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**INDUSTRIAL REVOLUTION**

The Industrial Revolution refers to the greatly increased output of machine-made goods that began in England during the 18th century. Before the Industrial Revolution, people wove textiles by hand. Beginning in the middle 1700s, machines did this and other jobs as well. The Industrial Revolution started in England and soon spread to Continental Europe and North America. It brought economic changes which took place in the eighteenth and the nineteenth centuries and completely transformed the European society. The Industrial Revolution brought about two main changes, viz. it replaced the domestic system by factory system and small scale production by mass production.

**Difference Between Industrial Revolution & French, Russian Revolution?**

The Industrial Revolution fundamentally differed from other revolutions. Whereas the other revolutions like the American Revolution, French Revolution and Russian were accomplished with violence. It was essentially peaceful in character.

Again, unlike other revolutions, it has no definite beginning and end. Whereas, the other revolutions commenced on specific dates and came to an end after accomplishing the desired objective, the industrial revolution is an on-going process. The inventions made during this period were not entirely new and some of them constituted an improvement over the existing ones.

Likewise the discoveries and inventions made during this period were further improved in the subsequent centuries. Finally, unlike other revolutions which try to promote and protect the interests of the down-trodden sections of society, the industrial revolution caused untold misery to the working classes. It provided the capitalists with all types of luxuries and boundless sources of enjoyment and workers fell victims to dirt, disease, sorrow, suffering etc.

In fact some scholars have objected to the use of term 'revolution' for these industrial changes on the ground that they caused no brutal violence, war, execution and persecution.

Further these changes were not sudden and took about a century. However, the changes in the production system were so radical that they can rightly be described as Revolution. It was chiefly because of the industrial revolution that the world passed into a new and different era, the era of machines. If we compare the conditions prevailing in the seventeenth century with the conditions in the nineteenth century the changes were indeed revolutionary. Domestic production was replaced by factory system and mass production replaced small scale production.

**The Scientific & Technological Innovations, which made the Revolution Possible****Steam Power**

The invention of the use of steam was one of the most revolutionary discoveries which greatly facilitated the adoption of the machine methods of production. Prior to the discovery of the system power also machines were in use, but the progress was rather slow due to lack of good motive power. These machines were worked on water or wind-power.

The discovery of the steam power solved this problem. It was independent of the weather and was also not limited by conditions of place. Steam power could be generated at any place and in any quantity according to the requirements. This was made possible with the help of an engine designed by Newcomen. This engine was further perfected by James Watt and it was possible to turn wheel and drive machinery.

### Iron and Steel

The introduction of steam-driven machinery also made it desirable that the wood machinery should be replaced by machinery made of some durable material, and thus usage of iron was a natural development. But as iron was not available in sufficient quantity an effort was made to increase its production through the use of cocking process. In 1829 Nelson invented a hot blast which made the use of raw coal, instead of coke, possible for the manufacture of iron. This invention greatly helped the growth of iron industry of Clyde.

The metal industry made yet another break through with the discovery of cheap methods of making steel, which was superior to iron on account of its lightness, hardness and durability. It particularly proved quite useful for the making of rails, building of ships and construction of factories and dwelling houses.

### Development of Coal Industry

The increasing use of steam power and iron and steel necessitated the development of coal industry. In fact the coal and the iron are the two foundations of the modern industrial society and a country lacking in either stands at a disadvantage.

In fact, France could not make much progress in the field of industrialization, mainly due to lack of sufficient quantity of coal, which obliged her to persist with the antiquated methods of production of iron for a long time. On the other hand, Britain and Germany were more favourably placed in this regard and naturally had a lead over France despite presence of rich iron deposits in that country.

### Changes in Means of Communication

Between 1800 and 1820 about 200 miles of rail lines were in operation in Britain. They were mainly used to carry raw material. Efforts were also made to bring improvements in road and inland waterways. As a result of all these changes Britain came to have thousand of good roads which greatly reduced the transportation cost.

Improvements were also affected in the inland waterways. As heavy goods such as iron and coal could not be carried to distant places by means of roads, the people took to the use of water as a means of communication by digging new canals. As a result, the industrial areas of Lancashire and Yorkshire and coalfields whose development had been hampered by the hilly character of the country due to absence of good roads and navigable rivers, were opened up for exploitation. After the arrival of the steam engine, steam boats also began to be used which revolutionized the water transport system.

First, railroads spurred industrial growth by giving manufacturers a cheap way to transport materials and finished products. Second, the railroad boom created hundreds of thousands of new jobs for both railroad workers and miners. These miners provided iron for the tracks and coal for the steam engines. Third, the railroads boosted England's agricultural and fishing industries, which could transport their products to distant cities. Finally, by making travel easier, railroads encouraged country people to take distant city jobs. Also, railroads lured city dwellers to resorts in the countryside.

### Textile Industry

By 1800, several major inventions had modernized the cotton industry. In the process one invention led to another.

First the invention of flying shuttle, a boat-shaped piece of wood to which yarn was attached, doubled the work a weaver could do in a day. Later in 1764, a textile worker invented a spinning wheel he named after his daughter, spinning jenny, allowed one spinner to work eight threads at a time. Later many small adaptations to these developed a spinning mule. The spinning mule made thread that was stronger, finer, and more consistent than earlier spinning machines.

The spinning mule, and the power loom were bulky and expensive machines. They took the work of spinning and weaving out of the house. Wealthy textile merchants set up the machines in large buildings called factories, which multiplied the production several times within short duration.

### **Improvements in Engineering Techniques**

The mechanical engineers particularly played an important role in the improvement of machinery as well as its efficient use. They made use of iron and steel in place of wood to create complex machinery.

## **Causes of Industrial Revolution in England**

### **Small Population**

The small size of England's population, necessitated it to increase productivity as production levels could not cope with England's growing trade, also necessitated that new devices should be found out to keep production in line with the growing demand. The shortage of the labour force compelled; the owners to encourage and apply new mechanical devices.

### **Protestant Religion**

A factor which contributed to England's lead in the technological revolution was that the English scientists and engineers had a very practical bent of mind. This was a direct result of the presence of protestant religion, as it enabled people to ask questions instead of maintaining blind faith.

A sizable section of people possessed enterprising spirit and requisite technical qualities. Further this class of people also possessed organizing abilities and was accustomed to the handling of large enterprises and labour force. These people were willing to invest money for the discovery of new techniques and give a fair trial to these techniques.

### **Enormous Expansion in Overseas Trade of Britain**

During the seventeenth and eighteenth centuries Britain had established an extensive colonial empire and successfully established monopoly over trade in these markets.

The growing demand for the British goods in these markets gave a stimulus to the British manufacturers to take to machine methods. It is well known that the mechanical inventions of textile industry were invented to increase the production of cotton cloth which was in great demand in India. These inventions are sometimes spoken of as the primary cause of the Industrial Revolution. In reality, they were a secondary cause only. Machines for turning out cheap goods in large quantities are useless unless there is a market capable of absorbing the increased output. The market must come first; the inventions follow.

### **Availability of Capital**

The increasing inflow of capital which Britain accumulated out of profits of its growing trade enabled it to make invest greatly on machinery and buildings, which in turn contributed to new technological developments.

### **Social and Political Stability**

Britain not only enjoyed complete freedom of trade but also an insulated geographical location. This factor greatly helped in industrial revolution, as being cut-off from the mainland of Europe, England remained immune from wars and upheavals of Napoleonic conflicts and conditions remained quite stable in the country. These stable conditions enabled England to develop their industrial capacity without fear of battle, damage or loss of life.

This social stability prevailing in England encouraged the people to invest in sectors where they could hope to receive high dividend in future. This led to adoption of new techniques and promotion of new industries.

### **The Availability of Coal and Iron Mines Close to each Other**

The location of the coal and iron mines close to each other encouraged the English to evolve new techniques for the manufacture of iron and utilization of the coals.

### **The Agricultural Revolution**

*Please see previous chapter on pre-industrial society*

### **Better Means of Transport**

England possessed a far better network of means of transportation than any other country of Europe which greatly helped the industrial revolution. In this task the government played an important role which spent considerable amount on the improvement of roads and construction of canals.

In short, we can say that in comparison to other European countries England was more favourably placed in many respects and no wonder stole lead over them in the field of technological revolution and industrialization.

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**IMPACT OF INDUSTRIAL REVOLUTION**

Industrial revolution led to the rise of industrial capitalism and finance capitalism. Before the industrial revolution goods were produced at home with the help of simple and cheap tools which did not need much capital. But with the installation of big machines huge funds were needed and a class of capitalist made its appearance.

However, with the passage of time the industrial operations grew still more complex and enormous funds were needed which could not be provided by the capitalists from their individual resources. Therefore, they began to look towards investment bankers for these funds. This ushered in era of Finance Capital. Though the industrial revolution was majorly an economic phenomenon, it greatly affected the social and political life of the countries it was prevalent in.

**Social Impacts**

In the social sphere also the industrial revolution produced far-reaching consequences. In the first place, the growth of factory system resulted in the growth of new cities. Workers shifted to places near the factories where they were employed.

This resulted in the growth of a number of new cities like Leeds, Manchester, Birmingham and Sheffield in Britain, which soon became the centres of industry, trade and commerce.

Secondly, the rise of cities was accompanied by the growth of slums. Before the advent of industrial revolution, the industry was scattered throughout the country. Artisans generally worked in their cottages or shops and were not entirely dependent on trade for their livelihood. They often combined manufacturing and agriculture.

This was not possible after the growth of factories and the workers had to live at places near the factory. As a large number of workers had to be provided accommodation, long rows of small one-room houses without garden or other facilities were built.

With the emergence of new factories and growth in population the problem assumed more serious dimensions. The factory owners were mainly interested in amassing great fortunes and hardly paid any attention to the welfare and well-being of their workers. In the dark, dingy and dirty houses the workers fell easy prey to various types of diseases and often died premature deaths.

Thirdly, the extremely low wages paid by the factory owners made it difficult for them to make both ends meet. As a consequence they were often obliged to send their women and children to factories, where they worked on extremely low wages.

The industrialists preferred women and children also because they were easy to manage. This exploitation of women and children resulted in "stunned bodies, deformed backs, horribly twisted legs, sunken chests and savage natures."

Fourthly, the conditions of factory life were not conducive to healthy family life. The women were required to work in factories and mines for long hours and were hardly left with any time or energy to look after their household or children.

Further, as they lived in extremely congested quarters they also lost their qualities of modesty and virtue. Often women and children began to drink like men. This wrecked their health and made their life miserable.

Fifthly, industrial revolution led to sharp divisions in society. The society got divided into two classes—the bourgeois and the proletariat. The former consisted of factory owners, great bankers, small industrialists, merchants and professional men. They amassed great wealth and paid very low wages to the workers.

The other class consisted of labourers who merely worked as tools in the factories. With the passage of time the lot of the capitalist classes went on improving and that of the working classes went on deteriorating. This caused great social disharmony, and gave rise to sharp conflict between the capitalists and the workers.

### Political Impact

In the political sphere also the industrial revolution had manifold impact. In the first place it led to colonization of Asia and Africa. Great Britain and other industrial countries of Europe began to look for new colonies which could supply them the necessary raw materials for feeding their industries and also serve as ready market for their finished industrial products. Therefore, the industrial countries carved out extensive colonial empires in the nineteenth century.

In fact these countries added so much territory to their empire that one historian has described it as "the greatest land grab movement in the history of the world." It is well known that colonialism produced adverse effects on the local people and resulted in their ruthless exploitation. However, it cannot be denied that it also paved the way for the industrialization of these territories because the European colonizers set up certain industries in these areas.

Secondly, industrial revolution sharply divided the countries. The industrially advanced countries which possessed necessary finances and technical know-how, invested their surplus capital in the backward countries and fully exploited their resources and crippled their industries. Thus the world came to be divided into two groups—the developed and the underdeveloped world, which is a cause of great tension even at present.

Thirdly, as a result of the Industrial Revolution a large number of Europeans went across the oceans and settled down in America and Australia and contributed to the Europeanization of these countries. It has been estimated that as against 145,000 people which left Europe in 1820's, over 9 million people left Europe between 1900 and 1910.

Fourthly, the Industrial Revolution provided a fillip to the reform movement in England. A number of Factory Laws were enacted to improve the lot of the workers between 1833-45 which tried to limit the working hours for children under eleven-years of age to 9 hours a day and that of women to 12 hours a day. These Acts also prohibited employment of children in mines and laid down general rules for the health and safety of workers.

With the setting up of factories in northern parts of England larger number of people shifted from south and their population greatly declined. However, these de-populated cities continued to send same number of representatives to the Parliament whereas the new industrial towns were not represented in the Parliament. This led to demand for redistribution of seats.

A movement known as Chartist Movement was launched to demand reforms for improving the lot of workers and for introduction of universal suffrage, secret voting, equal electoral districts, no property qualifications for membership, payment of members, and annual elections.

Though these demands did not receive favourable response from the government but in course of time these demands were conceded one by one. In this way we can say that the Industrial Revolution strengthened forces of democracy in England.

Fifthly, the industrial revolution led to a strong trade union movement.

The working men in various trades and industries formed trade union to protect themselves against their employers. Though initially the English law forbade these unions but ultimately they were accorded recognition by law in 1824. However, the trade unions could not prove effective as they were divided and lacked national unity.

It was only towards the close of the nineteenth century that the General Federation of British Trade Union was established which established friendly relations with the unions of other European countries. Thus by the close of the nineteenth century the trade unions came to occupy important position in the political and economic structure of the society.

Finally, industrial revolution paved the way for the development of new social and economic doctrines.

While philosophers like Malthus, Ricardo and James Mill defended capitalist system and wanted the state to abstain from interfering in the economic and social sphere, on the other hand philosophers like Robert Owen, Karl Marx, William Godwin, Proudhon etc. advocated creed of socialism and insisted that the whole society ought to strive for the improvement of the moral and physical standards of the people. Robert Owen, a mill-owner, set up in his industries co-operative communities in which families could share in work and enjoyment of its products.

But more concrete contributions towards the development of socialism were made by Karl Marx who examined the reports of the Parliamentary Commissions on effects of industrial revolution and came to the conclusion that the only solution lay in socialization of means of production, the abolition of the rule of capitalists and transfer of power to hitherto powerless proletariat.

## Industrial Revolution and Capitalism

Industrialization led to the decline of feudalism in Europe. A new system of society called Capitalism arose in its place. It was an economic system in which the means of production and distribution were privately owned and operated for profit. This system gave rise to two new social classes one was that of the factory owners who owned the factories and employed and paid wages to factory workers.

They also controlled the sale of goods and their main aim was to make maximum profits. They controlled the sale of goods and their main aim was to make maximum profits. They controlled the 'capital' or the money and, hence, were called capitalists. They were a prosperous group of people and led luxurious lives. The other class comprised of workers who worked in factories. They lived in great hardship and were exploited by the factory owners.

Imperialism is the policy of extending political and economic control over a weak country by a powerful one. The phenomena gained strength in the nineteenth century AD, largely due to the Industrial Revolution.

A market for manufactured goods and sources for obtaining cheap raw materials for producing more goods were desperately needed. Areas to invest surplus capital were also required. This led the European nations to acquire colonies in the politically and militarily weak countries of Asia and Africa. These countries could easily be conquered by the powerful Europeans. They provided a good opportunity for the investment of surplus capital. Besides, Asia and Africa were well provided with natural resources and had a huge potential to absorb finished goods.

	<b>Impact of Industrial Revolution</b>
<b>Size of Cities</b>	<ul style="list-style-type: none"> <li>• Growth of factories, bringing job seekers to cities</li> <li>• Urban areas doubling, tripling, or quadrupling in size</li> <li>• Factories developing near sources of energy</li> <li>• Many new industrial cities specializing in certain industries</li> </ul>
<b>Living Conditions</b>	<ul style="list-style-type: none"> <li>• No sanitary codes or building controls</li> <li>• Lack of adequate housing, education, and police protection</li> <li>• Lack of running water and indoor plumbing</li> <li>• Frequent epidemics sweeping through slums</li> <li>• Eventually, better housing, healthier diets, and cheaper clothing</li> </ul>
<b>Working Conditions</b>	<ul style="list-style-type: none"> <li>• Industrialization creating new jobs for workers</li> <li>• Workers trying to keep pace with machines</li> <li>• Factories dirty and unsanitary</li> <li>• Workers running dangerous machines for long hours in unsafe conditions</li> <li>• Harsh and severe factory discipline</li> <li>• Eventually, higher wages, shorter hours, and better working conditions</li> </ul>
<b>Emerging Social Classes</b>	<ul style="list-style-type: none"> <li>• Growing middle class of factory owners, shippers, and merchants</li> <li>• Upper class of landowners and aristocrats resentful of rich middle class</li> <li>• Lower middle class of factory overseers and skilled workers</li> <li>• Workers overworked and underpaid</li> <li>• In general, a rising standard of living, with some groups excluded</li> </ul>

The Industrial Revolution was a mixed blessing. It had both advantages and disadvantages.

### **Advantages**

- (i) Centre of economic life shifted from the villages to cities and towns where the factories were situated.
- (ii) Urban (cities) and rural (villages) life became dependant upon one another. Isolated life of self-sufficient villages came to an end.
- (iii) Men became free to develop their capabilities in areas other than farming.
- (iv) It brought countries and people together. There was an international awareness among people because developments in one country influenced the others.
- (v) The aristocracy and nobility with their feudal ideas were replaced by the newly rich middle class capitalists (bourgeoisie) who also became politically powerful.
- (vi) Better transport, communications and mechanized goods made life comfortable for man.



### Disadvantages

- (i) Cities became crowded, smoky, with problems of slums, housing, sanitation, accidents and epidemics.
- (ii) Women and child labour was badly exploited.
- (iii) Workers suffered from long working hours, low wages, and unemployment, unsafe conditions of work, with no rights to vote strike or form trade unions.
- (iv) Society, became divided into rich and poor, the 'Haves' and the 'Have- Nots'.
- (v) It led to wars of imperialism and colonization.

### Impact on India

#### Change in the Nature of Trade

The Industrial Revolution in England impacted the nature of trade of the British in India.

In a word, the Industrial Revolution transformed India into a country that supplied raw-materials to the industrial houses of Britain.

Prior to the Industrial Revolution British traders purchased cotton piece- goods and other handicraft items from India. And used to net huge profit by selling those in the European markets.

With the Industrial Revolution Britain started manufacturing various articles in a short time. For the manufacture of such articles huge raw-materials were needed.

Thus they procured raw-materials from India at a cheap price.

And at the same time Britain flooded the Indian markets with the machine-made products produced in British factories.

### Conclusion

Despite the problems that followed industrialization, the Industrial Revolution eventually had a number of positive effects. It created jobs for workers. It contributed to the wealth of the nation. It fostered technological progress and invention. It greatly increased the production of goods and raised the standard of living. Perhaps most important, it provided the hope of improvement in people's lives.

The Industrial Revolution produced a number of other benefits as well. These included healthier diets; better housing; and cheaper, mass-produced clothing. Because the Industrial Revolution created a demand for engineers as well as clerical and professional workers, it expanded educational opportunities. The middle and upper classes prospered immediately from the Industrial Revolution. For the workers it took longer, but their lives gradually improved during the 1800s. Labor eventually won higher wages, shorter hours, and better working conditions.

Between 1700 and 1900, revolutions in agriculture, production, transportation, and communication changed the lives of people in Western Europe and the United States. Industrialization gave Europe tremendous economic power. Much of Europe was gaining the capability to produce many goods faster and more cheaply. In contrast, the economies of Asia and Africa were still based on agriculture and small workshops.

The industrialization that took place in the 1700s and 1800s revolutionized every aspect of society, from daily life to life expectancy. Despite the hardships early urban workers suffered, population, health, and wealth eventually rose dramatically in all industrialized countries. The development of a middle class created great opportunities for education and democratic participation. Greater democratic participation, in turn, fuelled a powerful movement for social reform.

The long-term effects of the Industrial Revolution are still evident. Most people today in the industrialized countries can afford consumer goods that would have been considered luxuries fifty or a hundred years ago. Further, their living and working conditions are much improved over those of workers in the 19th century.

Even today, the economic pressures of industrialization frequently lead to the overuse of natural resources and the abuse of the environment. The profits derived from industrialization, however, permit thoughtful governments to invest in urban improvements.