Explore Historical Periods of Technological Evolution

HUMAN HISTORY is recorded chronologically. It is a series of significant events that are typically explained through their cause and the developments that occurred during that particular time. Each particular event or development is grouped and organized around a major advance in technology that dramatically impacted the human condition. The events or developments have all sparked major changes in how we live, what we do, and what life means at any given time.

Objectives:

1. Describe the categorization of time and the historical periods of technological evolution.
2. Describe the significance of the Industrial Revolution.

Key Terms:

cosmological
geological
historical
Industrial Revolution
microliths
periodization
Second Industrial Revolution

Time and the Evolution of Technology

History has been divided and grouped into periods to aid in our studies and our understanding. Although it is essentially continuous and fluid organizing, it provides us with a better handle on what, when, and why things happened.

PERIODIZATION

The categorization of time into discretely named timeframes is **periodization**. This organization of time is relatively a new study technique. It was not formed until the late Renaissance or early Industrial Age. This is when western cultures began to look back into history and study art, architecture, technology, political systems, and social systems.

Relative to our view and knowledge of our world and universe, we have created three main categories. These categories scale from largest to smallest as they relate to our human placement in time. There is the **cosmological**, which is the time period concerned with the origin and evolution of the universe. There is the **geological**, which is the time period concerned with the origin and evolution of Earth. Also, there is the **historical**, which is the time period concerned with the origin and evolution of humankind.

HISTORICAL PERIODS

Within the historical time category, we have created nine periods based on our technological evolution. As technology progressed, our ability and speed to improve on it also progressed. In general, each of the nine time periods progressively became shorter as technology advanced our abilities and cultures. All the major technological advancements of these periods have affected every element of human life. They have given us more time to think about our current conditions and to explore more efficient ways to provide for our needs.

Paleolithic Age

The Paleolithic Age (meaning "Old Stone Age") ranged from 500,000 BC to 10,000 BC. Humans used bone needles and unpolished stones as tools (e.g., stone axe). They also began to use fire, create paintings in caves, make basic musical instruments, and sculpt objects.

Mesolithic Age

The Mesolithic Age (meaning "Middle Stone Age") lasted from 10,000 BC to 4000 BC. It was characterized by small flint tools flaked in two directions (**microliths**). Technology of this time includes the wheel and axle, stone adzes, fishing tackle, the bow, and the sail. During this time period, leatherwork, basketry, domesticated animals, stone circles, and improved farming (with the sickle) were also produced.

Neolithic Age

The Neolithic Age (meaning "New Stone Age") lasted from 4000 BC to 2300 BC. Living conditions were improved with block and mud brick dwellings. Pottery was created with polished stone tools. Spinning and weaving tools were developed. Also, wooden and stone plows were developed to enhance agriculture.

FIGURE 1. Mud bricks became popularized in the Neolithic Age.

Bronze Age

The Bronze Age lasted from 2300 BC to 700 BC and is named after the discovery of bronze—a material that could be melted and formed. Some of the objects produced included metal pots and pans, metal jewelry, tools, and weapons. The chariot and potter's wheel were also created during this time.

Iron Age

The Iron Age lasted from around 700 BC to AD 450 and is named after the discovery of iron, which is a hard metal that enabled a larger use and application. Some of the tools from this period are the iron dagger, chisel, axe, and spearhead. The added strength allowed for the creation of the pump and lathe and the development of block and tackle.

FIGURE 2. Many tools used from 700 BC to AD 450 were made of iron.

Middle Ages

The Middle Ages is named for its location between the Roman Empire and the Renaissance. It lasted from around AD 450 to AD 1400. Ocean-going ships evolved and sparked the creation of the compass and mechanical clocks. In addition, the evolution of iron into cast iron helped develop the cannon. Other developments included the waterwheel, the windmill, the wheeled plow, horseshoes, stirrups, and the crank.

Renaissance/Reformation/Enlightenment

The Renaissance/Reformation/Enlightenment lasted from about AD 1400 to AD 1750. It marked a new awareness of education, knowledge, and power. This was sparked by the invention of the printing press, which allowed information to be mass produced and distributed.

Our ability to study the earth was advanced with the creation of the telescope, microscope, thermometer, and barometer. In addition, the modern rifle was invented.

Industrial Revolution

The **Industrial Revolution** marked the beginning of modern life as we know it and lasted from AD 1750 to AD 1950. It is named after the dramatic revolution in industry and how we produced goods. The creation of the steam engine allowed for complex machines to be made and for objects to be mass produced. The invention of electricity advanced the revolution even faster. Then the automobile, airplane, radio, television, and telephone were all produced. Next, the idea of traveling into space started with the creation of the rocket. Everyday life was altered from electric lights to advances in health care and medicine.

Information Age

The current time period is the Information Age. It began around AD 1950 and can be primarily attributed to electronics. With the technology from transistors to integrated circuits, we were able to create computers. This allowed us to develop the artificial heart and to create nuclear power plants and the space shuttle. The digitization of all information has been helped with the invention of the digital camera and recording devices. All of this information can be quickly exchanged across the world with communication satellites; this allows people and information to be connected via the computer to nearly anyone in the world.

The Significance of the Industrial Revolution

The Industrial Revolution is marked by a major development in technology that has altered every element of human life. It transformed how we lived, why we lived, and where we lived. It changed our social structures, our economic systems, the cultures we lived in, and the way we governed ourselves through politics. A whole series of conditions came together to allow this great change to occur during the late 18th and early 19th centuries.

ENGLAND

The first stages of the Industrial Revolution began in England. England had developed an advanced education system and created some of the first universities in the world. This allowed scientific research to be performed in a manner where the knowledge could be made practical. England was also one of the first countries to allow and establish a middle class (merchant class). This new class of people owned businesses and exchanged goods. They created access by the sea and opened a world of resources and markets. They were able to establish an efficient transfer system of people and goods to aid in the revolution. With better high farming techniques and improved cultivation, the farm workers had no jobs. They had to move into the cities to find work. With money now in the hands of a new class in society and the technology for machines that allowed mass production, factories were created where these new city dwellers could work.

SPREAD

The growth and power of the merchant class and the changing political systems allowed the Industrial Revolution to spread quickly. It spread through Western Europe and North America during the 19th centuries, eventually affecting most of the developing world.

PROS AND CONS

The Industrial Revolution had positive and negative effects on the human condition.

Pros

It provided a larger range of household objects that were cheaper and available to more people. It was also organized around profit and efficiency, which helped improve the productivity of each worker.

Cons

Goals for increased profit and efficiency also increased child labor and produced unhealthy working conditions. This required the new democratic governments to establish laws for working conditions (e.g., hours and age). The unhealthy conditions were also reflected in the homes (slums) created to house the factory workers. This required the governments to establish housing codes and laws.

SECOND INDUSTRIAL REVOLUTION

The first Industrial Revolution merged into the **Second Industrial Revolution**. This took place as our ability to travel greatly increased around 1850. Railways and steam-powered ships began to spread across the world. This added momentum to the economic and technological progress. As electricity was spread out and utilized, progress happened at an even more astounding rate. With the creation of the combustion engine, the automobile, and the airplane, humans quickly had access to the world. Information was exchanged even more quickly as telegraphs were replaced by telephones and radios by televisions.

FIGURE 3. Railways became popular during the Second Industrial Revolution.

Summary:

We have created categories and divided our past into periods to study and better understand them. Of the nine general periods of history, each relates to technological developments with dramatic implications. These periods in history have progressed in their impact on our lives and the time in which it has taken for us to develop new technologies.

Past technologies have allowed for an increase of knowledge to be exchanged and communicated with others. This has made our lives more rapid in almost every aspect, allowing for quicker and more immediate access to the things we need and desire. One major time period that altered every element of human life occurred during the Industrial Age. It brought us into modern times through the alteration of our environments and how we live on a daily basis. It dramatically changed all elements of human interaction.

Checking Your Knowledge:

1. What are the three main categories we have created to study our world and universe?
2. What is the basis for our nine categories within human history?
3. What are microliths?
4. How was everyday life changed by the Industrial Revolution?
5. What technology allowed us to travel faster as a result of the Second Industrial Revolution?

Expanding Your Knowledge:

What tools today can be traced back to the earliest periods of human history? What tools today are the products of microlith technology? How have we evolved these tools? What other important technologies were developed during the Industrial Age that improved the quality of life? How has the Information Age affected every element in your life today? Use the Internet to answer these questions, and write a paper on your findings.

Web Links:

Timelines of Invention and Technology

http://inventors.about.com/od/timelines/Timelines_of_Invention_and_Technology.htm

Impact of the Industrial Revolution

http://industrialrevolution.sea.ca/impact.html