

The Ideology of Innovation

Why Innovation Accelerated in Britain 1651-1851

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Will argue that the British Industrial Revolution – start of modern, innovation-led economic growth – was due to the spread of an Ideology of Innovation

New data on 677 Innovators active 1651-1851

Sample taken from innovators mentioned in:

- Allen (2009) *The British Industrial Revolution in Global Perspective*
- MacLeod & Nuvolari (2006) 'The Pitfalls of Prosopography'
- Berg (1994) *The Age of Manufactures*
- Berg (2007) *Luxury & Pleasure in Eighteenth-Century Britain*
- Bruland (2004) 'Industrialisation and Technological Change'
- Mokyr (2010) *The Enlightened Economy*
- Wood (1913) *A History of the Royal Society of Arts*

Best way to figure out why innovation increased is to look at individuals who innovated themselves.

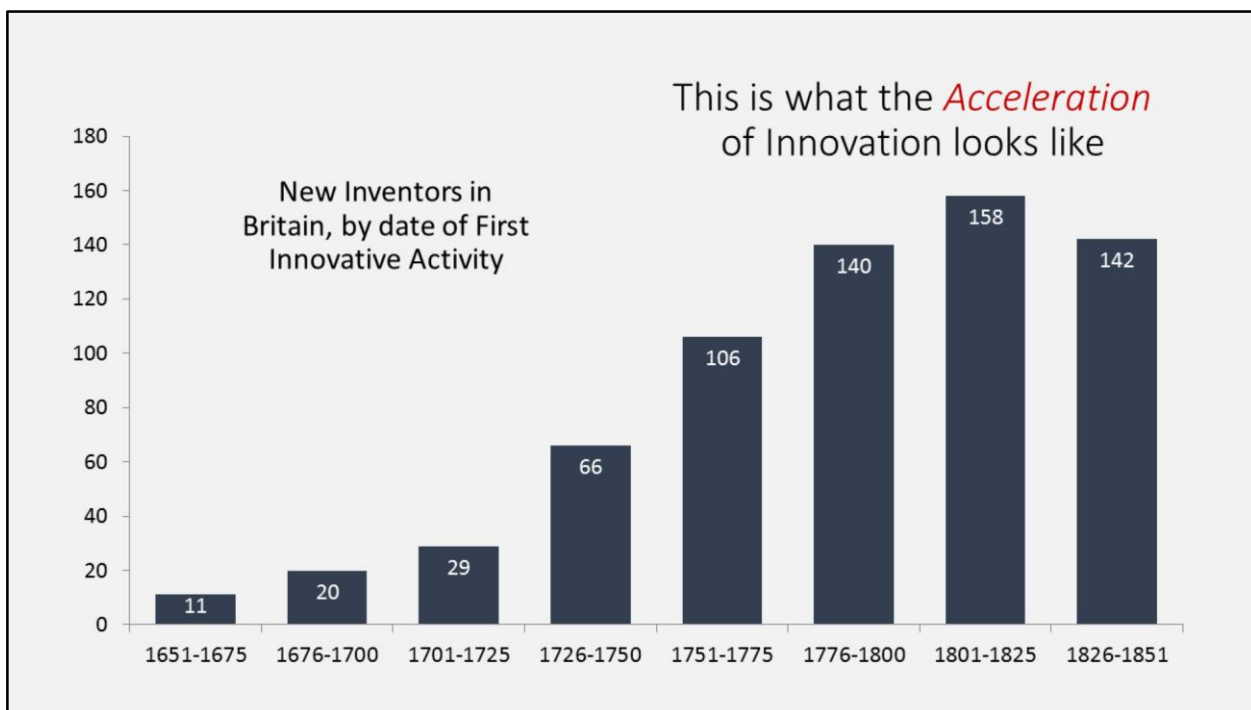
So I constructed a new dataset of inventors active between 1651 and 1851.

Civil War to Great Exhibition.

The sample was taken from older, smaller inventor lists (Allen, M&N), and I took all inventors mentioned in key works like Mokyr;

Corrected for usual biases in favour of patents or more famous industries by including others.

Details of inventors drawn primarily from a range of secondary sources including ODNB, even some primary sources where necessary.



And this is what the acceleration in innovation looks like.

Shows number of individuals innovative for the *first* time in each quarter-century.
Most individuals responsible for many innovations each.

NB: innovation of the IR applied to ALL industries – from agriculture to watch-making

Later transformative effects on economy & society

What explains this?

Existing Hypotheses

Demand
Institutions
Human Capital
Culture

I will argue it was caused by an Ideology of Innovation

But principal alternatives also worth briefly mentioning

Demand – hypothesis that innovators react to greater demands of harder-working consumers

Institutions – hypothesis that it became uniquely easier in Britain for innovators to appropriate rewards from inventions; like changes to the patent system

Human Capital – hypothesis that British workers were somehow more skilled to be innovators

Ideas & Culture – 2 principal hypotheses:

hypothesis that there was some sort of **spill-over of norms from scientific revolution** into the industrial world; or that general **shift in dignity for middling / bourgeois** encouraged them to try their hand at innovation

I don't have the time to deal in detail with all of these alternatives. However, I found from my data that they were **all important influences, but not actual causes of**

innovation

Indeed, my data suggests there was a set of more fundamental ideas in Britain at the time than those existing cultural hypotheses would suggest.

So I would like to introduce another explanation, which I believe better explains why innovation accelerated.

Ideology of Innovation

=

Mentality of Improvement

+

Commitment to advancing
improvement

Ideology or **ethos** of innovation.

By which I mean a combination of these 2 key elements.

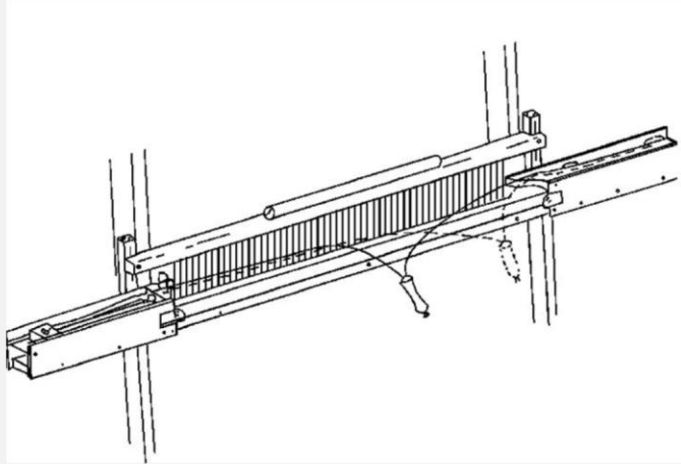
Ideology of Innovation
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Focus first on mentality of improvement

What is the improving mentality?



John Kay



Flying shuttle

Instead of just coming into work every day as usual; finding some way to make the process better, more efficient.

Or envisage an improved product to better satisfy a consumer.

John Kay. 1733 Flying shuttle. Ingenious improvement on already-complicated loom.

But only wood and string.

Initially applied to wool industry.

Flying shuttle used **ordinary** materials, applied to **ancient** technologies in **well-established** industries

Could have been done any time before.

What was the Mentality of Improvement?

1. Change in *approach* to the world
2. Can be applied to everything
3. Spread through *contact* with innovative individuals

Highlight other traits / properties of the mentality of improvement

Can be applied to everything



William Fairbairn

“In this way I inadvertently rendered one of the strongest passions of our nature subservient to the means of improvement.”

Applicable to all industries

And more broadly:

William Fairbairn (steam ships, iron bridges)
Hacks romance

Practises writing romantic letters to his crush, by attempting to reverse-engineer the published correspondence between two lovers in a magazine!

Spread from person to person



Richard Lovell Edgeworth

“He spoke of Dr
[Erasmus]
Darwin...
He described to
me a carriage,
which the Doctor
had invented”



Erasmus Darwin

Spread from person to person – almost without exception some evidence of this

In 1766 Edgeworth, an Irish gentleman,
attended an exhibition of curiosities,
and struck up a conversation with the curator.

Applied to Self-education



“I determined to try my skill in coach-making, and to endeavour to obtain similar advantages in a carriage of my own construction”



Interesting example as shows an aristocrat with very little practical skill could apply the improving mentality to his own education.

Today might be termed up-skilling.

Edgeworth went onto develop various instruments and agricultural machinery too.

What was the Mentality of Improvement?

1. Change in *approach* to the world
2. Can be applied to everything
3. Spread through *contact* with innovative individuals

1. Change in approach to the world. Explains innovations **not just in exciting new industries** or faced with increasing demand, but often using **ordinary** materials, applied to **ancient** technologies in **well-established** industries;

2. Universally applicable. Explains the sheer **range of industries** that experienced innovation, from agriculture to watch-making, and frequent instances of **self-education**.

3. Spread through **contact** with particularly innovative individuals; sometimes **serendipitously** too.

NB: spread of nearly all of them can be traced back to Isaac Newton, Robert Hooke, Christiaan Huygens, Thomas Sydenham

But Innovation **had** happened before

- Ancient Greece
- Ancient Rome
- Medieval Islamic Renaissance
- 12th Century Europe
- Song Dynasty China
- Renaissance Europe
- Dutch Republic
- Tokugawa Japan

But innovation had happened before.

Just think of **Leonardo Da Vinci** active in the 15th and early 16th centuries.

Why was this time different?

$$\begin{array}{c} \text{Ideology of Innovation} \\ = \\ \text{Mentality of Improvement} \\ + \\ \text{Commitment to advancing} \\ \text{improvement} \end{array}$$

Referring back to the ideology of innovation

It was the second element that made the crucial difference.

How Innovators displayed their commitment to spreading innovation

Involvement in Societies for the Diffusion of Knowledge	Publishing Activity	Teaching, Lecturing, Funding Education	Sharing to Societies, Public and via Exhibitions	Other Sharing	Total
49% (331)	60% (404)	34% (227)	31% (214)	37% (248)	83% (565)

Data I collected shows a lot of evidence of this tendency towards spreading innovation.

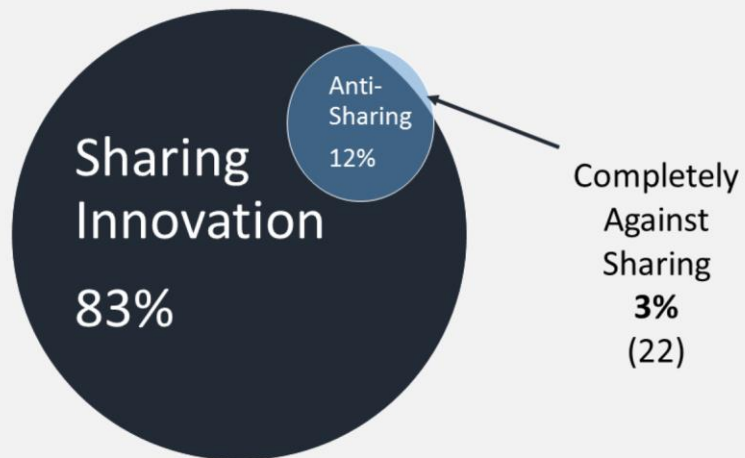
“Other” includes openly sharing inventions to others or giving tips
George Stephenson offered advice to locomotive drivers while waiting on station platforms

However, it’s when we look at them together that

My evidence shows an **almost universally-held commitment to spreading and diffusing innovation.**

Understates significance of non-innovating enthusiasts too – proselytisers and preachers for innovation.
Edinburgh University a hub, for example.

Though some Inventors were Anti-Sharing



Moreover, vanishingly few entirely against sharing.

Secrecy, Suing for patent infringement, **Extending** patents by lobbying Parliament

Some extremes.

Gunmaker Joseph Manton (sues own brother)

Iron pioneer Isaac Wilkinson (sues own son multiple times)

But exceptions to the rule.

This Reflects Mixed Motivations

Ascetic altruism
Prudent acquisitiveness
Ambition
Enthusiasm & Curiosity



Richard Roberts

This seemingly contradictory activity simply reflects the mixed motivations of inventors for holding the sharing mentality.

Like any other political or religious ideology, Ideology of Innovation was held to varying degrees.

From **altruistic, ascetic proselytisers**

To more **self-interested, prudent** or business-like individuals.

Or those who pursued **fame, prestige and glory**

Others simply animated **by sheer enthusiasm and excitement** for innovation itself

Ultimately, **most in-between, or a mixture of all.**

Richard Roberts (steam-powered loom)

selfishly **extended patents,**

selflessly helped to found the **Mechanics' Institute in Manchester,**

but ultimately was **impoverished by his addiction** to experimentation

$$\begin{array}{c} \text{Ideology of Innovation} \\ = \\ \text{Mentality of Improvement} \\ + \\ \text{Commitment to advancing} \\ \text{improvement} \end{array}$$

So evidence suggests it's these 2 elements that cause unprecedented acceleration and persistence of innovation.

Together, they constitute the Ideology of Innovation.

Like any popular ideology, the mentality of improvement is both surprisingly simple, yet utterly compelling.

But like any other political ideology or religion it needs its evangelists, its proselytisers, its boosters to spread and take root.

Indeed, this ideology is still **alive and well**, and has **spread across the world**.

It is why the wave of innovation and progress associated with the **IR has never stopped**.

Implications for today

- How to boost innovation
- Attracting & retaining individual innovators
- Importance of spreading the mentality of improvement

1. If I'm correct, this may provide us with an insight into the **holy grail of long-term economic growth** - How to boost the underlying rate of innovation

2. Policy makers need to take seriously the importance of individual innovators. **Freer movement of people might help.** Though like minds congregate. 18th C they flocked to Birmingham. Today, they flock to the San Francisco Bay area. If policy makers want their countries to innovate, they need to consider how to attract and retain **not their brightest**, necessarily, but their most innovative.

3. But **fundamentally**, we need the Edgeworths and Darwins of today to do as much as they can to spread this philosophy of improvement;

While also recognising that anyone can do the same.

Indeed, **I hope that *this* presentation may inspire others to innovate** merely by talking about so many innovators; though I've never tinkered or improved things myself