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# Coal was king of the Industrial Revolution, but not always the path to a modern economy

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# Coal was king of the Industrial Revolution, but not always the path to a modern economy

## **Abstract**

As the world moves to combat climate change, it's increasingly doubtful that coal will continue to be a viable energy source, because of its high greenhouse gas emissions. But coal played a vital role in the Industrial Revolution and continues to fuel some of the world's largest economies. This series looks at coal's past, present and uncertain future, starting today with how it's formed.

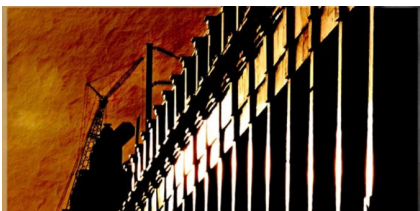
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## THE CONVERSATION



### Coal was king of the Industrial Revolution, but not always the path to a modern economy

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Coal powered the machinery and lit what English poet William Blake described as 'dark satanic mills'.  
Sam Leighton/Flickr, CC BY-NC

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Coal was king of the British Industrial Revolution. As coke, it provided an efficient fuel for reliably turning iron ore into iron.

Cheap iron built the famous bridge across the River Severn at Ironbridge Gorge in 1781. And the machinery that filled the new factories of the industrial age was built from it.

Coal then powered the machinery and lit what English poet William Blake (1757-1827) described as the "dark satanic mills" that revolutionised cotton manufacture. It powered James Watt's double-acting piston engine, whose reciprocating motion was converted into rotary motion by means of a crankshaft.

The resulting steamships and railway locomotives reduced the time and cost of bringing coal into factories and taking their products to British export markets across the globe.

Somewhat unexpectedly, the new forms of transport also generated exciting adventures for

the British population – the mass seaside resort and the day return. Thus were Thomas Cook and the British tourism industry born.

## Spoils of coal

Coal literally powered its way through the British economy of the 19th century – the so-called first industrial nation and workshop of the world.

It even fuelled engines that drained water from deeper, less accessible coal mines to keep the supply coming. When steel superseded iron later in the century, coal remained a critical raw material.

Subsequent generations of locomotives and steamships improved transport productivity enormously, and gradually forced owners of stagecoaches, canal boats and sailing ships out of business. Then locomotives, rails, steamships and coal themselves joined the growing range of British exports as other countries sought to mimic the nation's success.

Ironically, many ageing sailing ships were deployed to carry coal to refuel the growing network of coal bunkering stations around the oceans of the world, a trade that required low cost but no particular urgency.

Fast, reliable ocean liner services contributed to the first era of globalisation in the late 19th century, led by British steamship companies such as Cunard and P&O. They connected Britain across the Atlantic and eastwards, respectively.

Other countries followed suit, especially France, Belgium and Germany, which also had ample supplies of coal. While no one would deny the connection between coal and 19th-century industrialisation, why Britain was the first nation to modernise its economy by exploiting reserves remains highly contested.

## Why Britain?

A long-held view is that the antecedents of British success can be traced back centuries during which the nation gradually built the preconditions for modern development. Growth-inducing institutions can take many forms, and include a stable political system and the development of commercial law.

The emphasis in Britain was on rising literacy levels and logical reasoning derived from movements that encouraged analytical thinking about the problems of the real world – the scientific revolution and the Age of Enlightenment.

These “gifts of Athena” (in the words of economic historian Joel Mokyr) facilitated critical and creative thinking about “useful knowledge” necessary to solve growth constraints. In modern parlance, here was the knowledge economy.

This “Eurocentric” view – so-called because it assumes that development in Britain (and Europe) was ahead of the rest of the world – has now been challenged.

In his epochal study, *The Great Divergence*, US historian Kenneth Pomeranz used China as a point of comparison to reject the long-term antecedents of the “great divergence” between the



Coal powered James Watt's piston engine, whose reciprocating motion was converted into rotary motion by means of a crankshaft.  
Herman Pijpers/Flickr, CC BY

economic development of Europe and the rest of the world.

Pomeranz argues that Britain and China had arrived at similar stages of development by the 18th century ("a world of surprising resemblances", as he calls it) and that they reflected different, but equivalent, measures of progress.



Railway locomotives, along with steamships, reduced the time and cost of bringing coal into factories and taking their products to British export markets across the globe. Colleen Galvin/Flickr, CC BY

The divergence was then born of differing abilities to confront an impending global ecological crisis: growing populations faced food and raw material shortages in a low-technology era.

Fortuitously, Britain had coal, conveniently located, and an empire in the New World with the space to produce primary commodities – timber, sugar, cotton and wheat – which, alongside coal, facilitated industrialisation.

Pomeranz concludes that Britain was a "fortunate freak" because its development was due to a short-term windfall from "coal and empire", rather than to deeper determinants of long-term change.

### Paths to growth

The publication of *The Great Divergence* led to a broad and thought-provoking debate in economic history for a decade and a half.

What we learnt from it – above all else – was that there have been different forms of economic development across the world. And some of these have been pathways less recognisable to Europeanists accustomed to coal and heavy industry as staples, and Gross Domestic Product (GDP) as the measure, of development.

Other historians have drawn attention to forms of industrialisation, especially in Asia, that have needed more human – and less non-renewable natural – resources.

Now that we are living in an era when coal's environmental problems have come to the fore, it's heartening to be reminded that there are other growth paths.

The other relevant insight from the Great Divergence debate is that human agency is vital; there are no immutable lessons of geography or ecology, and no development path is unchanging.

Coal and other resources have always been abundant in many parts of the world. It's the human ingenuity found in particular societies – however derived – that has created high levels of wellbeing from these natural resources.


Let's hope we will find a way of maintaining living standards into the future while mitigating the impact of our growth on the environment.


*This is the second article in our series on the past, present and future of coal. Look out for other pieces over the coming days.*




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