to the wharf by waggon, plateways were nearly always used for this. Some were gravity-operated with a rope to return the empty waggons, like the Combe Hay inclined plane; others using horses to pull the empties back up the hill.
On level plateways, horses hauled both empty and full waggons.

The waggons on a **plateway** had flat-rimmed wheels and were guided by flanges on the track plates. The flat-rimmed wheels made them easy to move around where there were no plates to guide them, but if the waggons ran quickly and hit a stone on the plateway, there was a danger they would become de-railed and crash.

Railways had the guidance flanges on the wheels instead; and ran on the top edges of the rails. They could be used at higher speed because stones did not lodge on the running edges of the track and derailments were less likely.
When railways developed steam locomotives to run at high speed, they became a serious threat to the slower-moving canal trade

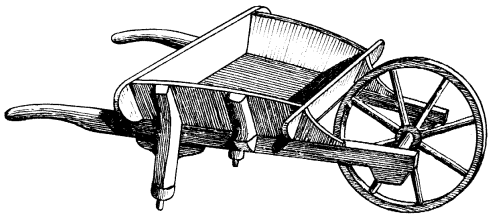


A Plateway similar to those on the Somersetshire Coal Canal

The plateways on the Somersetshire Coal Canal were based on a design by Benjamin Outram. The cast-iron plates were supported at their ends on stone blocks set in the ground, there were no cross-ties or sleepers like modern railway track.
Many of the stone blocks have survived in this area, they can be recognised by the neat hole which was made in the middle so that the rail could be pegged down.

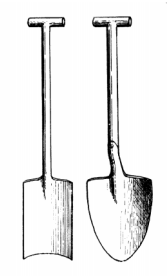
THE PEOPLE WHO BUILT THE CANAL

The canals were known as '**navigations**' and the men who worked on their construction were '**navigators**'. which became shortened to '**navvies**'. They were a rough crowd, given to drinking, swearing and fighting; they also worked incredibly hard for low wages.



Using nothing more than spades and wooden wheelbarrows, they shifted thousands of tons of earth and dug the canals by hand. Where rock outcrops were encountered, gunpowder could be used to break them up; but it was expensive, so canals often took a longer route around a hillside rather than trying to cut through it.

Stonemasons were more skilled. They cut and fitted the stone blocks which built up the engineering structures of the canal such as bridges and aqueducts - and, of course, the lock chambers. Each gang had its own mark which they cut into the finished stone to ensure that their work could be identified and they would be paid correctly.



Carpenters and **blacksmiths** were needed to make the lock gates and swivel bridges and their fittings. Machinery was expensive and there was no power except horses or water, so most of the work was done by hand.

As the canal neared completion, '**puddling**' was an important job.
Clay, dug from the ground near the canal, was spread in a thick layer over the bottom and sides of the newly cut ditch so as to make it waterproof; this was known as the '**puddle**'. To improve its qualities, it was thoroughly mixed with water by gangs of men in special boots trampling the wet mixture. Sometimes a herd of bullocks would be driven up and down the canal to do the same job.

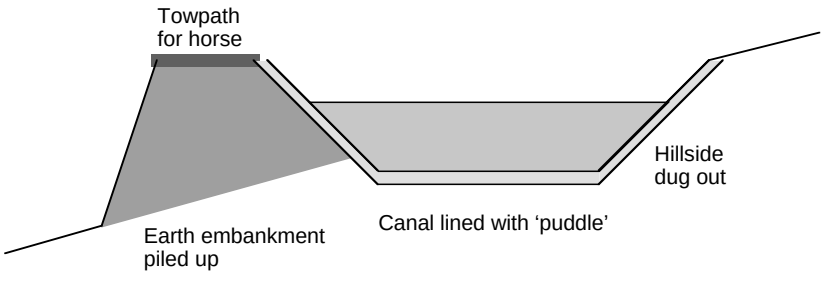


Fig. 10 Cross section of a typical canal

When the canal was finished, these rowdy navvies moved on to other parts of the country and other jobs, leaving the local people in peace and quiet once gain.

THE PEOPLE WHO WORKED ON THE CANAL

Once the canal was opened, it provided employment for **boatmen** who operated their horse-drawn boats from Paulton to as far away as Oxford. In the early days the boatman's family stayed home and he would return to them after each trip. Later, especially on the Northern canals, families lived on the boats and **women** and **children** took their turns at the work. Some boats were operated by all-women crews and at least one child is known to have operated his own boat.
Lengthsmen and **lock-keepers** looked after the canal and, if a lock-keeper was taken ill or died, his **wife** would take on the job

A Christening on a Narrow Boat

This photograph was taken on another canal at about the time the S. C. C. closed. The dress was typical of the period for canal women who always took great care with their appearance despite living in such cramped circumstances. The small cabin they are sitting on was their only home; it served as kitchen. lounge and bedroom and was heated by a coal stove.
The children slept in spaces like small cupboards but when the boat was unladen, they had plenty of room to play in the empty hull.

As well as those who worked directly on the canal, there were others who kept them supplied. Horses had to be shod and **farriers** were essential to keep any horse-drawn transport system functioning. Supplying fodder for the horses was also a profitable business.
Inns and **Ale-houses** lined the canal, particularly near lock flights where the hard work of working a boat through the locks would be rewarded by a drink, or where a boatman waiting his turn to go through might be diverted away from his work and into parting with some of his wages. Although many of the old inns have gone, there are still a few remaining today as country pubs.

THE HEYDAY OF THE CANAL

Once the canal was opened and working properly, the quantity of coal it carried increased steadily. By 1854, there was over 16 times as much Somerset coal being sold as there had been before the canal was built.
Although the canal was expensive to operate, with large bills for the pumping engine and repairs, the income from so much coal traffic ensured that the shareholders were well rewarded for their investment.

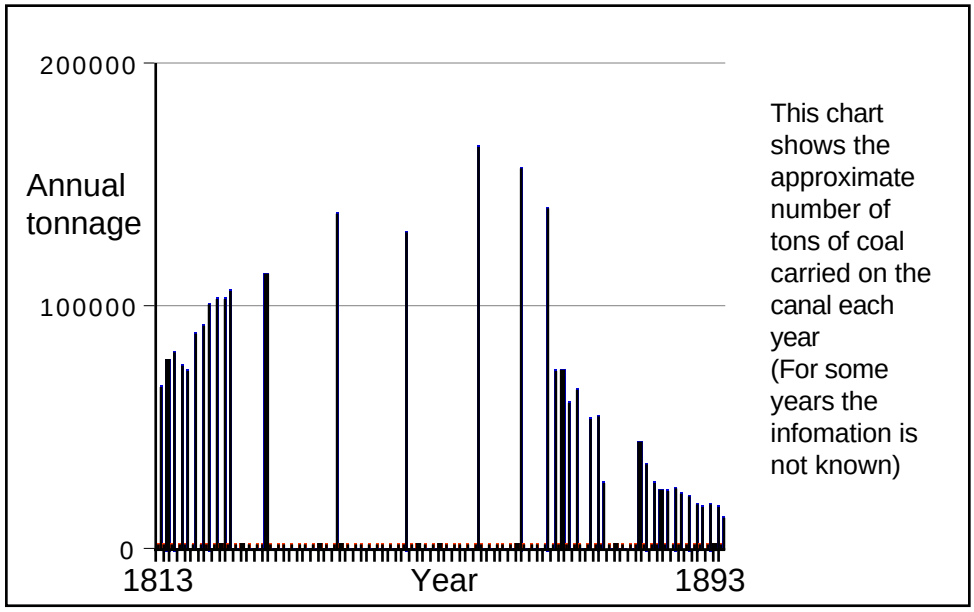


Fig.11 Annual Tonnage Carried

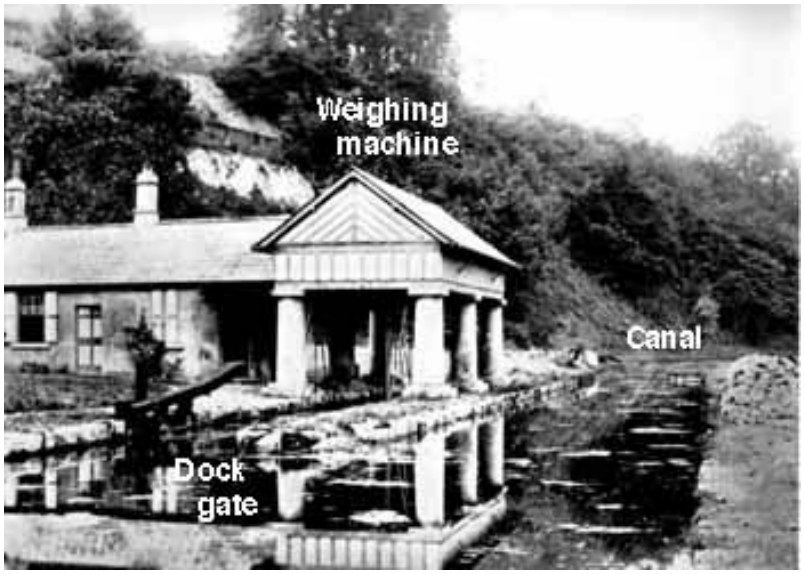
TOLLS
Tolls were charged for using the canal, they were calculated by multiplying tons of cargo by the distance carried. To ensure that this charging was done fairly, both weight and distance had to be measured accurately.
The **distance** was shown by **milestones** set in the bank of the canal at half-mile intervals, these had the distance from the end of the canal at Limpley Stoke, marked on a cast iron plate.
The **weight** was measured in two different ways: at first, **gauging** was used, then a **weighing machine** was installed.

GAUGING
When a boat is filled with heavy cargo, it floats lower in the water.
Before it was used for the first time, each boat on this canal was loaded with various heavy stone blocks of a known weight; the height it floated in the water was carefully measured and written-down in a book. The next time the boat came through the canal with a cargo on board, its floating height was measured and compared with the figures in the book to work out how many tons of cargo it was carrying.
This was called 'gauging' and was carried out at the Limpley Stoke end of the canal at Dundas Wharf

WEIGHING

Weighing a boat could only be done when it wasn't supported by buoyancy in the water. This was achieved by floating the boat into a special dock which had a wooden platform at the bottom. The dock gate was closed and the water drained out - the boat would settle on the platform which was hung by metal rods from an overhead weighing machine. When the weight of the boat was fully resting on the platform, various small weights were placed on the levers of the machine until they exactly balanced the boat through a lever system. The small weights were marked with the real weight of the boat which they represented.

By weighing the empty boat before it picked up a cargo, when it came back along the canal the weight of the boat with its cargo could be measured and then used to calculate how much cargo it was carrying.



The Weigh House at Midford

The strong stone pillars supported the works of the weighing machine under the pointed roof.

The iron rods which held the platform can just be seen in the shadow underneath the roof but the platform is under the water. The cottage contained the delicate measuring weights and the company's record books where the cargo in each boat was noted.

The weighing machine was installed in 1831 and was an expensive piece of 'high technology' of its day. The fact that it was worth installing, suggests that the company suspected a lot of income was being lost by various ways of cheating the gauging method.

The Somersetshire Coal Canal was one of only four canals in this country to have a boat weighing machine.

Death on the Canal

Saturday afternoon, as a lad, engaged in a barge from Devizes, was winding the windlass to let the water through the locks, near Combhay, he lost his balance and fell in; he was not missed for a space of 4 or 5 minutes when., in apprehending some incident caused by his absence, the bargeman dragged the water and found the body with life extinct.

Bath Chronicle 1st April 1830

THE DECLINE OF THE CANAL

EARLY RAILWAY COMPETITION

The opening of the Great Western Railway in 1841 marked the beginning of the end for canals. It didn't run anywhere near the Somersetshire Coal Canal, so at first it made very little difference to the trade, but it took long-distance traffic away from the Kennet & Avon Canal and the Wilts & Berks Canal.

Canals could never compete with railways for speed, so they reduced their tolls in an attempt to keep trade. The S.C.C. was forced by the other canals to charge less, so that they could all survive. Eventually the K & A canal sold-out to the G.W.R in 1852 but coal from the S.C.C. continued to be distributed by that waterway for many years.

When a branch railway line was opened by the G.W.R. from Frome to Radstock in 1854, the mine owners were slow, at first, to use it. However, because the S.C.C. had a virtual monopoly of trade in the Somerset coalfield, it felt it could treat the mine owners with contempt and seemed oblivious of the effect this would have. Eventually coal started to be shipped by rail, even though the canal could offer cheaper rates.

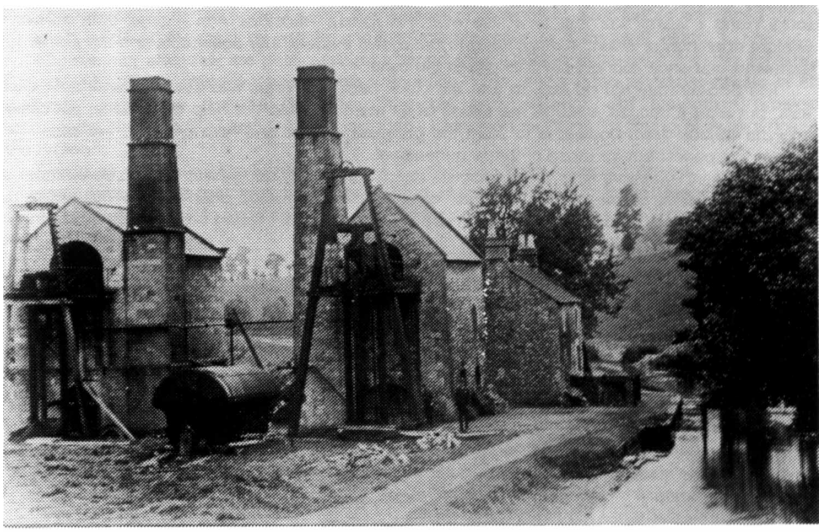
SELL-OUT TO THE SOMERSET & DORSET JOINT RAILWAY

During the period after 1856 there was a slow but steady decline in trade on the canal and, increasingly, proposals to bring more railways to the area were put forward.

In 1870, the southern branch of the S.C.C. was still being worked as a horse-drawn tramway. When plans were made by the Somerset and Dorset Joint Railway Company to extend their track into Bath, the S.C.C. Company realised that this would close the tramway immediately. Without further ado, they sold the tramway to the S & D J R and the railway was built along the route, opening in 1874.

Also, during this period, railways were extending into southern England from the north, bringing cheaper Midlands coal and taking over the markets which had been served by the S.C.C. The decline in trade steepened.

The high running cost of the canal now became a great disadvantage and, as the income declined, the canal began to lose money. On one occasion the company was owing money for coal for the pumping engine. The engine at Combe Hay had been moved, probably in the 1840s, to be reassembled alongside a second one at Dunkerton. Now one of the engine boilers had become worn out and the company could not afford to replace it. The canal struggled on with lower water levels and just the one pump working.



The Pumping Engines at Dunkerton

Maintenance was reduced and the canal became difficult to navigate as it silted up; the water level fell still further

because leaks were not being repaired. This meant boats could not be fully laden in case they became stuck in shallow water; so the tolls, which were based on tonnage, brought in even less money.

By 1893, the company conceded that it could not continue to operate in this way and the canal should be closed down or sold to whoever would buy it. It was offered for sale in 1894 but no purchaser could be found.
In November 1898 the remaining pump was shut down, but the winter's rains kept the water level up until the next year, when the end finally came. The last trip was made on a sunny morning in the first week of August by the boat Phoebe, captained by Dan Harris.

The Last Boat on the Canal

There was plenty of water in the lower reaches of the coal canal, and at that time it was capable of taking as full loads of coal as at any time in its existence. The water was, I remember, remarkably clear, and fresh-water fish were everywhere swimming happily about. The lock gates seemed to be in quite good condition.

The weighing machine at Midford was intact, with its ironwork looking ready to hold its boat-loads of coal, and the stone pillar supports reminded me of a Greek temple or perhaps of Pharaoh's Bed on the Island of Philae, in Egypt, but it could not have been used for a very long time, as it was standing among a perfect bed of water-reeds .

The locks at Combe Hay also had plenty of water in the lower ponds; I remember that they contained some quite big pike. The lake in the hollow below Southstoke overflowed in a pretty stream and kept the canal at that point well supplied with water; in fact those ponds which were at the lower levels ran over the tops of the locks as the boat went up stage by stage. Above the pond fed by this little stream, however, the water was very low indeed, although the boats going up let down their water behind them and helped a little,

The top lock was made of iron, no doubt the more easily to hold up the full weight of the water, which stretched all the way to Paulton. The water in this part of the canal was very low, and some distance along the bank towards Dunkerton stood two big pumping engines, of which only one was working. These were designed to raise the water from the Cam Brook to the higher level of the canal. . . . A noticeable feature was a large beam of wood which rose up and down, discharging a quantity of water at each stroke; As there was only one of these machines at work, the water was only deep enough for the canal boat to carry light loads -- that is twelve-and-a-half tons.

Recollections of a passenger on the last boat

Once again, the engineering which had enabled the canal to work efficiently now became a liability. The concentrated drop at Combe Hay, which had been convenient for back-pumping, meant that the canal approaching from Dunkerton was well up the hillside, above the level of most of the houses. Without maintenance, there was a possibility that weak points in the canal banks might go unnoticed until the water burst through and sweep away people or property. Local residents wanted the canal closed and drained as quickly as possible.
Various ideas were put forward and eventually the problem was solved when the Great Western Railway bought the canal and its surrounding land in order to build a railway.

REPLACEMENT BY A RAILWAY

Work on the Camerton and Limpley Stoke railway line began in 1904 and it was finally completed in 1910. Like the canal, it was intended to carry coal, new pits had opened at Dunkerton and Camerton, but there was a passenger service as well.
In many places, the line of the canal was unsuitable for the railway, so large cuttings and embankments had to be built. In particular, wherever the canal followed a winding course to keep on level ground up a side valley, the railway was taken straight across the valley on an embankment. This meant that much of the canal was not actually built on and has survived to this day.

During the First World War, the railway passenger services were withdrawn as an economy measure. They were reinstated in 1923 and withdrawn again in 1925, the same year that Dunkerton Colliery closed.
The line was used for the making of three films. 'The Ghost Train' in 1935, 'Kate Plus Ten' in 1937 and, still being shown from time to time, 'The Titfield Thunderbolt' in 1952.
Although it had officially been closed in 1951, the line was left in place until 1958, when the track was lifted and the trees and weeds took over.

HOW MUCH IS LEFT TO SEE?

Despite having been closed for 100 years, much of the canal is still visible if you know where to look.
The **Timsbury** and **Paulton basins** are still visible and are in water. Restoration has begun on the section of canal leading towards **Radford** and the **Paulton Dry Dock** has been excavated and is on display to the public.
From Radford to Dunkerton there are short stretches of recognisable canal, some on public paths, others in private grounds, but the first major engineering feature to survive will be found beside the A367 road in Dunkerton.
Spanning the Severcombe valley, **Dunkerton Aqueduct** is a good example of the solid, practical architecture which is typical of this canal. Unlike the graceful Dundas Aqueduct on the Kennet & Avon Canal, this one just looks like a large earth embankment with a tunnel through it. Massive stone blocks, interspersed with patches of brickwork repairs, tell of a hard-working unglamourous life.
The **lock flight** at **Combe Hay** is perfectly recognisable. Some of the locks from 1 to 10 are in remarkably good condition and a very pretty bridge at Lock 5 survives undamaged, but these are on private property and must not be visited without permission. **Engine Wood** can be visited by the public. The stone **leat** which carried the water from the engine to the canal has recently been exposed and the brickwork remains of part of the engine **chimney** is plainly visible. It is interesting to speculate whether this, or a site in the grounds of Caisson House, might be where the **Caisson Lock** remains are interred.
Locks 11 to 15 are on a public path and a walk down **Rowley Bottom** to view them is probably the best way to begin to appreciate this canal. At Lock 13, there is a **milestone** beside the lock but without its plate. Lock 16 has disappeared under the railway embankment and Locks

17 to 22 have recently been filled with rubbish but some of their outlines are still visible.
Very little of the original **ironwork** survives on any of the locks, there are stories that it was removed some time in the 1960s, possibly to help restore another canal. The **lock gates** still survive in poor condition on Lock 9; unusually, they are wooden framed and iron plated. Numerous patches of brickwork show where repairs have taken place and the soft stonework is worn into **grooves** in many places by the towing ropes and by the constant rubbing of the boats themselves.
At **Midford**, there is another of the three surviving bridges, but the **aqueduct**, leading to the southern branch plateway, is by far the most noticeable feature. One of the few works of any architectural merit on the canal, it is in poor condition; but repairs are imminent. On the far side of the stream from the public footpath, the area which contained the **basins** and **tramway sidings** for the southern branch can be seen, along with an interesting curved-roof structure known locally as the **'powder house'.**
Although the weighing machine, on a site behind the Hope and Anchor public house, has been removed, the **Weigh House** is still in place and has been extended to form a dwelling house. This can be seen by looking over the parapet of the road bridge.

On the **southern branch**, the course of the **tramway** from **Welton** to **Radstock** can still be traced. Along the course of the Somerset and Dorset Railway, short meanders of canal are visible in many places and the **stone blocks** of the tramway can often be found on the tow-path.
At **Wellow** there is a spectacular **tunnel** running underneath the road near the Church, it can be visited with the landowners' permission.

Between Midford and Monkton Combe is **Tucking Mill**. William Smith mined Bath Stone on Combe Down and ran a tramway down this valley to transport the stone to the canal boats. The track of the tramway can still be followed and some of the **stone tramway blocks** are visible in the ground. Later, Fullers Earth was processed here.
Smith lived in the large house at the foot of the tramway, but a **plaque** in his honour has erroneously been placed on the cottage nearby.
At **Dundas**, a quarter of a mile of the **canal** has been refilled with water and opened as a mooring for pleasure boats. There is a **Visitors' Centre** with a detailed **map** of the whole canal and many interesting **artefacts** as well as **refreshment** facilities.
The Company's Seal is held at the Great Western Railway Museum, Swindon.

The Somersetshire Coal Canal Society arranges regular walks for members and obtains the landowners' permission to visit parts of the canal which are normally inacessible to the public. Special arrangements can be made for educational trips and the Society can provide guides with a detailed knowledge of the canal .
Contact: Derrick Hunt, 43, Greenland Mills, Bradford on Avon BA15 1BL 01225 863066

Books:
"The Somersetshire Coal Canal Rediscovered" Niall Allsop. (Millstream Books)
A book of 8 walks along and around the canal using public footpaths.

"The Somersetshire Coal Canal and Railways" Kenneth R. Clew. (David & Charles)
The definitive history of the canal (Out of print but available in specialist bookshops or through internet suppliers.)

THE SOMERSETSHIRE COAL CANAL SOCIETY

THE SOMERSETSHIRE COAL CANAL SOCIETY is a registered charity (1047303)

It was founded in January 1992 with the aim:
TO FOCUS AN INTEREST ON THE PAST, PRESENT AND FUTURE OF THE OLD SOMERSETSHIRE COAL CANAL
it became a registered charity in 1995

The Society is aimed at those people who are interested in restoring the canal and finding out more about its history. As a member of the Society you will be able to join our programme of guided walks, talks and work parties. You will receive our newsletter "Weigh-House" to keep you up to date with our activities and research.

The Society is working to restore the canal to navigation and protect the line and structures of the canal for future generations.

Membership application forms are available from:

The Membership Secretary
c/o 43, Greenland Mills,
Bradford on Avon
Wiltshire
BA15 1BL

WEBSITE - http://www.coalcanal.org

Questions to answer

P3 -Why did a thin coal seam make it difficult to work?

P3 -Why should making Welsh coal cheaper affect the sales of Somerset Coal?

P1 Fig.1 -Radford and Foxcote are mentioned in the lists of places on the canal branches but not shown on the map, work out where they should be on the map and draw them in.

P12 - Why should the sides and bottom of a canal need to be waterproof?

P12 Fig.10 - What do you think they did with the earth they dug out of the hillside?

P12 Fig.10 - The towpath was for a horse, what was the horse needed for?

P13 Picture - What was the chimney pipe (behind the child) connected to?

P5 - Why didn't the box with the boat in it crash to the bottom of the caisson chamber?

P5 - How many months was it between starting work on the caisson and abandoning it?

P6 - Why is the inclined plane called "inclined"?

P6 Fig.4 - Why was a brake needed on the drum?

P6 Fig.4 - What would happen if the track was single all the way up the inclined plane?

P8 - Compare Fig.5 with Fig.6. - In Fig.5, the lock is emptied through paddles in the gate. In Fig.6 the lock is refilled through an underground tunnel. If they had tried to refill the lock by letting water through paddles in the top gate, what would it do to a boat waiting in the lock?

P10 Fig.8 - If the southern branch from Radstock is on the left of the drawing and the northern branch from Paulton is on the right, is the Cam Brook flowing towards you or away from you?

P11 Picture - The horses walked between the rails, why weren't sleepers or cross ties used to hold the rails together?

P16 Picture - What is the curved-topped object between the chimneys?

P16 Picture - Do you think the pumping engines were working when this picture was taken? How many clues can you find to support your answer?

Things to find out

P17 - In 'The Last Boat on the Canal' the passenger describes the pumping engines. Why do you think he was describing them from memory and did not actually see them that day

P3 - What was coal used for?

P3 Fig. 2 - Who was Georgii III. Regis

P4 - John Sutcliffe's salary was One Guinea *per* day, was this more or less than One Pound *per* day?

P4 - What is a fossil? Can you find one?

P4 - Why do we need to find oil and natural gas

P9 Fig.7 - Is Combe Hay village to the right or to the left of the maps shown here?

P12 - Were horses the only animals used to pull boats on canals?

P13 Picture - What materials would the women's clothes be made of?

P13 - What did a farrier do?

P13 - What kind of drinks did the inns sell?

P7 - The coal prices were written as "15d per cwt", what is a "d" and what is "cwt"?