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River Severn

CASE STUDY

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Severn

Location: 52N 3W (UK); length: 300 km; drainage Basin: 11,000 sq km (4000 sq miles)

Tributaries of the Severn

Avon, Stour and Teme

The River Severn, which has its headwaters on Plynlimon mountain in central Wales, flows through the west midlands of England before reaching the sea at the Bristol Channel. It is one of Britain's longest rivers and, in the past, one of those most prone to give problems from flooding. Dams on the upper Severn (the largest of which is the Clywedog) now control the river.

The cities of Gloucester and Shrewsbury were built at crossing points of the lower Severn (called the Severn Vale) provides a major communications route between the southwest of England and the English Midlands and Birmingham.

A tidal bore reaches up the Severn from the Severn estuary to beyond Gloucester.

Much of the northern part of the Severn Valley above Ironbridge has been greatly influenced by the ice sheets of the last Ice Age. The ice never got into Ironbridge, and instead piled up against the entrance to the gorge (which at that time was a continuous line of hills). When the ice left the region, great thicknesses of ground moraine were left behind, filling in what had previously been a much deeper valley.

However, the most spectacular change came about as a great lake formed at the southern margin of the ice, around what is now the village of Bildwas. Lake Bildwas filled

▼ The Clywedog is a reservoir to control the waters of the Afon Clywedog, one of the major headwaters of the Severn.

▲ Lake Vrynwy, a major lake on the northernmost headwaters of the Severn in Wales. It is used as a reservoir and provides a direct water supply for Liverpool.

higher and higher until it eventually spilled south over the hills and quickly eroded Ironbridge gorge. In this way the headwaters of the Severn, which had previously flowed north to the Dee, were diverted for ever south to the Bristol Channel.

The ground moraine, and the meltwaters flowing from the ice sheets produced an immense amount of easily reworked material in the valley bottoms. So, as sea levels changed after the Ice Age, the river was able to cut down into the material easily, creating a flight of broad river terraces. Most of the river terraces are less than 50,000 years old, an incredibly short period in which to form.

Places on the Severn

Shrewsbury

Shrewsbury is protected within a great meander on the Middle Severn. It still looks the part of an ancient fortress city on the Welsh Marches and its Norman castle still dominates the core of the meander, commanding views across the river. It still has a garrison. Part of the city walls still survive and its bridge names tell of its strategic role in England's history. The English Bridge was the bridge to the east and from where reinforcements came. The Welsh Bridge was the bridge to the west and across which soldiers advanced on the Welsh, then an independent country. The river was a vital line of defence.

The Severn is still liable to frequent flooding. To reduce the number of times flood waters affected the city the Clywedog Dam was built on the upper Severn in the 1960s. Although the flood risk is reduced, the floodplain is still largely given over to parks and playing fields.

Bildwas

Bildwas is a small village which was once the site of glacial Lake Bildwas and much later thriving Bildwas Abbey. Its main claim to fame is now the twin power stations that stand just above the entrance to Ironbridge gorge.

Wroxeter

A fortified signal station was built against the Severn by the Romans in the 1st century. By the time the Romans left four centuries later this site had developed into Britain's fourth largest city – Viroconium, occupying some 80 ha / 200 acres. Now all but vanished, it tells of a time when Severnside living, on the edge of the Roman Empire, meant many troops (legions) were stationed here and so it became a hive of activity.

Coalport

The name Coalport stands for one of the most famous porcelain factories in England. Here at the village of Coalport in the Ironbridge

▼ The Severn just below Shrewsbury, where it meanders on great thicknesses of alluvium over boulder clay. The rock of the valley floor is tens of metres below the river bed.

Gorge firing kilns were built in the small strip of land between the river and steeply-sloping gorge sides. The factory has now been relocated to Stafford.

Blists Hill

If ever a place is associated with images of belching smoke and iron furnaces, it is Blists Hill. Here iron was mined from shafts 200 m/600 ft below the surface. This supply of iron gave rise to an important ironworks. Here, too is the terminus of the Shropshire canal which connects to the River Severn at Coalport via a 60 m/210 ft inclined plain. Barges were manhandled up and down the inclined plain because the terminus of the Shropshire canal is high on the hillside and there was no chance of building sufficient locks to connect the two systems.

▼ Ironbridge to Coalport was a bustling centre on the Severn. But as the river was not navigable a canal had to be built. This consisted of a short stretch from the Severn at Coalport connected to a higher level canal by an inclined plane on which barges were hauled up and down. It was a primitive kind of lift. This picture shows one of a number of pottery and brickworks kilns close to the Coalport section of the canal.

▼ The settlement of Ironbridge, now an important tourist attraction. The narrowness of the valley is easily seen. This fast-flowing stretch of river is not navigable.

▲ The world's first iron bridge gave its name to the settlement of Ironbridge in the Severn Gorge.

Ironbridge

Ironbridge gorge has always been a major obstacle to east-west traffic in Shropshire. The steep-sided gorge also makes it very difficult to build houses and factories. The village has therefore been built on terraces cut from the steep slopes of the gorge. To provide a link across the gorge, the Iron Bridge from which the gorge and village take their names was built in the nearby iron works of Abraham Darby in 1779. It was the worlds first bridge of iron and has a span of 30 m / 100 ft – stupendous for those days. Its iron arches are not riveted, as would be the case today, but secured using metal wedges and dovetail joints, all designed as though the bridge were being made from wood. The bridge weighs 378 tons, using far more iron that an engineer would think necessary today, but as this was the world's first bridge it designers were playing safe – and the bridge still stands securely after two centuries as a result.

Coalbrookdale

It was Abraham Darby who, in 1709, began to smelt iron using coke. He was motivated to do this because charcoal was getting scarce. It took 100 tons of timber to make 25 tons of charcoal and Britain was fast running out of forests.

Darby's invention was responsible for lowering the price of iron making and so ushered in the new Iron Age. Blast furnaces were built in the steep tributary Coalbrookdale, whose name tells of the presence of the vital raw material.

This was not a promising site by modern measures, for not only was it cramped, but the sides of Ironbridge gorge and Coalbrookdale are prone to landslides. But at the time, the closeness of coal, iron and water was vital because none of these materials could be moved far in the age before canals or railways.

In the early 19th century the blast furnaces at Coalbrookdale rivalled the largest in the world.

▲ Bewdley is an ancient market town. This is the fine stone bridge crossing the Severn. The main street reaches up on to higher ground to the left.

Upton upon Severn

Perhaps nothing more signifies the importance of a river crossing than the English Civil, War Battle of Upton Bridge which occurred in 1651. At this time the route across the Severn was vital both to the Parliamentarians and Royalists.

Upton, like so many of the riverside towns below Ironbridge, was once a river port, handling cargoes brought up river from Bristol and Gloucester. This trade lasted until the arrival of the railway in the mid 19th century.

Bridgnorth

The twin towns of Bridgnorth, Low Town – on the narrow floodplain to the east of the river – and High Town – on a bluff of sandstone on top of the river cliff on the outside of the meander, are connected by a six arched bridge (and by Britain's steepest cliff railway). They are a classic example of sites both on the flat land beside a meander and the defensive site guarding an important route along the valley.

High Town is the earliest and was the site chosen for the building of a Norman castle. The ruins still overlook the river. Low town was developed as a river port. The traditional steep connecting road is called Cartway. Along its flanks caves were excavated in the soft sandstone and used as houses until Victorian times.

Upper Arley

Another of the small villages built close by the Severn. Here a small river port developed and houses were accumulated up the steep riverside bank. A ferry was also used to ply across the river, but because of the rapid current it had to be secured with an overhead cable.

Bewdley

The name means ‘beautiful place’ in Norman French. Bewdley was an important medieval river port. Thomas Telford designed the stone bridge that spans the river. The town and its market place, however, were built clear of

flooding and lie on the western slopes of the valley.

Worcester

Dominated by its cathedral whose grounds stretch to the river's edge, the cathedral and the old city stand on a river terrace out of reach of the floods. By contrast rows and rows of Victorian terraced houses have been build close to the river on the flood plain, putting them at risk each winter.

Tewkesbury

Tewkesbury, a market town at the confluence of the Avon and the Severn, was founded by the Romans who called it Etocessa. The present abbey was founded in 1102 on the ruins of an 8th century Benedictine Abbey. During the Reformation the abbey was destroyed but the fine Norman church remains. The town plan is in the shape of a Y, the main roads leading north along the Severn and the Avon and south along the Severn. The abbey and town lie on a low river terrace between the rivers, but they tend to keep away from the Severn because of its greater liability to flood.

The town contains many buildings dating back from the Middle Ages and is one of the best-preserved Medieval towns in Britain.

Newnham

This west-bank village lies on a river cliff produced by one of the last meanders of the

▲ A diversion canal was built from the Severn to Gloucester. A canal led from Sharpness to the city, where docks were excavated from the floodplain muds. Much of the dock area is now a tourist attraction and marina.

▼ The main quayside of old Worcester lay between the city bridge and the cathedral. This picture shows part of the quayside with the cathedral in the background. The picture looks

Severn before it widens into Britain's biggest estuary. It is a good place to see the tidal bore.

Slimbridge

Renowned as a place for wildfowl, these estuarine mud flats and coastal marshes are one of the world's most famous nature reserves.

The Severn Bridge

Just west of Bristol lie two of Europe's longest bridges, the first and second Severn Bridges. The first bridge (now listed as a Grade 1 building for preservation) was opened on September 8, 1966, some hundred years after the railway tunnel that goes under the Severn.

The first bridge was begun in 1961. It was built at the same time, and in the same way as the Forth Road Bridge (although the Forth Road Bridge opened 2 years earlier).

▼ This is the first Severn Bridge built in the 1960s. The second Severn bridge is just down river. This picture was taken looking west to Wales from the English bank.

The fast current in the Severn made construction very difficult. Two giant piers were needed. The west pier was so difficult that it could only be worked on for two 20 minutes each day - when the tide was low enough.

The towers rose from these piers and then a box-girder road deck was suspended between them. The road decks were made in 20 m length in a steelworks at Chepstow, then floated down the river to the site.

This was a pioneering structure for its time and made transport between Wales and England so popular that within 20 years the number of vehicles using it was three times the maximum number it had been designed for.

Furthermore the design proved to have some weaknesses and so the bridge had to be strengthened between 1985 and 1991.

This construction made Britain the world centre for long span bridges. Britain is still at the forefront of the technology and responsible for the new link in Hong Kong to Lantau island that will be 4,600 feet long.