Alex Kemp

Mr. Sweeney

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The Unstoppable Revolution

 The term “industrial revolution” has no concrete definition to its name. The reasons for this are very simple. First of all, the period of history that is associated with the term industrial revolution occurs in an extremely broad expanse of time; starting around the mid 1600’s and finally concluding, according to The Industrial Revolution, as late as the early 1900’s. Secondly, the number of countries that are said to have experienced an industrial revolution, England, America, France, etc., did so at different times. Lastly, the number of factors that initiated the revolutions is so numerous that it is almost impossible to give credit to just one. Also, on top of the amount of factors involved in the revolution, there is also debate on whether or not the term industrial revolution fits the given time periods. With influence pouring in from countless amounts of sources and many specific discoveries, it can be said that industrialization was certainly not the only factor responsible for revolution (Hoppit 185). In essence, an industrial revolution could be best described as a time period where economic and technological advancement occurred and “revolutionized” society as a whole (Wrigley 1). The argument that must be made, however, is that with so many different aspects of time and influence that go into an “industrial revolution”, why should there be a definite ending? Society has not stopped in its ever continuous evolution of agriculture, banking, trade, population, science, and production, nor does it seem like an end will occur anytime soon.

 Throughout the years, many individuals have developed theories as to why the first industrial revolution came about. With each person attributing more and more factors that helped cause the event, it is difficult to decide which factors contributed most, and which contributed least. What can be seen is that population growth, changing lifestyles, agricultural stimulus, and scientific advancements were all major contributors to why success came so quickly, and abruptly (Wyatt 11). Not only did each one of these aspects bring their own success, but they also built onto the success of each other and ultimately led to revolution.

 Possibly the biggest and most influential of the aspects was the sharp increase in population that occurred from the late 16th century to the 19th century. Specifically concentrated in Europe, countries such as England, Spain, Italy, and France all experienced large explosions of population, and grew rapidly. It was even said that during the early 1500’s, “England’s population stood at 4 million, France at 15 million, Italy at 11 million, and Spain at 6 million. From the 16th century to the beginning of the 19th century, population in France, Spain, and the Italian and German states grew by 50 percent to 80 percent while that of the British Isles soared by 280 percent.” (Wyatt 12). The reasons for such a sudden increase actually came from the century before when Europe was experiencing periods of extreme death and hardship. Riddled with plague, bad weather, uprisings, and famine, Europe lost over a quarter of its population and was in desperate need of relief. When the plague subsided, the majority of crisis that had been dominating the country started to lessen and opened up the opportunity for a rebound. More and more people began to live longer because of the waning plagues, and increases in food production led to healthier diets. By the end of the 1800s, the estimated amount of inhabitants in England alone was around 17 million, a total increase of around 13 million people from the 15th century. On a larger scale, the estimated world population was estimated at around 1.6 billion (Wyatt 13).

 With the countries displaying a very promising recovery in the population, other factors started to appear as well. According to The Industrial Revolution, people during the 18th century began to shift toward urbanized areas rather than stay in the countryside. It was even said that Great Britain alone held 70 percent of all urban growth in Europe, with London holding the title of “[L]argest urban area on the continent”. As cities grew larger, lifestyles, appearances, and cultures all started to change. Social status became more of a reality, and many people went to great lengths to show their predominance. The rich would ride through the streets in carriages, dress in the latest fashions, and attend social events such as operas and theaters, while the middle class would imitate. Often times the high and middle classes would also own a substantial amount of farmland that showed off their wealth, and would attend formal schooling so that they could further their education (Samuels 24). Literacy rates rose as a result of this and brought with them a new level of communication. Newspapers, magazines, mail, and advertisement all began to take shape with increasing numbers of literate people, and continued to grow throughout the centuries. On the other hand, however, the lower class was not as fortunate and the divide between the higher classes and the poor began to widen. Before the recovery of the European population, the majority of people depended on agriculture for their livelihood, and stayed around the rural village areas in order to survive. Although this system had been in place ever since the Roman Empire’s collapse, it did not leave any room for improvements in their lifestyles. With the allure of the city leading people to live more independently, the need for communal based living was slowly becoming more obsolete. No longer bound to the traditional small community, people struck out in search of employment in the city and quickly claimed the available jobs. For those who did not arrive fast enough, jobs were scarce. This “first come first serve” system essentially created the lower class status in the city (Wyatt 15).

 As is the case with almost every major event in history, once one event takes place, more and more events attach themselves to the first as a result. This cause and effect situation was one of the most common scenarios seen in during the time frame of the industrial revolution. As populations continued to soar, and urbanization continued to occur, the problem of food consumption became apparent. Since a large number of the farmers had already began moving to the city, fewer workers were left to pick up the slack. Before the beginning of the industrial revolution, farming techniques remained relatively unchanged for over a millennia after the fall of the Roman Empire. The basic small plot of land used to provide just enough food to survive on was still common, and experimentation with this system was almost nonexistent up until the Middle Ages. It was only until the need for more crops came into view that techniques and inventions began to increase production (Wyatt 26-27). Crop rotation was among the first breakthroughs, as well as the use of fertilizer. By rotating different crops each year, the problems with soil nutrition could be solved. If the farmer planted grains for example, the nitrogen levels in the soil would be depleted, resulting in unhealthy crops for the next year. In order to counter this action, the next year’s crops would be alternated, or rotated, to a nitrogen storing crop such as beans or oats. This ensured that there would be more nutrients available for the grains and that a more diverse supply of food could be harvested because of the increase in yield. Fertilizer, commonly manure,was another way that farmers could improve yields, due to the fact that it contained essential nutrients (Wyatt 31).

 Along with the advancements that came from farming techniques, many different inventions were also created in order to increase food supply. In 1701, Jethro Tull invented a mechanized seed drill used to make sowing less strenuous, and in 1785, the cast-iron plowshare was invented in England by an engineer by the name of Robert Ransome. Both these inventions increased crop production and helped make the dwindling number of farmers even more efficient. As stated in The Industrial Revolution, “The agricultural worker in Great Britain produced more food, allowing the proportion of workers devoted to agriculture to fall. By the 18th century, Great Britain had experienced an increased output of 30% in people engaged in agriculture” (35). Clearly the inventions and techniques being implemented were helping immensely. Much later down the road, in the year 1834, Cyrus McCormick patented the first reaping machine, not long after that, in 1838, a very heavy version of the combine was designed which put together the action of the reaper with a bounding mechanism. These inventions cut harvest time down significantly and furthered the farmers output. Eventually, these devices would inspire the creation of steam powered combines, and finally gasoline powered combines and tractors in 1910 (Samuels 15-16). Other, lesser factors that went into the increased output of food by farmers included irrigation, and livestock breeding that provided more meats to the population. Although irrigation was not always needed because of England’s rainy climate, and livestock was not as widespread as agriculture because of its difficulty maintaining, their contributions were very important.

 With reform occurring in the agricultural field and middle to high class individuals looking to further their education, in it no wonder that the number of inventions also started to rise. Although there were quite a few inventions used for farming, this was certainly not the only avenue that needed to be updated. Considered to be the heart of the Industrial Revolution by some, the development of more efficient methods of production and transportation was immensely important. For many years, most of the labor used to make consumer goods was primarily human or animal driven. With the dawn of revolution already taking place, however, inventors began searching for alternative forms of energy. Steam and water power were two such sources. In the year 1690, an inventor by the name of Denis Papin created the first primitive steam device heated by coal. His concept would eventually form the basis for a man named James Watt to patent the first steam engine over fifty years later (McElroy 69). By 1800, 55 Watt steam engines had already been made and were performing tasks such as pumping water from mines. This reciprocating cycle of coal fired steam engines being used to pump water from coal mines continued throughout the next several centuries and only stopped when the first gasoline powered engines were made (Wrigley 46). Later on in the mid 1800s, steam was successfully being applied to mobile systems with the most notable success coming in the form of locomotives and steamboats (McElroy 231).

 Along with the advancement of steam power, the primitive yet effective method of water power was also implemented. Textile factories, mills, and manufacturing facilities began using the force of running water to power their machinery. This made it possible for mechanical devices to help with manufacturing, and increased the amount of goods produced. Water driven mechanical looms, spindles, and sewing machines were all apparatuses that came as a result of water powered systems. In America during the 18th century, these water driven factories were especially popular, totaling around 60,000 mills throughout the country. Even interchangeable part, a concept developed by Eli Whitney that made mass production possible, was tied into the water driven factory system. With more machines designed to work with the water powered factory, creating a system of interchangeable parts allowed quicker repair times and more production. Gradually, coal fired steam engines would even begin to replace water powered plants as they became more efficient, but water power was none the less an important part of the industrial revolution (Samuels 10-12).

 Other inventions and advancements aside from new forms of energy were also important in the development of the industrial revolution. In 1709, Abraham Darby introduced a process of coke blasting iron, in 1752 Benjamin Franklin began experiments on electricity, in 1794 Eli Whitney patented the cotton gin, in 1830 the Tom Thumb locomotive became the first serviced locomotive in America, in 1839 Charles Goodyear patented the vulcanization of rubber, in 1856 Henry Bessemer converted pig iron into steel, and from 1876 to 1883 the first gasoline engine was patented, the telephone was invented, the incandescent light bulb was created, and the first gas powered automobile was made (Wyatt xvi-xix). There were also notable advances in pottery, and canal transportation that created room for even more advancement (Hoppit 188). New glazes, bodies, and kiln temperatures, lead to more elaborate and decorative ceramic items and canal transportation increased heavily; by 1790, England had over 4000 miles of canals. Clearly the level of ingenuity and discovery during this time was profound and consistent, and shows just how much advancement really took place.

 With the start of the Industrial Revolution said to have started its path in the mid 1600’s, there is no doubt as to whether or not it actually took place. There are clear indications that with the population boom in Europe, the ideas and lifestyles of the time began to change as the continent recovered. From the middle class up, urbanization led to a higher rate of education and individual success became apparent. This flood of individuals searching for work in the city did increase the number of inventions and industrialization sharply and significantly, but it also gave the dwindling number of farmers an even higher work load. Ultimately, however, this pressure led to even more labor saving devices that allowed farmers to be extremely efficient in keeping up with demand.

 The question that still remains is simple. With characteristics such as a growth in the population, a strong tendency to urbanization, a change in lifestyle, agricultural advancement, and a large number of labor saving inventions and discoveries, why should there be a definite ending to the Industrial Revolution? With many sources claiming that the official ending occurred sometime in the early 1900s that leaves over a hundred years of similar characteristics with no title. Since the benchmark of 1.6 billion people was reached in the late 1800s, the worldly population has expanded to the brink of 7 billion people. From the beginning of the industrial revolution in the mid 1600s to its proposed ending in the early 1900s, about 250 years, the world population rose to 1.6 billion. In less than half that time, 1900 to present day, the population rose to 5.4 billion people (Wyatt 14). This clearly shows that the population has not stopped increasing. As for the change in lifestyle that led to increased social status, the modern world has certainly retained that mentality and has used inventions and discoveries to do so. Social networking sites formed from the creation of the internet, and communications such as video and telephone allow our society to display individual success and trends like never before. Even the agricultural advances from the industrial revolution pale in comparison to the GPS guided tractors, airborne crop dusters, and genetically engineered crops of the 21st century that supply the massive demand of food to our population. Lastly, with several large discoveries already listed, the last 112 years has given the world very significant advances. Nuclear energy and other renewable power sources have emerged that carry the potential to phase out traditional coal fired energy, gasoline powered automobiles are being challenged by electric and hybrid models, steamboats that once were the most technological means of transportation gave way to high speed rail and air travel, and mass production of goods made possible by interchangeable parts would not keep up with the fully automated factory systems of the modern times.

 The Industrial Revolution, with the main factors that give it definition, can easily be applied to today’s growing society. The ingenuity and advancement of the human race will never stop evolving, and with no tangible way of locating a time that the Industrial Revolution has ever ceased, there is no reason why it should.

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