

SOCIAL AND HUMAN COSTS OF INDUSTRIALIZATION: A REVIEW OF SOME NEGATIVE EFFECTS ON SOCIETY DURING THE FIRST INDUSTRIAL REVOLUTION

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Abstract: The Industrial Revolution, which took place from the late 18th to the mid-19th century, had a profound impact on society. It leads to unprecedented economic and technological progress, as well as significant changes in the social structure. Along with the positives, there are quite a few negative effects. The purpose of this article is to present the basics, such as exploitation of workers, poor working conditions, child labor, poor physical and mental condition of the population, urbanization, environmental pollution, etc. As Great Britain began its industrialization before all other countries, therefore its citizens were exposed to the negative effects for the longest time, the data and sources used are mainly from the United Kingdom. A descriptive method is used, presenting both contemporary sources and those from the time of the industrial revolution itself, specifically Adam Smith and Thomas Malthus. The information collected is interpreted by analyzing the negative social consequences of industrialization. Although usually distinguished, in practice these effects are closely related. For example, poor working conditions and long working hours, combined with environmental pollution, lead to a deterioration in the health of the working class. Due to the intensive burning of fossil fuels, air pollution in industrial cities during the period was many times higher than modern standards. Along with the negative effects of industrialization itself, the uneven distribution of wealth is increasing. All this leads to social unrest, protests and movements for workers' rights, which shows the clear need for social reforms. It was the emergence of the first trade unions and the formation of labor movements that were a response to the exploitation and poor conditions faced by workers during this time. As a positive side, if it can be called so, of the negative effects of industrialization, the political impetus for the development of the first systems of social security, education and health care was formed towards the end of the 19th century. A change in public attitudes brought about by the negative effects of industrialization reflected a growing recognition of the need to move away from the early laissez-faire approach and provide greater social security for wage workers on the part of the state. Therefore, industrialization itself is an important cause of the transformation from a market economy to a mixed economy system.

Keywords: industrialization; social effects; working class; social health insurance

1. INTRODUCTION

This article focuses on the profound transformations brought about by the First Industrial Revolution. It began in Great Britain in the second half of the 18th century and spread to Western Europe and the United States around 1820-1840. This was an important period in the economic history of the world, marked by the mechanization of production and the rise of factories. Key industries such as the textile industry, the chemical industry, the iron and steel industry are developing, and significant strides are being made in agriculture and transportation. Despite economic progress, the benefits of the industrial revolution were not shared equally (Haradhan, 2019). This paper focuses on the condition of the working class at the time of the First Industrial Revolution. There are numerous socio-economic consequences on this largest part of society, leading to a change in economic models related to the establishment of a social function in the economy by the state. The change in public attitudes toward the end of the 19th century can be seen as a response to the visible social unrest caused by the negative effects of industrialization.

2. MATERIALS AND METHODS

This paper is based on historical references and economic theories presented in scholarly works. References are made to works by Adam Smith, Thomas Malthus, David M. Turner, Daniel Blackie, and Peter Capuano, among others. Direct quotes from contemporaries of the First Industrial Revolution are included. Statistical information is presented to support the claims regarding the intensification of labor during this period. Overall, the methodology is an approach involving historical research, economic theories and critical analysis to provide a comprehensive understanding of the subject. By synthesizing these diverse elements, the paper strives to contribute to a holistic understanding of the complexities inherent in the early phases of industrialization, shedding light on the profound changes that shaped societies and laying the groundwork for subsequent reflections on the relationship between industrial progress, societal well-being, and the role of governance.

3. RESULTS AND DISCUSSIONS

At the time of the industrial revolution, there was a drastic change in work patterns, characterized by long and intensive working hours. A social system is still missing, as well as public holidays. The mechanization of production, the growth of factories, and the pursuit of profit by industrialists are prerequisites for increasing the working hours of urban workers. By 1850, workers were considered to be working significantly more than a century earlier (Voth, 1998). A number of studies show that at the time of the First Industrial Revolution, the prevailing working time was no less than 10-12 hours a day, 60-80 hours a week and 300 days a year. Before the industrial revolution or during the so-called "proto-industrial period" of early capitalism in Western Europe, people worked about 150-200 days a year. (OECD, 2021).

The negative social effects during the period were not limited to able-bodied men, but extended to children and women. The rapid growth of factories during the Industrial Revolution created a great demand for labor, outstripping population growth. This led not so much to an increase in wages, but due to the lack of an administratively defined working age, children from poor families, which were the majority, had to enter work from an early age. The Industrial Revolution also played a role in establishing patterns of gender inequality in the workplace. Women, often employed in factories, were paid significantly less than men for the same work. The pay gap is rooted in gender stereotypes and assumptions about the economic role of women, namely that they are not the main breadwinners in the family, therefore they are treated unequally to men in the workplace (Kiger, 2021). The growth of the industry catalyzed the use of child labor and discrimination against women on a large scale.

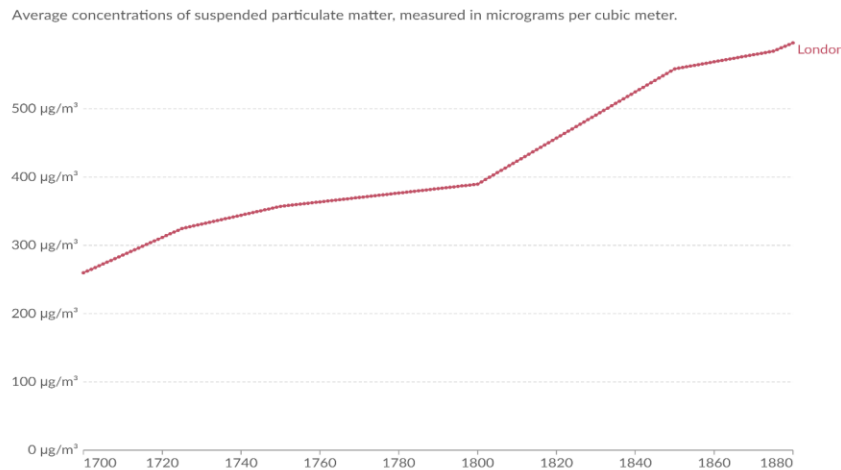
The grim reality of dangerous working conditions in factories and mines underscores the human toll exacted by industrialization. Instances of fatal accidents and permanent injuries caused by machinery operations have been well-documented, revealing a sobering aspect of the industrial revolution. In *Disability in the Industrial Revolution: Physical impairment in British coalmining, 1780-1880*, authors David M. Turner and Daniel Blackie outline the impact of injury and chronic illness on miners and the socio-economic consequences of physical impairment during the era. These consequences are associated with complex shifts in household roles, strained family relationships, economic vulnerability, and a reevaluation of personal and societal values regarding work and abilities. It highlights the variability of these experiences and the importance of community and family support in coping with the challenges imposed by disability in coal mining communities (2018). Peter Capuano's book *Changing Hands: Industry, Evolution and the Reconfiguration of the Victorian Body* also describes documented cases of severe accidents at work in factories in England, which by the 1820s had begun to attract much public attention (2015). These historical accounts serve as poignant reminders of the human cost embedded in the trajectory of industrial progress and the pressing need for safeguards to protect the welfare of workers. Machines, without adequate safety measures, pose a serious threat to the welfare of workers. The aftermath of such incidents often leaves workers not only grappling with physical recovery but also facing the specter of enduring scars or disabilities that can significantly impact their lives. Even after recovery, workers often face the prospect of permanent scarring or disability from workplace injuries. In addition, the disability of men combined with the lack of compensation for this is another reason for other family members to enter the workforce.

Industrialization also changed lifestyles and habits. The introduction of machines in transport and agriculture leads to reduced physical activity and a sedentary lifestyle. Consumption of processed food, often treated with salt and sugar for preservation, has been identified as a contributing factor to unhealthy habits. The prevalence of such dietary habits is associated with an increase in lifestyle-related diseases. (Rafferty, 2017). The industrial revolution intensified the migration processes towards the cities. Development plans, sanitary infrastructure and building codes are lacking. Due to low income, workers are forced to live in shelters with poor hygiene (Haradhan, 2019). Improper disposal of waste and the lack of sewage systems are the reason for the accumulation of waste on the streets and water bodies.

The multifaceted challenges of the Industrial Revolution extend beyond the immediate health impacts of workplace injuries. Overpopulation exacerbates the strain on resources, while increased pollution further compounds the decline in overall population health. Industrial pollution, particularly from the burning of coal, emerges as a significant contributor to environmental degradation, with profound consequences for public well-being. The widespread use of coal in factories for powering machinery and in homes for heating purposes results in the release of harmful pollutants into the air, including sulfur dioxide, carbon dioxide, and particulate matter. The ramifications of such industrial activities are vividly illustrated by examples like the fine particulate matter pollution observed in cities such as London (Figure 1).

According to the current safety standards of the World Health Organization, it is recommended that the level of particulate matter does not exceed 20 $\mu\text{g}/\text{m}^3$ (WHO, 2024).

Figure 1. Air pollution in London from 1700 to 1880.



Source: (Ritchie, 2017).

In addition to air pollution, industrial processes during the first industrial revolution generated significant wastes, including chemicals and by-products, and the disposal of these wastes often had a detrimental effect on the environment, especially water bodies. Also, the growth of industrial activities contributes to the increase in noise pollution in urban areas. The consequences of pollution during this period went beyond the environmental impact and significantly affected public health. Airborne pollutants are associated with respiratory problems, while waterborne pollutants contribute to the spread of waterborne diseases. The general unsanitary conditions prevailing in many industrialized cities facilitate the transmission of various epidemics. These health challenges highlight the negative social and environmental consequences of unregulated industrialization during the early phases of the Industrial Revolution.

Another negative effect is related to the absolute uniformity of the workplace. Unlike agricultural workers and artisans, factory workers' working time is often spent performing completely identical and repetitive tasks, often reduced to a few movements. It is a factor affecting the mental health, behavior and moral standards of workers. Adam Smith extensively discusses the consequences of the division of labor. As the specialization of tasks progresses, a significant portion of the population, particularly those engaged in manual labor, becomes confined to a few simple and repetitive tasks, often just one or two. Smith argues that the mental faculties of these individuals are shaped by their routine work. Those who spend their entire lives performing repetitive tasks, with predictable outcomes, lack the need to engage their intellect or creativity to overcome unfamiliar challenges. The monotony of their work leads to a decline in mental agility, and they may become as unintelligent and ignorant as humanly possible. This mental lethargy not only hampers their ability to participate in meaningful conversations but also prevents them from experiencing noble and compassionate sentiments. Consequently, they struggle to make sound judgments regarding even basic responsibilities in their personal lives. Smith contends that individuals in such a state are ill-equipped to comprehend the broader interests of their country and lack the capacity to defend it in times of war, unless deliberate efforts are made to educate and empower them. The lack of variety and stimulation in their occupations contributed to a mindset that looked down on precarious and dynamic lifestyles. Moreover, their physical vigor is compromised, limiting their ability to exert strength in any field other than the one they have been trained in. "But in every improved and civilized society this is the state into which the labouring poor, that is, the great body of the people, must necessarily fall, unless government takes some pains to prevent it." (Smith, [1776] 1937, pp. 734-735). Smith thus presents a generally negative impact of the division of labor on the intellectual and moral development of workers during the Industrial Revolution. Task specialization, although economically beneficial, raises a number of questions about its impact on the development of individuals in industrial society and their ability to contribute fully to its well-being, on which the author recommends government intervention.

Thomas Malthus also drew attention to the negative effects of working in factories. In "Observations on the effects of the corn laws: and of a rise or fall in the price of corn on the agriculture and general wealth of the country". The author considered "... that an excessive proportion of manufacturing population does not seem favourable to national quiet and happiness..." (Malthus, 1814, p. 28). He observes that wages in industry are liable to great changes even in times of peace, for they "...always remain subject to the fluctuations which arise from the caprices of taste and

fashion, and the competition of other countries. These fluctuations naturally tend to generate discontent and tumult and the evils which accompany them ; and if to this we add, that the situation and employment of a manufacturer and his family are even in their best state unfavourable to health and virtue, it cannot appear desirable that a very large proportion of the whole society should consist of manufacturing labourers. Wealth, population and power are, after all, only valuable, as they tend to improve, increase, and secure the mass of human virtue and happiness.” (ibid.: 28-29). Like Smith, Malthus' concerns related to the potential social and economic consequences of industrialization. It highlights issues such as wage volatility, unfavorable working conditions and the wider impact of industrialization on the welfare and happiness of the population. Malthus associated the concept of "wealth" with its ability to enhance human virtue and overall social happiness, not simply with economic prosperity and the ability to buy more and more goods.

In his 1814 book, Malthus discussed the positive and negative effects of allowing free grain imports. He concluded that England was more efficient at producing industrial goods than agricultural products, so removing tariffs on imported grain would allow the country to divert resources to industry. Thus, by specializing in industrial goods and producing less grain, the country could achieve greater economic prosperity (ibid.: 23-24). In our view, the passage on the relevant pages contains an early formulation of the principle of comparative advantage. However, the negative effects on society of too large a proportion of industrial workers in the economy, along with the country's dependence on foreign grain imports, eventually led Malthus to believe that the prohibitions should be maintained. An increase in the share of labor in the processing industries reduces the sustainability of society, yet the ultimate goal of economic theory and economic development is to contribute to an increase in public welfare. It is precisely because of this argument that Malthus did not delve deeper into the analysis of the comparative costs in industry and agriculture, and the economic effect for the country. Through free foreign trade and the country's advantages in industry, more food will be able to be imported than the country itself can produce at the time. This would mean an increase in the share of workers employed in industry. But what would be the intangible effect on public welfare?

Even according to some of the most prominent economists of the period, industrialization was harmful to the physical and mental health of industrial workers. This is so not only because of the limitation of work during their life in one or a few elementary actions, which leads to mental degradation. The working conditions of wage labor at that time were associated with a lack of any type of insurance, labor safety standards, standardized working hours and minimum wages. Poor working conditions harm physical health, and significant wage fluctuations sometimes call into question even the physical survival of urban workers. Education is not provided by the state, nor is it compulsory. The great mass of wage laborers, put on the brink of survival, cannot afford to enroll their children in private schools. Therefore, the latter should join the laborers from childhood, as soon as they are fit to do any work. The complex influence of all these factors leads to the degradation of the virtues of the working class. These are actually the causes of social conflicts and labor riots during the period under review.

In 1820, Robert Owen published a report in which he proposed a working-class solution as a fundamental principle for the ultimate reorganization of society. This marked a departure from traditional political means, private property, and the pursuit of profits, advocating instead a fair wage system in favor of wage labor, laying the foundations for socialist ideas popularized by his followers in the 1830s. Owen's ideas emphasized the creation of a fair and benevolent environment for dealing with societal problems, especially in the context of industrialization. Although its utopian aspects may be viewed with concern, Owen is acknowledged as a trailblazer in shaping a distinct British form of socialism (Siméon, 2012).

The negative effects of industrialization lead to a rethinking of the need to provide greater social security to wage workers. Thus, towards the end of the 19th century, compulsory education was introduced in Great Britain. The first primary education act, known as the Foster Act, was passed in 1870 and covered children from 5 to 13 years of age (Britannica, 2023). This legislation aimed to address the issues of child labor and provide basic education to the working-class children who were often employed in factories at a young age.

The foundations of social health insurance in this country were laid only in 1911, when it became compulsory for workers. It was taken from the model of Germany (Gorsky, 2015). In 1883, Bismarck created the world's first social health insurance (Busse, R., Blümel, M., Knieps, F., Bärnighausen, T., 2017). Social elements in the economies of the countries of Western Europe began to appear at about the same time, even some of them, such as the example of health care - later in Britain than in other countries. It follows that, as Britain industrialized several decades before other countries in the region, the working class in that country suffered the longest from the negative effects of industrialization.

5. CONCLUSIONS

The negative consequences of industrialization did not escape the contemporaries of this era. Even Adam Smith and Thomas Malthus pointed to the wider social consequences of the industrial revolution, linking economic conditions

to the general welfare and happiness of the population. They reflect a perspective that goes beyond mere economic considerations and touches on the social and moral dimensions of industrialization. Thomas Malthus's insights into the consequences of free grain imports reveal the delicate balance between economic benefits and potential societal instability. The negative effects of industrialization on the working class, including poor working conditions, unstable wages, etc. contribute to social unrest. The harsh realities facing urban populations prompt reflection on the complex interplay between industrial progress and social well-being.

Towards the end of the 19th century there was a remarkable change in public attitudes. Reforms such as compulsory education and social health insurance reflect the growing recognition of the need for greater social security for wage workers. Social values and management strategies are adapting to cope with the changing landscape brought about by industrial progress. This marked a departure from the earlier laissez-faire approach, indicating a developing understanding of the state's role in mitigating the adverse effects of industrialization. The introduction of compulsory education and social health insurance marked important steps towards building a more equitable and supportive social system during a period when industrialization was reshaping social structures and norms.

As we reflect on this historical context, it provides valuable lessons for contemporary societies grappling with the challenges posed by rapid technological and economic transformations, emphasizing the importance of balancing progress with social responsibility. The consequences of industrialization extend far beyond the immediate physical toll on workers, affecting broader social and environmental dimensions. This reinforces the need for responsible industrial practices and the adoption of strict environmental standards to ensure a sustainable and healthy approach to industrialization in the modern age.

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