

Free a short history of the western scientific progress research paper example

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During the early years of the 14th century, most of the western civilizations are active in spreading their Christian faith. They have travel half way across the globe in order to fulfill their religious duties as well as expand their political territories. Religion has been powerful during this time and anyone who opposes their beliefs is commonly punished (Henry 3). However, there are also some who are taking the odds against religion and looking up into the sky for answers about the cosmos and other realities of life. These people are the creators and initiators of the modern science which was enhanced through a historic revolution (Shapin 16). In this essay, a brief history of the western scientific progress is discussed. The essay also opts to analyze the transition made by some of the great scientists and inventors and how it affected the western scientific progress .

There were no significant progresses to the world of science during the middle ages (500-1350 AD). The scientific process of research has not yet well understood and applied during this time. People do not accept the claims that came from scientific inquiry and experimentation. The schools and other educational institutions before the Western Renaissance were controlled by the Christian religion (Butterfield 29). The political and religious leaders incorporated the doctrines and teachings from the ancient Greeks and Romans. Most of the students during this time only accept what is written by the words of the authorities which mostly came from the philosophical teachings of Greek scholars. The world view of the educated Europeans before the Western Renaissance was greatly governed by the philosophy and mathematics of Aristotle and Ptolemy. However, during the Renaissance, all these teachings controlled by the religion were challenged

by what the historians coined as the scientific people (Grant 174).

One of the first scientific minds that initiated the western scientific progress was Nicolaus Copernicus. He is a mathematician and an astronomer from Poland. He used scientific inquiry in order to analyze the cosmos and examines the motion of each of the heavenly bodies. With his findings, he immediately rejected the idea of geocentric theory or the idea that the earth is the center of the universe (Butterfield 29). Copernicus replaced it with the heliocentric theory of the cosmos which means the earth is only one of the heavenly bodies which revolved around the Sun. In 1543, Copernicus released his book 'On the Revolutions of the Heavenly Spheres' to the public. It was also the year of his death. Although his theory is one of the closest theories which are greatly accepted in the modern times, he has not enough evidence to prove it during his time (Shapin 22).

The heliocentric theory of the cosmos by Copernicus was not generally accepted by the public due to the lack of philosophical evidences. The public was also not ready to abandon the traditional concepts which were provided to them by the church. The church as well as the political leaders of the early Europe kept away this theory since it could damage the reputation and the principles of the Christian Religion. However, not a long time has passed since Copernicus' claims were proven by the advancements of mathematics and physics. These claims were also enhanced by the scientific people who lived after his era (Grant 174).

Other scientists also used the heliocentric theory of Copernicus as the foundations of their scientific inquiry. One of these scientific people is Tycho Brahe who is a Danish Astronomer. It was Tycho Brahe who first recorded the

movements of every planet for several years. His hypothesis is also the same with Copernicus but he died before including mathematical analysis through his works. It was his student, Johannes Kepler who continued the works of Tycho Brahe and included mathematical conclusions to the planetary motions. He demonstrated using mathematics that the planets are revolving around the Sun and that the heliocentric theory is true. He also added that the motion of the planets around the sun is elliptical and not circles. He was the first to describe the laws of planetary motion (Shapin 60).

Another major discovery that greatly challenged the concepts provided by the Christian Church was the works of Galileo Galilei. Galileo was an Italian scientist which provides a lot of theories and scientific inquiries about the cosmos. He built his own telescope and discovered many observations within the solar system. He was the first to discover the moons of Jupiter as well as the craters of the moon and the sunspots of the Sun. He challenged the concept of Aristotle which argues that the heavenly bodies are made up of pure substances. The notion of Aristotle was greatly accepted by the church and Galileo was condemned and has been arrested. Even though he did not become free after his arrest, his works have been published all over Europe (Shapin 16).

The advancements of the scientific studies of the cosmos, there are other parts of sciences that flourished during the early start of Renaissance period. During the 16th century, expeditions and expansions provided information about the new world. The explorers brought to Europe some of the unusual species of plants and animals. With these discoveries, the educated Europeans found themselves at the center of opportunities for new

knowledge and information in the branch of botany and anatomy. Botany and Anatomy was the earliest branch of science the developed during the early part of the Renaissance period. The new species found in the new world have revived the study of nature during the 16th century. It also introduced some of the basic ideas about the scientific method of research which uses inquiry, experiment and analysis (Grant 174).

The advancements in the field of botany also provoked the progress of the science of anatomy or the study of body parts. Anatomy during the 16th century was only taught using the traditional works of the mediaeval scholars. However, one professor with the name Andreas Vesalius was not contented with the traditional readings and started to make his own dissections of the human body. He was considered to be the founder of the modern anatomy by making drawings and analysis of the human body from his dissections. He published his work ‘ On the fabric of the human body’ in 1543 as it is even used by the modern scientists due to its uniqueness and accuracy. The works of Vesalius became one of the early progresses of science and initiated the scientific method of research (Grant 174).

The advances of the science of botany, anatomy and astronomy have been the fuel to the progress of the scientific method of research. The scientific method is a process of research which includes forming a hypothesis, testing it with experimentation and creating conclusion using the analysis of the data. This method was greatly enhanced by Francis Bacon. He was an English writer who emphasized that in order to progress in the world of science, experimentations and observations should be used. He argued that scientists should focus their inquiry through empirical methods and not

relying on reasoning from abstract theories (Henry 33).

The scientific method was later enhanced by the notion and principles of Rene Descartes. Descartes is a French mathematician who developed the analytical geometry (Shapin 48). He also argued that scientists should focus on empirical methods although his approach is more mathematical. He insisted that experimentation is not enough to provide a conclusion but it still needs logic and mathematics. He also introduced the idea that “everything should be doubted” before believing its logic. He was also famous for the lines “I think, therefore I am” (Henry 18).

The advancements of astronomy, physics and mathematics were brought together by the simple laws of motion of Sir Isaac Newton. He converged the mathematical conclusions of Kepler and the discoveries of Galileo to form the law of gravitation. He explained that the universe is governed by these laws of motion and the law of gravity. He also accelerated the progress of mathematics by introducing the calculus. Sir Isaac Newton’s discoveries and concepts are considered to be the climax of the Scientific Revolution (Butterfield 151).

After the advancements made by challenging the church, the establishment of the scientific method and the convergence of ideas made by Newton, several discoveries and inventions were made. Torricelli invented the barometers which helped in the progress of biology and physics (Shapin 40). Leeuwenhoek invented the microscope which helped in the progress of microbiology (Shapin 132). Boyle discovered the relationship between pressure and volume of gases which established the technology of steam engine (Shapin 49). These major breakthroughs are the result of the

scientific revolution. Their inventions and ideas also helped in the development of the industrial revolution (Butterfield 203).

These advances were put together and applied to major technologies in the 18th century such as the steam engine. Steam engine was invented by James Watts which uses the concept of pressure and volume which was provided by Boyle's Law. The invention of the steam engine established the development of the new era of technology. It helped in the creation of industrial processes which greatly affected or changed the society (Butterfield 203).

The western scientific progress started with the initial challenge of the early scientific people. It was greatly accelerated by the concept of scientific method and was put together into one theory during its climax. The scientific revolution was a part of the history which was also put together by many brilliant minds. The modern science was established with the help of these advances made in the scientific revolution.

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