

Example of social and ethical issues in computing report

[Business](#), [Industries](#)



CS417

Assignment1 Part2

Industrial Revolution Research

Industrial Revolution

Abstract

The Industrial Revolution is famous for developing the industrial advantages that are common today. New inventions helped the textile factories grow and produce cloth. The steam engine was very important for making transportation faster and easier. Ships and railroad locomotives started using steam engines which made a significant change in transporting raw materials and finished products to sell. Building the ships and railroad trains used materials like iron and steel that were important and still are for modern manufacturing of many products. The social impacts from the Industrial Revolution were felt especially in the lives of women and children who went to work in factories. Industry was a very bad and dangerous place to work so the first reforms for safe working conditions were passed during this time.

Introduction

The Industrial Revolution in England and in the USA must have been an exciting time to be alive. New inventions were being developed all the time. The steam engine started out as a simple vacuum cleaner like device to vacuum water out of mines. But the design was improved so that a steam engine could be carried on a ship and used for energy. The popularity of ships for transportation of goods and people after the invention of the steam

engines caused changes in the landscape because canals were made in England and New England changing the ways people received products from manufacturers. People were able to travel much easier on machines than on animals. The locomotive engine for railroads was an incredible invention which made overland travel faster and longer distances could be traveled. . The changes that led to the Industrial Revolution, a few of the technological developments, and the standard of living will be discussed further in this essay. Inventors were major players in the technological advances that were made at the time. The impact of Eli Whitney's invention of the cotton gin and Francis Cabot Lowell's impact on weaving cloth revolutionized the textile industry for both England and the USA so they will be discussed. The inventor of the first steam engine to fuel a boat in the USA, Robert Fulton will also be discussed because the steam engine was a great success of the Industrial Revolution. The social impact will briefly be discussed below and so will some of the advantages and disadvantages of the revolution.

Definition - Industrial Revolution

The symbols of the Industrial Revolution have been steam engines for railroad locomotives and steam ships. The beginning of the revolution is dated from the last part of the 1700s lasting into the 1900s. Until that time work was done by human power but the revolution occurred when machines started taking the place of human labor. Great Britain is considered the country where everything started first on farms then moving into the cities especially with major changes in the textile industry. The new innovations spread across Europe and across the world so the impacts were felt on

culture, society and the economy of countries and globally. The three main changes that came with the Industrial Revolution are (a) people were freed from hard labor by machines (b) people and animals were replaced by steam engines, (c) raw materials were more available. (Berlanstein, 1992, p. 26)

Birthplace of the Industrial Revolution

England was the location where the revolution started. The country had the raw materials and the workforce necessary to keep the factories running. Nardinelli (n. d) called England the “workshop of the world.” Farms in Great Britain were the birthplace of the Industrial Revolution. . The country had grown from being a colonial power and there was an aristocratic system where the rich had all the power. Even though the innovations that were started during the Industrial Revolution were bad for people’s health and the environment the process continued. Regular people did not have any power to stop bad things from happening in their communities. On the other hand the Industrial Revolution helped make an Empire for English royalty that also gave advantages to the people of England like jobs and consumer goods.

Changes That Led to The Revolution

Nardinelli (n. d.), an economist explained that “between 1760 and 1860, technological progress, education, and an increasing captital stock” were the three main categories of change that brought the Industrial Revolution.

Workers were able to count on a certain amount of weekly pay. In farming the amount of money that could be made was never known for sure because changes in the weather could destroy the crops people relied on for money.

Berlanstein (1992) explained how the changes started in the country side

and in the small towns of England. (p. 53) Merchants were in charge of the production and selling of farm equipment and small industries. Berlanstein (1992) explained that the merchants moved around the region depending on where raw materials and labor were located. Berlanstein concluded that “ Both regional labor markets and long-distance circuits left some migrants in cities, but altogether migration, fertility and mortality produced only modest rates of urban growth.” (p. 53) So cities did not necessarily continually increase in population because of the Industrial Revolution. The population would change from increasing to decreasing depending on the work available.

Some Major Technological Developments

Water wheels were used to mill grain and new tools were available because of the improvements in iron production. Better machine tools improved a variety of way that energy had been used in the past. Powering engines with steam was a big improvement. Industries used steam to power their factories. Railway locomotives and ships started using steam power to transport people, goods, and raw materials. The boats that fisherman relied on to make money catching and selling fish were adapted to the steam engine. Wood had been the main way of heating homes and businesses but coal replaced wood for fuel.

Technology and Work Organization

Production in England before the revolution was based on handicrafts. Items for the home were made in the homes. The Industrial Revolution caused a big change in the organization of work. The technology that was introduced

allowed the factory system to develop. Families no longer needed to work together at home to produce items they need for their own use. The factory system meant that special buildings held the equipment to make a product. Many workers who were strangers to each other worked together on the machinery to produce items that would be sold. A middle class grew who had money to spend on the goods. The first factories were in the textile and ironworks industries but the application of the factory system was so successful that the factory system was used to make household items and luxury goods. The new machines coupled with human labor made the factory system possible.

Industrial Revolution and The Standard of Living

Standard of living is the “ real income per person” (Nardinelli, n. d.) It turns out that the discussion on standard of living in the Industrial Revolution has not been agreed upon by historians. Nardinelli (n. d.) describes the two groups as the “ pessimists” and the “ optimists.” The disagreement is over whether or not the standard of living of the working class improved or became worse because of the Industrial Revolution. The pessimists claim the standard of living for the British working class did not improve until the 1840s and 1850s while on the other hand the optimists claim that by 1810 or before the standard of living were improving. (Nardinelli, n. d.) Workers in factories and offices that received reliable wages showed a slow increase for about forty years until 1820. (Lindert &Williamson, 1983) The real wages doubled for these workers from 1820 until 1852. (Lindert &Williamson, 1983) Not all the workers during those years received wages. Brown (1990) pointed

out that any increase in wages was to make up for the dangerous working conditions and the bad living conditions. (cited by Nardinelli, n. d.)

Inventors who played a major role in the industrial revelation

Eli Whitney & The Cotton Gin

The use of the Spinning Mule created a big in the textile manufacturing industry (See fig. 1) An Englishman Samuel Crompton invented the Spinning Mule so he was responsible for the increase in the textile industries demand for cotton in England and eventually around the world. He combined some elements of the spinning jenny (1764) invented by James Hargreaves and the water frame (1769) patented by Richard Arkwright to create the design for the spinning mule. An American inventor Eli Whitney invented the cotton gin (patented in 1793) which had the great advantage that the machine could separate the cotton from the seed. This was a savings on human labor and the making of cotton cloth became time efficient compared to any of the earlier designs. The machine used a teeth-like comb to comb the cotton away from the cotton seed. The improved technical designs for cotton made the industry expand and the ability to use metal parts instead of wooden parts was an essential improvement. (see fig. 2)

Figure1. Spinning Mule

Source: Pezzab, 2007, Wikipedia Commons, spinning-mule. jpg

Figure . A cotton gin from 1896

Source: Dwight Burdette, 1896, Library of Congress,

http://en.wikipedia.org/wiki/File:Lummus_Cotton_Gin_Advertisement.JPG

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Robert Fulton and the Steam Engine

Inventing a steam engine that people would use was the dream of many inventors at the time. Thomas Savery invented a very simple steam engine (patent 1698) to pull water out of coal mining shafts and tunnels. (See fig) A large metal closed pot was filled with water and then steam was forced into the pot; the pressure forced the water upwards and out of the mines. The steam was cooled with sprinkler systems which caused condensation. A vacuum was created this way so more water could be vacuumed out of the mines. A Scotsman, James Watt patented the steam engine (1769) that has been given credit for ushering in the Industrial Revolution. (Bellis, n. d.)

Richard Fulton invented the engine that was commonly used in steam ships. An artist drew the engine room of the SS Humboldt from his or her imagination while the ship was being built. The design improvements from the first patented steam engine had become refined by 1851. Robert Fulton, an American from Pennsylvania, spent four years building prototypes for his first steamship. The Clermont was the name of his first American steamship. The inauguration sendoff for the Clermont was in 1807 on the Hudson River. The ship was launched in Albany, New York.

Figure . First patented steam engine

Source: <http://0.tqn.com/d/inventors/1/0/-/E/steamenginesavery.jpg>

Figure Steam Engine room on a steam ship.

Source: Harper's New Monthly Magazine, No. XII, May 1851, Vol. II

https://en.wikipedia.org/wiki/File:SS_Humboldt_engine_room.jpg

Francis Cabot Lowell and the American Textile Industry

Francis Cabot Lowell was an American cloth merchant who traveled to England in 1811 to learn more about their successful textile industry. He memorized the power looms he saw working in England and then returned to the United States to build an American version. A master mechanic, Paul Moody and Lowell adapted the English power loom design and built a new power loom to weave cloth. The first newly invented mill power drive (1814) was located in Waltham, Massachusetts. The two men were continually improving the design. The American textile industry was established from that time because weaving fabric was now at the same level as spinning fabric. The Waltham Mill was unique because it was "one of the first in the world to combine under one roof all the operations necessary to convert raw fiber into cloth, and it proved a success" (Bellis, n. d.). Lowell's Waltham mill was a profit making success, too. He died at the age of 42 but his partners, the Boston Associates, located more sites at East Chelmsford (Lowell), "Chicopee, Manchester and Lawrence," Massachusetts (Bellis, n. d.). The new way of weaving fabric was called the "Waltham-Lowell system" and by 1850 the Boston Association controlled 20 percent of cotton production in the USA (Bellis, n. d.).

Social Impact of the Industrial Revolution

Berlanstein (1992) has written that the biggest social changes the Industrial Revolution started was the attitude of people towards women and children. Women became an essential part of the workforce so their role as mother to many children decreased. The women in England were not giving birth to so

many children as before. Public education was available so children did not have to be looked after during so many hours of the day. A strange thing happened though." Ironically, society ascribed greater importance to the role of the mother precisely at a time when her function was being undermined or at least significantly altered by the evolution of social institutions" (Berlansteing, 1992, p. 77). Women entered the workforce for short periods of time before they were married. The types of work women entered were for domestic service, factory work, and sewing at home. Women did not apply for employment unless it has a service orientation or was at a level that allowed them to leave easily when they wanted to get married. (Berlanstein, 1992, p. 78)

Advantages and disadvantages of Industrial Revolution

The advantages that came from the Industrial Revolution are the new ideas for machines and tools that were patented. Using steam for energy revolutionized transportation by railways and by ships. Canals were built in the United Kingdom and in New England so steam ships could travel more easily. The ships and the trains were made from the same raw materials they were transporting to be used in industry. This kept the industrial process going because the transportation industry needed new parts or replacement parts and new ships and trains to transport more products and passengers. The textile industry was revolutionized and making cloth became faster and more efficient. People were able to leave the farm if they wanted or needed work in the city. If people did not live by a river it was still easy for them to travel with the railroad lines. We have advantages today in transportation

and other industries that developed from the time of the Industrial Revolution.

Laws were made to protect workers and children. The First Factory Act (1802) set the legal amount of time a child could work in the factories at twelve hours per day. The Factory Act of 1833 forbid children less than the age of nine to work in factories. Children between 9 and 13 years old could only work for eight hours per day plus they had to have schooling two hours per day. The Ten Hour Act of 1847 made it illegal to allow women and children to work more than ten hours a day in a factory. The Mines Act of 1842 forced mine owners to stop hiring women to work in the mines and to stop hiring boys under the age of 13 for working underground in the mines. Labor unions developed so there would not be child labor, poor working conditions and long hours. Public education was started for children. People were able to receive wages on a regular basis and that did not happen on a farm.

The disadvantages were the dangerous working conditions. People were forced to work long hours and the conditions were not safe. Children were a big part of the workforce. They made very little money working for adults spinning thread or making fabric. Children were forced to work long hours from 12 to 18 hours a day with one break. The conditions were not safe for the children and no one was there to look after their welfare so they were treated badly. Very bad accidents happened because safety was not an issue for the factory owners. The working conditions also led to poor health especially for breathing problems from breathing in the particles and dust in the air. Air pollution was very bad in London during the Industrial Revolution

because of the use of coal and now air pollution is still a problem around the world from industries. People who worked in the mines were in danger everyday they also developed very bad health problems. Even today working in mines is dangerous. People were exploited for working in factories they were not paid well. Also the housing that grew up around factories was not part of a planned city; they did not have sewer systems for example.

For some topics it is not clear whether or not a disadvantage or advantage was made. The standard of living is still a controversial subject but drawings from the time do not show that people had nice places to live and work.

Women were able to have a choice between domestic duties and finding a job outside the home which was an advantage. The interesting thing that happened is the English women chose only to enter the workplace for a short period of time. Their main goal was still to be married. After their marriage women did not go back to work. They may have built the groundwork for the disadvantages females have in modern times trying to break the glass ceiling in modern times. (Berlanstein, 1992, p. 78).

Conclusion

The Industrial Revolution started in England because they had the raw materials and the workforce necessary. People did not have the power to protect their families working in the factories either. The economic system forced them to work so they would have a place to live and food to eat. Reformers in England worked hard to make positive changes so people would have better lives. Labor unions and modern reformers still have to work hard to try to make sure people have safe working conditions and can

afford a high quality of life. At this late date the benefits and disadvantages of the Industrial Revolution are still being debated. In general the methods and strategies started during that time have led to environmental problems that we have to deal with now. Due to the environmental problems it is hard to argue that the advantages of the Industrial Revolution outweigh the disadvantages.

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