

Y8 History

Week beginning 29/06/20

Lesson One: The North East in the Industrial Revolution

Lesson One:

1. As you have seen in previous lessons, there were lots of different reasons why Britain became the world's first major industrial economy. Many major innovations were created in the North East of England. Read through the text and identify all of the REASONS why the North East of England thrived during the Industrial Revolution.
2. Then look at the information about several key figures- George Stephenson, William Armstrong and Joseph Swan. For each figure, explain:
 - a. What was their innovation?
 - b. How did this change their industry?
 - c. How might their innovations have helped other industries around the country to grow, develop and thrive?
3. Write a paragraph summarising why the North East was so important during the Industrial Revolution.

Task One

Read through the information and identify all of the reasons why the North East of England thrived during the Industrial Revolution.

The Industrial Revolution is the phrase used to describe the big changes that were made to the way people lived and worked in the late 18th and 19th centuries. People moved from the countryside into towns and cities; others moved from making products by hand to producing the same products in vast quantities in large factories. But why did this happen? And why did much of it involve the North East of England?

Several things were needed for these changes to happen, many of which were connected together. Firstly, the resources needed to be available to power new machines. The most important fuel during the Industrial Revolution was coal. This was a type of mineral that, when set alight, would burn far hotter than wood or charcoal. It also burnt for longer, making it far more efficient. From the late medieval period onwards, more and more people started to heat their homes with coal and use it in making goods, particularly

metals. It was clear that the North East of England had an abundant supply of coal, with large areas of County Durham and Northumberland sitting on top of vast quantities of it. Mining coal therefore became very important to many in the North East. It was also of extremely high quality, particularly when compared to coal from Europe, which could not burn as hot and was less easy to mine.

The coal miners were helped by the fact that it was very easy for them to get their coal to their customers. The River Wear and the River Tyne were both deep and wide, meaning that any coal that was dug up could easily be moved by boat. There were also large parts of the coal fields near to the coast, again making it easy to transport the coal to where people wanted it, particularly London. This allowed the North East's coal miners to sell their coal across Britain, rather than just to local customers. This, in turn, meant that more and more people wanted their coal. This allowed their businesses to grow and made it more worthwhile to dig deeper mines.

This quest for profit also led to many developing new technologies that could help the miners make more money, either by being able to get more coal out of the ground, or by making it cheaper to mine. One of the main costs was of getting the coal to the boats. From the seventeenth century, miners had realised that it was far easier to move trucks full of coal if they were on rails, and built lots of wooden rails to move goods. These were known as Newcastle Roads, and important ones were built at Tanfield and Wylam. The rails were later made from metal, as it was stronger and lasted longer than the wooden rails.

The North East thus became somewhere that money could be made, and so intelligent and enterprising people from the North tended to stay, rather than moving elsewhere to make their fortunes. This led to lots of innovation. The first steam engines had been created to draw water out of mines. Mines therefore became some of the first places to make use out of steam engines. These allowed people to dig deeper mines. It also gave people ideas, and the first steam locomotive (what we would call a train today) was designed to make it easier to move coal from the mines at Wylam. It is no coincidence that its inventor, George Stephenson, grew up in a cottage right next to the Wylam Wagonway, one of the first railways.

The desire to innovate, and the profits that could be made from this, turned Newcastle and Durham into major centres of knowledge and learning. A Literary and Philosophical Society was created in Newcastle in the late eighteenth century. Durham University was founded in 1832, and Newcastle University followed in 1834. The culture of learning and self-improvement drove many further new technologies to be invented, with huge developments in areas as varied as hydraulics, electricity and photography.

Task Two

Read through the information about the important figures from the North East who made significant changes during the Industrial Revolution. For each one, explain: a. What was their innovation? b. How did this change their industry? And c. How might their innovations have helped other industries around the country to grow, develop and thrive?

George Stephenson

Stephenson was a pioneering railway engineer and inventor of the 'Rocket', the most famous early railway locomotive.

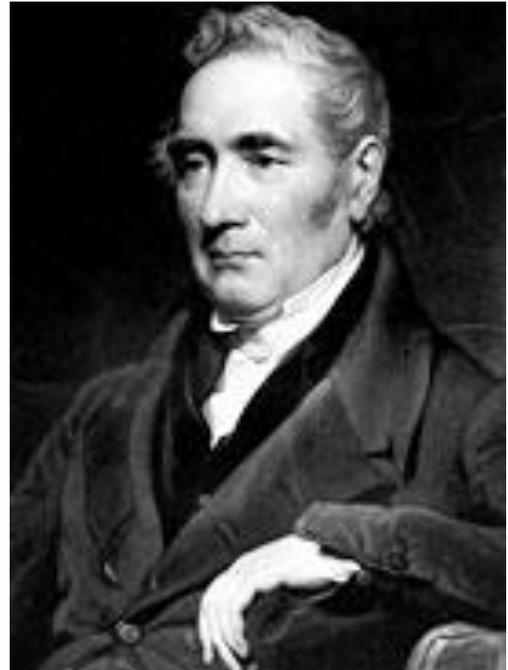
George Stephenson was born on 9 June 1781 near Newcastle-upon-Tyne. His father worked with steam engines at a coalmine. Stephenson himself worked at the mine and learned to read and write in his spare time. He gained a reputation for managing the steam engines and worked in a number of different coalmines in the northeast of England and in Scotland.

In 1814, Stephenson constructed his first steam locomotive, 'Blucher', for moving coal at Killingworth Colliery near Newcastle. In 1815, he invented a safety lamp for use in coalmines, nicknamed the 'Geordie'.

In 1821, Stephenson was appointed engineer for the construction of the Stockton and Darlington railway. It opened in 1825 and was the first public railway. The following year Stephenson was made engineer for the Liverpool to Manchester Railway. In October 1829, the railway's owners held a competition to find the best kind of locomotive to pull heavy loads over long distances. Thousands came to watch. Stephenson's locomotive 'Rocket' was the winner, achieving a record speed of 36 miles per hour.

The opening of the Stockton to Darlington railway and the success of 'Rocket' led to railway lines appearing all over the country. Stephenson became engineer on a number of these projects and also helped build railways in Belgium and Spain.

Stephenson died on 12 August 1848 in Chesterfield in Derbyshire. His only son Robert was also a railway engineer and worked with his father on many of his projects.



William George Armstrong

William George Armstrong is Britain's forgotten genius. He was an inventor, engineer, scientist and businessman who was hugely important in the nineteenth century. He brought global fame to his great Elswick works on the north bank of the Tyne and became a national hero. At one point, Elswick employed over 25,000 people in the manufacture of hydraulic cranes, ships and armaments.

Armstrong built Newcastle's Swing Bridge and the hydraulic mechanism that operates London's Tower Bridge. He created Cragside in Northumberland, the first house in the world to be lit by hydroelectricity, and planted in its grounds seven million trees. The gift of Jesmond Dene park to the people of Newcastle, the founding of Armstrong College (which evolved into Newcastle University), and the endowment of seven hospitals, including the Royal Victoria Infirmary, and the Hancock Museum of Natural History (now the Great North Museum) were among his countless acts of charity.



Armstrong became Britain's largest industrialist and one of the wealthiest men in Europe. He was the first engineer – indeed, the first scientist – to become a member of the House of Lords. Those who dismiss him as a fabulously rich weapons manufacturer who treated his workers badly fail to acknowledge the vast benefits that he brought to his native Newcastle, to his country, and to the human race at large. When he died, on 27 December 1900, at the age of 90 – a few weeks before Queen Victoria – *The Times* said in its obituary: 'With his death Newcastle loses her greatest citizen and the country at large one of the worthies of the expiring century.'

Why Armstrong matters

- * He was 'the inventor of modern artillery' (*The Times*).
- * He was an environmentalist 150 years in advance of his time, advocating water and solar power as substitutes for fossil fuels.
- * He built Cragside in Northumberland, the first house in the world to be lit by hydroelectricity.
- * He was the world's first international arms dealer, forging business links with governments around the world, from Brazil to Japan.
- * He created the mechanisms that operate London's Tower Bridge and Newcastle's Swing Bridge.
- * He restored England's finest castle – Bamburgh, on the Northumberland coast.
- * He employed more than 25,000 people at his Elswick Works on the Tyne, a powerhouse of the British Empire.
- * He founded Newcastle University, which began life as the College of Science.

Joseph Swan

Joseph Wilson Swan was born in Sunderland on October 31st 1828. He was said to have had an enquiring mind even as a child. He had a fascination of his surroundings, the industry of the area and reading.

First Employment

At the age of 14 he was apprenticed to a pair of pharmacists, but unfortunately they died before the completion of his apprenticeship. He then joined a Newcastle chemical firm run by his brother-in-law, John Mawson. They produced collodion which was used in the 'wet plate' photographic process.

Photography

Joseph put much of his energies into testing and developing alternative processes, realising that the wet plate process had many drawbacks. The first affordable procedure for carbon printing allowing permanent photographic prints to be made was patented by Swan in 1882.

In 1877 he invented the 'Dry plate' process of developing photographs, and revolutionised the advance of photography. This was followed by the invention of bromide paper in 1879. Altogether over 70 patents were taken out by Joseph Swan in the field of photography.

The Electric Light Bulb

Joseph made good use of his time with Mawsons. He experimented with ways of extending the life of an electrically heated filament to allow him to make an effective electrically powered light. With a carbon wire sealed into a vacuum bulb, Swan was able to produce a long-lasting electric light that could replace candles as the main way of lighting rooms after dark.

Swan described his bulb on 19th December 1879. On the 3rd February 1879 he demonstrated his bulbs to the Newcastle Literary and Philosophical Society, thus lighting the first public building in the world with electric lighting. It was 9 months later before Edison managed to light a bulb for 13 hours continuously, and as has been noted Swan had had some success already with his carbon filament bulbs.

In 1880 Mosley St. in Newcastle was the first street in Britain to be lit by electric bulbs. Swan's home in Underhill Gateshead was the first private house to be lit electrically closely followed by Lord Armstrong's mansion in November 1880. Lord Armstrong had chaired the meeting of the Literary and Philosophical Society when Swan had demonstrated his bulbs.

In November 1882 the Savoy theatre staged *Iolanthe*, the fairy operetta, and the Swan United Electric Light Company equipped the fairies with incandescent star lights worked by a small battery hidden behind their hair. This was the first time 'fairy lights' had been used and it is where the term, still in use today, originated.

Honoured

He was considered to be a brilliant scientist of his day and gathered many honours as a result. Beside a doctorate (D Sc.) from Durham University he received a Knighthood in King Edward VII's birthday Honours in 1904. He received other awards and honours from various scientific bodies.

"There are no inventions without a pedigree, meaning that nothing is developed in complete isolation. An inventor always draws on the work of others that have gone before."

Task Three

Write a PEEL paragraph summarising why the North East was so important during the Industrial Revolution.



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Lesson Two: The Industrial Revolution Quiz

1. Re-read through the work you have completed on the Industrial Revolution from your previous lessons.
2. Complete the end-of-unit quiz. You can access this through your class Team.