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# COAL AND WALES

*An introduction*



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The coal industry has shaped the Wales we know and live in today but what is coal and why was it so important?

Look through this eBook and spark your curiosity for the history of the coal industry in Wales. The eBook focuses on the coal industry in Wales from the 1700s up until the early 1900s.



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# COAL AND WALES

An introduction

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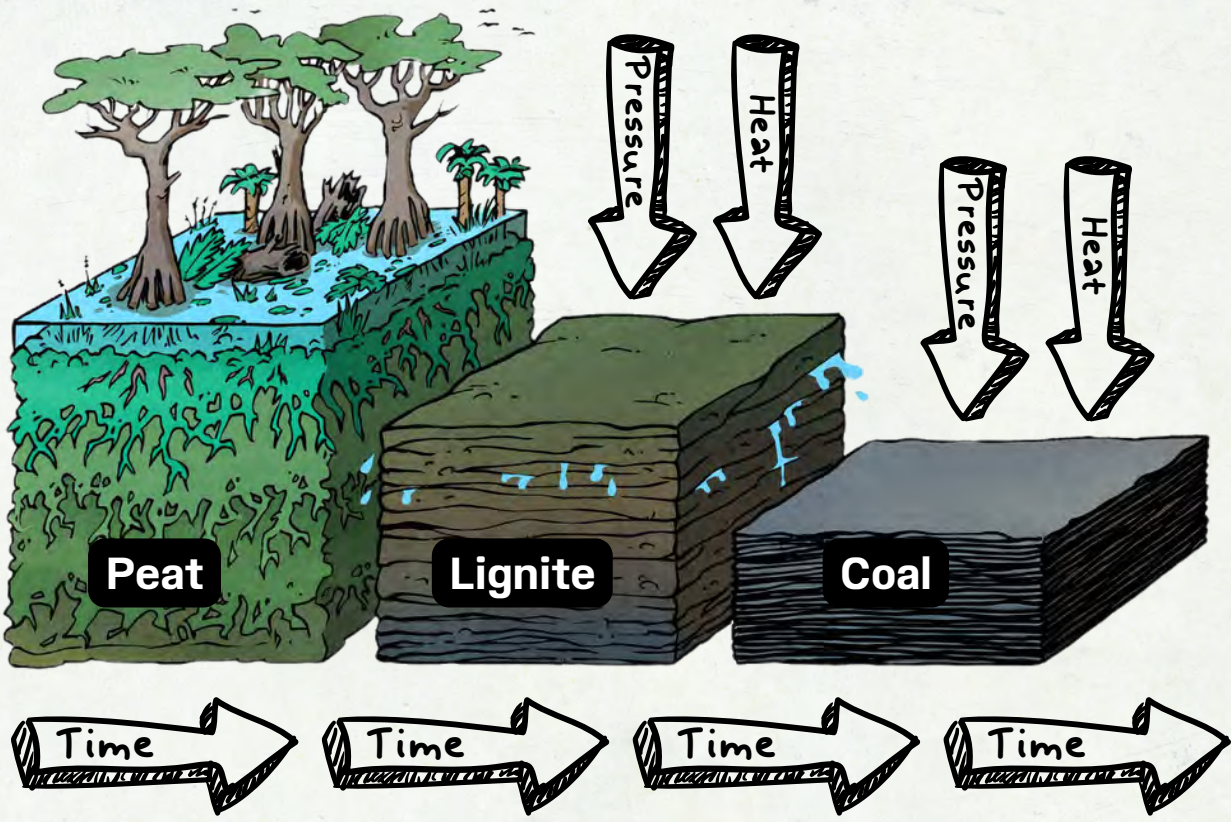
*Mae'r adnodd hwn ar gael yn Gymraeg.  
This resource is available in Welsh.*

# WHAT IS COAL?

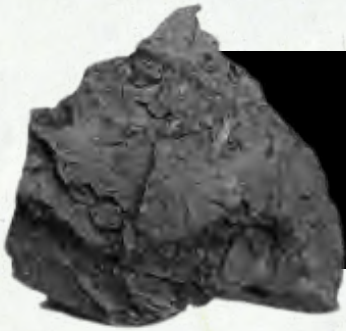
Coal takes hundreds of millions of years to form. When trees and plants die on dry land they are soon rotted by bacteria. Millions of years ago, in swampy, watery areas the tree and plant remains are caught in the water and without oxygen bacteria can not break the remains down as easily. Over millions of years many layers of swamp plants are compacted, heated and fossilised to form different types of coal. Today we call coal a fossil fuel.



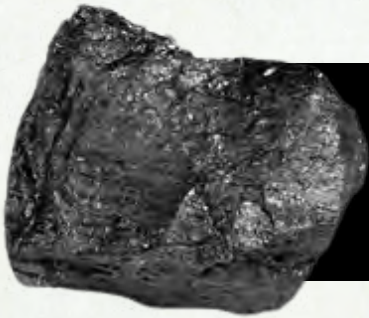
The deeper the coal seam, the better the quality of coal. This is because the deeper levels are older and have been squashed more, leaving higher concentrations of carbon, which means that the coal gives off more heat when it is burned.



# TYPES OF COAL



Lignite | The poorest form of coal as it contains the least carbon.



Sub-bituminous | A slightly better fuel than Lignite.



Bituminous | The most common type of coal. Known in Britain as 'Steam Coal.'



Anthracite | The hardest coal, usually found at the deepest levels.



# WHERE WAS THE COAL IN WALES?

Covering an area of about 1,000 square miles, the South Wales Coalfield is the largest continuous coalfield in Britain. The coalfield can be broadly split into two types of coal. The valleys area had mainly bituminous coal. Further west had anthracite.

When people think of Welsh coal they think of the valleys of south Wales. However, north Wales also has a proud coal mining heritage dating back hundreds of years. The North Wales Coalfield can be divided into two sections, around nine miles in width. Both coalfields are under water at certain places too!



© Amgueddfa Cymru



Female surface workers queuing  
for the pay, about 1880





# WHAT IS COAL MINING?

Coal mining is the process of taking coal from the earth. Coal deposits were sometimes close to the surface. Early on miners would dig large open pits and remove the coal; some called this 'Patching.' As the coal closer to the surface was used up, miners would have to dig further and deeper.

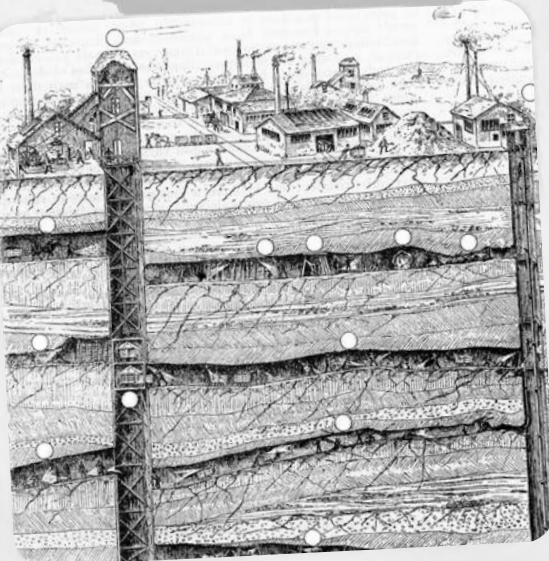


# TWO TYPES OF MINING

Drift mines were dug horizontally into hills and mountains. You could often walk into them, but they did get deeper as you went further, you may have had to use a ladder or rope to go down.



Drift mine



Shaft mining

Mine shafts were dug directly down into the ground and levels would branch off from the main shaft. Some coal shafts reached depths of around 750 metres; that's nearly half a mile deep!

# Morning Chronicle

March 27, 1850

Price 4d

## A DAY IN THE LIFE OF A WELSH MINER

5am start. Daylight is no consideration to those whose job is two miles from the pit mouth.

They carry with them their dinner of bread and cheese, a closed tin jug with tea – sometimes, no doubt, with beer – a few candles, and the tools with which they cut the coal.

They enter the mines, sometimes walking straight into drift mines, sometimes down shafts with steam powered lifts. Before the men enter, a special officer uses a safety lamp in every part of the mine the miners will be working in. After this, the men and boys enter. The boys take their place at the doors used for air ventilation and work begins.



© Amgueddfa Cymru



© Amgueddfa Cymru

# Morning Chronicle

March 27, 1850

Price 4d

## A DAY IN THE LIFE OF A WELSH MINER

CONTINUED

The coal is placed in drams to which hauliers "hook on" the horses and the coal is sent to the shaft for raising.

All work is carried on by candle-light; very rarely is the safety lamp used.

After 10 or 12 hours the workers return the way they entered. Miners arrive at their cottage, where wives have hot water in readiness. He strips and washes. Then takes his evening meal of broth, meat or cheese. Then up at 4am to start again.



© Amgueddfa Cymru



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# WHAT JOBS WERE UNDERGROUND?

Colliers are the miners who cut the coal from the coalface. For hundreds of years they did this by hand using only a mandrel.



Colliers



Hauliers

Hauliers worked with a horse and dram to haul out the coal which the colliers had cut.

There were rows of stables underground, Horse Keepers looked after the horses when they were in the stables.



Horse Keepers

# WHAT TOOLS DID A MINER USE?

Over time miners across Wales used many different tools underground. Here are a few of the more common ones.

- 1 Jack | A tin jug for tea.
- 2 Tommy | A tin food box.
- 3 Safety Lamp | A light that would also help discover gases.
- 4 Curling box | A two handled metal scoop that was used to pick up coal and put it into the drams.
- 5 Mandrel | A coal pick that was used for cutting coal.





© Amgueddfa Cymru

Haulier and Mate, Tynybedw  
Colliery, about 1890

# DID CHILDREN WORK UNDERGROUND?

Before 1842, children would start working underground from the age of 8; some were even as young as 4. Many were air-door keepers. They would open and close doors underground to regulate the air.

After 1842, it became illegal for boys under 10 to work underground and women could not work underground at all. Women did continue to work on the surface, sorting coal, and many other hard jobs.



Big Pit workers, about 1890

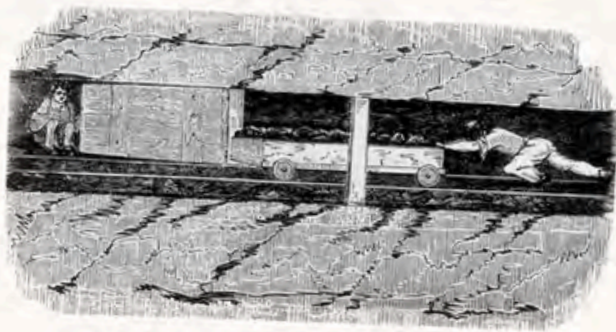


REPORTS  
FROM  
COMMISSIONERS:  
CHILDREN'S EMPLOYMENT  
(MINES).

In 1842, the government began to investigate child employment underground. Officials went all across Wales to interview the workers.

"I went to sleep because my lamp had gone out. I was frightened for someone had stolen my bread and cheese. I think it was the rats."

**Mary Davis, age 6.**



**Air-door keeper at work**

"I have been down about three years. When I first went down I could not keep my eyes open; I don't fall asleep now; I smoke my pipe."

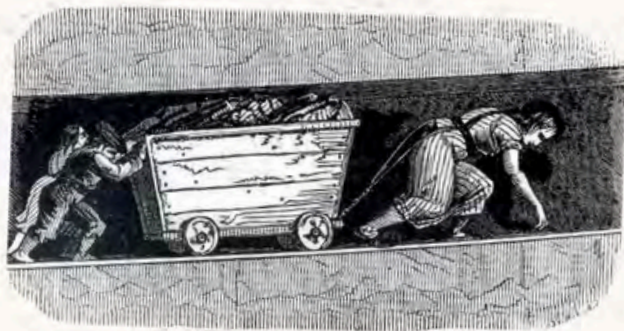
**William Richards, age 7**



**Dragging coal to the surface**

"I have been below six or eight months and I don't like it much. I come here at six in the morning and leave at six at night."

**Susan Reece, age 6**



**Hauling coal to the surface**



By the 1900s children were still working underground. This postcard photograph is of Rhys Wallace Jones, from Aberdare, before he started work, the day after his 13th birthday.

POST CARD

82.76I/1

Mrs. Sarah Jones,  
5, Gladys Gardens,  
Aberdare

THE ADDRESS ONLY TO BE WRITTEN HERE.

Hello Mam,  
This is the photo taken of me the day after my 13th birthday. It was my first day working underground. I have my Jack, Tommy and lamp all ready! Will see you after work.  
Rhys Wallace Jones



# WAS IT DANGEROUS UNDERGROUND?

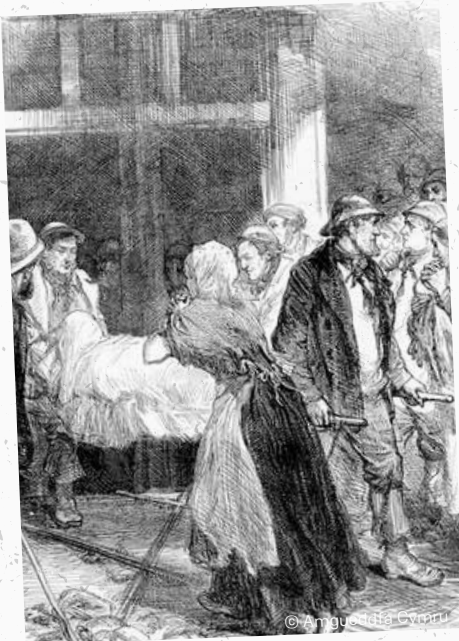
There were many dangers underground. You could fall under a moving dram, get kicked by a colliery horse, or injure yourself with machinery and sharp tools. The many gases underground could asphyxiate miners, and worse still, the gases and coal dust were explosive.

After a lifetime underground many miners developed problems seeing or breathing normally. Disabled people were common within coalfield communities.

George Preece of Abercynon with prosthetic legs following a colliery accident. In 1909, he was run over by a tram.



George Preece



Troedyrhiw  
Colliery

At Troedyrhiw Colliery, Porth, 1877, water flooded the mine, killing 5 men and trapping 9 underground for 9 days.

Coal wagons in Roath Dock sidings, Cardiff, 1910



# HOW DID THEY LIVE?

As the industry grew in Wales more and more people were needed and housing was in demand.

Houses in mining communities were usually built in long rows. Rows upon rows would spread across the valleys of south Wales. They came in all sizes too. Some had two rooms downstairs and two rooms upstairs. Some had one room down and one room up. Some even had three floors. They were normally built of stone, and some had gardens, but many did not.



**Rhyd-y-car Cottages at St Fagans**



One room downstairs would be used as a living room, kitchen, dining room and bathroom. All the cooking would be done on the open coal fire. To the side of the main fire would be a small oven used for cooking bread. There was no running water in many homes, which meant women and children left at home collected buckets of water every day. These were heated then used for a bath in front of the fire. Next to the main room, there was often a small room called a pantry, where food would be prepared and stored.

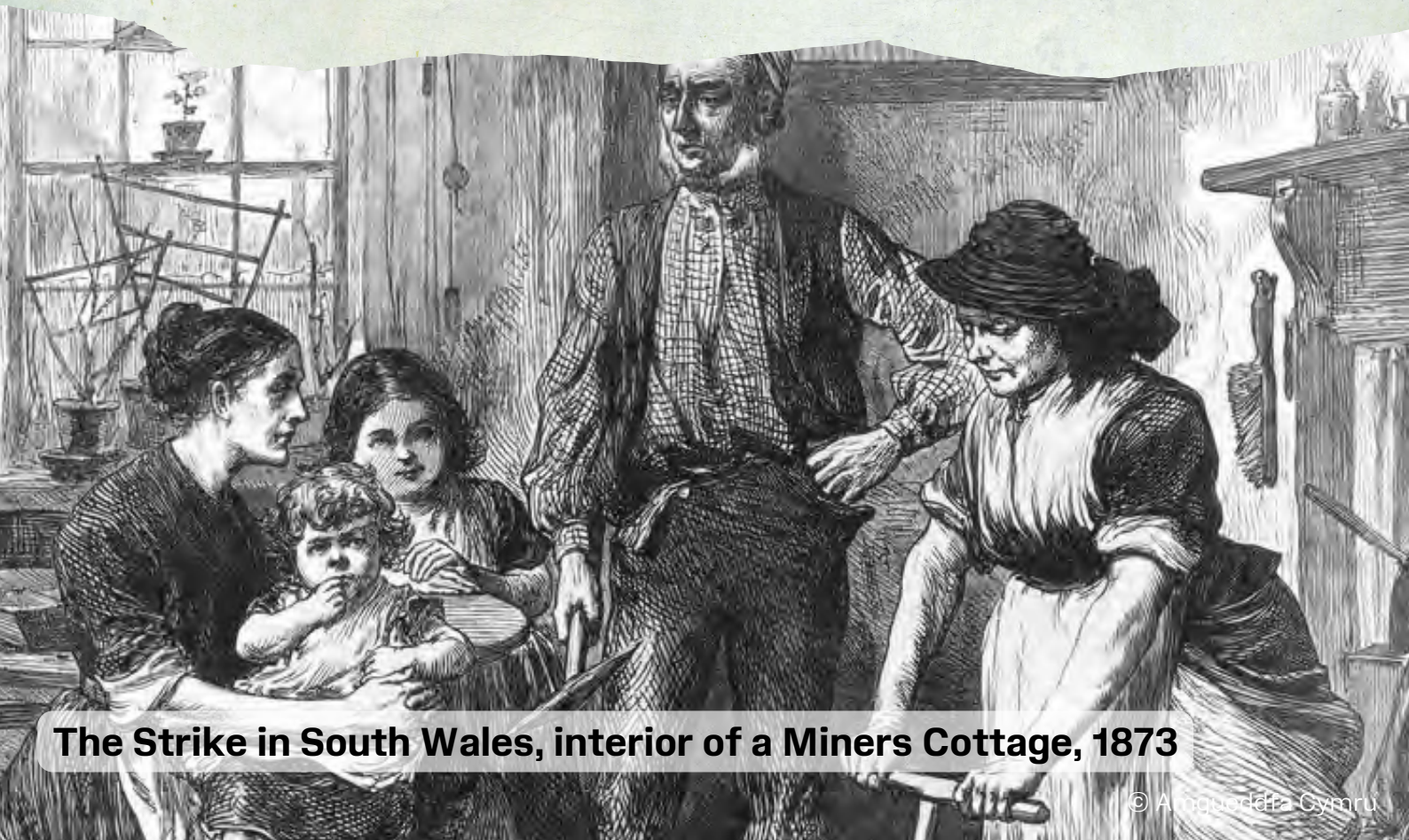
## Miner washing in tin bath, Ferndale



© Amgueddfa Cymru

The toilet would be outside. These outside toilets were mostly shared between many houses.

Overtime houses did get running water and sewage, but housing in the industrial areas changed little from the mid-1800s, to the first half of the 1900s.



**The Strike in South Wales, interior of a Miners Cottage, 1873**

© Amgueddfa Cymru

Sinking a shaft, Wyllie  
Colliery, Pontllanffraith, 1911





# WHEN DID COAL MINING START?

The first traces of a coal industry in Wales date back to the 1200s and 1300s. There is evidence of mining in the Blaenavon area going back to the 1300s, and of mine workings at Mostyn dating as far back as 1261.

Little is known about the early coal mining at Mostyn but by the 1600s it was the most productive coal mine in Wales. It was supplying coal to the wider area, which was used for malt drying, lime burning and in the smithies. Mostyn coal even began to be exported to Ireland for their fuel needs.



**Lead and Coal Mines at  
Mostyn, 1684**

# WHAT WAS COAL USED FOR?

While many industries used Welsh coal it was the copper and iron industries that pushed coal mining towards becoming a vast industry in Wales.

In the late 1600s the Mansel family had begun opening mines in Briton Ferry and Swansea. That would continue into the early 1700s when the family had 23 collieries. In 1698, Humphrey Mackworth began exploiting the land in and around Neath, opening Gnoll Colliery and others. The reason for this activity was the smelting of ores.

At the start, the coal was being mined and sent to Cornwall to smelt copper. Coal was also used as fuel for driving pumps used in the draining of the Cornish copper mines.

The influence of the copper-smelting industry on the development of the south Wales coal trade cannot be over-estimated...

A. H. John, 1943

It was the copper trade that brought the "black diamond" into the commercial world in anything like considerable quantity.

Charles Wilkins, 1888



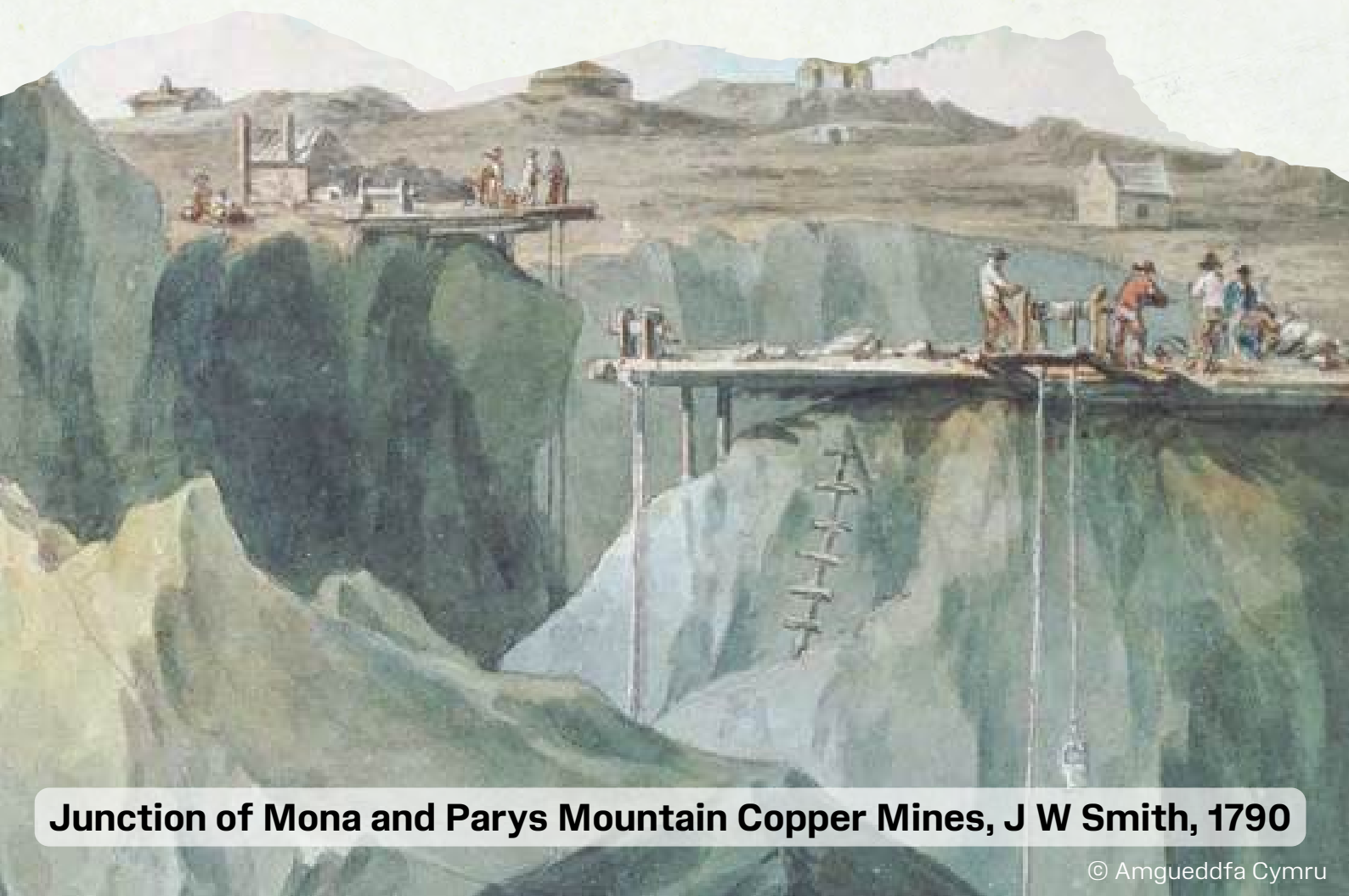
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# COAL AND COPPER RISING

Smelting is simply heating up an ore and extracting the metal. Around three tons of coal is needed to smelt one ton of copper. So, it made sense to bring the ore to the coal and not the other way round.

There were three smelting companies in the Neath and Swansea areas by 1729. That number would increase to seven by 1784. Between the seven companies they were buying over 72% of the copper ore in Britain.

For a time, copper was mined on Anglesey. It was sent down to Swansea to be smelted using Welsh coal.



**Junction of Mona and Parys Mountain Copper Mines, J W Smith, 1790**

**Neath Abbey with colliery in foreground and Neath Abbey smelting works in distance, 1805**



© Amgueddfa Cymru

The figures in the foreground, represent the manner in which the coal is conveyed, from the pits to the smelting houses. The vehicles in which this fuel is carried, are called dram waggons. Four or five of these heavy machines, linked together, and filled with coal, are drawn with the greatest ease by means of a single horse upon the rail roads...

Edward Donovan, 1805

**Coal Works, a view near Neath in Glamorganshire, south Wales, J Hassell, 1798**



© Amgueddfa Cymru



Courtesy of Cyfarthfa Castle

# MAKING COAL BURN HOTTER AND CLEANER

Coal was a good fuel, but it could be improved. Stacking coal in 'coking-pits' and burning it in a specific way, created coke, a fuel that would burn hotter and cleaner. Layering the coal into pits was a skilled job, as the coal needed to be burnt evenly. Often women could be found doing this job as well as men; they were called 'Coke-girls'. Ironworks normally had coking pits near their blast furnaces.

## Morning Chronicle

March 21, 1850

Price 4d

### A DAY IN THE LIFE OF A 'COKE-GIRL'

I am a coke-girl. I am 24, and I have worked at Penydarren Ironworks three years and a half.

My business is to stack the coal for coking in the pits. I earn five shillings a week. I have often to lift coal from drams, which weigh over a hundred weight, and carry them to the pit. I work eleven hours a day, taking the year through.

I cannot read or write. I work in all weathers - rain, snow, or frost. I stand the rain and wind often all day long, because we must work.



© Amgueddfa Cymru

Being the reverse of the direction point of angle when marked on a vertical line (right) and downwards from the object as in last VIII. Example the ground exactly itself.

MARK  
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Anuncio de 2 años a partir de la fecha de publicación de este anuncio.

**Nant-y-Glo Ironworks, attributed to H Gastineau, 1830**



# COKE AND IRON

Abraham Darby of Coalbrookdale had experience using coal in copper smelting. In 1709, he began producing iron in coke fuelled furnaces. Soon after, in 1727, a coke fuelled furnace was constructed at Bryn Coch, near Neath. Throughout the 1750s and 1760s huge furnaces were built at Hirwaun, Merthyr Tydfil and many other places across Wales.

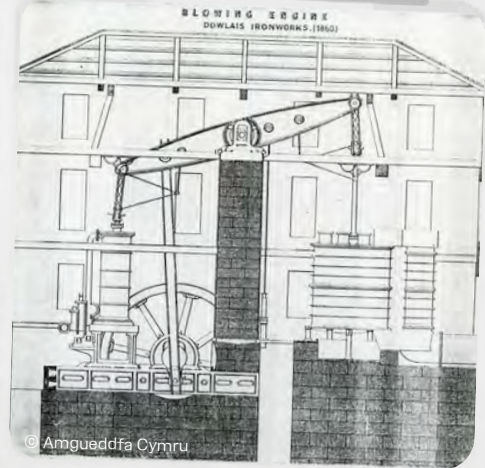
The process of using coke in furnaces and iron making overall continued to evolve through the 1700s, but by 1800 the iron industry in Wales was at the heart of the Industrial Revolution and coal was at the heart of the iron industry.

# FUELLING THE IRON INDUSTRY

Coked coal was layered into huge blast furnaces, iron ore and limestone were added, and air was blown into the furnace. Molten iron would come from the base.



Blast Furnace



Blowing Engine

Blowing engines that pushed air into the furnace were originally powered by waterwheels. New blowing engines were steam powered which meant they were fuelled by coal.



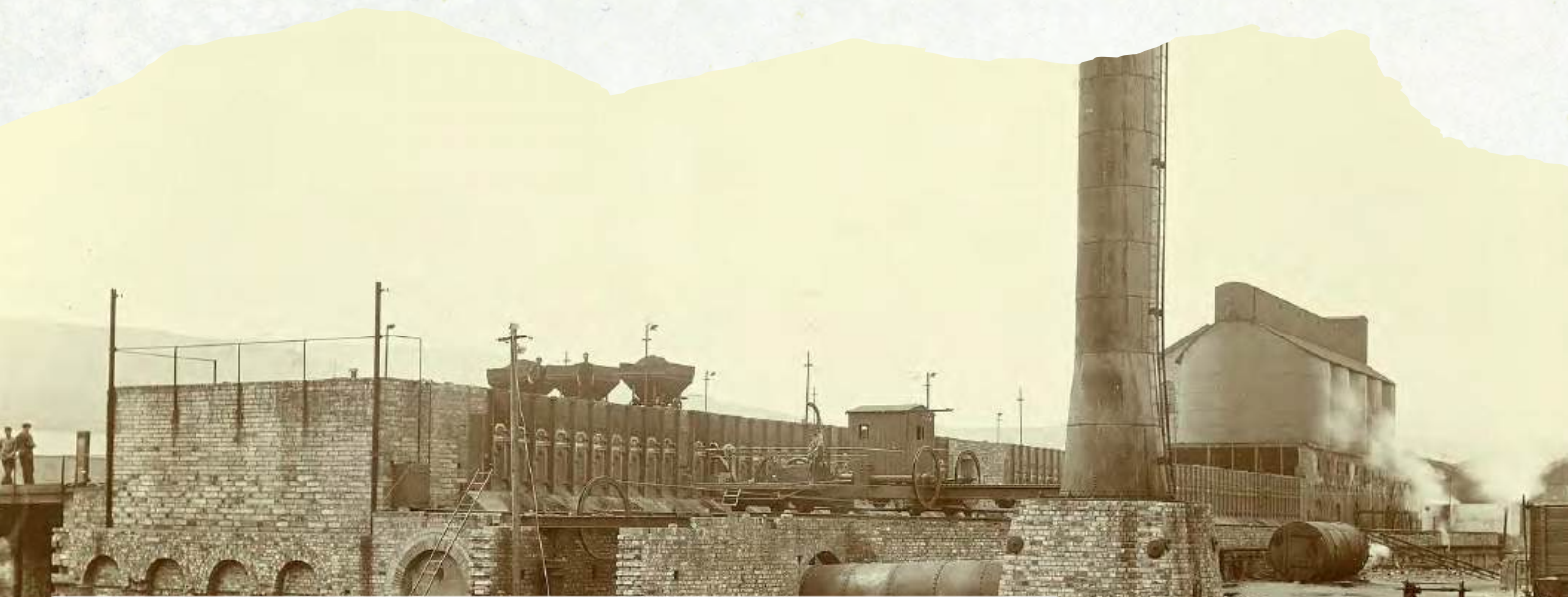
The smaller refining furnaces at ironworks would also use coke. Coal or coke was fuelling everything!



# MORE IRON! MORE COAL!

Just at Merthyr Tydfil, 17,000 tons of iron were made in 1800, a gigantic amount for the time. That would go up to 130,000 tons by 1840. When you consider one ironworks in Merthyr Tydfil used 850 tons of coal a day, you realise how important coal was to the industry. That is over 300,000 tons every year, for just one of four ironworks in Merthyr Tydfil alone.

As technology changed huge coke ovens replaced the open coking pits. But, by the time many of these new coking ovens were opened ironworks across Wales were already closing.

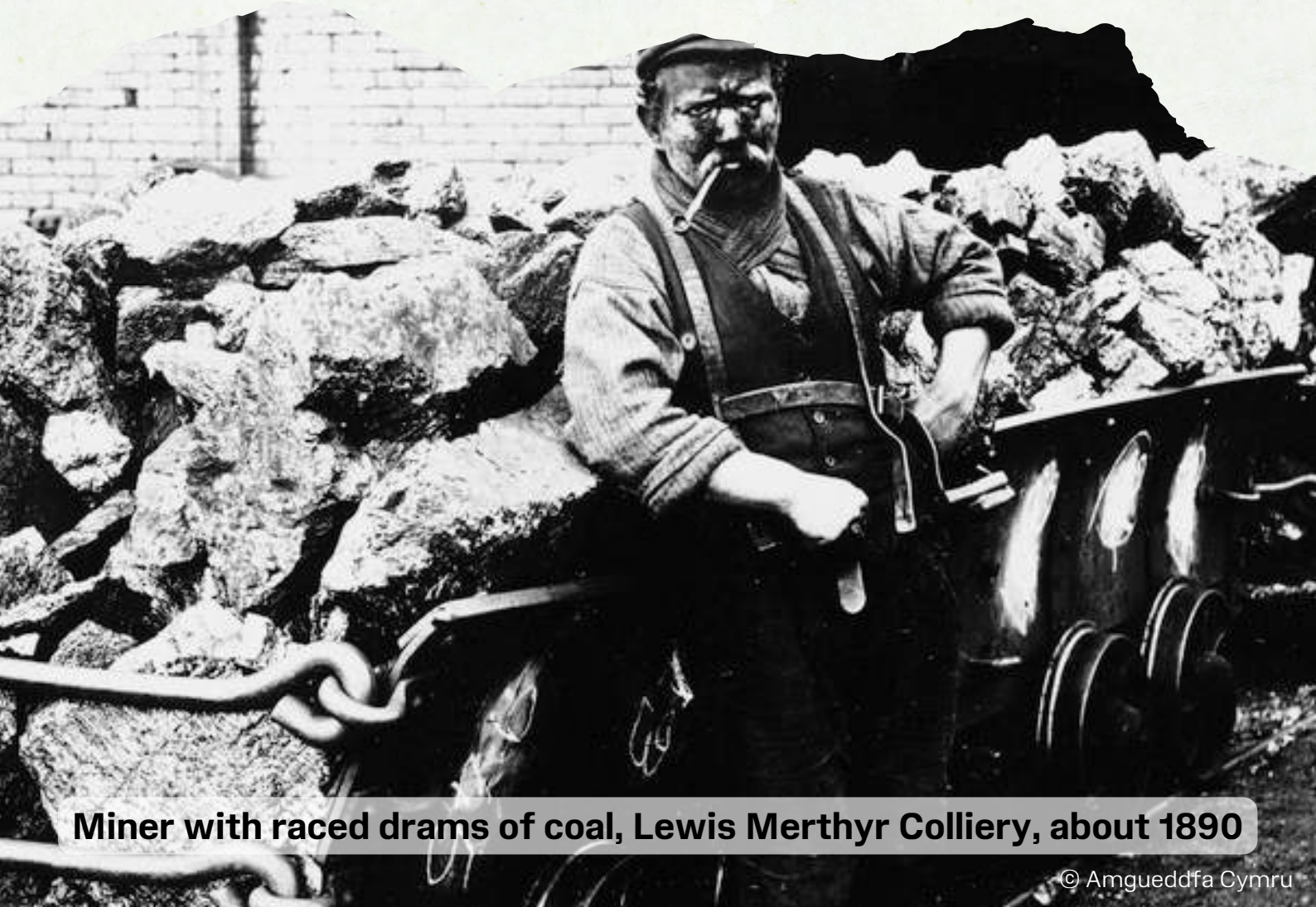




# THE POWER OF STEAM

The rise of steam-powered technology in the second half of the nineteenth century, was pushing the demand on coal to whole new heights. To meet this need, new collieries opened, more miners were employed, and mines were driven deeper than ever before.

The process of making iron and copper could be reproduced elsewhere in the world, but the coal, needed for steam engines, could not be reproduced. By the 1860s, ironworks were closing but more and more pits were being sunk regardless. The demand for Welsh coal was enormous.



**Miner with riced drams of coal, Lewis Merthyr Colliery, about 1890**

# COAL POWER EVERYWHERE

Steam ships transported people and cargo all across the world.



Steam ships



Trains

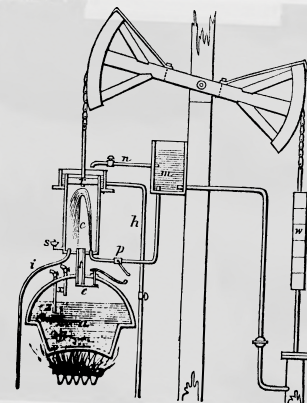
By the 1840s, railways were opening across Britain and coal was the main fuel.



Heating homes

Homes in urban areas were using coal as the main source of heat. Coal would heat water for a bath too!

Many factories had steam engines. By 1835, around 75% of cotton mills were steam powered.



Steam engines



It is rare to find one coal in which is combined all the qualities essential for the requirements of a ship of war...

*Henry de la Beche, 1848*

# FUELLING THE NAVY

The Navy began using Welsh coal to power their ships in 1854.

The best steam coal lay deep underground in the Rhondda valleys, and to mine it needed lots of manpower and investment. In the Rhondda alone, thirty-seven collieries were opened between 1860 and 1881. By 1914, fifty-three were in operation.



**Steamships at Barry Docks, about 1900**



# COAL PORTS ACROSS WALES

Ports, like Cardiff and Barry, became major exporters of coal, sending it all across Britain and the rest of the world. In 1862, 2 million tons of coal were exported from Cardiff Docks. By 1913, this had risen to nearly 11 million.

By 1910, there were 250 tramp steamers owned at Cardiff. Tramp steamers transported coal across the world and often brought cereals back, the so called 'coal out, grain home' trade.



**Queen Alexandra Dock, Cardiff, about 1910**

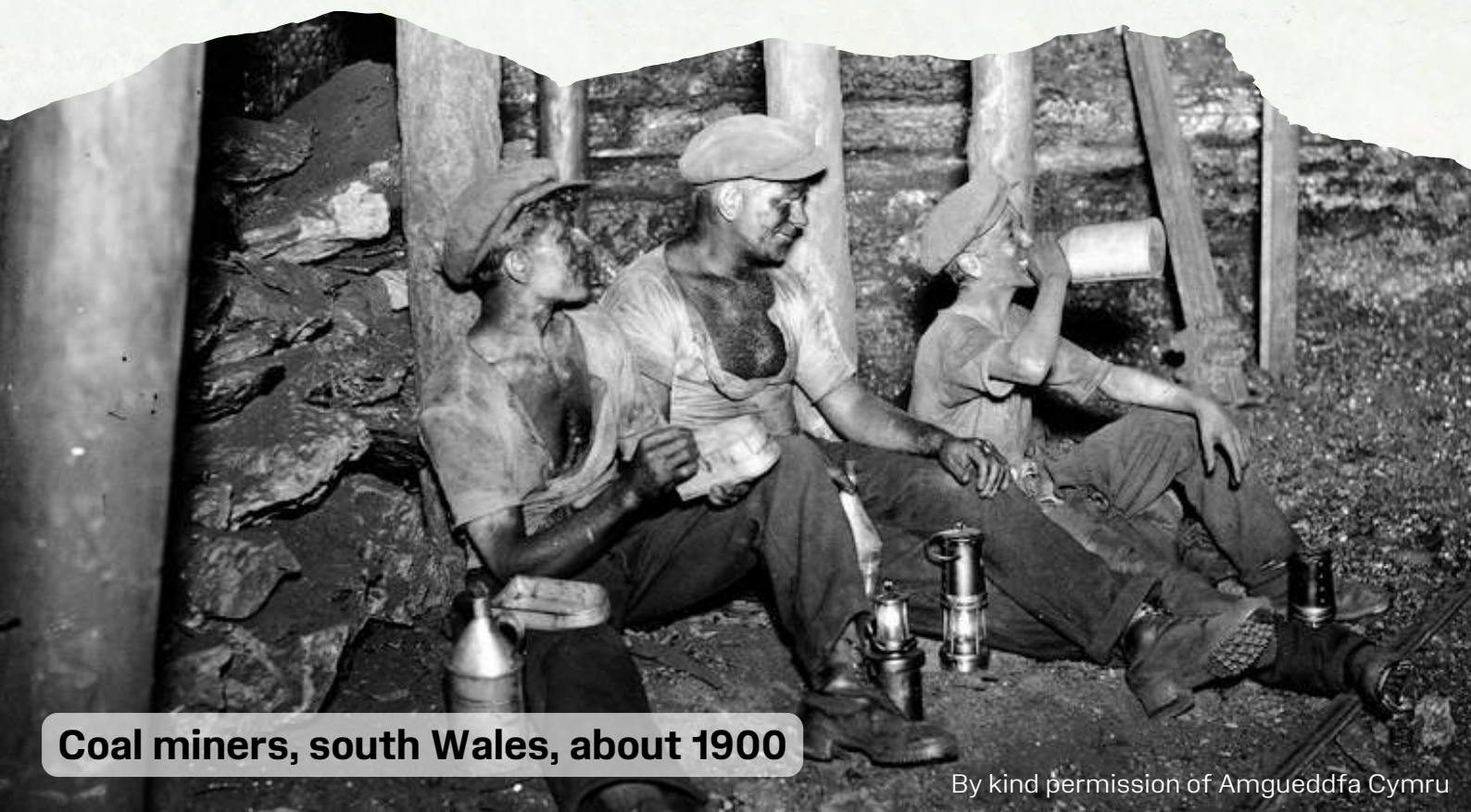
# THE END OF AN ERA

At its peak in 1913, the South Wales Coalfield was the most productive in Britain and employed nearly a quarter of a million men.

The coal industry would go on for many more decades in Wales. It would become more mechanised and eventually would be nationalised.

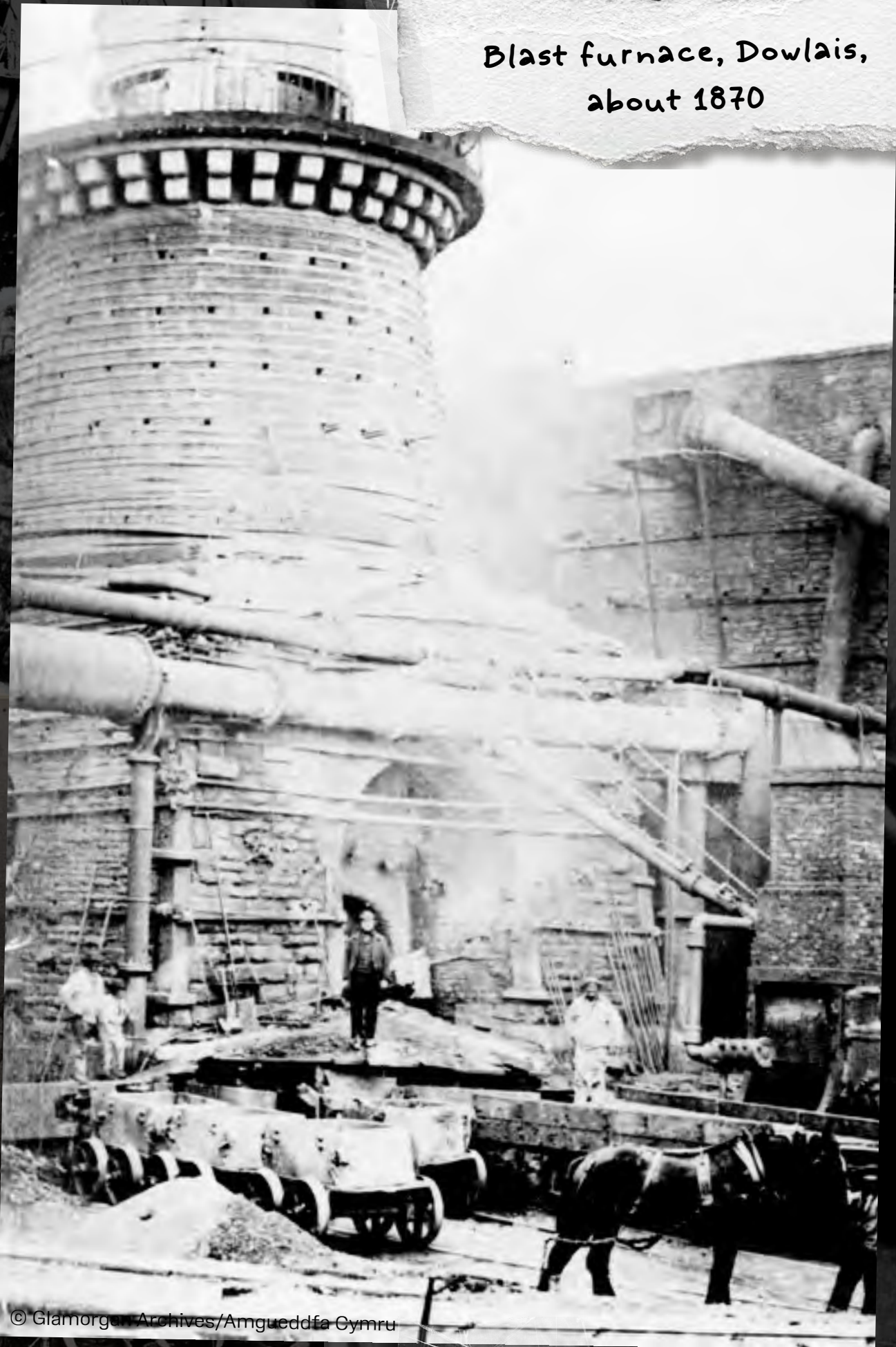
With the rising costs of mining and other fuels being used over coal, the industry slowly declined.

Now, just a generation or so on from the coal industry disappearing in Wales, many children have never seen or touched this 'black diamond' that altered the country on every level.



Coal miners, south Wales, about 1900

Blast furnace, Dowlais,  
about 1870



# RHYD-Y-CAR | MINERS HOMES THROUGH TIME

Take a virtual tour of the Rhyd-y-car Cottages to find out more about miners housing in Wales.

**CLICK  
HERE**  
→



## Rhyd-y-car: Miner's Homes Through Time

Travel through time at Rhyd-y-car miner's cottages.

 Google Arts & Culture



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# COAL AND WALES

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## Key vocabulary |

### **Colliery**

*A coal mine.*

### **Collier**

*A worker who mines coal.*

### **Haulier**

*A worker that hauls coal from the coalface. Sometimes by hand, sometimes with by guiding a horse.*

### **Drift mine**

*A mine which is entered by a tunnel rather than a vertical shaft.*

### **Shaft**

*A shaft is dug downwards to reach the coal.*

### **Level**

*A level is a horizontal path that comes off the shaft.*

### **Face or Coalface**

*This is where the coal is cut from.*

### **Seam**

*The name for a deposit of coal found underground.*

### **Dram**

*Used for transporting coal. Can be called a tram or wagon.*

### **Ore**

*A rock that metal can be extracted from.*

### **Smelt or Smelting**

*Removing metals from ores using heat.*

### **Furnace**

*A structure that is heated to high temperatures to smelt ores.*



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visit the Amgueddfa Learn  
pages on the below link

**[museum.wales/learn/](https://museum.wales/learn/)**