

Revolution in the Textile Industry



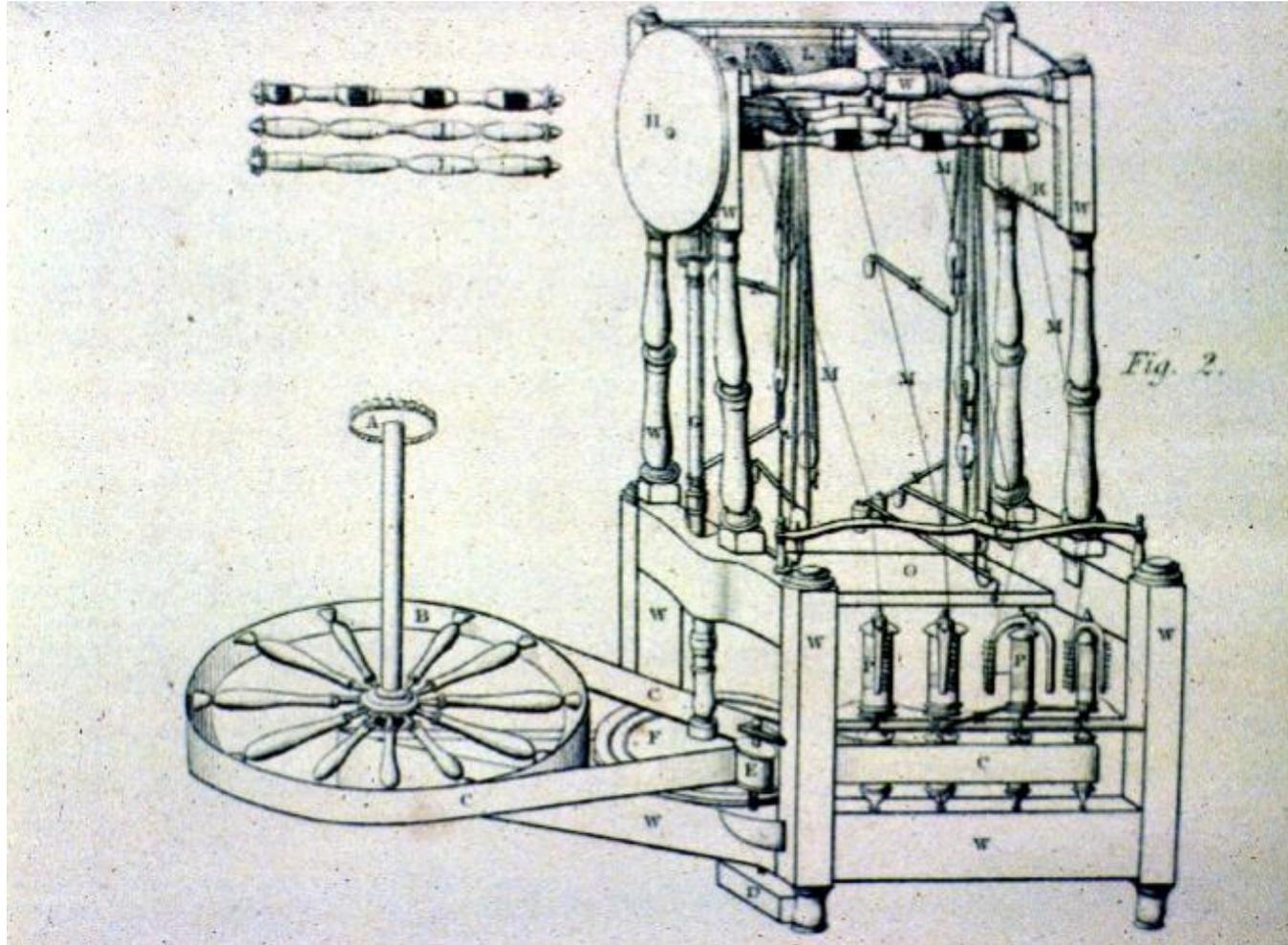
1733 – John Kay's Flying Shuttle



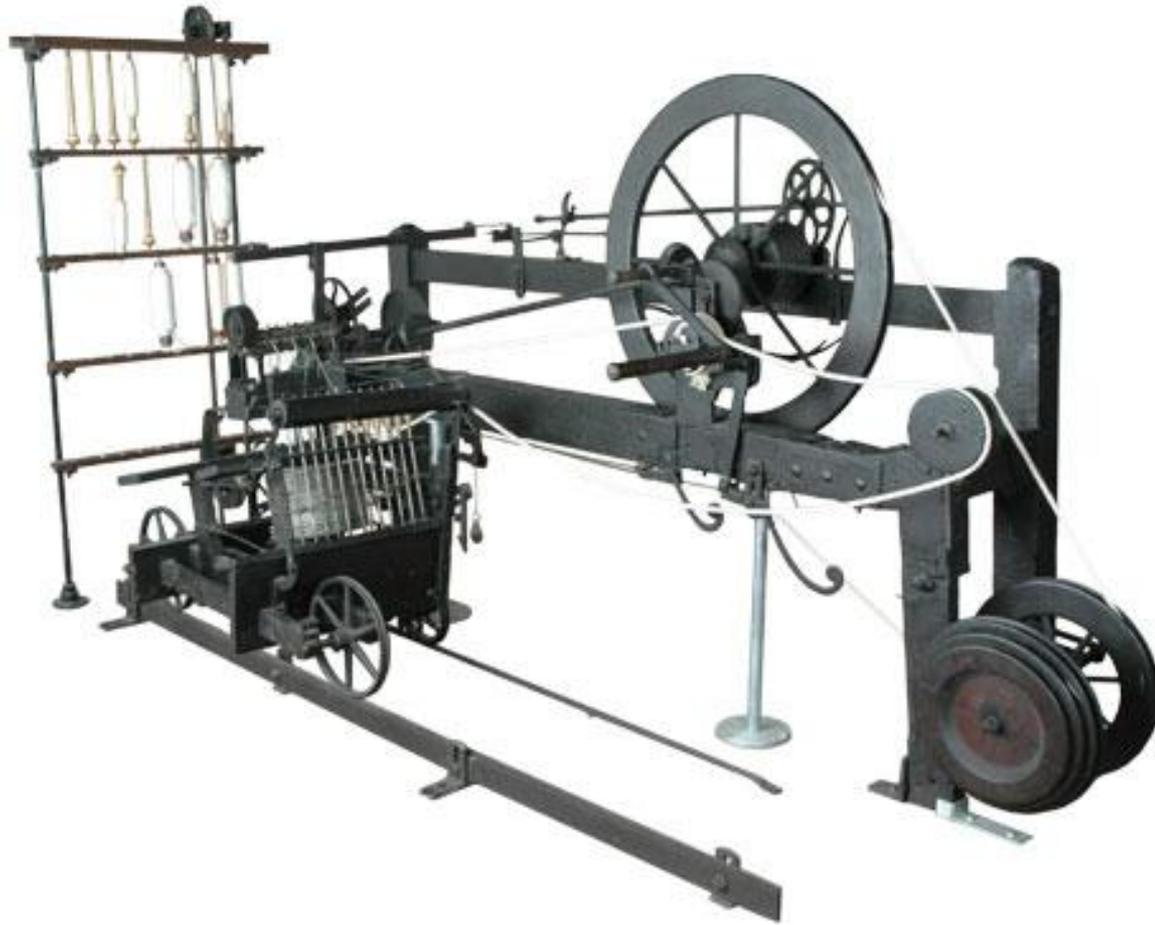
1765 – James Hargreaves' Spinning Jenny



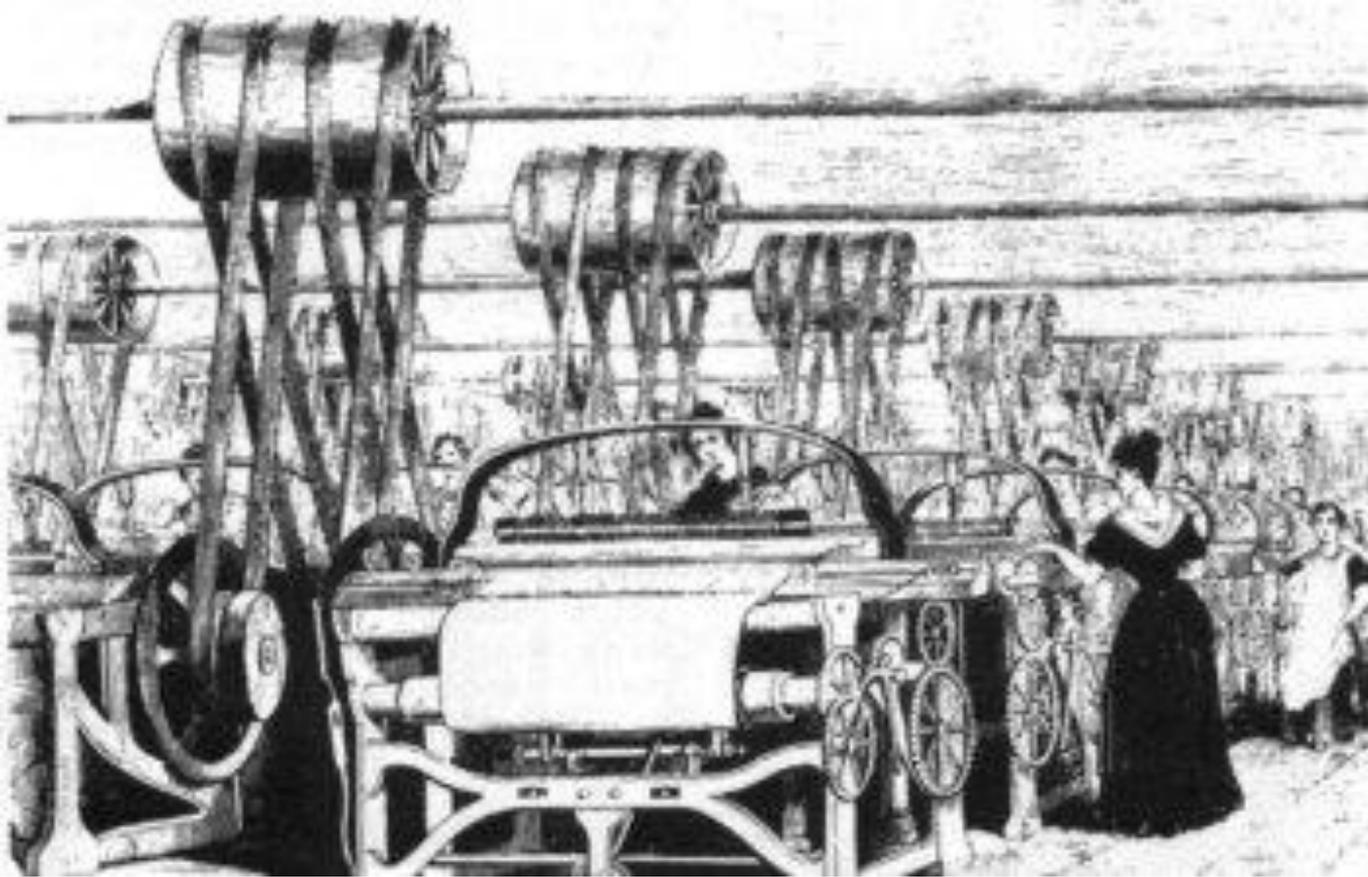
1765 – Richard Arkwright's Water Frame



1779 – Samuel Crompton's Spinning Mule

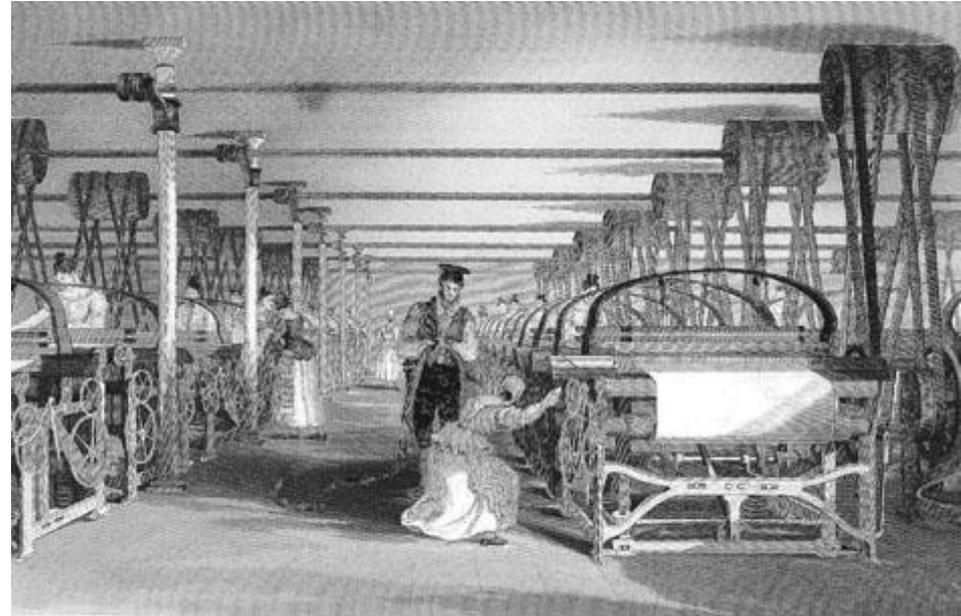


1787 – Edmund Cartwright's Power Loom



From Cottage to Factory

- The water frame, spinning mule, and power loom could not coexist with the cottage system
 - They were too bulky
 - They required a different power source
- Now, entrepreneurs brought workers to the machines rather than vice versa!!!
 - Usually in rural areas near sources of power



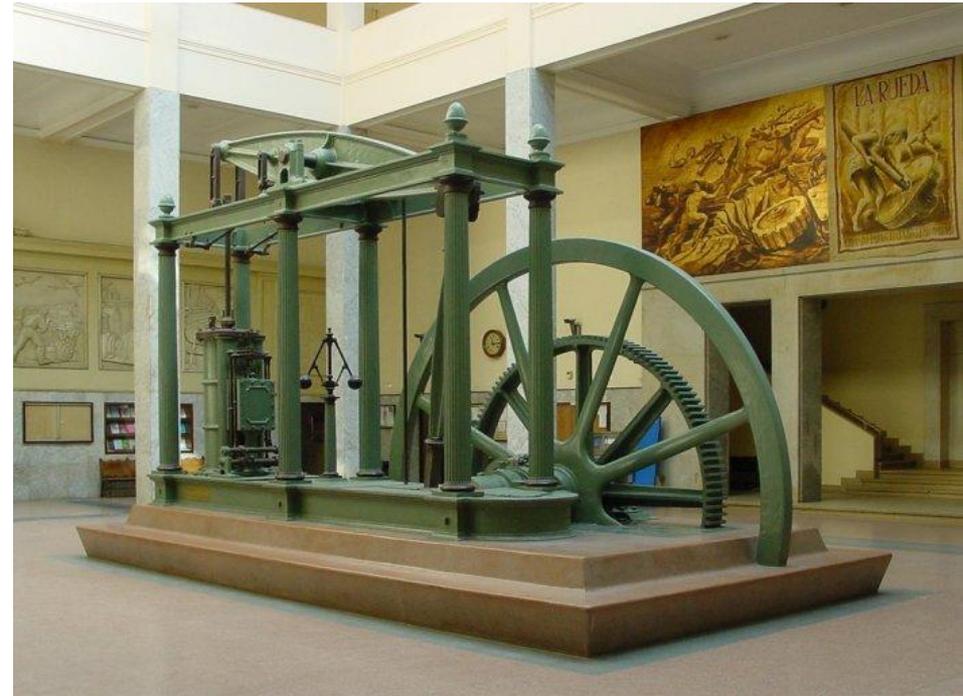
The Problem of Energy

- Decline in available wood put pressure on the iron industry
 - Depended on charcoal as fuel to make pig iron
- Solution? Coal
 - England contained an abundance of coal reserves
 - When mining for coal, the mines would fill with water that needed to be pumped out
 - How? STEAM ENGINE!



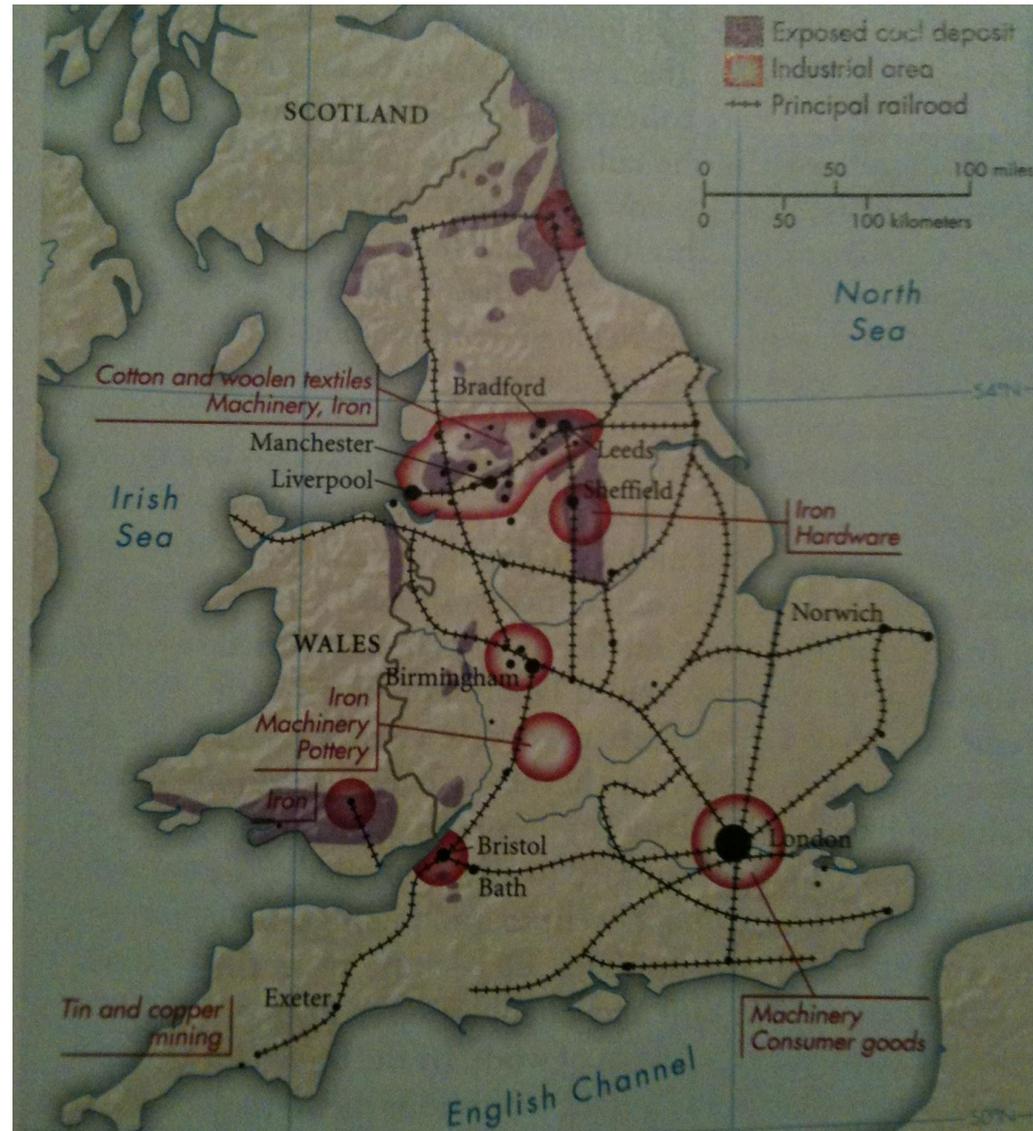
The Steam Engine

- Savery and Newcomen produced first steam engines that replaced mechanical pumps
- 1769 – James Watt improves the Newcomen model
 - Greatly increased efficiency at the mines
 - He created an engine that could turn a shaft in order to power machinery!!!
- “Steam is an Englishman”



The Steam Engine and the Textile Factories

- Steam engines moved factories away from water sources near coal sources and eventually to cities
 - Greatly increased production possibilities
- Demand for cotton rose dramatically!
- Demand for coal rose dramatically!

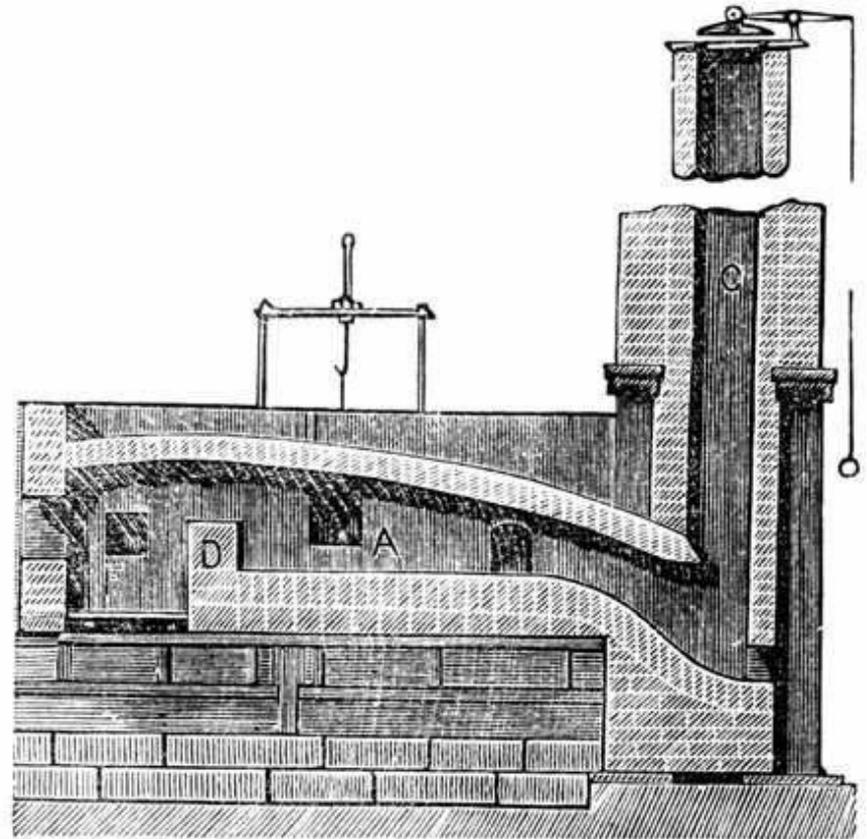


Growth of Cities



Changes in the Iron Industry

- Due to demand for new machines, iron industry had to adapt
 - How? New technology
- 1780s – Henry Cort invents puddling
 - Pig Iron → Wrought iron
 - Wrought iron was of a better quality and able to withstand strain

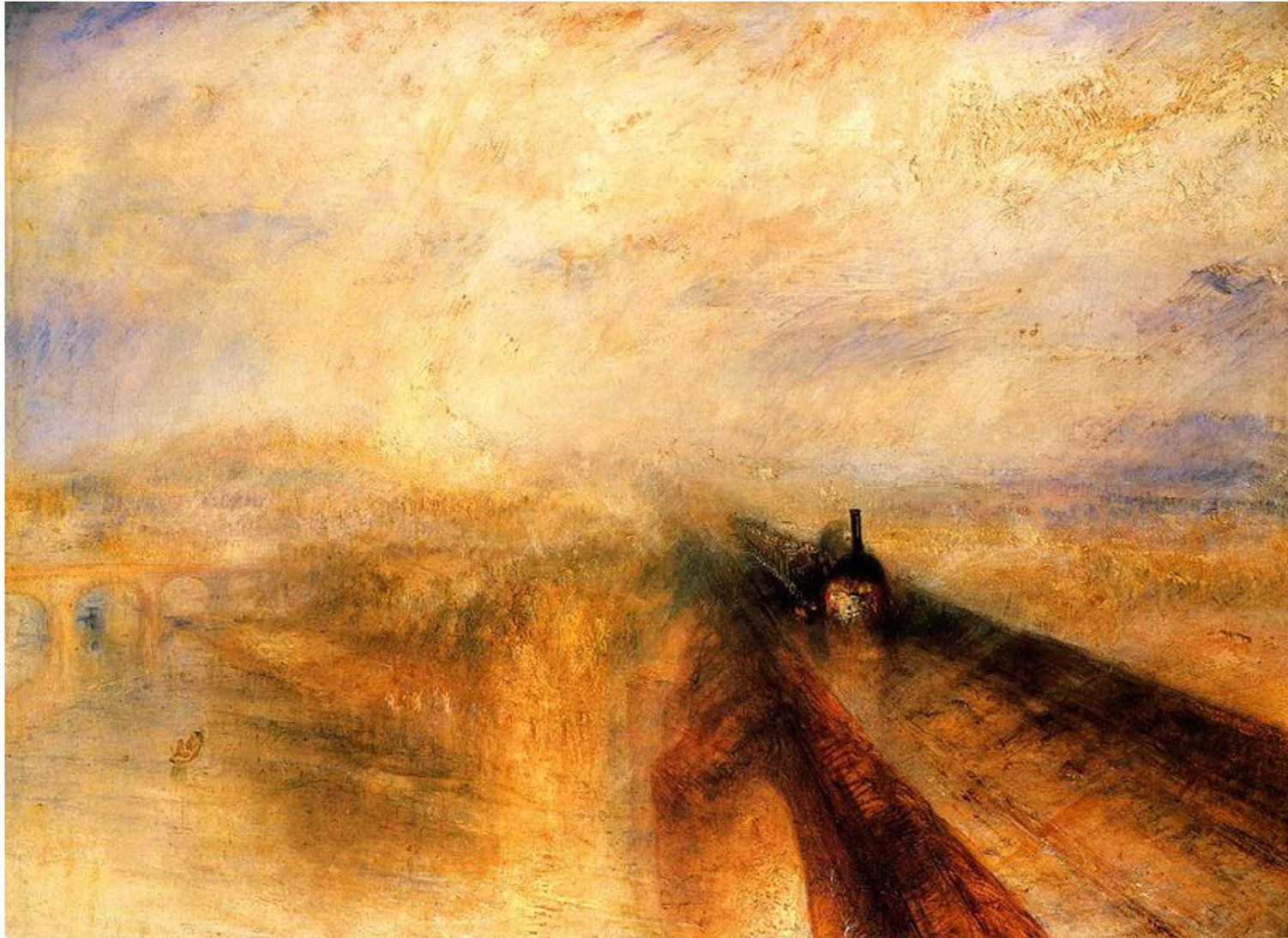


And finally, the Railroad!!!

- Improvements in coal mining and iron-making allowed for the creation of the railroad
- 1830 – George Stephenson's *Rocket* opened the Liverpool-Manchester Railway
 - At 16 mph!! That's fast!
- Effect: Increased size of markets → Larger Factories → Demand for more workers → Increase in urbanization



Turner: Rain, Steam, and Speed (1844)



1851 – Great Exhibition at the Crystal Palace

- Britain had become the “workshop of the world”
 - 2/3 of world’s coal
 - ½ of world’s iron
 - ½ of world’s cotton cloth
 - 20% of industrial goods
- Man had conquered nature, and Britain was the first to do it!

