
UNIT 9 INDUSTRIAL CAPITALISM IN ENGLAND

Structure

- 9.0 Objectives
- 9.1 Introduction
- 9.2 The Importance of the Industrial Revolution of the Eighteenth and Early Nineteenth Centuries
- 9.3 A Background to the Rise of Industrial Capitalism in Eighteenth and Early Nineteenth Centuries England
 - 9.3.1 Commercial Production – Nature
 - 9.3.2 Population Increases
 - 9.3.3 Supply of Capital
- 9.4 Manufacturing Industry
 - 9.4.1 Innovation and its Impact
 - 9.4.2 Social Stimulus to Entrepreneurship
 - 9.4.3 Consequences
- 9.5 Markets And Demand
 - 9.5.1 The Role of the State
- 9.6 Rehabilitating the Industrial Revolution
 - 9.6.1 The Gradualist Argument and Its Critics
- 9.7 Consolidation of Industrial Capitalism After 1840
 - 9.7.1 The Importance of Railways
 - 9.7.2 Innovations
 - 9.7.3 Capital
 - 9.7.4 Competition and the Colonial Market
- 9.8 Let Us Sum Up
- 9.9 Keywords
- 9.10 Answers to Check Your Progress

9.0 OBJECTIVES

After reading this Unit, you should be able to :

- understand how certain historians have chosen to correct the emphasis on 18th and 19th Century England as a significant period for industrial revolution,
- understand why even these historians are correct on the whole in seeing the 18th and early 19th century as a decisive period for the growth of industrial capital in England,
- understand the importance of the agricultural revolution preceding the industrial revolution in seventeenth and early eighteenth century,
- understand how the interlinkages of supply of capital, various modes of manufacture, innovation, trade and market in the eighteenth and early nineteenth centuries gave a fillip to the growth of industrial capital, and
- understand how after 1840 with the emergence of newly industrialising nations like Germany and U.S.A., the character of industrialisation took a new turn.

9.1 INTRODUCTION

In the history of the rise of industrial capitalism, it has been England that has held pride of place. This was the "first industrial nation", and, as mentioned above, it has even become customary to regard all other "industrializations" as determined by what was seen in England. Since England has such a special place in the origins of industrial capitalism, this Unit pays special attention to the beginnings of industrialization there. It is divided into two sections: (i) the industrial revolution (c.1740-1840) (ii) the consolidation and crisis of industrial capitalism in the mid and late nineteenth century.

9.2 THE IMPORTANCE OF THE INDUSTRIAL REVOLUTION OF THE EIGHTEENTH AND EARLY NINETEENTH CENTURIES

In the economic history of industrial capitalism in England, discussions always focus on the Industrial Revolution of the eighteenth and early nineteenth centuries. There can be no doubt, as historians and economists have shown, that it was here, and at this time, more than elsewhere in Europe, that industrial capital became a major factor in economic, social and political life, leading to "revolutionary" changes and making for an "Industrial Revolution".. Other European regions were to follow, but their path would always be influenced by the existence of "the first industrializer".

True, following in the footsteps of earlier researchers such as Paul Mantoux (1928), G. Unwin (1927), W. Ashley (1914) John Clapham (1926-38) and others, many influential "revisionist" scholars of the recent past have attempted to alter this version of what happened. They accept the view, put forward by Mantoux, that "in spite of the apparent rapidity of its development, the industrial revolution sprang from far-distant causes". More crucially, they have gone further in the direction of Heaton (1932) who has questioned the validity of the term "revolution" in this context: "a revolution which continued for 150 years and had been in preparation for at least another 150 years may well seem to need a new label". They have stressed that, at the time of the "revolution", the influence of industrial capital in England was limited to a few industries and a few regions. They have said that the rising authority of industrial capital in England cannot be regarded as a "revolution" (even an "industrial" revolution). Others have also pointed out that "enclaves" existed in Europe where industrial capital was becoming as important as it was in regions of England. Such writing coincides with the work, mentioned above, of Fernand Braudel, which associates European capitalism with a long term process which cannot be easily tied to specific periods or countries. Immanuel Wallerstein, also mentioned earlier, has also spoken of the connections between capitalism and a "world system", with Europe as its centre, which developed from the fifteenth century.

Taken together, this picture implies that it is incorrect to exaggerate the importance of the activities of industrial capital in England of a specific period or its significance for the development of industrial capitalism in Europe. This is a useful corrective to established histories of industrial capitalism in England and Europe. But, in recent debate, British historians Maxine Berg and Pat Hudson, have correctly "rehabilitated" the idea that industrial capital in England became a decisive feature of the country in the eighteenth and early nineteenth centuries. They have also "rehabilitated" the notion that economic developments in the eighteenth century in England were "revolutionary" and constituted "an Industrial Revolution".

Such "rehabilitation" does not affect aspects of industrial capitalism in Europe which "revisionist" historians did not choose to dispute. These aspects include notions that the productivity of industrial capital improved faster in eighteenth century and early nineteenth century England than they did anywhere else in Europe. Also that leading English manufacturers developed these changes without any "model" before them, guided often by their own failures and the failures of many around them. The persistence of these notions left untouched the idea that the "industrial revolution" period in England had a special significance for the growth of industrial capitalism in Europe. The "rehabilitation", though, by British historians of the Industrial Revolution in England, restores exceptional stress to the importance for Europe of what took place there.

9.3 A BACKGROUND TO THE RISE OF INDUSTRIAL CAPITALISM IN EIGHTEENTH AND EARLY NINETEENTH CENTURIES ENGLAND

Among the many factors that were responsible for the development of industrial capitalism in England, and the "industrial revolution", was the "agricultural revolution", which grew out of the commercial agriculture of the seventeenth and early eighteenth centuries. At this earlier

time, in English agriculture, cultivation was by and large market oriented. It was also specialized according to the convenience of soil, climate, location and product. Prices for livestock and livestock products did not warrant specialization in the latter. Crop cultivation was a little different and had a regional bias although overall it was directed at foodstuff and fodder production, where most farms registered an interest in livestock raising as well as in the growing of cereals. There was special stress in wheat production in East Anglia, Essex, Kent, Dorset, parts of the Midlands and Monmouth, Hereford and Pembrokeshire. Barley was the special crop of Cambridgeshire, Hertfordshire, Berkshire, Wiltshire and parts of Yorkshire; and in Northumberland, Durham, Lancashire, Cheshire, Derbyshire, Nottinghamshire and Lincolnshire, oats cultivation had pride of place. Although such divisions coincided with dietary preferences, specialization was more often linked to other factors: the clay soils of the Midlands were ideal for wheat production, for instance. There was much production for the market, for exchange between regions, as well as sale to centres of industrial and commercial concentration, such as London.

9.3.1 Commercial Production – Nature

Commercial production was primarily on the farms of the large tenants of greater and lesser landowners. These proprietors (the Howards, Talbots and other less eminent squires), were not concerned with the productivity of their land as much as the rent it yielded, but they instituted major improvements in order to assure themselves of high rents. They worked with a variety of tenants, some of whom had tenancies for life, and some of whom were cotters (i.e. tenants who could be evicted at will). A number of freeholders (who paid a small quitrent to a proprietor to be "free" of his demands) and copy holders (whose rights depended on copies of manorial rolls they possessed) existed on such estates, and they rented additional land from such estates to supplement their holdings. In all this, about half the land of the country, in a belt from Hampshire and stretching to Yorkshire, was still held in strips in open fields, where a three-field rotation operated. Here, crops were grown on two fields (often sown with different crops in different seasons) and the third field was left fallow, for recovery from soil exhaustion. Meadow and pasture were held in common, and the system had the advantage of enforcing a cultivation cycle and overcoming problems of location. It was undoubtedly a flexible system, where rotation of crops could be varied, but it discouraged individual initiatives, especially in drainage, since strips were small.

In such circumstances, where capital was often tied up in agriculture, and substantial profits could or did accrue from cultivation, either as rent or as outright profit, transfer of capital from agriculture to industry was a major requirement of the rise of industrial capitalism in the country. Equally important for the rise of industrial capitalism was the improvement in agricultural productivity and the ample availability of food for seasonal and perennial industrial labour. Such improvement was initially the result of reorganization of cultivation; but from the end of the eighteenth century, improvement was also the result of the application of industrial technology to cultivation. In the first of these cases, transfer of capital to industry could be observed piecemeal over the course of the eighteenth century and early nineteenth century, as investments took place in mining among the great estate owners of the north and the Midlands; arrangements for letting out urban real estate were also noticeable. The second case involved the development of changes in the technology of production and adequate means to ensure that such changes were widely implemented.

Here, many technological innovations necessary for improved productivity had been in use from the end of the seventeenth century. Crucial among these was the introduction into a crop rotation of root crops and legumes (mangelwurzels, beetroot, clover, sainfoin etc.), which reinvigorated the soil, and allowed farmers to forgo the necessity of leaving it uncultivated (fallow) to avoid soil exhaustion. Mixing marls (soil which was a mixture of carbonate of lime and clay) in sandy soil, as a fertilizer, also became the established practice on some estates at this time. The improvements were associated with Viscount Townshend, Thomas Coke (Earl of Leicester) and Lord Lovell, who showed, thereby, how to increase fodder and food supply, as well as land under regular cultivation. They developed centres of display (their estates at Woburn, Petworth, and Wentworth), and their achievements were joined by those of midland proprietors (such as Robert Bakewell), who developed breed sheep and cattle.

Upto the middle of the eighteenth century, such techniques received wide application as great tenants, who were commercially minded, increased land under their cultivation. Small holdings were systematically enclosed through Acts of Parliament. Some of this was the

result of changes in the status of the tenant. For great proprietors, in their search for higher rents ceased to allow tenancies for life, and increased rents at regular intervals, demanding, thereby, greater market-orientation from those who held land. They also bought out freeholders and copy holders where they could, and they thus provided more land for short-term tenancies. "Enclosure" of land which was held in common or cultivated in open fields, and which belonged to large properties, was initially piecemeal and the result of agreements with tenants at times of low harvests and high prices of food. Strips and commons were consolidated to introduce improvements and increase productivity to preserve income levels. This also was to release a sizable sections of rural population for industrial labour.

Increases in population and large-scale manufacture, as well as the growth in the size of towns, during the mid-eighteenth century, established that higher profits were to be obtained through commercial farming. When this coincided with times of high foodstuff prices, enclosures by Acts of Parliament were undertaken in large number from around 1759. After that year, until 1781, the number of Acts of Enclosure seldom fell below thirty, and the years of maximum activity centred around periods of high food prices (1764-65, 1770-74, 1777 etc.). For such Acts, public meetings were called, a draft private bill was framed, it was eventually sent to a Parliamentary Committee, who passed an Act and appointed Commissioners who assessed land value before and after enclosure, establishing an amount which was to be used for improvement and assistance to the poor who were affected by the redistribution.

In such circumstances, although reliable figures are difficult to establish, "it is beyond doubt that annual production rose considerably in the second half of the century" (T.S. Ashton). This trend continued into the first decades of the nineteenth century, when, in the 1830s, it was reinforced by further scientific inputs into farming. For the latter, the activities of the Royal Agricultural Society, founded in 1838, were partly responsible. But there were other signs of major improvement: under-drainage, which was necessary for cultivation of heavy clayland, was begun extensively in the 1820s; and extensive use of fertilizer became noticeable in the 1840s.

In the circumstances, corn output in England and Wales increased from 14.8 million quarters at the beginning of the century to 21.1 million in 1800. A portion of this came from the increased land under cultivation; and a portion from the increased intensity of cultivation, as a result of which, for instance, yield of wheat per acre increased by roughly a third during the second half of the eighteenth century. In the case of animal husbandry, there are disputes concerning the increases in the size and number of sheep and cattle that were reared and sold. It is difficult to speak of a substantial increase in the availability of meat, especially since epidemics (as in 1745), and droughts (as in 1730) struck. Under the "high farming" of the 1830s and 1840s, cattle breeding and dairy orientation in farming became more common.

Many industries benefited directly from the changes in agricultural output. Obviously, milling and baking took the lead, but a large portion of the wheat and barley crop also went to distilling (for the production of beer and whisky) and also for the production of starch. Clearly, increases in the supply of animal products led to output of wool and tallow.

9.3.2 Population Increases

Clearly associated with rises in agricultural output, and a crucial factor in the growth of industrial capitalism, was the increase in population over the eighteenth century. At the time, the methods of increasing consumption in a stable population were comparatively limited; and technological innovation had not yet created the concentration of labour and population which might maintain "self-sustained growth". The increase in demand and labour that a growing population supplied were crucial to the development of industrial capitalism; and substantial growth in population undoubtedly did take place over the century, from c 5.83 million in England and Wales in 1701 to 9.16 millions in 1801

How such growth took place and what its impact was, however, is a subject of the following debate. The source which underlies all estimates are the parish registers of baptism and burial for the period: registers which are often considered far from reliable in determining actual birth and death at any time, their accuracy varying from occasion to occasion. Disputes over

- But the significance of the increase in the birth rate for population growth has been enhanced by various research. Some show that prosperity could lead to larger families. Other research shows that the social effect of improvements in medical facilities in the eighteenth century have been exaggerated. Concretely, though, no suggestion is wholly able to establish the ascendancy of the birth rate hypothesis, since this requires a more solid justification than the parish registers can provide.

With a pick up of commercial activity in agriculture and industry, such "bankers" were joined by various country banks which were set up during periods of expanding trade after mid-century (e.g. 1750-3, 1762, 1765-6, 1770-3 and 1789-92). These organizations were small, depended on a set of local industries, and had one office. They were also backed by London banks in times of difficulty. A network existed, therefore, for redistributing resources at the time that manufacturing industry increasingly came to require it, in the middle years and last quarter of the eighteenth century.

1) What exactly were the 'revisionist' historians disputing?

[illegible]

- 2) How did agricultural revolution help the development of industrial capitalism?

.....

.....

.....

.....

.....

- 3) Have historians been able to clearly demonstrate increase in the 'birth-rate' as the criteria for population growth in the 17th or 18th centuries?

.....

.....

.....

.....

.....

- 4) What were the sources of capital for the early entrepreneurs?

.....

.....

.....

.....

.....

9.4 MANUFACTURING INDUSTRY

The manufacturing units that absorbed the consequences of many of these changes were established in England in various regions according to advantages of location and resources. This was inevitable in the case of mining. Tin was mined in Cornwall, lead in Cumberland, West Durham and Derbyshire, while clay for the potteries was primarily found in Staffordshire and coal in the colliery areas of Shropshire, Worcestershire, Staffordshire, Yorkshire and South Wales. Iron ore was mined in the colliery regions after Abraham Darby began smelting ore with coke in 1709. Trading centres, meanwhile, were concentrations of industry. This was especially the case with London, which was not only known for its corn-mills, breweries, distilleries and tanneries, but also as a centre of fashion-goods production, and manufacture of coaches, furniture, millinery, silverware and jewellery. Elsewhere, Bristol built ships, and was active in refining West Indian goods (sugar, tobacco) and had thriving units for the manufacture of glass, pottery and brass. Shipyards were to be found in Liverpool (known also for a range of manufactured goods); and in Newcastle, where there were also steel furnaces and workshops for anchors, chains, picks, shovels and cutlery.

The structure of such enterprise varied. In one form, the skilled artisan could work at home or in a nearby shop, owning his tools and stock-in-trade and selling his product on the market; often he employed an apprentice and one or two journeymen, and sometimes he put out work to other men in the same trade.

Another form could be a larger enterprise, typically in textile industry, with a cluster of buildings for spinning, weaving, dyeing, storage, and finally for living quarters for the master and his family. Yet another was "putting out," especially in the wollen industry. Yarn was "put out", or handed over to spinners and weavers, who then worked at home and brought the

finished product to the owner. Putting out could occur over a very wide radius, upto 150 miles, for example from London as far as Westmoreland in the north.

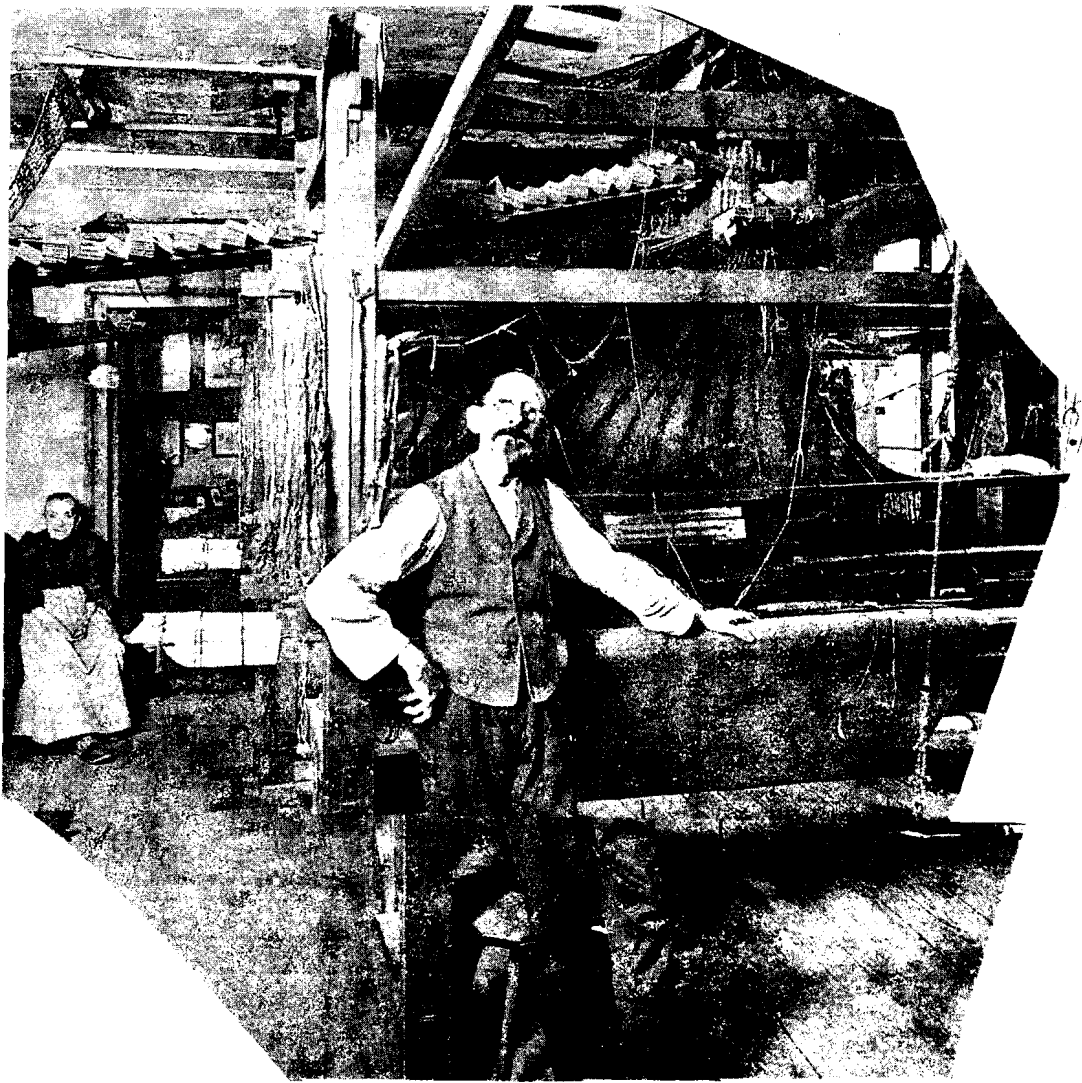


Fig. 1 : The Home Based Artisan : A Weaver at Work at Home in England

9.4.1 Innovation and its Impact

Over the eighteenth century, such manufacturing industry reacted to the factors mentioned above (growing availability of agricultural foodstuffs, and labour etc.) and also to considerable technological innovation. The most famous inventions are well known:

- for the textile industry, most significant were Kay's flying shuttle (1733), which increased the pace of weaving, Arkwright's Spinning Jenny (1769), and later more advanced innovations which further revolutionized spinning, i.e. Crompton's "mule" of 1779 Arkwright's water frame of 1785 and (for weaving), Cartwright's Power Loom of 1785.
- in the coal and iron industry, the development of coke by Abraham Darby (1709) and the use of "puddling" and hammering by Cort, allowed the use of the country's large reserves of coal for iron smelting. Hitherto, the consequences had been production of brittle iron, full of impurities, which broke easily. This required use of charcoal (which was in short supply) for smelting. The innovations, on the other hand, in the case of coke, altered the quality of coal, while other innovations permitted the quick removal of impurities.
- the application of steam power to production through the Newcomen Engine (1705-06) and, more significantly, James Watt's engines, allowed the running of large wooden and metal machines which permitted the entrepreneur to undertake major economies of resources.



Fig. 2 : The Face of the Early British Industrial Revolution : A Family at the Ironforge

To these were added the infinite number of small inventions constantly improving machines and speeding up business.

The results were impressive. The innovations led to economies in various aspects of the for production, for instance, was extensive before the introduction of machines based on atmospheric force or steam power; it led to major investments in horses, their maintenance, and in "dams, ponds, culverts, troughs and water wheels". The use of the atmospheric engine avoided some of these investments, as did the rotary engine of James Watt when it replaced the water-wheel as a "prime-mover" in machinery. Such innovation also gave the entrepreneur greater flexibility: he no longer had to have large supplies of water for his machines. Again, the major fall in iron prices allowed the use of cheap iron instead of expensive copper or brass in machinery; it also permitted the replacement of timber by the more durable iron in construction.

Crucial was the economy in time. As Sir John Barnard, a merchant, advised: "Above all things learn to put a due value on Time, and husband every moment as if it were to be your last: in Time is comprehended all we possess, enjoy or wish for; and in losing that we lose them all." (*A present for an Apprentice* [1741]). Ending "putting out" did just that; now the factory was the centre of production, and the production process was at the entrepreneur's finger tips. Overall, the inventions at this time led to "economies of scale", i.e. producing more in such a way that the cost per unit fell.

9.4.2 Social Stimulus to Entrepreneurship

It has been repeatedly pointed out that the character of British society stimulated the rise of entrepreneurship. The pursuit of wealth in trade and manufacture (or in the professions) led to the accumulation of fortunes which gave individuals rank and status. Utter rejection of such fortune as "tainted" was not a feature of English society, as it was in Europe. Nobles themselves invested in activities which linked their estates to manufacturing. This is certainly true of the proprietors of coal land.

Britain also possessed groups of Protestant "dissenters", such as the Quakers, who were well-knit, could depend upon each other for support and who distanced themselves from the landed gentry. These groups made a virtue of thrift, and focused their activity on trade. The Barclay family is an instance of such a type, and its contribution to banking is well known.

9.4.3 Consequences

The results of this for output of manufacturing industry were considerable. In the case of the coal industry, in the great northern field, exports increased by a factor of four between 1701-10 and 1791-1800. In Cornwall, in 1731-40, the average annual production of copper was 7,500 tons; but in the period 1794-1800, it was 48,000. In the iron industry, in 1720, the production of pig iron was around 25,000 tons; in 1788, estimates put it at 61,000, in 1796, 109,000 and in 1806, 227,000 tons. In the case of textiles, the number of pieces of broad cloth milled in Yorkshire averaged 34,400 in 1731-40, while in 1791-1800, the figure stood at 229,400. Between the 1700s and the 1790s, the output of printed cloths increased from 2.4 million yards to 25.9 million yards, and the value of exports of cotton goods rose from about 24,000 pounds annually in 1701 to 5,851,000 pounds in 1800.

9.5 MARKETS AND DEMAND

This growth depended on a combination of favourable circumstances in the foreign and home market for English goods. This has been outlined by M.W. Flinn as follows:

- i) production received some encouragement during the period before 1740 from a rise in income in northern England and Scotland, but this cannot be overstressed since only one third of the population lived in this area. The bulk of the rise in income, though, probably went on buying foodstuffs. Overseas demand rose, but only moderately. The importance of the period was that, in the case of the poorer population of the north, "even if, as yet, ... [their] rising real income was buying little in the way of manufactured goods, [their] rising real income was slowly leading [them] into the market for this type of expenditure". Overseas, a range of new products (textiles, metal goods and other manufactures) replaced the focus on wool in the country's exports.
- ii) after the 1740s, the growth in real wages declined but there was a substantial rise in the overseas market; while, after the Seven Years' War, decline in overseas demand was balanced by an increase in real wages. This see-saw motion repeated itself in the 1780s, when, after the American War of Independence, overseas markets recovered and rising prices bit into real wages. A persistence of low real wages among the poor, during the 1780s and 1790s, was compensated by increasing purchasing power among the middle and upper classes and by buoyant foreign demand. The latter was the consequence of the French Revolutionary Wars, during which England came to control the markets traditionally dependent on French products. This advantage was intensified during the Napoleonic Wars of 1805-1814, when the British government blockaded continental ports. This further reinforced British control of markets in the Americas.

In this course of affairs, although, at home, demand from the poorer classes undoubtedly led to increases in agricultural production and the transport industries which were linked to it, it was middle class demand that merits attention. It was a large class, proportionately larger than on the Continent. There was a long history to this development, but it created a market for substantial rather than fine goods, in other words, those suitable for machine production.

Remarkably, although the eighteenth century is associated with the origins of apologia for free trade and laissez-faire, the period was marked by major combinations of manufacturers who fixed prices and production. Hence, the industrial growth of the time cannot be delinked from this phenomenon. There is evidence of fulling mills, in 1707, near Huddersfield, which fixed times of work and minimum prices for their products, in consultation with each other. Iron masters of Furness decided the maximum they would pay for charcoal. In the 1760s, when demand for atmospheric engines increased, a common sales' policy was established by Abraham Darby and John Wilkinson. Combinations also existed between steel tilers, silver plate manufacturers, file smiths and tool makers.

True, some of these combinations were established by statute, indicating the interest shown by the British government in regulating the conditions of growth. These bodies were permitted

by law to control their members and their activities. This was true of the Cutlers' Company of Hallamshire and the Framework Knitters' Company. Old organizations with similar powers existed in the mining industries of Cornwall and Derbyshire, and in the Forest of Dean. But the greater number of combinations were thrown up by manufacturers themselves, and undoubtedly persisted into the nineteenth century, and that too on a national scale. T. S. Ashton points out:

"In 1785, the Cornish Metal Company and the Anglesey Company divided the market for copper in agreed proportions. And at the same time the regional organisations of iron masters, potters, Birmingham manufacturers and even the individualist cotton spinners, united in the General Chamber of Manufacturers to defend their common interests from the threat of taxation and competition from abroad. There must have been many hidden understandings and agreements of which there is no record. But often there was no need for secrecy. The industrialists and the public had not yet absorbed the teaching of the economists as to the benefits of rivalry between producers, and there were not lacking voices to declare that competition must lead to a deterioration of quality. Ordered trade, rather than increased output and lower prices, was still the aim of many who spoke with authority".

9.5.1 The Role of the State

The role of the state (however small) in the formation of combinations was, of course, not untypical of the important part that government played in the economy at this time. Large centres of production were still controlled by the government: the royal arsenal at Chatham and various other units at Greenwich are typical. They set an example of complex industrial organization and employed many, while smaller units were run by local authorities to prevent destitution and were organized by contractors on their behalf. Sizeable government orders for munitions were of importance to the iron industry (firms such as the Wilkinsons, the Walkers and the Carron partners); and the same must be said for the wool and textile industries, who supplied orders for uniforms, blankets etc. Elsewhere, the scale of excise duties (for licenses to produce) determined the activities of various concerns.

The Navigation Act (initially passed in 1660), and related legislation, were important to the shipbuilding industry, since they required that trade with the colonies and carriage of goods from Asia, Africa and America could only be done on English ships. The same held good for the trade in timber, naval stores and wine from the Continent. Anyway, all goods carried in foreign vessels attracted a special "alien's duty", and the government followed a protectionist policy of considerable scope (general import duties rising from 10% in 1698 to 15% in 1704 to 20% in 1747, 25% in 1759, 30% in 1779 and 35% in 1782). Various goods attracted special duties and, in the case of agricultural products, the most celebrated was the duty on corn imports, established by the Corn Law (initially passed in 1670) by a sliding scale, which varied from 25% of the home price to a minor charge when that price was particularly high.

A major measure of relaxation of England's protectionist regime was ultimately to be established from the 1820s, under the Tory regimes of Canning and Wellington, when Huskisson at the Board of Trade relaxed or abolished many duties. The major social, political and fiscal problems of such a relaxation, though, were indicated in the protracted struggle over the abolition of the Corn Laws (which were only ended in 1846). The welfare legislation of the second Whig government of the 1830s (especially the new Poor Law of 1834), moreover, told a clear story: that even a party staffed by liberals and utilitarians such as Owen Chadwick, was determined, for all its talk of *laissez faire*, to commit the state to measures which protected the "greatest happiness of the greatest number" from the greed of the minority of entrepreneurs. If free trade was the regime under which England's industrialization ultimately developed in the mid nineteenth century, its influence was seriously contested at the time the industrial revolution occurred.

9.6 REHABILITATING THE INDUSTRIAL REVOLUTION

The main questions which have been raised of the kind of account presented here of the rise of industrial capitalism in Britain have been aptly summarized by Maxine Berg and Pat Hudson in their recent attempt to "rehabilitate" the Industrial Revolution.

9.6.1 The Gradualist Argument and its Critics

- i) a "gradualist" perspective has come to attract serious attention - a perspective where "new statistics have been produced which illustrate the slow growth of industrial output and gross domestic product". Arguments stress that "productivity grew slowly; fixed capital proportions, saving and investment changed only gradually; workers' living standards and their personal consumption remained largely unaffected before 1830 and were certainly not squeezed". Such contention has come to imply that "the macroeconomic indicators of industrial and social transformation were not present"; hence, "the notion of industrial revolution has been dethroned almost entirely, leaving instead only a long process of structural change in employment from agrarian to non-agrarian occupations".
- ii) major arguments stress "continuity between eighteenth and nineteenth century social protest and radicalism". Also, "in demography, the dominant explanation of the late eighteenth century population explosion stresses its continuity with a much earlier established demographic regime which remained intact until at least the 1840s"; and "...socio-cultural historiography...has argued that the English industrial bourgeoisie failed to gain political and economic ascendancy..."

The most important literature which stresses the "gradualist" approach is the writing of N.F.R. Crafts and the output of the Cambridge school of demographic studies (best seen in the various writings of E.A. Wrigley and R.S. Schofield, especially *The Population History of England, 1541-1871*).

Berg and Hudson have strongly criticised the gradualist arguments statistics saying :

- a) Crafts uses records which have ignored the role of women and children in industrial labour. Their wages were less than standard men's wages and innovation was adapted for their specific use:

"The peculiar importance of youth labour in the industrial revolution is highlighted in several instances of textile and other machinery being designed and built to suit the childworker. The spinning jenny was a celebrated case; the original country jenny had a horizontal wheel requiring a posture most comfortable for children aged nine to twelve. Indeed, for a time, in the very early phases of mechanization and factory organization in the woollen and silk industries as well as in cotton, it was generally believed that child labour was integral to textile machine design.";

- b) Crafts' use of "sample industries" for his large scale data also understates the significance of changes in food processing, metal wares, distilling, lead, furniture, coach making, chemicals and engineering. Such use tends to downplay the impact of change in particular regions, whereas a "revolutionary" picture of change would emerge from aggregate assessments of the impact of the industrialization which interconnect regional studies.

Berg and Hudson therefore believe that "gradualist" assessments of slow productivity growth would be seriously revised if figures for female and child labour were properly incorporated. Indeed, it is bluntly stated that this was a specific feature of industrialization which was crucial to rapid and "revolutionary" growth.

9.7 CONSOLIDATION OF INDUSTRIAL CAPITALISM AFTER 1840

After the period of spirited growth described above, industrial capitalism in Britain was consolidated in the mid nineteenth century, partly through participation in international construction of railways. However, the increasing importance of textile, and steel production elsewhere, in Europe and the United States, increasingly placed British production under severe competition after the 1870s, which is described as the beginnings of the Great Depression. This "depression" affected both agriculture and industry: the former as a result of the arrival of cheap grain from North America on British markets from the 1870s, and the

latter because of competition from new industrializers. Britain faced difficulties in revamping her existing infrastructure, as innovation took place in various fields; and in some cases, the innovation was more applicable to her competitors than to her (as in the case of the Thomas-Gilchrist process of steel making). Although production levels were high in the late nineteenth century, Britain did not have a monopoly over industrialization as she had had at the beginning of the century. In sectors such as electricals and chemicals production, she was quickly bypassed by Germany and the United States.

9.7.1 The Importance of Railways

The gradual development of steam-engine drawn railway lines in England after the first Darlington-Stockton rail was built (1825), substantially affected the iron and coal industries in Britain, which provided rolling stock, rail etc. The railways contributed to "economies of scale", because, for a variety of industries, they cut down the time taken for transport (which was hitherto by a complex series of turnpike [or toll] roads, canals and waterways) and the cost of transport as well. Their significance, finally, for English industry was not limited to the consequences of construction in England, but owed from building in the Americas, India and Europe, which provided major avenues for exports. The Dowlais Iron Company, for example, during 1830-50, did business with 12 British companies and 16 foreign companies. The comparative scale of the demand here is indicated by the following figures:

World railway mileage opened, per decade
(to the nearest thousand miles)

Year	UK	Europe including UK	America	Rest of the world
1840-50	6000	13000	7000	-
1850-60	4000	17000	24000	1000
1860-70	5000	31000	24000	7000
1870-80	2000	39000	51000	12000

(Source: E.J. Hobsbawm, Industry and Empire, p.115)

Hobsbawm points out that at peak construction (1846-8), the British railway industry absorbed investment of c.200 million pounds and directly employed c.200,000. It accounted mainly for the increase by 100%, during c.1835-1845, of the country's iron output. If cotton had been crucial to the economy of industrial capitalism to the 1840s, it was coal and iron which led thereafter. The figures for increases in production in the industries are given below, while it should be noted, as Hobsbawm points out, that employment in coal alone rose from 200,000 in 1850 to c. 500,000 in 1880.

Production of pig-iron, steel and coal ('000s tons)

Year	Pig Iron	Steel	Coal
1850	2250	49	49,000
1880	7750	1440	1,47,000

9.7.2 Innovations

Crucial for the iron industry was the process which allowed the production of steel, a more tensile and malleable product than iron. This was the consequence of Henry Bessemer's innovation of 1856 whereby air blasts at the bottom of masses of molten metal reduced the carbon content of iron, producing steel: a process which was perfected further by Sir William Siemens and Pierre Martin (1866) in the open hearth process. Other innovations in this area, such as the changes introduced by Sydney Thomas and P.C. Gilchrist (1878) to allow iron ore with high phosphoric content to be processed into steel, were applied more to European industries rather than British.

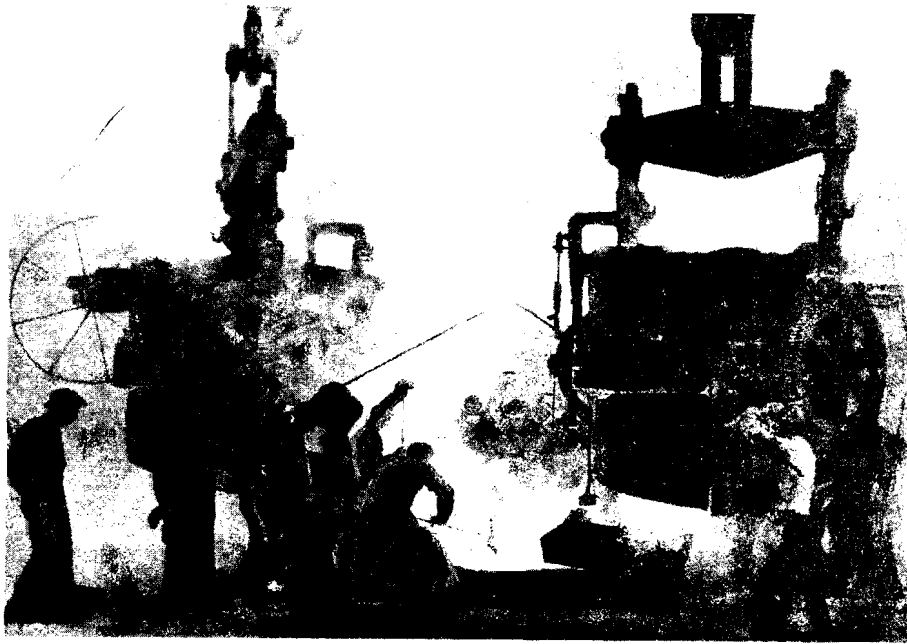


Fig. 3 : A Bessemer Converter for Making Steel, 1900

9.7.3 Capital

Much of the industrial expansion of this period was the consequence of the large amounts of capital generated during the early phase of the industrial revolution. Hobsbawm estimates that by the 1840s, almost 60 million pounds was available for investment in British industry (presumably after some consideration of possibilities of plough-back); and that this could only be invested in government stocks which yielded about 3.4%. Such capital inevitably flowed to railways, given their considerable attractions (the Stockton Darlington generated c.15% interest on investment in 1839-41, and the Liverpool-Manchester, a 10% dividend in 1830). Once the process began, the pool of investible capital increased, until, by 1870, some 700 million pounds were invested abroad (c.25% in the United States). It also generated an entire arena of capital activity which was not wholly tied to industry, and which thrived on the major stock exchanges which rose in Manchester, Liverpool and Glasgow during the railway mania of the 1840s.

9.7.4 Competition and the Colonial Market

It was with increasing competition from European economies and the economy of the United States, from the 1860s, that the international position of British industrial capitalism declined. The consequence was the resort to underdeveloped and colonial markets which became of increasingly important to the country by the end of the nineteenth century.

In this context, however, Eric Hobsbawm correctly points out that *with time* the colonial market and the market of underdeveloped regions were of importance to the British economy (and other European economies) in view of the ease of sale and the poor likelihood of immediate competition. British techniques were imbibed quickly in Europe and used to help competition against British manufacture. This was less easy in colonial and underdeveloped circumstances. With the development of competition in US and European markets, and the transfer of British trade to other markets, following competition, is clear from the following figures.

Exports of Cotton piece goods (million yards) (% of total)

Year	Europe/USA	Under developed world	Others
1820	60.4	31.8	7.8
1840	29.5	66.7	3.8
1860	19.0	73.3	7.7
1880	9.8	82.0	8.2
1900	7.1	86.3	6.6

(Source E.J. Hobsbawm, *Industry and Empire*, p.146)

Crucial to Britain, as markets, in the nineteenth and twentieth centuries, were Argentina, Brazil, India and the Far East. Colonial control over India also permitted the government to encourage railway construction in this country, by British manufacturers, under terms.

• Check Your Progress 2

- 1) What were the forms of manufacturing enterprise coming into existence in the 18th & 19th century England?

.....

.....

.....

.....

- 2) Was rise in income in England the sole factor behind increasing the market for industrial goods?

.....

.....

.....

.....

- 3) What is the criticism of the 'gradualist' argument by Berg and Hudson?

.....

.....

.....

.....

- 4) What were the major changes in industrial capitalism in England after 1840? Summarise in 5 lines.

.....

.....

.....

.....

.....

9.8 LET US SUM UP

In this Unit we saw

- how in the 18th and early 19th centuries industrial capitalism in England took a decisive step forward;
- that crucial to its growth was the agricultural revolution which facilitated increased food supply, transfer of capital from agriculture to industry and release of population rendered surplus by enclosures industrial areas,
- that growth in agricultural output is associated with rise in population in this period; and that increase in turn facilitated to fulfill the increased demand for labour in this period,
- that how social & economic networks were enabling entrepreneurs to acquire capital
- that innovations in manufacturing bunched together in the 18th and early 19th century to provide a major impetus to production

- that a rise in income before 1740 and a combination of rise of middle classes and growth of overseas market after 1740 give a substantial scope to the market for industrial capitalism
- that the 'gradualist' argument which stressed continuities with earlier demographic regime and slow growth of industrial productivity has been criticised for not taking into account the substantial contributions of female and child labour and for not taking a connected regional picture of emerging industrialisation,
- that with the emergence of U.S. and Germany as newly industrialising nation after 1870s English capitalism – (a) faced a more competitive international environment, (b) engaged in 'economics of scale', (c) saw an export of capital overseas.

9.9 KEY WORDS

Demography	:	The science which studies various trends of population. These include birth rate, death rate, fertility and secular increase or decrease of population.
Enclaves	:	In this context pockets of economy where industrial growth did or did not take place
Laissez faire	:	A term to denote a trade regime free from restriction
Putting out	:	a system whereby entrepreneurs advanced the required capital and raw material to artisans and craftsman. The latter worked on these at home and returned the finished product to the entrepreneurs.
World System	:	As defined by certain scholars, as terminology to indicate how industrial production, marketing and consumption combined with world trade to create a global system.

9.10 ANSWERS TO CHECK YOUR PROGRESS EXERCISES

Check Your Progress 1

- 1) See Section 9.2. The thrust was to contain the exaggerated importance of a particular period.
- 2) See Section 9.3 and Sub-sec. 10.3.1. You could begin by pointing out the role of commercialisation.
- 3) See Sub-sec. 9.3.2. You could point out how historians have been limited by lack of sources.
- 4) See Sec. 9.3.3. You could point out how the entrepreneurs raised loans amongst themselves or from trusts or other merchants, etc.

Check Your Progress 2

- 1) See Section 9.4. As artisans working from home using his own tools or putting out system where capital was advanced to him, etc.
- 2) See Section 9.5. You could point out other factors like overseas demand.
- 3) See Sub-sec. 9.6.1. They point out how the role of women and children in industrial labour has been ignored by the gradualists.
- 4) See Section 9.7. You could examine the changes in the English industrialisation in the wake of the fact that England did not have monopoly over industrialisation any more.