

How DID THESE CAUSE RAPID INDUSTRIALIZATION?

Technological and business innovation

The 1870s and 1880s are full of examples of men who were prepared to experiment with, adapt to and develop new ideas, and who made vast sums of money. Two of the many examples are Andrew Carnegie in steel and Thomas Edison in electricity.

Andrew Carnegie and United States Steel

Until the 1860s, steel was costly to produce; the Bessemer process revolutionised its manufacture. Carnegie did not invent the process, but when he saw it in Britain he realised its enormous potential. Working with Henry Frick (see page 108), who controlled substantial amounts of the energy supply needed for Carnegie's steel mills, Carnegie built up a steel company that alone was producing more steel than the whole of Britain by 1900. His annual profit by 1900 was \$42 million.

Note:

The Bessemer process was the first method that enabled quality steel to be mass-produced from iron ore.

Carnegie's companies not only developed the technology but also invested massively in new manufacturing plants and equipment. Carnegie controlled the whole process – from the raw materials needed, such as coal and ore, through the manufacturing process to distribution. He innovated, invested and kept prices as low as possible. In good times he banked profits to keep his plants operational in bad times. He ruthlessly opposed any attempts to form unions in his factories. When attempts were made by his men to organise for better pay and conditions, he brought in his own armed guards and used violence to stamp out the action. Several people were killed and wounded in this struggle.

Thomas Edison and electricity

Inventions are one thing, but the ability to spot the commercial potential of an invention is another. It was Michael Faraday in Britain who made the key scientific discoveries about electricity, but it was Thomas Edison in the USA who made electricity 'commercial'. There are three main reasons why Edison is such a good example of the entrepreneurship of the age:

- He was responsible for a large number of actual inventions, such as the electric light bulb.
- He had the skill to industrialise those inventions, make them commercially viable, and produce and sell them on a large scale.
- He developed the first great industrial research laboratory, with chemists, engineers and mechanics, to work on more similar inventions.

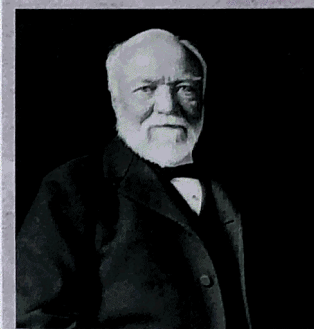
Edison was helped considerably by the Patent Acts passed by Congress in the late 18th century and early 19th century, which stopped other manufacturers from copying his ideas.

↖ ROLE OF FED. GOVT.

Key figures

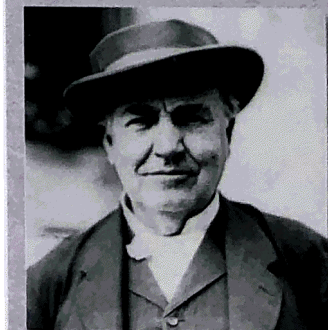
Andrew Carnegie (1835–1919)

Carnegie was a Scottish immigrant to the USA and a classic 'rags to riches' example. He started as a messenger boy and ended up dominating the US steel industry. He gave away most of his \$500 million fortune.



Thomas Edison (1847–1931)

One of the greatest inventors of all time, Edison held 1093 patents. He was almost totally self-educated, and had great commercial sense. His most famous invention is the electric light bulb.



Key figure

Henry Frick (1849–1919)

Frick was a highly successful but ruthless businessman. He founded his own company, which manufactured a fuel called coke, and he later became chairman of the Carnegie Steel Company. Frick was sometimes known as the 'most hated man in America' for his brutal treatment of trade unions and colleagues for whom he had no further use. During one strike, nine locked-out workers were attacked and killed by the security forces that he had hired.

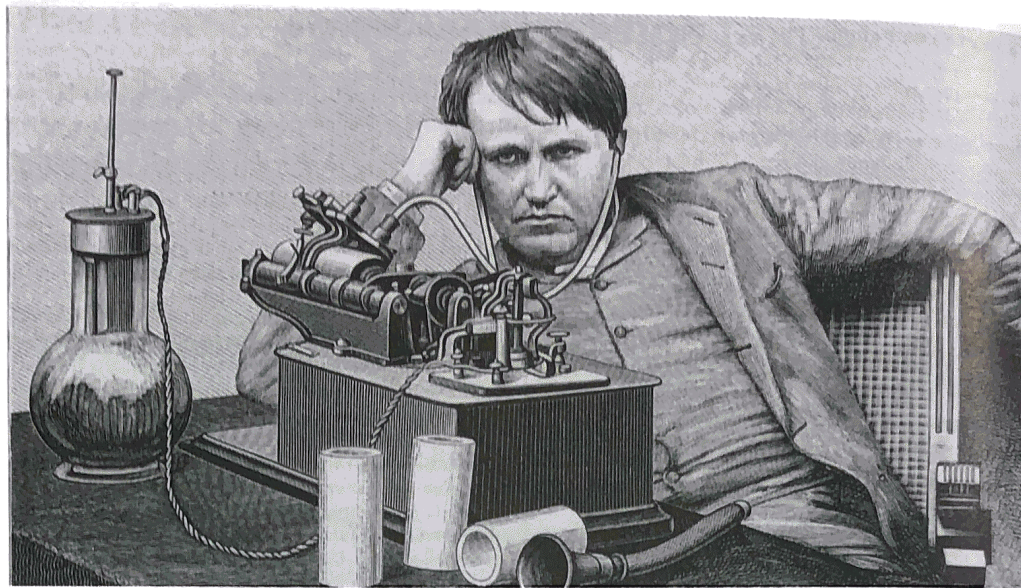


Figure 4.5 Thomas Edison listening to the first phonogram sent to New York from England

Availability of capital

CIVIL WAR

Entrepreneurs need capital, especially if they are, for example, trying to build generators that can provide electricity for a whole city and lay the hundreds of kilometres of cable needed as well. By 1870, largely due to the stimulus provided by the Civil War – when the government needed money to pay for the war, and the arms manufacturers needed capital to build their factories – a highly developed stock market, where the necessary capital could be raised, had developed in New York.

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The huge profits generated by the war were invested in this stock market, and the capital needed to build a railway across the continent or steel mills in Pittsburgh could be raised. By 1865, the annual turnover of the New York Stock Exchange was over \$6 billion, and by 1880 it had become the second largest money market in the world. The finance for the industrial revolution could be raised here, and fortunes could be made by those who speculated in stocks and shares.

The rise of the corporation and the trust

The complete absence of any rules or regulations meant that businessmen were free to create organisations that could cope with massive nationwide expansion. The corporation emerged.

A corporation could own, for example, a large number of railways. It could hire the management it wanted to run it, it could sue and be sued, and it could buy, sell and own property. It could merge with other railways or take over companies that made railway engines. It could attract investors and speculators, and its managers could own shares in the company and run it for their own benefit. There were no rules about keeping accounts

Why A Corporation?
1.
2.
3.

or reporting to anyone. It proved to be the perfect vehicle for the growth of giant industries.

The other vehicle for massive expansion was the trust. Some states had old laws that forbade a company set up in that state from owning property in other states or owning shares in other companies. A man named Henry Flagler found a way around this by creating a 'trust'. The secretary of Standard Oil, Flagler appointed himself as a 'trustee' for stocks and property that the company was not allowed to own. In the end, three employees of Standard Oil at its headquarters in Cleveland, Ohio were the 'trustees' of all the properties and assets outside the state, and did just as they were told to do by their boss, **John D. Rockefeller**. It was a simple, but perfectly legal, device to get around one of the very few barriers in the way of an organisation that could end up controlling the entire US oil industry.

WHY WERE TRUSTS
CREATED?
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Protective tariffs

WHY TARIFFS?
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As Congress was largely dominated by business interests, and presidents and their Cabinets were highly responsive to the needs of US industry and overseas trade, the commercial policy of the government also helped expansion. Congress was happy to impose protective tariffs to ensure that foreign-manufactured goods were more expensive than home-produced ones. Duties could be as high as 50% of the cost of the imported goods.

Role of Fed. Govt.

However, tariffs were controversial – especially in the 1880s and 1890s. Although manufacturers liked them because they reduced competition from abroad, the farmers of the South and the West opposed them because they increased their operating costs. The Republican Party supported tariffs, while the Democrats did not, and tariffs were an important issue in the 1888 presidential election campaign. Republican dominance in the late 19th century meant that high tariffs remained in use.

With a rapidly expanding population, and protective tariffs ensuring that US-manufactured goods were cheaper than those from abroad, demand soared. Energy supply was sufficient: in 1870, 40 million tonnes of coal was extracted in the USA; by 1900, 270 million tonnes were dug out. The unions were weak. Conditions in the United States after the Civil War were perfect in every way for an industrial revolution.

Questions

- ① What role did the federal government in the USA play in the decades of industrial expansion?
- ② How far were the railways responsible for US industrial expansion between 1870 and 1900?

Key figure

John D. Rockefeller
(1839–1937)

Rockefeller created the Standard Oil Company through very aggressive business methods, and dominated the oil industry in the United States. He was the first American billionaire. When he retired, he devoted his life to charitable works.

