

TECHNOLOGY AND SOCIETY

A. Material Inventions and Their Impact on Human Life

1. To stay alive, people need food, water, clothing, shelter, and medicine. (We also need things that are non-material, such as love and friendship.)
2. When we study technology (which means *material inventions*) as part of history, we want to know how it affects *society*—which in this context means organized human life.
3. Some technologies don't produce food or clothing or other values, but they help us to do it. Communication and transportation technology are like this. (As a simple example, imagine a 911 call, and the ambulance that comes because of it, which combination of communication and transportation are often necessary in order to bring a person in need to the medicine, i.e. medical *technology*, that can save them.)
4. One thing that most of our technologies have in common is the need for some kind of *power*. The modern Internet and all the devices that tap into it obviously need electricity. Vehicles need some kind of fossil fuel (gasoline) to propel them.
5. As we will see, the spread of technology in modern history has at least *doubled*, if not *tripled*, the average human life span, i.e. how long we live, and also greatly improved the *quality* of life.
6. Even so, technological advancement comes at a cost, and with various challenges, from things like negative lifestyle changes (sitting too much, and not getting enough exercise) to overeating (because of the superabundance of food, especially processed food) to wider—even global—impacts, such as of pollution.
7. Not surprisingly, even though technology is so popular because it helps us to live, people have rejected technology in various ways. (Some people ride bicycles to work instead of driving; parents place “screen time” limits on their kids; most people recycle various products; and people generally strive to be “environmentally conscious.”)
8. In this part of the story, we will study the positive impacts of technology and the challenges that people face because of it.

B. Organizing the Story

1. Since the story of technology involves so many different kinds of technology, we will need to use a new kind of timeline.
2. The timeline we will use, available on the next page, will divide the story into four periods, or chapters: *pre-industrial*, *proto-industrial*, *industrial*, and *advanced industrial*.
3. This way of organizing history will help us to group together the major inventions and to see how they affect organized human life. You can use it as a handout for writing the information yourself, as you see it in class, or you can wait for versions of diagram to be provided as handouts on the class web page as we go.

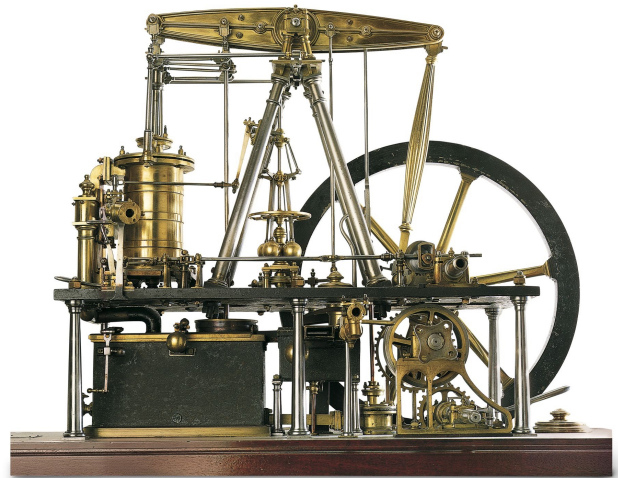
<i>pre-industrial</i>	1769	<i>proto-industrial</i>	1869	<i>industrial</i>	1969	<i>advanced ind.</i>
Food & Water						
Clothing						
Shelter						
Medicine						
Power						
Transportation						
Communication						
Life Expectancy						
Social Movements						

C. Pre-Industrial Life (- c.1769)

6. Pre-industrial life is a long chapter when human beings did not possess any of the advanced technology we have today. Life was much simpler and moved at a slower pace.
7. The main problem people had was how to obtain enough food. The so-called “Agricultural Revolution” occurred some time before **3000 BC**, making it possible to grow crops and domesticate certain types of animals.
8. This gave people just enough spare time to spend on such things like the invention of writing, and thus the recording of history.
9. Amazingly, little beyond the creation of agriculture was accomplished to further material life for the next 5000 years. People could live, but there was almost no progress.
10. Human beings worldwide until industrial times live only about 25 years. (This is, of course, an average. Some lucky and hardy individuals lived perhaps as long as we do today. Some people died very young from famine, malnutrition, disease, and war.)

D. The Watt Steam Engine (c.1769)

1. By far the most important of technological advance in history was the Steam Engine of James Watt, invented **c.1769**.
 - a) A steam engine uses the sciences of physics, which studies physical things and energy.
 - b) As anyone can observe, when you boil a pot of water with a lid on it, the steam forces the lid to jump as it escapes.
 - c) Physics explains how water vapor creates this pressure.
 - d) If one can create a vessel where water is heated to produce vapor and the pressure created by that vapor is captured as a mechanical force, one can produce an *engine*.
 - e) It was by examining a prior engine, made by another engineer named Thomas Newcomen, that inventor James Watt was able to create his breakthrough design, the *Watt Steam Engine* **c.1769**.
 - f) Because the process of invention takes a long time, it’s hard to choose a date for an invention. Does one choose the first moment when an inventor had the basic idea? Does one choose the time when his first prototype is created? Or is it the first time it is used by other people? The best date to choose for the *Watt Steam Engine* is **c. (“circa”) 1769**.



An early working model of the Watt Steam Engine. Large stationary engines like this were used in mining to raise large amounts of ore, run escalators for workers, pump water, and later to move very large vehicles.