

The Chief Features of the Industrial Revolution

The following passage is a clear and detailed account of the historical process known the Industrial Revolution, which brought about such radical changes in nineteenth century England and in the western world. Note that it was written a hundred years ago.

The essence of the Industrial Revolution is the substitution of competition for the mediaeval regulations which had previously controlled the production and distribution of wealth. On this account it is not only one of the most important facts of English history, but Europe owes to it the growth of two great systems of thought — Economic Science, and its antithesis, Socialism. The development of Economic Science in England has four chief landmarks, each connected with the name of one of the four great English economists. The *first* is the publication of Adam Smith's *Wealth of Nations* in 1776 in which he investigated the causes of wealth and aimed at the substitution of industrial freedom for a system of restriction. The production of wealth, not the welfare of man, was what Adam Smith had primarily before his mind's eye; in his own words, "*the great object of the Political Economy of every country is to increase the riches and power of that country*". His great book appeared on the eve of the Industrial Revolution. A second stage in the growth of the science is marked by Malthus' *Essay on Population*, published in 1798, which may be considered the product of that revolution, 20 then already in full swing. Adam Smith had concentrated all his attention on a large production; Malthus directed his inquiries, not to the causes of wealth but to the causes of poverty, and found them in his theory of population. A third stage is marked by Ricardo's *Principles of Political Economy and Taxation*, which appeared in 1817, and in which Ricardo sought to ascertain the laws of the distribution of wealth. Adam Smith had shown how wealth could be produced under a system of industrial freedom, Ricardo showed how wealth is distributed under such a system, a problem which could not have occurred to any one before his time.

The fourth stage is marked by John Stuart Mill's *Principles of Political Economy*, published in 1848. Mill himself asserted that "*the chief merit of his treatise*" was the distinction drawn between the laws of production and those of distribution, and the problem he tried to solve was, how wealth ought to be distributed. A great advance was made by Mill's attempt to show what was and what was not inevitable under a system of free competition. In it we see the influence which the rival system of Socialism was already beginning to exercise upon the economist. The whole spirit of Mill's book is quite different from that of any economic works which had up to his time been written in England. Through a restatement of Ricardo's system, it contained the admission that the distribution of wealth is the result of "*particular social arrangements*", and it recognised that competition alone is not a satisfactory basis of society. (...)

Coming to the facts of the Industrial Revolution, the first thing that strikes us is the far greater rapidity which marks the growth of population. Before 1751 the largest decennial increase, so far as we can calculate from our imperfect materials, was 3 per cent. For each of the next three decennial periods the increase was 6 per cent.; then between 1781 and 1791 it was 9 per cent.; between 1791 and 1801, 11 per cent.; between 1801 and 1811, 14 per cent.; between 1811 and 1821, 18 per cent. (...)

Next we notice the relative and positive decline in the agricultural population. In 1811 it constituted 35 per cent. of the whole population of Great Britain; in 1821, 33 per cent.; in 1831, 28 per cent. And at the same time its actual numbers have decreased. (..)

An agrarian revolution plays as large part in the great industrial change of the end of the eighteenth century as does the revolution in manufacturing industries, to which attention is more usually directed. Our next inquiry must therefore be: What were the agricultural changes which led to this noticeable decrease in the rural population? The three most effective causes were: the destruction of the common-field system of cultivation; the enclosure, on a large scale, of common and waste lands; and the consolidation of small farms into large. We have already seen that while between 1710 and 1760 some 300,000 acres were enclosed, between 1760 and 1843 nearly 7,000,000 underwent 70 the same process. Closely connected with the enclosure system was the substitution of large for small farms. In the first half of the century Laurence, though approving of consolidation from an economic point of view, had thought that the odium attaching to an evicting landlord would operate as a strong check upon

it. But these scruples had now disappeared. Eden in 1795 notices how constantly the change was effected, often accompanied by the conversion of arable to pasture; and relates how in a certain Dorset shire village he found two farms where twenty years ago there had been thirty. The process went on uninterruptedly into the present century. Cobbett, writing in 1826, says: "*In the parish of Burghclere one single farmer holds, under Lord Carnarvon, as one farm, the lands that those now living remember to have formed fourteen farms, bringing up in a respectable way fourteen families.*" The consolidation farms reduced the number of farmers, while the enclosure drove the labourers off the land, as it became impossible for them to exist without their rights of pasturage for sheep and geese on common lands.

Severely, however, as these changes bore upon the rural population, they wrought, without doubt, distinct improvement from an agricultural point of view. They meant the substitution of scientific for unscientific culture. "*It has been found,*" says Laurence, "*by long experience, that common or open fields are great hindrances to the public good, and to the honest improvement which every one might make of his own.*" Enclosures brought an extension of arable cultivation and the tillage of inferior soils; and in small farms of 40 to 100 acres, where the land was exhausted by repeated corn crops, the farm buildings of clay and mud walls and three-fourths of the estate often saturated with water, consolidation into farms of 100 to 500 acres meant rotation of crops, leases of nineteen years, and good farm buildings. The period was one of great agricultural advance; the breed of cattle was improved, rotation of crops was generally introduced, the steam-plough was invented, agricultural societies were instituted. In one respect alone the change was injurious. In consequence of the high prices of corn which prevailed during the French war, some of the finest permanent pastures were broken up. Still, in spite of this, it was said in 1813 that during the previous ten years agricultural produce had increased by one-fourth, and this was an increase upon a great increase in the preceding generation.

Passing to manufactures, we find here the all-prominent fact to be the substitution of the factory for the domestic system the consequence of the mechanical discoveries of the time. Four great inventions altered the character of the cotton manufacture; the spinning-jenny, patented by Hargreaves in 1770; the water-frame, invented by Arkwright the year before; Crompton's mule introduced in 1779, and the self-acting mule first invented by Kelly in 1792, but not brought into use till Roberts improved it in 1825. None of these by themselves would have revolutionised the industry. But in 1769 - the year in which Napoleon and Wellington were born - James Watt took out his patent for the steam-engine. Sixteen years later it was applied to the cotton manufacture. In 1785 Boulton and Watt made an engine for a cotton-mill at Papplewick in Notts, and in the same year Arkwright's patent expired. These two facts taken together mark the introduction of the factory system. But the most famous invention of all, and the most fatal to domestic industry, the power-loom, though also patented by Cartwright in 1785, did not come into use, for several years, and till the power-loom was introduced the workman was hardly injured. At first, in fact, machinery raised the wages of spinners and weavers owing to the great prosperity it brought to the trade. In fifteen years the cotton trade trebled itself; from 1788 to 1803 has been called its "golden age"; for, before the power-loom but after the introduction of the mule and other mechanical improvements by which for the first time yarn sufficiently fine for muslin and a variety of other fabrics was spun, the demand became such that "*old barns, cart-houses, out-buildings of all descriptions were repaired, windows broke through the old blank walls, and all fitted up for loom-shops; new weavers' cottages with loom-shops arose in every direction every family bringing home weekly from 40 to 120 shillings per week.*" At a later date, the condition of the workman was very different. Meanwhile, the iron industry had been equally revolutionised by the invention of smelting by pit-coal brought into use between 1740 and 1750, and by the application in 1788 of the steam-engine to blast furnaces. In the eight years which followed this later date, the amount of iron manufactured nearly doubled itself.

A further growth of the factory system took space independent of machinery, and owed its origin to the expansion of trade, an expansion which was itself due to the great advance made at this time in the means of communication. The canal system was being rapidly developed throughout the country. In 1777 the Grand Trunk canal, 96 miles in length, connecting the Trent and Mersey, was finished; Hull and Liverpool were connected by one canal while another connected them both with Bristol; and in 1792, the Grand Junction canal, 90 miles in length, made a water-way from London through Oxford to the chief midland towns. Some years

afterwards, the roads were greatly improved under Telford and Macadam; between 1818 and 1829 more than a thousand additional miles of turnpike road were constructed; and the next year, 1830, saw the opening of the first railroad. These improved means of communication caused an extraordinary increase in commerce, and to secure a sufficient supply of goods it became the interest of the merchants to collect weavers around them in great numbers, to get looms together in a work-shop, and to give out the warp themselves to the workpeople. To these latter this system meant a change from independence to dependence; at the beginning of the century the report of a committee asserts that the essential difference between the domestic and the factory system is that in the latter the work is done "*by persons who have no property in the goods they manufacture.*" Another direct consequence of this expansion of trade was the regular recurrence of periods of over-production and of depression, a phenomenon quite unknown under *the old system*, and due to this new form of production on a large scale for a distant market.

These altered conditions in the production of wealth necessarily involved an equal revolution in its distribution. In agriculture the prominent fact is an enormous rise in rents. Up to 1795, though they had risen in some places, in others they had been stationary since the Revolution. But between 1790 and 1833, according to Porter, they at least doubled. In Scotland, the rental of land, which in 1795 had amounted to £ 2,000,000, had risen in 1815 to £ 5,278,685. A farm in Essex, which before 1793 had been rented at 10s. an acre, was let in 1812 at 50s., though, six years after, this had fallen again to 35s. In Berks and Wilts, farms which in 1790 were let at 14s., were let in 1810 at 70s., and in 1820 at 50s. Much of this rise, doubtless, was due to money invested in improvements — the first Lord Leicester is said to have expended £ 400,000 on his property — but it was far more largely the effect of the enclosure system, of the consolidation of farms, and of the high price of corn during the French war. Whatever may have been its causes, however, it represented a great social revolution, a change in the balance of political power and in the relative position of classes. The farmers shared in the prosperity of the landlords; for many of them held their farms under beneficial leases, and made large profits by them.

In consequence, their character completely changed; they ceased to work and live with their labourers, and became a distinct class. The high prices of the war time thoroughly demoralised them, for their wealth then increased so fast, that they were at a loss what to do with it. Cobbett has described the change in their habits, the new food and furniture, the luxury and drinking, which were the consequences of more money coming into their hands than they knew how to spend. Meanwhile, the effect of all these agrarian changes upon the condition of the labourer was an exactly opposite and most disastrous one. He felt all the burden of high prices, while his wages were steadily falling, and he had lost his common-rights. It is from this period, viz, the beginning of the present century, that the alienation between farmer and labourer may be dated. Exactly analogous phenomena appeared in the manufacturing world. The new class of great capitalist employers made enormous fortunes, they took little or no part personally in the work of their factories, their hundreds of workmen were individually unknown to them; and as a consequence, the old relations between masters and men disappeared, and a "cash nexus" was substituted for the human tie. The workmen on their side resorted to combination, and Trades-Unions began a fight which looked as if it were between mortal enemies rather than joint producers. The misery which came upon large sections of the working people at this epoch was often, though not always, due to a fall in wages, for, as I said above, in some industries they rose. But they suffered likewise from the conditions of labour under the factory system, from the rise of prices, especially from the high price of bread before the repeal of the corn-laws, and from those sudden fluctuations of trade, which, ever since production has been on a large scale, have exposed them to recurrent periods of bitter distress. The effects of the Industrial Revolution prove that free competition may produce wealth without producing well-being. We all know the horrors that ensued in England before it was restrained by legislation and combination.

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