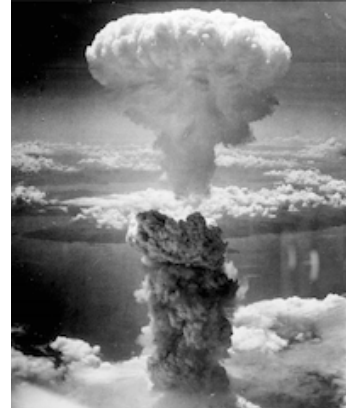
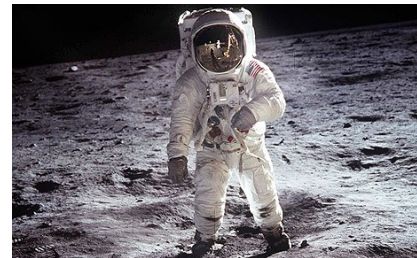


D. The Industrial and *Advanced* Industrial Periods of Technology

1. As we have seen, the transition from steam power to the use of oil for power created a new phase of history. In a sense, we are still in it. We still use cars and planes, which rely on oil/gasoline. So we are still in “industrial” times.
2. However, in a different sense, we live in a more advanced time. It involves the addition of new technologies that makes our an “advanced” industrial period:
 - a) nuclear power
 - b) space exploration
 - c) computers
3. The first of the milestones of the period of advanced technology is the use of the atomic bomb in **1945** as part of World War II.
4. This involves a whole new level of power, as demonstrated by the size of the explosions created by the bombs that use this kind of power. A single atomic bomb can destroy an entire city. An atomic power plant can generate the electricity for a city with greater efficiency than any other form of power.
5. Unfortunately, the science of atomic energy has stalled for now. Atomic power is generated using a process called “fission,” which creates nuclear waste as a byproduct. This is an environmental concern, and people generally don’t like it.
6. A form of nuclear power call “fusion” will eventually be developed that can overcome the problems of fission. If and when we get there, we probably *will* reach a super-industrial stage of development. This is truly something to look forward to.
7. Human beings also began to develop rockets during World War II, and then space exploration proceeded with remarkable progress until **1969**, when Neil Armstrong became the first man to walk on the moon.
8. This is a tremendous milestone, exactly one hundred years after the transcontinental railroad of **1869**, and two hundred years after the steam engine of **1769**.
9. However, as with nuclear power, space exploration has stalled. It has been nearly 50 years since the greatest accomplishment in the field of space exploration took place.
10. The one technology that truly distinguishes our advanced society from any previous time is *computers*. This technology, driven by private innovation, has advanced by leaps and bounds and continues to push forward.
11. In **1946** a government project to calculate how to position artillery pieces (modern “cannons”) in times of war more efficiently led to the design of the most famous early computer called the “ENIAC” (Electronic Numerical Integrator and Computer). It was 130 feet long and weighed 30 metric tons. It was nicknamed a “Giant Brain”. It could perform mathematical calculations 2400 times faster than a person.

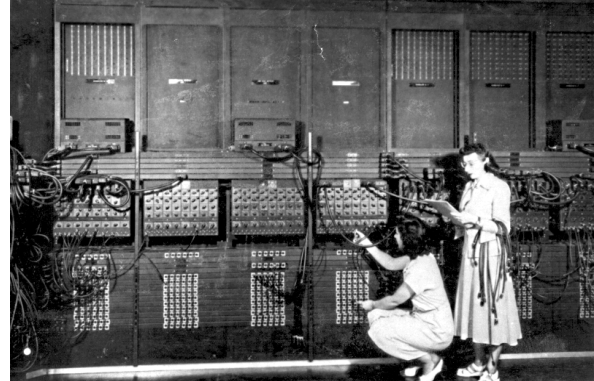


The use of the atomic bomb in **1945** signaled the beginning of a new era of technological development.



Space exploration has largely stalled since the amazing feat of placing a man on the moon in **1969**, but new private ventures hint at renewed space exploration, and the eventual *normalcy* of space travel.

- 12. Since that time, computers have advanced with incredible speed. The most amazing modern computer, the *smartphone*, is 40,000,000 times smaller than the ENIAC, but 1700 times *more powerful*.
- 13. Since the atomic bomb was invented in **1945** and the ENIAC was developed in **1946** we will use these two dates as a tandem anchor fact to mark the transition to *advanced industrial civilization*. Here's what that looks like on the timeline:



“Programmers” work to configure the ENIAC to perform a mathematical calculation. This “giant brain” could perform a complex mathematical calculation 2400 times faster than a human being.

