

## E. The “Age of Steam” or “Proto-Industrial” Phase of History (1769-1869)

1. The Watt Steam Engine is the invention that triggered the “Age of Steam.”
2. Simply put, this means that a variety of inventions that transformed human life all proceeded from this one fount.
3. One great transformation that occurred was the pairing of the steam engine with various forms of machinery for the production of clothing. Everything from “spinning” (the production of thread from raw materials like cotton and wool), and weaving (turning thread into cloth) was mechanized with this new form of power. Machines like the *Spinning Jenny* (c.1764) and the power loom (c.1787) created a “Textile Revolution” whereby it became normal for there to be an abundance of clothing for the first time in history.
4. Apart from engines for elevators and other industrial machinery in mines, the pairing of steam engines to ships and wagons also began soon after **1769**.
5. A steam engine could be paired with a paddle wheel to make it turn and propel a vessel through water even if there was no wind. Never again would sailors have to rely on nature to sail down (or especially *up*) rivers or across oceans. The first hybrid steam ship to cross the Atlantic ocean, the SS Savannah did so in less than a month in **1819**, whereas the Mayflower had taken 63 days. The SS Sirius was the first ship to do it completely under steam power (no wind), and it made the voyage in only 19 days in **1837**.
6. Somewhat later, steam engines were paired with very basic carriages, of the same kind that were pulled by horses, and with the invention of rail, this type of transportation innovation generated railroads—first in England, and soon in America.



A factory with steam powered looms could produce thousands of times more clothing that traditional “cottage” industry with the same amount of human labor.



Early steam “locomotives” did lose the first races against horse-drawn carriages, but advancements in steam power soon proved the worth of the new technology.

7. Progress in this area was slow. This is part of what characterizes the “proto-industrial” phase from the most modern industrial periods. In the *pre-industrial* era, there was almost *no* progress. In the *proto-industrial* period, there was measurable progress—which was itself quite radical compared to pre-industrial times, but almost laughable compared to what we experience today in terms of the pace of change. That’s one element that distinguishes this period.
8. During this still relatively slow period of progress, pre-industrial technologies still prevailed in some cases. For instance, the Erie Canal—basically a long ditch connecting Lake Erie to the Hudson River and thus New York City in **1825** still represented a huge boon to New York, which became the main commercial city in America because of all the goods flowing from the mid-West to the city instead of Boston or Philadelphia.
9. Another reason to refer to this phase of industrial history as “proto-industrial,” is that all the inventions of this period are now obsolete, and have been replaced by more advanced implementations of similar technologies. With regard to steam power, for instance, we now use *oil* (refined as gasoline) to fuel *internal combustion engines* in our ships and trains—and in modes of transportation that would never be practical with wood or coal-fired steam engines, but which are with with internal combustion engines, namely planes and automobiles.
10. The Age of Steam or Proto-Industrial phase of history is almost exactly **one century**. That’s handy, especially when trying to remember the dates. **C. 1769**, the Watt Steam Engine was invented, and in **1869** the greatest accomplishment of the era, the construction of the first *transcontinental* railroad—the Union Pacific Railroad—was completed, linking California to the East Coast.
11. As is often the case in the story of modern industry, just as one form of technology is peaking, it’s already becoming obsolete. In **1870**, an industrial colossus was formed: the Standard Oil company of John D. Rockefeller. This company would propel a whole new industry forward, and make Rockefeller possibly the richest man in all of history. (It’s hard to compare wealth across periods. Rockefeller was certainly the richest man that had ever lived until his time. How his wealth compares to that of Bill Gates or Jeff Bezos is hard to reckon.) Regardless, the full-fledged Industrial Age, or as it is commonly known “*The Industrial Revolution*” was truly beginning.