United Kingdom and British Empire 1815–1870

Erik Gallagher

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Chapter 1

Industrial Revolution

The **Industrial Revolution** was the transition to new manufacturing processes in Europe and the United States, in the period from between 1760 to 1820 and 1840. This transition included going from hand production methods to machines, new chemical manufacturing and iron production processes, the increasing use of steam power and water power, the development of machine tools and the rise of the mechanized factory system. The Industrial Revolution also led to an unprecedented rise in the rate of population growth.

Textiles were the dominant industry of the Industrial Revolution in terms of employment, value of output and capital invested. The textile industry was also the first to use modern production methods.

The Industrial Revolution began in Great Britain, and many of the technological innovations were of British origin. By the mid-18th century Britain was the world's leading commercial nation, controlling a global trading empire with colonies in North America and the Caribbean, and with major military and political hegemony on the Indian subcontinent, particularly with the proto-industrialised Mughal Bengal, through the activities of the East India Company. The development of trade and the rise of business were among the major causes of the Industrial Revolution.

The Industrial Revolution marks a major turning point in history; almost every aspect of daily life was influenced in

some way. In particular, average income and population began to exhibit unprecedented sustained growth. Some economists have said the most important effect of the Industrial Revolution was that the standard of living for the general population in the western world began to increase consistently for the first time in history, although others have said that it did not begin to meaningfully improve until the late 19th and 20th centuries.

GDP per capita was broadly stable before the Industrial Revolution and the emergence of the modern capitalist economy, while the Industrial Revolution began an era of per-capita economic growth in capitalist economies. Economic historians are in agreement that the onset of the Industrial Revolution is the most important event in the history of humanity since the domestication of animals and plants.

The precise start and end of the Industrial Revolution is still debated among historians, as is the pace of economic and social changes. Eric Hobsbawm held that the Industrial Revolution began in Britain in the 1780s and was not fully felt until the 1830s or 1840s, while T. S. Ashton held that it occurred roughly between 1760 and 1830. Rapid industrialization first began in Britain, starting with mechanized spinning in the 1780s, with high rates of growth in steam power and iron production occurring after 1800. Mechanized textile production spread from Great Britain to continental Europe and the United States in the early 19th century, with important centres of textiles, iron and coal emerging in Belgium and the United States and later textiles in France.

An economic recession occurred from the late 1830s to the early 1840s when the adoption of the Industrial Revolution's early innovations, such as mechanized spinning and weaving, slowed and their markets matured. Innovations developed late in the period, such as the increasing adoption of locomotives, steamboats and steamships, hot blast iron smelting and new technologies, such as the electrical telegraph, widely introduced in the 1840s and 1850s, were not powerful enough to drive high rates of growth. Rapid economic growth began to occur after 1870, springing from a new group of innovations in what has been called the Second Industrial Revolution. These innovations included new steel making processes, mass-production, assembly lines, electrical grid systems, the large-scale manufacture of machine tools and the use of increasingly advanced machinery in steam-powered factories.

Etymology

The earliest recorded use of the term "Industrial Revolution" appears to have been in a letter from 6 July 1799 written by French envoy Louis-Guillaume Otto, announcing that France had entered the race to industrialise. In his 1976 book *Keywords: A Vocabulary of Culture and Society*, Raymond Williams states in the entry for "Industry": "The idea of a new social order based on major industrial change was clear in Southey and Owen, between 1811 and 1818, and was implicit as early as Blake in the early 1790s and Wordsworth at the turn of the [19th] century." The term *Industrial Revolution* applied to technological change was becoming more common by the late 1830s, as in Jérôme-AdolpheBlanqui's description in 1837 of *la révolutionindustrielle*.

Friedrich Engels in *The Condition of the Working Class in England* in 1844 spoke of "an industrial revolution, a revolution which at the same time changed the whole of civil society". However, although Engels wrote his book in the 1840s, it was not translated into English until the late 1800s, and his expression did not enter everyday language until then. Credit for popularising the term may be given to Arnold Toynbee, whose 1881 lectures gave a detailed account of the term. Economic historians and authors such as Mendels, Pomeranz and Kridte argue that the proto-industrialization in parts of Europe, Islamic world, Mughal India, and China created the social and economic conditions that led to the Industrial Revolution, thus causing the Great Divergence.

Some historians, such as John Clapham and Nicholas Crafts, have argued that the economic and social changes occurred gradually, and that the term *revolution* is a misnomer. This is still a subject of debate among some historians.

Requirements

Six factors facilitated industrialization: high levels of agricultural productivity to provide excess manpower and food; a pool of managerial and entrepreneurial skills; available ports, rivers, canals and roads to cheaply move raw materials and outputs; natural resources such as coal, iron and waterfalls; political stability and a legal system that supported business; and financial capital available to invest. Once industrialization began in Great Britain, new factors can be added: the eagerness of British entrepreneurs to export industrial expertise and the willingness to import the process. Britain met the criteria and industrialized starting in the 18th

century. Britain exported the process to western Europe (especially Belgium, France and the German states) in the early 19th century. The United States copied the British model in the early 19th century and Japan copied the Western European models in the late 19th century.

Important technological developments

The commencement of the Industrial Revolution is closely linked to a small number of innovations, beginning in the second half of the 18th century. By the 1830s the following gains had been made in important technologies:

- **Textiles** – mechanised cotton spinning powered by steam or water increased the output of a worker by a factor of around 500. The power loom increased the output of a worker by a factor of over 40. The cotton gin increased productivity of removing seed from cotton by a factor of 50. Large gains in productivity also occurred in spinning and weaving of wool and linen, but they were not as great as in cotton.
- **Steam power** – the efficiency of steam engines increased so that they used between one-fifth and one-tenth as much fuel. The adaptation of stationary steam engines to rotary motion made them suitable for industrial uses. The high pressure engine had a high power to weight ratio, making it suitable for transportation. Steam power underwent a rapid expansion after 1800.

- **Iron making** – the substitution of coke for charcoal greatly lowered the fuel cost of pig iron and wrought iron production. Using coke also allowed larger blast furnaces, resulting in economies of scale. The steam engine began being used to pump water and to power blast air in the mid 1750s, enabling a large increase in iron production by overcoming the limitation of water power. The cast iron blowing cylinder was first used in 1760. It was later improved by making it double acting, which allowed higher blast furnace temperatures. The puddling process produced a structural grade iron at a lower cost than the finery forge. The rolling mill was fifteen times faster than hammering wrought iron. Hot blast (1828) greatly increased fuel efficiency in iron production in the following decades.
- **Invention of machine tools** – The first machine tools were invented. These included the screw cutting lathe, cylinder boring machine and the milling machine. Machine tools made the economical manufacture of precision metal parts possible, although it took several decades to develop effective techniques.

Textile manufacture

British textile industry statistics

In 1750 Britain imported 2.5 million pounds of raw cotton, most of which was spun and woven by cottage industry in Lancashire. The work was done by hand in workers' homes or

occasionally in shops of master weavers. In 1787 raw cotton consumption was 22 million pounds, most of which was cleaned, carded and spun on machines. The British textile industry used 52 million pounds of cotton in 1800, which increased to 588 million pounds in 1850.

The share of value added by the cotton textile industry in Britain was 2.6% in 1760, 17% in 1801 and 22.4% in 1831. Value added by the British woollen industry was 14.1% in 1801. Cotton factories in Britain numbered approximately 900 in 1797. In 1760 approximately one-third of cotton cloth manufactured in Britain was exported, rising to two-thirds by 1800. In 1781 cotton spun amounted to 5.1 million pounds, which increased to 56 million pounds by 1800. In 1800 less than 0.1% of world cotton cloth was produced on machinery invented in Britain. In 1788 there were 50,000 spindles in Britain, rising to 7 million over the next 30 years.

Wages in Lancashire, a core region for cottage industry and later factory spinning and weaving, were about six times those in India in 1770, when overall productivity in Britain was about three times higher than in India.

Cotton

Parts of India, China, Central America, South America and the Middle-East have a long history of hand manufacturing cotton textiles, which became a major industry sometime after 1000 AD. In tropical and subtropical regions where it was grown, most was grown by small farmers alongside their food crops and was spun and woven in households, largely for domestic consumption. In the 15th century China began to require

households to pay part of their taxes in cotton cloth. By the 17th century almost all Chinese wore cotton clothing. Almost everywhere cotton cloth could be used as a medium of exchange. In India a significant amount of cotton textiles were manufactured for distant markets, often produced by professional weavers. Some merchants also owned small weaving workshops. India produced a variety of cotton cloth, some of exceptionally fine quality.

Cotton was a difficult raw material for Europe to obtain before it was grown on colonial plantations in the Americas. The early Spanish explorers found Native Americans growing unknown species of excellent quality cotton: sea island cotton (*Gossypiumbarbadense*) and upland green seeded cotton *Gossypiumhirsutum*. Sea island cotton grew in tropical areas and on barrier islands of Georgia and South Carolina, but did poorly inland. Sea island cotton began being exported from Barbados in the 1650s. Upland green seeded cotton grew well on inland areas of the southern U.S., but was not economical because of the difficulty of removing seed, a problem solved by the cotton gin. A strain of cotton seed brought from Mexico to Natchez, Mississippi in 1806 became the parent genetic material for over 90% of world cotton production today; it produced bolls that were three to four times faster to pick.

Trade and textiles

The Age of Discovery was followed by a period of colonialism beginning around the 16th century. Following the discovery of a trade route to India around southern Africa by the Portuguese, the Dutch established the Verenigde OostindischeCompagnie (abbr. VOC) or Dutch East India

Company, the world's first transnational corporation and the first multinational enterprise to issue shares of stock to the public. The British later founded the East India Company, along with smaller companies of different nationalities which established trading posts and employed agents to engage in trade throughout the Indian Ocean region and between the Indian Ocean region and North Atlantic Europe.

One of the largest segments of this trade was in cotton textiles, which were purchased in India and sold in Southeast Asia, including the Indonesian archipelago, where spices were purchased for sale to Southeast Asia and Europe. By the mid-1760s cloth was over three-quarters of the East India Company's exports. Indian textiles were in demand in North Atlantic region of Europe where previously only wool and linen were available; however, the amount of cotton goods consumed in Western Europe was minor until the early 19th century.

Pre-mechanized European textile production

By 1600 Flemish refugees began weaving cotton cloth in English towns where cottage spinning and weaving of wool and linen was well established; however, they were left alone by the guilds who did not consider cotton a threat. Earlier European attempts at cotton spinning and weaving were in 12th-century Italy and 15th-century southern Germany, but these industries eventually ended when the supply of cotton was cut off. The Moors in Spain grew, spun and wove cotton beginning around the 10th century.

British cloth could not compete with Indian cloth because India's labour cost was approximately one-fifth to one-sixth

that of Britain's. In 1700 and 1721 the British government passed Calico Acts in order to protect the domestic woollen and linen industries from the increasing amounts of cotton fabric imported from India.

The demand for heavier fabric was met by a domestic industry based around Lancashire that produced fustian, a cloth with flax warp and cotton weft. Flax was used for the warp because wheel-spun cotton did not have sufficient strength, but the resulting blend was not as soft as 100% cotton and was more difficult to sew.

On the eve of the Industrial Revolution, spinning and weaving were done in households, for domestic consumption and as a cottage industry under the putting-out system. Occasionally the work was done in the workshop of a master weaver. Under the putting-out system, home-based workers produced under contract to merchant sellers, who often supplied the raw materials. In the off season the women, typically farmers' wives, did the spinning and the men did the weaving. Using the spinning wheel, it took anywhere from four to eight spinners to supply one hand loom weaver.

Invention of textile machinery

The flying shuttle, patented in 1733 by John Kay, with a number of subsequent improvements including an important one in 1747, doubled the output of a weaver, worsening the imbalance between spinning and weaving. It became widely used around Lancashire after 1760 when John's son, Robert, invented the drop box, which facilitated changing thread colors.

Lewis Paul patented the roller spinning frame and the flyer-and-bobbin system for drawing wool to a more even thickness. The technology was developed with the help of John Wyatt of Birmingham. Paul and Wyatt opened a mill in Birmingham which used their new rolling machine powered by a donkey. In 1743 a factory opened in Northampton with 50 spindles on each of five of Paul and Wyatt's machines. This operated until about 1764. A similar mill was built by Daniel Bourn in Leominster, but this burnt down. Both Lewis Paul and Daniel Bourn patented carding machines in 1748. Based on two sets of rollers that travelled at different speeds, it was later used in the first cotton spinning mill. Lewis's invention was later developed and improved by Richard Arkwright in his water frame and Samuel Crompton in his spinning mule.

In 1764 in the village of Stanhill, Lancashire, James Hargreaves invented the spinning jenny, which he patented in 1770. It was the first practical spinning frame with multiple spindles. The jenny worked in a similar manner to the spinning wheel, by first clamping down on the fibres, then by drawing them out, followed by twisting. It was a simple, wooden framed machine that only cost about £6 for a 40-spindle model in 1792, and was used mainly by home spinners. The jenny produced a lightly twisted yarn only suitable for weft, not warp.

The spinning frame or water frame was developed by Richard Arkwright who, along with two partners, patented it in 1769. The design was partly based on a spinning machine built for Thomas High by clockmaker John Kay, who was hired by Arkwright. For each spindle the water frame used a series of four pairs of rollers, each operating at a successively higher

rotating speed, to draw out the fibre, which was then twisted by the spindle. The roller spacing was slightly longer than the fibre length.

Too close a spacing caused the fibres to break while too distant a spacing caused uneven thread. The top rollers were leather-covered and loading on the rollers was applied by a weight. The weights kept the twist from backing up before the rollers. The bottom rollers were wood and metal, with fluting along the length. The water frame was able to produce a hard, medium count thread suitable for warp, finally allowing 100% cotton cloth to be made in Britain. A horse powered the first factory to use the spinning frame. Arkwright and his partners used water power at a factory in Cromford, Derbyshire in 1771, giving the invention its name.

Samuel Crompton's Spinning Mule was introduced in 1779. Mule implies a hybrid because it was a combination of the spinning jenny and the water frame, in which the spindles were placed on a carriage, which went through an operational sequence during which the rollers stopped while the carriage moved away from the drawing roller to finish drawing out the fibres as the spindles started rotating. Crompton's mule was able to produce finer thread than hand spinning and at a lower cost. Mule spun thread was of suitable strength to be used as warp, and finally allowed Britain to produce highly competitive yarn in large quantities.

Realising that the expiration of the Arkwright patent would greatly increase the supply of spun cotton and led to a shortage of weavers, Edmund Cartwright developed a vertical power loom which he patented in 1785. In 1776 he patented a

two-man operated loom which was more conventional. Cartwright built two factories; the first burned down and the second was sabotaged by his workers. Cartwright's loom design had several flaws, the most serious being thread breakage. Samuel Horrocks patented a fairly successful loom in 1813. Horock's loom was improved by Richard Roberts in 1822 and these were produced in large numbers by Roberts, Hill & Co.

The demand for cotton presented an opportunity to planters in the Southern United States, who thought upland cotton would be a profitable crop if a better way could be found to remove the seed. Eli Whitney responded to the challenge by inventing the inexpensive cotton gin. A man using a cotton gin could remove seed from as much upland cotton in one day as would previously, working at the rate of one pound of cotton per day, have taken a woman two months to process.

These advances were capitalised on by entrepreneurs, of whom the best known is Richard Arkwright. He is credited with a list of inventions, but these were actually developed by such people as Thomas Highs and John Kay; Arkwright nurtured the inventors, patented the ideas, financed the initiatives, and protected the machines. He created the cotton mill which brought the production processes together in a factory, and he developed the use of power—first horse power and then water power—which made cotton manufacture a mechanised industry. Other inventors increased the efficiency of the individual steps of spinning (carding, twisting and spinning, and rolling) so that the supply of yarn increased greatly. Before long steam power was applied to drive textile machinery. Manchester acquired the nickname Cottonopolis during the early 19th century owing to its sprawl of textile factories.

Although mechanization dramatically decreased the cost of cotton cloth, by the mid-19th century machine-woven cloth still could not equal the quality of hand-woven Indian cloth, in part due to the fineness of thread made possible by the type of cotton used in India, which allowed high thread counts. However, the high productivity of British textile manufacturing allowed coarser grades of British cloth to undersell hand-spun and woven fabric in low-wage India, eventually destroying the industry.

Wool

The earliest European attempts at mechanized spinning were with wool; however, wool spinning proved more difficult to mechanize than cotton. Productivity improvement in wool spinning during the Industrial Revolution was significant but was far less than that of cotton.

Silk

Arguably the first highly mechanised factory was John Lombe's water-powered silk mill at Derby, operational by 1721. Lombe learned silk thread manufacturing by taking a job in Italy and acting as an industrial spy; however, because the Italian silk industry guarded its secrets closely, the state of the industry at that time is unknown.

Although Lombe's factory was technically successful, the supply of raw silk from Italy was cut off to eliminate competition. In order to promote manufacturing the Crown paid for models of Lombe's machinery which were exhibited in the Tower of London.

Iron industry

UK iron production statistics

Bar iron was the commodity form of iron used as the raw material for making hardware goods such as nails, wire, hinges, horse shoes, wagon tires, chains, etc., as well as structural shapes.

A small amount of bar iron was converted into steel. Cast iron was used for pots, stoves and other items where its brittleness was tolerable. Most cast iron was refined and converted to bar iron, with substantial losses. Bar iron was also made by the bloomery process, which was the predominant iron smelting process until the late 18th century.

In the UK in 1720, there were 20,500 tons of cast iron produced with charcoal and 400 tons with coke. In 1750 charcoal iron production was 24,500 and coke iron was 2,500 tons. In 1788 the production of charcoal cast iron was 14,000 tons while coke iron production was 54,000 tons. In 1806 charcoal cast iron production was 7,800 tons and coke cast iron was 250,000 tons.

In 1750 the UK imported 31,200 tons of bar iron and either refined from cast iron or directly produced 18,800 tons of bar iron using charcoal and 100 tons using coke. In 1796 the UK was making 125,000 tons of bar iron with coke and 6,400 tons with charcoal; imports were 38,000 tons and exports were 24,600 tons. In 1806 the UK did not import bar iron but exported 31,500 tons.

Iron process innovations

A major change in the iron industries during the Industrial Revolution was the replacement of wood and other bio-fuels with coal. For a given amount of heat, mining coal required much less labour than cutting wood and converting it to charcoal, and coal was much more abundant than wood, supplies of which were becoming scarce before the enormous increase in iron production that took place in the late 18th century.

By 1750 coke had generally replaced charcoal in the smelting of copper and lead, and was in widespread use in glass production. In the smelting and refining of iron, coal and coke produced inferior iron to that made with charcoal because of the coal's sulfur content. Low sulfur coals were known, but they still contained harmful amounts. Conversion of coal to coke only slightly reduces the sulfur content. A minority of coals are coking.

Another factor limiting the iron industry before the Industrial Revolution was the scarcity of water power to power blast bellows. This limitation was overcome by the steam engine.

Use of coal in iron smelting started somewhat before the Industrial Revolution, based on innovations by Sir Clement Clerke and others from 1678, using coal reverberatory furnaces known as cupolas. These were operated by the flames playing on the ore and charcoal or coke mixture, reducing the oxide to metal. This has the advantage that impurities (such as sulphur ash) in the coal do not migrate into the metal. This technology was applied to lead from 1678 and to copper from 1687. It was

also applied to iron foundry work in the 1690s, but in this case the reverberatory furnace was known as an air furnace. (The foundry cupola is a different, and later, innovation.)

By 1709 Abraham Darby made progress using coke to fuel his blast furnaces at Coalbrookdale. However, the coke pig iron he made was not suitable for making wrought iron and was used mostly for the production of cast iron goods, such as pots and kettles. He had the advantage over his rivals in that his pots, cast by his patented process, were thinner and cheaper than theirs.

Coke pig iron was hardly used to produce wrought iron until 1755–56, when Darby's son Abraham Darby II built furnaces at Horsehay and Ketley where low sulfur coal was available (and not far from Coalbrookdale). These new furnaces were equipped with water-powered bellows, the water being pumped by Newcomen steam engines. The Newcomen engines were not attached directly to the blowing cylinders because the engines alone could not produce a steady air blast. Abraham Darby III installed similar steam-pumped, water-powered blowing cylinders at the Dale Company when he took control in 1768. The Dale Company used several Newcomen engines to drain its mines and made parts for engines which it sold throughout the country.

Steam engines made the use of higher-pressure and volume blast practical; however, the leather used in bellows was expensive to replace. In 1757, iron master John Wilkinson patented a hydraulic powered blowing engine for blast furnaces. The blowing cylinder for blast furnaces was introduced in 1760 and the first blowing cylinder made of cast

iron is believed to be the one used at Carrington in 1768 that was designed by John Smeaton.

Cast iron cylinders for use with a piston were difficult to manufacture; the cylinders had to be free of holes and had to be machined smooth and straight to remove any warping. James Watt had great difficulty trying to have a cylinder made for his first steam engine. In 1774 John Wilkinson, who built a cast iron blowing cylinder for his iron works, invented a precision boring machine for boring cylinders. After Wilkinson bored the first successful cylinder for a Boulton and Watt steam engine in 1776, he was given an exclusive contract for providing cylinders. After Watt developed a rotary steam engine in 1782, they were widely applied to blowing, hammering, rolling and slitting.

The solutions to the sulfur problem were the addition of sufficient limestone to the furnace to force sulfur into the slag and the use of low sulfur coal. Use of lime or limestone required higher furnace temperatures to form a free-flowing slag. The increased furnace temperature made possible by improved blowing also increased the capacity of blast furnaces and allowed for increased furnace height. In addition to lower cost and greater availability, coke had other important advantages over charcoal in that it was harder and made the column of materials (iron ore, fuel, slag) flowing down the blast furnace more porous and did not crush in the much taller furnaces of the late 19th century.

As cast iron became cheaper and widely available, it began being a structural material for bridges and buildings. A famous early example was the Iron Bridge built in 1778 with cast iron

produced by Abraham Darby III. However, most cast iron was converted to wrought iron.

Europe relied on the bloomery for most of its wrought iron until the large scale production of cast iron. Conversion of cast iron was done in a finery forge, as it long had been. An improved refining process known as potting and stamping was developed, but this was superseded by Henry Cort's puddling process. Cort developed two significant iron manufacturing processes: rolling in 1783 and puddling in 1784. Puddling produced a structural grade iron at a relatively low cost.

Puddling was a means of decarburizing molten pig iron by slow oxidation in a reverberatory furnace by manually stirring it with a long rod. The decarburized iron, having a higher melting point than cast iron, was raked into globs by the puddler. When the glob was large enough, the puddler would remove it. Puddling was backbreaking and extremely hot work. Few puddlers lived to be 40. Because puddling was done in a reverberatory furnace, coal or coke could be used as fuel.

The puddling process continued to be used until the late 19th century when iron was being displaced by steel. Because puddling required human skill in sensing the iron globs, it was never successfully mechanised. Rolling was an important part of the puddling process because the grooved rollers expelled most of the molten slag and consolidated the mass of hot wrought iron. Rolling was 15 times faster at this than a trip hammer. A different use of rolling, which was done at lower temperatures than that for expelling slag, was in the production of iron sheets, and later structural shapes such as beams, angles and rails.

The puddling process was improved in 1818 by Baldwyn Rogers, who replaced some of the sand lining on the reverberatory furnace bottom with iron oxide. In 1838 John Hall patented the use of roasted tap cinder (iron silicate) for the furnace bottom, greatly reducing the loss of iron through increased slag caused by a sand lined bottom. The tap cinder also tied up some phosphorus, but this was not understood at the time. Hall's process also used iron scale or rust, which reacted with carbon in the molten iron. Hall's process, called *wet puddling*, reduced losses of iron with the slag from almost 50% to around 8%.

Puddling became widely used after 1800. Up to that time British iron manufacturers had used considerable amounts of iron imported from Sweden and Russia to supplement domestic supplies. Because of the increased British production, imports began to decline in 1785 and by the 1790s Britain eliminated imports and became a net exporter of bar iron.

Hot blast, patented by James Beaumont Neilson in 1828, was the most important development of the 19th century for saving energy in making pig iron. By using preheated combustion air, the amount of fuel to make a unit of pig iron was reduced at first by between one-third using coke or two-thirds using coal; however, the efficiency gains continued as the technology improved. Hot blast also raised the operating temperature of furnaces, increasing their capacity. Using less coal or coke meant introducing fewer impurities into the pig iron. This meant that lower quality coal or anthracite could be used in areas where coking coal was unavailable or too expensive; however, by the end of the 19th century transportation costs fell considerably.

Shortly before the Industrial Revolution an improvement was made in the production of steel, which was an expensive commodity and used only where iron would not do, such as for cutting edge tools and for springs. Benjamin Huntsman developed his crucible steel technique in the 1740s. The raw material for this was blister steel, made by the cementation process.

The supply of cheaper iron and steel aided a number of industries, such as those making nails, hinges, wire and other hardware items. The development of machine tools allowed better working of iron, causing it to be increasingly used in the rapidly growing machinery and engine industries.

Steam power

The development of the stationary steam engine was an important element of the Industrial Revolution; however, during the early period of the Industrial Revolution, most industrial power was supplied by water and wind. In Britain by 1800 an estimated 10,000 horsepower was being supplied by steam. By 1815 steam power had grown to 210,000 hp.

The first commercially successful industrial use of steam power was due to Thomas Savery in 1698. He constructed and patented in London a low-lift combined vacuum and pressure water pump, that generated about one horsepower (hp) and was used in numerous water works and in a few mines (hence its "brand name", *The Miner's Friend*). Savery's pump was economical in small horsepower ranges, but was prone to boiler explosions in larger sizes. Savery pumps continued to be produced until the late 18th century.

The first successful piston steam engine was introduced by Thomas Newcomen before 1712. A number of Newcomen engines were installed in Britain for draining hitherto unworkable deep mines, with the engine on the surface; these were large machines, requiring a significant amount of capital to build, and produced upwards of 3.5 kW (5 hp). They were also used to power municipal water supply pumps. They were extremely inefficient by modern standards, but when located where coal was cheap at pit heads, opened up a great expansion in coal mining by allowing mines to go deeper.

Despite their disadvantages, Newcomen engines were reliable and easy to maintain and continued to be used in the coalfields until the early decades of the 19th century. By 1729, when Newcomen died, his engines had spread (first) to Hungary in 1722, Germany, Austria, and Sweden. A total of 110 are known to have been built by 1733 when the joint patent expired, of which 14 were abroad. In the 1770s the engineer John Smeaton built some very large examples and introduced a number of improvements. A total of 1,454 engines had been built by 1800.

A fundamental change in working principles was brought about by Scotsman James Watt. With financial support from his business partner Englishman Matthew Boulton, he had succeeded by 1778 in perfecting his steam engine, which incorporated a series of radical improvements, notably the closing off of the upper part of the cylinder, thereby making the low-pressure steam drive the top of the piston instead of the atmosphere, use of a steam jacket and the celebrated separate steam condenser chamber. The separate condenser did away with the cooling water that had been injected directly

into the cylinder, which cooled the cylinder and wasted steam. Likewise, the steam jacket kept steam from condensing in the cylinder, also improving efficiency. These improvements increased engine efficiency so that Boulton and Watt's engines used only 20–25% as much coal per horsepower-hour as Newcomen's. Boulton and Watt opened the Soho Foundry for the manufacture of such engines in 1795.

By 1783 the Watt steam engine had been fully developed into a double-acting rotative type, which meant that it could be used to directly drive the rotary machinery of a factory or mill. Both of Watt's basic engine types were commercially very successful, and by 1800, the firm Boulton& Watt had constructed 496 engines, with 164 driving reciprocating pumps, 24 serving blast furnaces, and 308 powering mill machinery; most of the engines generated from 3.5 to 7.5 kW (5 to 10 hp).

Until about 1800 the most common pattern of steam engine was the beam engine, built as an integral part of a stone or brick engine-house, but soon various patterns of self-contained rotative engines (readily removable, but not on wheels) were developed, such as the table engine. Around the start of the 19th century, at which time the Boulton and Watt patent expired, the Cornish engineer Richard Trevithick and the American Oliver Evans began to construct higher-pressure non-condensing steam engines, exhausting against the atmosphere. High pressure yielded an engine and boiler compact enough to be used on mobile road and rail locomotives and steam boats.

The development of machine tools, such as the engine lathe, planing, milling and shaping machines powered by these

engines, enabled all the metal parts of the engines to be easily and accurately cut and in turn made it possible to build larger and more powerful engines.

Small industrial power requirements continued to be provided by animal and human muscle until widespread electrification in the early 20th century. These included crank-powered, treadle-powered and horse-powered workshop and light industrial machinery.

Machine tools

Pre-industrial machinery was built by various craftsmen—millwrights built water and windmills, carpenters made wooden framing, and smiths and turners made metal parts. Wooden components had the disadvantage of changing dimensions with temperature and humidity, and the various joints tended to rack (work loose) over time.

As the Industrial Revolution progressed, machines with metal parts and frames became more common. Other important uses of metal parts were in firearms and threaded fasteners, such as machine screws, bolts and nuts. There was also the need for precision in making parts. Precision would allow better working machinery, interchangeability of parts and standardization of threaded fasteners.

The demand for metal parts led to the development of several machine tools. They have their origins in the tools developed in the 18th century by makers of clocks and watches and scientific instrument makers to enable them to batch-produce small mechanisms.

Before the advent of machine tools, metal was worked manually using the basic hand tools of hammers, files, scrapers, saws and chisels. Consequently, the use of metal machine parts was kept to a minimum. Hand methods of production were very laborious and costly and precision was difficult to achieve.

The first large precision machine tool was the cylinder boring machine invented by John Wilkinson in 1774. It was used for boring the large-diameter cylinders on early steam engines. Wilkinson's boring machine differed from earlier cantilevered machines used for boring cannon in that the cutting tool was mounted on a beam that ran through the cylinder being bored and was supported outside on both ends.

The planing machine, the milling machine and the shaping machine were developed in the early decades of the 19th century.

Although the milling machine was invented at this time, it was not developed as a serious workshop tool until somewhat later in the 19th century.

Henry Maudslay, who trained a school of machine tool makers early in the 19th century, was a mechanic with superior ability who had been employed at the Royal Arsenal, Woolwich. He worked as an apprentice in the Royal Gun Foundry of Jan Verbruggen. In 1774 Jan Verbruggen had installed a horizontal boring machine in Woolwich which was the first industrial size lathe in the UK. Maudslay was hired away by Joseph Bramah for the production of high-security metal locks that required precision craftsmanship. Bramah patented a lathe that had similarities to the slide rest lathe.

Maudslay perfected the slide rest lathe, which could cut machine screws of different thread pitches by using changeable gears between the spindle and the lead screw. Before its invention screws could not be cut to any precision using various earlier lathe designs, some of which copied from a template. The slide rest lathe was called one of history's most important inventions. Although it was not entirely Maudslay's idea, he was the first person to build a functional lathe using a combination of known innovations of the lead screw, slide rest and change gears.

Maudslay left Bramah's employment and set up his own shop. He was engaged to build the machinery for making ships' pulley blocks for the Royal Navy in the Portsmouth Block Mills. These machines were all-metal and were the first machines for mass production and making components with a degree of interchangeability.

The lessons Maudslay learned about the need for stability and precision he adapted to the development of machine tools, and in his workshops he trained a generation of men to build on his work, such as Richard Roberts, Joseph Clement and Joseph Whitworth.

James Fox of Derby had a healthy export trade in machine tools for the first third of the century, as did Matthew Murray of Leeds. Roberts was a maker of high-quality machine tools and a pioneer of the use of jigs and gauges for precision workshop measurement.

The effect of machine tools during the Industrial Revolution was not that great because other than firearms, threaded fasteners and a few other industries there were few mass-

produced metal parts. The techniques to make mass-produced metal parts made with sufficient precision to be interchangeable is largely attributed to a program of the U.S. Department of War which perfected interchangeable parts for firearms in the early 19th century.

In the half century following the invention of the fundamental machine tools the machine industry became the largest industrial sector of the U.S. economy, by value added.

Chemicals

The large-scale production of chemicals was an important development during the Industrial Revolution. The first of these was the production of sulphuric acid by the lead chamber process invented by the Englishman John Roebuck (James Watt's first partner) in 1746. He was able to greatly increase the scale of the manufacture by replacing the relatively expensive glass vessels formerly used with larger, less expensive chambers made of riveted sheets of lead. Instead of making a small amount each time, he was able to make around 50 kilograms (100 pounds) in each of the chambers, at least a tenfold increase.

The production of an alkali on a large scale became an important goal as well, and Nicolas Leblanc succeeded in 1791 in introducing a method for the production of sodium carbonate. The Leblanc process was a reaction of sulfuric acid with sodium chloride to give sodium sulfate and hydrochloric acid. The sodium sulfate was heated with limestone (calcium carbonate) and coal to give a mixture of sodium carbonate and calcium sulfide. Adding water separated the soluble sodium

carbonate from the calcium sulfide. The process produced a large amount of pollution (the hydrochloric acid was initially vented to the air, and calcium sulfide was a useless waste product). Nonetheless, this synthetic soda ash proved economical compared to that from burning specific plants (barilla) or from kelp, which were the previously dominant sources of soda ash, and also to potash (potassium carbonate) produced from hardwood ashes. These two chemicals were very important because they enabled the introduction of a host of other inventions, replacing many small-scale operations with more cost-effective and controllable processes. Sodium carbonate had many uses in the glass, textile, soap, and paper industries. Early uses for sulfuric acid included pickling (removing rust from) iron and steel, and for bleaching cloth.

The development of bleaching powder (calcium hypochlorite) by Scottish chemist Charles Tennant in about 1800, based on the discoveries of French chemist Claude Louis Berthollet, revolutionised the bleaching processes in the textile industry by dramatically reducing the time required (from months to days) for the traditional process then in use, which required repeated exposure to the sun in bleach fields after soaking the textiles with alkali or sour milk. Tennant's factory at St Rollox, North Glasgow, became the largest chemical plant in the world.

After 1860 the focus on chemical innovation was in dyestuffs, and Germany took world leadership, building a strong chemical industry. Aspiring chemists flocked to German universities in the 1860–1914 era to learn the latest techniques. British scientists by contrast, lacked research universities and did not train advanced students; instead, the practice was to hire German-trained chemists.

Cement

In 1824 Joseph Aspdin, a British bricklayer turned builder, patented a chemical process for making portland cement which was an important advance in the building trades. This process involves sintering a mixture of clay and limestone to about 1,400 °C (2,552 °F), then grinding it into a fine powder which is then mixed with water, sand and gravel to produce concrete. Portland cement was used by the famous English engineer Marc Isambard Brunel several years later when constructing the Thames Tunnel. Cement was used on a large scale in the construction of the London sewerage system a generation later.

Gas lighting

Another major industry of the later Industrial Revolution was gas lighting. Though others made a similar innovation elsewhere, the large-scale introduction of this was the work of William Murdoch, an employee of Boulton& Watt, the Birmingham steam engine pioneers.

The process consisted of the large-scale gasification of coal in furnaces, the purification of the gas (removal of sulphur, ammonia, and heavy hydrocarbons), and its storage and distribution. The first gas lighting utilities were established in London between 1812 and 1820. They soon became one of the major consumers of coal in the UK. Gas lighting affected social and industrial organisation because it allowed factories and stores to remain open longer than with tallow candles or oil. Its introduction allowed nightlife to flourish in cities and towns as interiors and streets could be lighted on a larger scale than before.

Glass making

Glass was made in ancient Greece and Rome. A new method of producing glass, known as the cylinder process, was developed in Europe during the early 19th century. In 1832 this process was used by the Chance Brothers to create sheet glass. They became the leading producers of window and plate glass. This advancement allowed for larger panes of glass to be created without interruption, thus freeing up the space planning in interiors as well as the fenestration of buildings. The Crystal Palace is the supreme example of the use of sheet glass in a new and innovative structure.

Paper machine

A machine for making a continuous sheet of paper on a loop of wire fabric was patented in 1798 by Nicholas Louis Robert who worked for Saint-Léger Didot family in France. The paper machine is known as a Fourdrinier after the financiers, brothers Sealy and Henry Fourdrinier, who were stationers in London. Although greatly improved and with many variations, the Fourdriner machine is the predominant means of paper production today. The method of continuous production demonstrated by the paper machine influenced the development of continuous rolling of iron and later steel and other continuous production processes.

Agriculture

The British Agricultural Revolution is considered one of the causes of the Industrial Revolution because improved agricultural productivity freed up workers to work in other

sectors of the economy. However, per-capita food supply in Europe was stagnant or declining and did not improve in some parts of Europe until the late 18th century.

Industrial technologies that affected farming included the seed drill, the Dutch plough, which contained iron parts, and the threshing machine.

The English lawyer Jethro Tull invented an improved seed drill in 1701. It was a mechanical seeder which distributed seeds evenly across a plot of land and planted them at the correct depth.

This was important because the yield of seeds harvested to seeds planted at that time was around four or five. Tull's seed drill was very expensive and not very reliable and therefore did not have much of an effect. Good quality seed drills were not produced until the mid 18th century.

Joseph Foljambe's*Rotherham plough* of 1730 was the first commercially successful iron plough. The threshing machine, invented by the Scottish engineer Andrew Meikle in 1784, displaced hand threshing with a flail, a laborious job that took about one-quarter of agricultural labour. It took several decades to diffuse and was the final straw for many farm labourers, who faced near starvation, leading to the 1830 agricultural rebellion of the Swing Riots.

Machine tools and metalworking techniques developed during the Industrial Revolution eventually resulted in precision manufacturing techniques in the late 19th century for mass-producing agricultural equipment, such as reapers, binders and combine harvesters.

Mining

Coal mining in Britain, particularly in South Wales, started early. Before the steam engine, pits were often shallow bell pits following a seam of coal along the surface, which were abandoned as the coal was extracted. In other cases, if the geology was favourable, the coal was mined by means of an adit or drift mine driven into the side of a hill. Shaft mining was done in some areas, but the limiting factor was the problem of removing water. It could be done by hauling buckets of water up the shaft or to a sough (a tunnel driven into a hill to drain a mine). In either case, the water had to be discharged into a stream or ditch at a level where it could flow away by gravity.

The introduction of the steam pump by Thomas Savery in 1698 and the Newcomen steam engine in 1712 greatly facilitated the removal of water and enabled shafts to be made deeper, enabling more coal to be extracted. These were developments that had begun before the Industrial Revolution, but the adoption of John Smeaton's improvements to the Newcomen engine followed by James Watt's more efficient steam engines from the 1770s reduced the fuel costs of engines, making mines more profitable. The Cornish engine, developed in the 1810s, was much more efficient than the Watt steam engine.

Coal mining was very dangerous owing to the presence of firedamp in many coal seams. Some degree of safety was provided by the safety lamp which was invented in 1816 by Sir Humphry Davy and independently by George Stephenson. However, the lamps proved a false dawn because they became unsafe very quickly and provided a weak light. Firedamp

explosions continued, often setting off coal dust explosions, so casualties grew during the entire 19th century. Conditions of work were very poor, with a high casualty rate from rock falls.

Transportation

At the beginning of the Industrial Revolution, inland transport was by navigable rivers and roads, with coastal vessels employed to move heavy goods by sea. Wagonways were used for conveying coal to rivers for further shipment, but canals had not yet been widely constructed. Animals supplied all of the motive power on land, with sails providing the motive power on the sea. The first horse railways were introduced toward the end of the 18th century, with steam locomotives being introduced in the early decades of the 19th century. Improving sailing technologies boosted average sailing speed 50% between 1750 and 1830.

The Industrial Revolution improved Britain's transport infrastructure with a turnpike road network, a canal and waterway network, and a railway network. Raw materials and finished products could be moved more quickly and cheaply than before. Improved transportation also allowed new ideas to spread quickly.

Canals and improved waterways

Before and during the Industrial Revolution navigation on several British rivers was improved by removing obstructions, straightening curves, widening and deepening and building navigation locks. Britain had over 1,600 kilometres (1,000 mi) of navigable rivers and streams by 1750.

Canals and waterways allowed bulk materials to be economically transported long distances inland. This was because a horse could pull a barge with a load dozens of times larger than the load that could be drawn in a cart.

In the UK, canals began to be built in the late 18th century to link the major manufacturing centres across the country. Known for its huge commercial success, the Bridgewater Canal in North West England, which opened in 1761 and was mostly funded by The 3rd Duke of Bridgewater. From Worsley to the rapidly growing town of Manchester its construction cost £168,000 (£22,589,130 as of 2013), but its advantages over land and river transport meant that within a year of its opening in 1761, the price of coal in Manchester fell by about half.

This success helped inspire a period of intense canal building, known as Canal Mania. New canals were hastily built in the aim of replicating the commercial success of the Bridgewater Canal, the most notable being the Leeds and Liverpool Canal and the Thames and Severn Canal which opened in 1774 and 1789 respectively.

By the 1820s a national network was in existence. Canal construction served as a model for the organisation and methods later used to construct the railways. They were eventually largely superseded as profitable commercial enterprises by the spread of the railways from the 1840s on. The last major canal to be built in the United Kingdom was the Manchester Ship Canal, which upon opening in 1894 was the largest ship canal in the world, and opened Manchester as a port. However it never achieved the commercial success its

sponsors had hoped for and signalled canals as a dying mode of transport in an age dominated by railways, which were quicker and often cheaper.

Britain's canal network, together with its surviving mill buildings, is one of the most enduring features of the early Industrial Revolution to be seen in Britain.

Roads

France was known for having an excellent system of roads at the time of the Industrial Revolution; however, most of the roads on the European Continent and in the U.K. were in bad condition and dangerously rutted.

Much of the original British road system was poorly maintained by thousands of local parishes, but from the 1720s (and occasionally earlier) turnpike trusts were set up to charge tolls and maintain some roads. Increasing numbers of main roads were turnpiked from the 1750s to the extent that almost every main road in England and Wales was the responsibility of a turnpike trust. New engineered roads were built by John Metcalf, Thomas Telford and most notably John McAdam, with the first 'macadamised' stretch of road being Marsh Road at Ashton Gate, Bristol in 1816. The first macadamised road in the U.S. was the "Boonsborough Turnpike Road" between Hagerstown and Boonsboro, Maryland in 1823.

The major turnpikes radiated from London and were the means by which the Royal Mail was able to reach the rest of the country. Heavy goods transport on these roads was by means of slow, broad wheeled, carts hauled by teams of horses. Lighter goods were conveyed by smaller carts or by teams of

pack horse. Stagecoaches carried the rich, and the less wealthy could pay to ride on carriers carts. Productivity of road transport increased greatly during the Industrial Revolution and the cost of travel fell dramatically. Between 1690 and 1840 productivity almost tripled for long-distance carrying and increased four-fold in stage coaching.

Railways

Reducing friction was one of the major reasons for the success of railroads compared to wagons. This was demonstrated on an iron plate covered wooden tramway in 1805 at Croydon, England.

"A good horse on an ordinary turnpike road can draw two thousand pounds, or one ton. A party of gentlemen were invited to witness the experiment, that the superiority of the new road might be established by ocular demonstration. Twelve wagons were loaded with stones, till each wagon weighed three tons, and the wagons were fastened together. A horse was then attached, which drew the wagons with ease, six miles [10 km] in two hours, having stopped four times, in order to show he had the power of starting, as well as drawing his great load."

Railways were made practical by the widespread introduction of inexpensive puddled iron after 1800, the rolling mill for making rails, and the development of the high-pressure steam engine also around 1800.

Wagonways for moving coal in the mining areas had started in the 17th century and were often associated with canal or river systems for the further movement of coal. These were all horse drawn or relied on gravity, with a stationary steam engine to

haul the wagons back to the top of the incline. The first applications of the steam locomotive were on wagon or plate ways (as they were then often called from the cast-iron plates used). Horse-drawn public railways did not begin until the early years of the 19th century when improvements to pig and wrought iron production were lowering costs.

Steam locomotives began being built after the introduction of high-pressure steam engines after the expiration of the Boulton and Watt patent in 1800. High-pressure engines exhausted used steam to the atmosphere, doing away with the condenser and cooling water. They were also much lighter weight and smaller in size for a given horsepower than the stationary condensing engines. A few of these early locomotives were used in mines. Steam-hauled public railways began with the Stockton and Darlington Railway in 1825.

The rapid introduction of railways followed the 1829 Rainhill Trials, which demonstrated Robert Stephenson's successful locomotive design and the 1828 development of hot blast, which dramatically reduced the fuel consumption of making iron and increased the capacity of the blast furnace.

On 15 September 1830, the Liverpool and Manchester Railway, the first inter-city railway in the world, was opened, and was attended by Prime Minister, the Duke of Wellington. The railway was engineered by Joseph Locke and George Stephenson, linked the rapidly expanding industrial town of Manchester with the port town of Liverpool. The opening was marred by problems, due to the primitive nature of the technology being employed, however problems were gradually ironed out and the railway became highly successful,

transporting passengers and freight. The success of the inter-city railway, particularly in the transport of freight and commodities, led to Railway Mania.

Construction of major railways connecting the larger cities and towns began in the 1830s but only gained momentum at the very end of the first Industrial Revolution. After many of the workers had completed the railways, they did not return to their rural lifestyles but instead remained in the cities, providing additional workers for the factories.

Other developments

Other developments included more efficient water wheels, based on experiments conducted by the British engineer John Smeaton, the beginnings of a machine industry and the rediscovery of concrete (based on hydraulic lime mortar) by John Smeaton, which had been lost for 1,300 years.

Social effects

Factory system

Prior to the Industrial Revolution, most of the workforce was employed in agriculture, either as self-employed farmers as landowners or tenants, or as landless agricultural labourers. It was common for families in various parts of the world to spin yarn, weave cloth and make their own clothing. Households also spun and wove for market production. At the beginning of the Industrial Revolution India, China and regions of Iraq and elsewhere in Asia and the Middle East produced most of the world's cotton cloth while Europeans produced wool and linen

goods. In Britain by the 16th century the putting-out system, by which farmers and townspeople produced goods for market in their homes, often described as *cottage industry*, was being practiced.

Typical putting out system goods included spinning and weaving. Merchant capitalists typically provided the raw materials, paid workers by the piece, and were responsible for the sale of the goods. Embezzlement of supplies by workers and poor quality were common problems. The logistical effort in procuring and distributing raw materials and picking up finished goods were also limitations of the putting out system.

Some early spinning and weaving machinery, such as a 40 spindle jenny for about six pounds in 1792, was affordable for cottagers. Later machinery such as spinning frames, spinning mules and power looms were expensive (especially if water powered), giving rise to capitalist ownership of factories.

The majority of textile factory workers during the Industrial Revolution were unmarried women and children, including many orphans. They typically worked for 12 to 14 hours per day with only Sundays off. It was common for women take factory jobs seasonally during slack periods of farm work. Lack of adequate transportation, long hours and poor pay made it difficult to recruit and maintain workers. Many workers, such as displaced farmers and agricultural workers, who had nothing but their labour to sell, became factory workers out of necessity. (See: British Agricultural Revolution, Threshing machine)

The change in the social relationship of the factory worker compared to farmers and cottagers was viewed unfavourably by

Karl Marx; however, he recognized the increase in productivity made possible by technology.

Standards of living

Some economists, such as Robert E. Lucas, Jr., say that the real effect of the Industrial Revolution was that "for the first time in history, the living standards of the masses of ordinary people have begun to undergo sustained growth ... Nothing remotely like this economic behaviour is mentioned by the classical economists, even as a theoretical possibility." Others, however, argue that while growth of the economy's overall productive powers was unprecedented during the Industrial Revolution, living standards for the majority of the population did not grow meaningfully until the late 19th and 20th centuries, and that in many ways workers' living standards declined under early capitalism: for instance, studies have shown that real wages in Britain only increased 15% between the 1780s and 1850s, and that life expectancy in Britain did not begin to dramatically increase until the 1870s. Similarly, the average height of the population declined during the Industrial Revolution, implying that their nutritional status was also decreasing. Real wages were not keeping up with the price of food.

During the Industrial Revolution, the life expectancy of children increased dramatically. The percentage of the children born in London who died before the age of five decreased from 74.5% in 1730–1749 to 31.8% in 1810–1829.

The effects on living conditions of the industrial revolution have been very controversial, and were hotly debated by

economic and social historians from the 1950s to the 1980s. A series of 1950s essays by Henry Phelps Brown and Sheila V. Hopkins later set the academic consensus that the bulk of the population, that was at the bottom of the social ladder, suffered severe reductions in their living standards. During 1813–1913, there was a significant increase in worker wages.

Food and nutrition

Chronic hunger and malnutrition were the norm for the majority of the population of the world including Britain and France, until the late 19th century. Until about 1750, in large part due to malnutrition, life expectancy in France was about 35 years and about 40 years in Britain. The United States population of the time was adequately fed, much taller on average and had life expectancy of 45–50 years although U.S. life expectancy declined by a few years by the mid 19th century. Food consumption per capita also declined during an episode known as the Antebellum Puzzle.

Food supply in Great Britain was adversely affected by the Corn Laws (1815–1846). The Corn Laws, which imposed tariffs on imported grain, were enacted to keep prices high in order to benefit domestic producers. The Corn Laws were repealed in the early years of the Great Irish Famine.

The initial technologies of the Industrial Revolution, such as mechanized textiles, iron and coal, did little, if anything, to lower food prices. In Britain and the Netherlands, food supply increased before the Industrial Revolution due to better agricultural practices; however, population grew too, as noted by Thomas Malthus. This condition is called the Malthusian

trap, and it finally started to be overcome by transportation improvements, such as canals, improved roads and steamships. Railroads and steamships were introduced near the end of the Industrial Revolution.

Housing

The rapid population growth in the 19th century included the new industrial and manufacturing cities, as well as service centers such as Edinburgh and London. The critical factor was financing, which was handled by building societies that dealt directly with large contracting firms. Private renting from housing landlords was the dominant tenure. P. Kemp says this was usually of advantage to tenants. People moved in so rapidly there was not enough capital to build adequate housing for everyone, so low-income newcomers squeezed into increasingly overcrowded slums. Clean water, sanitation, and public health facilities were inadequate; the death rate was high, especially infant mortality, and tuberculosis among young adults. Cholera from polluted water and typhoid were endemic. Unlike rural areas, there were no famines such as the one that devastated Ireland in the 1840s.

A large exposé literature grew up condemning the unhealthy conditions. By far the most famous publication was by one of the founders of the Socialist movement, *The Condition of the Working Class in England* in 1844 Friedrich Engels described backstreet sections of Manchester and other mill towns, where people lived in crude shanties and shacks, some not completely enclosed, some with dirt floors. These shanty towns had narrow walkways between irregularly shaped lots and dwellings. There were no sanitary facilities. Population density

was extremely high. However, not everyone lived in such poor conditions. The Industrial Revolution also created a middle class of businessmen, clerks, foremen and engineers who lived in much better conditions.

Conditions improved over the course of the 19th century due to new public health acts regulating things such as sewage, hygiene and home construction. In the introduction of his 1892 edition, Engels notes that most of the conditions he wrote about in 1844 had been greatly improved. For example, the Public Health Act 1875 led to the more sanitary byelaw terraced house.

Sanitation

In *The Condition of the Working Class in England* in 1844 Friedrich Engels described how untreated sewage created awful odours and turned the rivers green in industrial cities.

In 1854 John Snow traced a cholera outbreak in Soho in London to faecal contamination of a public water well by a home cesspit. Snow's findings that cholera could be spread by contaminated water took some years to be accepted, but his work led to fundamental changes in the design of public water and waste systems.

Water supply

Pre-industrial water supply relied on gravity systems and pumping of water was done by water wheels. Pipes were typically made of wood. Steam powered pumps and iron pipes allowed the widespread piping of water to horse watering troughs and households.

Literacy and industrialization

Modern industrialization began in England and Scotland in the 18th century, where there were relatively high levels of literacy among farmers, especially in Scotland. This permitted the recruitment of literate craftsman, skilled workers, foremen and managers who supervised the emerging textile factories and coal mines. Much of a labor was unskilled, and especially in textile mills children as young as eight proved useful in handling chores and adding to the family income. Indeed, children were taken out of school to work alongside their parents in the factories. However, by the mid-nineteenth century, unskilled labor forces were common in Western Europe, and British industry moved upscale, needing many more engineers and skilled workers who could handle technical instructions and handle complex situations. Literacy was essential to be hired. A senior government official told Parliament in 1870:

- Upon the speedy provision of elementary education depends are industrial prosperity. It is of no use trying to give technical teaching to our citizens without elementary education; uneducated labourers—and many of our labourers are utterly uneducated—are, for the most part, unskilled labourers, and if we leave our work–folk any longer unskilled, notwithstanding their strong sinews and determined energy, they will become overmatched in the competition of the world.

The invention of the paper machine and the application of steam power to the industrial processes of printing supported

a massive expansion of newspaper and pamphlet publishing, which contributed to rising literacy and demands for mass political participation.

Clothing and consumer goods

Consumers benefited from falling prices for clothing and household articles such as cast iron cooking utensils, and in the following decades, stoves for cooking and space heating. Coffee, tea, sugar, tobacco and chocolate became affordable to many in Europe. The consumer revolution in England from the early 1600s to roughly 1750 had seen a marked increase in the consumption and variety of luxury goods and products by individuals from different economic and social backgrounds. With improvements in transport and manufacturing technology, opportunities for buying and selling became faster and more efficient than previous. The expanding textile trade in the north of England meant the three-piece suit became affordable to the masses. Founded by Josiah Wedgwood in 1759, Wedgwood fine china and porcelain tableware was starting to become a common feature on dining tables. Rising prosperity and social mobility in the 18th century increased the number of people with disposable income for consumption, and the marketing of goods (of which Wedgwood was a pioneer) for individuals as opposed to items for the household started to appear, and the new status of goods as status symbols related to changes in fashion and desired for aesthetic appeal.

With the rapid growth of towns and cities, shopping became an important part of everyday life. Window shopping and the purchase of goods became a cultural activity in its own right, and many exclusive shops were opened in elegant urban

districts: in the Strand and Piccadilly in London, for example, and in spa towns such as Bath and Harrogate. Prosperity and expansion in manufacturing industries such as pottery and metalwares increased consumer choice dramatically. Where once labourers ate from metal platters with wooden implements, ordinary workers now dined on Wedgwood porcelain. Consumers came to demand an array of new household goods and furnishings: metal knives and forks, for example, as well as rugs, carpets, mirrors, cooking ranges, pots, pans, watches, clocks and a dizzying array of furniture. The age of mass consumption had arrived.

- —□ *"Georgian Britain, The rise of consumerism", Dr Matthew White, British Library.*

Increased literacy rates, industrialisation, and the invention of railway created a new market for cheap popular literature for the masses and the ability for it to be circulated on a large scale. Penny dreadfuls were created in the 1830s to meet this demand. *The Guardian* described penny dreadfuls as "Britain's first taste of mass-produced popular culture for the young", and "the Victorian equivalent of video games". By the 1860s and 1870s more than one million boys' periodicals were sold per week. Labelled an "authorpreneur" by the *Paris Review*, Charles Dickens used innovations from the revolution to sell his books, such as the powerful new printing presses, enhanced advertising revenues and the expansion of railroads. His first novel, *The Pickwick Papers* (1836), became a publishing phenomenon, with its unprecedented success sparking numerous spin-offs and merchandise ranging from *Pickwick* cigars, playing cards, china figurines, Sam Weller puzzles, Weller boot polish and joke books. Nicholas Dames in

The Atlantic writes, "Literature" is not a big enough category for *Pickwick*. It defined its own, a new one that we have learned to call "entertainment."

In 1861, Welsh entrepreneur Pryce Pryce-Jones formed the first mail order business, an idea which would change the nature of retail. Selling Welsh flannel, he created mail order catalogues, with customers able to order by mail for the first time—this following the Uniform Penny Post in 1840 and the invention of the postage stamp (Penny Black) where there was a charge of one penny for carriage and delivery between any two places in the United Kingdom irrespective of distance—and the goods were delivered throughout the UK via the newly created railway system. As the railway network expanded overseas, so did his business.

Population increase

The Industrial Revolution was the first period in history during which there was a simultaneous increase in both population and per capita income.

According to Robert Hughes in *The Fatal Shore*, the population of England and Wales, which had remained steady at six million from 1700 to 1740, rose dramatically after 1740. The population of England had more than doubled from 8.3 million in 1801 to 16.8 million in 1850 and, by 1901, had nearly doubled again to 30.5 million. Improved conditions led to the population of Britain increasing from 10 million to 40 million in the 1800s. Europe's population increased from about 100 million in 1700 to 400 million by 1900.

Urbanization

The growth of modern industry since the late 18th century led to massive urbanisation and the rise of new great cities, first in Europe and then in other regions, as new opportunities brought huge numbers of migrants from rural communities into urban areas. In 1800, only 3% of the world's population lived in cities, compared to nearly 50% today (the beginning of the 21st century). Manchester had a population of 10,000 in 1717, but by 1911 it had burgeoned to 2.3 million.

Effect on women and family life

Women's historians have debated the effect of the Industrial Revolution and capitalism generally on the status of women. Taking a pessimistic side, Alice Clark argued that when capitalism arrived in 17th-century England, it lowered the status of women as they lost much of their economic importance. Clark argues that in 16th-century England, women were engaged in many aspects of industry and agriculture. The home was a central unit of production and women played a vital role in running farms, and in some trades and landed estates. Their useful economic roles gave them a sort of equality with their husbands. However, Clark argues, as capitalism expanded in the 17th century, there was more and more division of labour with the husband taking paid labour jobs outside the home, and the wife reduced to unpaid household work. Middle- and upper-class women were confined to an idle domestic existence, supervising servants; lower-class women were forced to take poorly paid jobs. Capitalism, therefore, had a negative effect on powerful women.

In a more positive interpretation, Ivy Pinchbeck argues that capitalism created the conditions for women's emancipation. Tilly and Scott have emphasised the continuity in the status of women, finding three stages in English history. In the pre-industrial era, production was mostly for home use and women produce much of the needs of the households. The second stage was the "family wage economy" of early industrialisation; the entire family depended on the collective wages of its members, including husband, wife and older children. The third or modern stage is the "family consumer economy," in which the family is the site of consumption, and women are employed in large numbers in retail and clerical jobs to support rising standards of consumption.

Ideas of thrift and hard work characterized middle-class families as the Industrial Revolution swept Europe. These values were displayed in Samuel Smiles' book *Self-Help*, in which he states that the misery of the poorer classes was "voluntary and self-imposed – the results of idleness, thriftlessness, intemperance, and misconduct."

Labour conditions

Social structure and working conditions

In terms of social structure, the Industrial Revolution witnessed the triumph of a middle class of industrialists and businessmen over a landed class of nobility and gentry. Ordinary working people found increased opportunities for employment in the new mills and factories, but these were often under strict working conditions with long hours of labour

dominated by a pace set by machines. As late as the year 1900, most industrial workers in the United States still worked a 10-hour day (12 hours in the steel industry), yet earned from 20% to 40% less than the minimum deemed necessary for a decent life; however, most workers in textiles, which was by far the leading industry in terms of employment, were women and children. For workers of the labouring classes, industrial life "was a stony desert, which they had to make habitable by their own efforts." Also, harsh working conditions were prevalent long before the Industrial Revolution took place. Pre-industrial society was very static and often cruel – child labour, dirty living conditions, and long working hours were just as prevalent before the Industrial Revolution.

Factories and urbanisation

Industrialisation led to the creation of the factory. The factory system contributed to the growth of urban areas, as large numbers of workers migrated into the cities in search of work in the factories. Nowhere was this better illustrated than the mills and associated industries of Manchester, nicknamed "Cottonopolis", and the world's first industrial city. Manchester experienced a six-times increase in its population between 1771 and 1831. Bradford grew by 50% every ten years between 1811 and 1851 and by 1851 only 50% of the population of Bradford was actually born there.

In addition, between 1815 and 1939, 20 percent of Europe's population left home, pushed by poverty, a rapidly growing population, and the displacement of peasant farming and artisan manufacturing. They were pulled abroad by the enormous demand for labour overseas, the ready availability of

land, and cheap transportation. Still, many did not find a satisfactory life in their new homes, leading 7 million of them to return to Europe.

This mass migration had large demographic effects: in 1800, less than one percent of the world population consisted of overseas Europeans and their descendants; by 1930, they represented 11 percent.

The Americas felt the brunt of this huge emigration, largely concentrated in the United States.

For much of the 19th century, production was done in small mills, which were typically water-powered and built to serve local needs. Later, each factory would have its own steam engine and a chimney to give an efficient draft through its boiler.

In other industries, the transition to factory production was not so divisive. Some industrialists themselves tried to improve factory and living conditions for their workers. One of the earliest such reformers was Robert Owen, known for his pioneering efforts in improving conditions for workers at the New Lanark mills, and often regarded as one of the key thinkers of the early socialist movement.

By 1746 an integrated brass mill was working at Warmley near Bristol. Raw material went in at one end, was smelted into brass and was turned into pans, pins, wire, and other goods. Housing was provided for workers on site. Josiah Wedgwood and Matthew Boulton (whose Soho Manufactory was completed in 1766) were other prominent early industrialists, who employed the factory system.

Child labour

The Industrial Revolution led to a population increase but the chances of surviving childhood did not improve throughout the Industrial Revolution, although *infant* mortality rates were reduced markedly. There was still limited opportunity for education and children were expected to work. Employers could pay a child less than an adult even though their productivity was comparable; there was no need for strength to operate an industrial machine, and since the industrial system was completely new, there were no experienced adult labourers. This made child labour the labour of choice for manufacturing in the early phases of the Industrial Revolution between the 18th and 19th centuries. In England and Scotland in 1788, two-thirds of the workers in 143 water-powered cotton mills were described as children.

Child labour existed before the Industrial Revolution but with the increase in population and education it became more visible. Many children were forced to work in relatively bad conditions for much lower pay than their elders, 10–20% of an adult male's wage.

Reports were written detailing some of the abuses, particularly in the coal mines and textile factories, and these helped to popularise the children's plight. The public outcry, especially among the upper and middle classes, helped stir change in the young workers' welfare.

Politicians and the government tried to limit child labour by law but factory owners resisted; some felt that they were aiding the poor by giving their children money to buy food to avoid

starvation, and others simply welcomed the cheap labour. In 1833 and 1844, the first general laws against child labour, the Factory Acts, were passed in Britain: Children younger than nine were not allowed to work, children were not permitted to work at night, and the work day of youth under the age of 18 was limited to twelve hours. Factory inspectors supervised the execution of the law, however, their scarcity made enforcement difficult. About ten years later, the employment of children and women in mining was forbidden. Although laws such as these decreased the number of child labourers, child labour remained significantly present in Europe and the United States until the 20th century.

Organisation of labour

The Industrial Revolution concentrated labour into mills, factories and mines, thus facilitating the organisation of *combinations* or trade unions to help advance the interests of working people. The power of a union could demand better terms by withdrawing all labour and causing a consequent cessation of production. Employers had to decide between giving in to the union demands at a cost to themselves or suffering the cost of the lost production. Skilled workers were hard to replace, and these were the first groups to successfully advance their conditions through this kind of bargaining.

The main method the unions used to effect change was strike action. Many strikes were painful events for both sides, the unions and the management. In Britain, the Combination Act 1799 forbade workers to form any kind of trade union until its repeal in 1824. Even after this, unions were still severely restricted. One British newspaper in 1834 described unions as

"the most dangerous institutions that were ever permitted to take root, under shelter of law, in any country..."

In 1832, the Reform Act extended the vote in Britain but did not grant universal suffrage. That year six men from Tolpuddle in Dorset founded the Friendly Society of Agricultural Labourers to protest against the gradual lowering of wages in the 1830s.

They refused to work for less than ten shillings a week, although by this time wages had been reduced to seven shillings a week and were due to be further reduced to six. In 1834 James Frampton, a local landowner, wrote to the Prime Minister, Lord Melbourne, to complain about the union, invoking an obscure law from 1797 prohibiting people from swearing oaths to each other, which the members of the Friendly Society had done. James Brine, James Hammett, George Loveless, George's brother James Loveless, George's brother in-law Thomas Standfield, and Thomas's son John Standfield were arrested, found guilty, and transported to Australia. They became known as the Tolpuddle Martyrs. In the 1830s and 1840s, the Chartist movement was the first large-scale organised working class political movement which campaigned for political equality and social justice. Its *Charter* of reforms received over three million signatures but was rejected by Parliament without consideration.

Working people also formed friendly societies and co-operative societies as mutual support groups against times of economic hardship. Enlightened industrialists, such as Robert Owen also supported these organisations to improve the conditions of the working class.

Unions slowly overcame the legal restrictions on the right to strike. In 1842, a general strike involving cotton workers and colliers was organised through the Chartist movement which stopped production across Great Britain.

Eventually, effective political organisation for working people was achieved through the trades unions who, after the extensions of the franchise in 1867 and 1885, began to support socialist political parties that later merged to become the British Labour Party.

Luddites

The rapid industrialisation of the English economy cost many craft workers their jobs. The movement started first with lace and hosiery workers near Nottingham and spread to other areas of the textile industry owing to early industrialisation. Many weavers also found themselves suddenly unemployed since they could no longer compete with machines which only required relatively limited (and unskilled) labour to produce more cloth than a single weaver.

Many such unemployed workers, weavers, and others, turned their animosity towards the machines that had taken their jobs and began destroying factories and machinery.

These attackers became known as Luddites, supposedly followers of Ned Ludd, a folklore figure. The first attacks of the Luddite movement began in 1811. The Luddites rapidly gained popularity, and the British government took drastic measures, using the militia or army to protect industry. Those rioters who were caught were tried and hanged, or transported for life.

Unrest continued in other sectors as they industrialised, such as with agricultural labourers in the 1830s when large parts of southern Britain were affected by the Captain Swing disturbances. Threshing machines were a particular target, and hayrick burning was a popular activity. However, the riots led to the first formation of trade unions, and further pressure for reform.

Shift in production's center of gravity

The traditional centers of hand textile production such as India, parts of the Middle East and later China could not withstand the competition from machine-made textiles, which over a period of decades destroyed the hand made textile industries and left millions of people without work, many of whom starved.

The Industrial Revolution also generated an enormous and unprecedented economic division in the world, as measured by the share of manufacturing output.

Effect on cotton production and expansion of slavery

Cheap cotton textiles increased the demand for raw cotton; previously, it had primarily been consumed in subtropical regions where it was grown, with little raw cotton available for export. Consequently, prices of raw cotton rose. Some cotton had been grown in the West Indies, particularly in Hispaniola, but Haitian cotton production was halted by the Haitian Revolution in 1791. The invention of the cotton gin in 1792 allowed Georgia green seeded cotton to be profitable, leading to the widespread growth of cotton plantations in the United

States and Brazil. In 1791 world cotton production was estimated to be 490,000,000 pounds with U.S. production accounting to 2,000,000 pounds. By 1800, U.S. production was 35,000,000 pounds, of which 17,790,000 were exported. In 1945 the U.S. produced seven-eights of the 1,169,600,000 pounds of world production.

The Americas, particularly the U.S., had labour shortages and high priced labour, which made slavery attractive. America's cotton plantations were highly efficient and profitable, and able to keep up with demand. The U.S. Civil War created a "cotton famine" that led to increased production in other areas of the world, including new colonies in Africa.

Effect on environment

The origins of the environmental movement lay in the response to increasing levels of smoke pollution in the atmosphere during the Industrial Revolution. The emergence of great factories and the concomitant immense growth in coal consumption gave rise to an unprecedented level of air pollution in industrial centers; after 1900 the large volume of industrial chemical discharges added to the growing load of untreated human waste.

The first large-scale, modern environmental laws came in the form of Britain's Alkali Acts, passed in 1863, to regulate the deleterious air pollution (gaseous hydrochloric acid) given off by the Leblanc process, used to produce soda ash. An Alkali inspector and four sub-inspectors were appointed to curb this pollution. The responsibilities of the inspectorate were gradually expanded, culminating in the Alkali Order 1958

which placed all major heavy industries that emitted smoke, grit, dust and fumes under supervision. The manufactured gas industry began in British cities in 1812–1820. The technique used produced highly toxic effluent that was dumped into sewers and rivers. The gas companies were repeatedly sued in nuisance lawsuits. They usually lost and modified the worst practices.

The City of London repeatedly indicted gas companies in the 1820s for polluting the Thames and poisoning its fish. Finally, Parliament wrote company charters to regulate toxicity. The industry reached the US around 1850 causing pollution and lawsuits.

In industrial cities local experts and reformers, especially after 1890, took the lead in identifying environmental degradation and pollution, and initiating grass-roots movements to demand and achieve reforms. Typically the highest priority went to water and air pollution.

The Coal Smoke Abatement Society was formed in Britain in 1898 making it one of the oldest environmental NGOs. It was founded by artist Sir William Blake Richmond, frustrated with the pall cast by coal smoke.

Although there were earlier pieces of legislation, the Public Health Act 1875 required all furnaces and fireplaces to consume their own smoke. It also provided for sanctions against factories that emitted large amounts of black smoke. The provisions of this law were extended in 1926 with the Smoke Abatement Act to include other emissions, such as soot, ash, and gritty particles and to empower local authorities to impose their own regulations.

Nations and nationalism

In his 1983 book *Nations and Nationalism*, philosopher Ernest Gellner argues that the industrial revolution and economic modernization spurred the creation of nations.

Industrialisation beyond Great Britain

Continental Europe

The Industrial Revolution in Continental Europe came later than in Great Britain. It started in Belgium and France, then spread to the German states by the middle of the 19th century. In many industries, this involved the application of technology developed in Britain in new places. Typically the technology was purchased from Britain or British engineers and entrepreneurs moved abroad in search of new opportunities. By 1809, part of the Ruhr Valley in Westphalia was called 'Miniature England' because of its similarities to the industrial areas of Britain. Most European governments provided state funding to the new industries. In some cases (such as iron), the different availability of resources locally meant that only some aspects of the British technology were adopted.

Austria-Hungary

The Habsburg realms which became Austria-Hungary in 1867 included 23 million inhabitants in 1800, growing to 36 million by 1870. Nationally the per capita rate of industrial growth

averaged about 3% between 1818 and 1870. However, there were strong regional differences. The railway system was built in the 1850-1873 period. Before they arrived transportation was very slow and expensive. In the Alpine and Bohemian (modern-day Czech Republic) regions, proto-industrialization began by 1750 and became the center of the first phases of the industrial revolution after 1800. The textile industry was the main factor, utilizing mechanization, steam engines, and the factory system. In the Czech lands, the "first mechanical loom followed in Varnsdorf in 1801," with the first steam engines appearing in Bohemia and Moravia just a few years later. The textile production flourished particularly in Prague and Brno (German: Brünn), which was considered the 'Moravian Manchester'. The Czech lands, especially Bohemia, became the center of industrialization due to its natural and human resources. The iron industry had developed in the Alpine regions after 1750, with smaller centers in Bohemia and Moravia. Hungary—the eastern half of the Dual Monarchy, was heavily rural with little industry before 1870.

In 1791 Prague organized the first World's Fair/List of world's fairs, Bohemia (modern-day Czech Republic). The first industrial exhibition was on the occasion of the coronation of Leopold II as a king of Bohemia, which took place in Clementinum, and therefore celebrated the considerable sophistication of manufacturing methods in the Czech lands during that time period.

Technological change accelerated industrialization and urbanization. The GNP per capita grew roughly 1.76% per year from 1870 to 1913. That level of growth compared very favorably to that of other European nations such as Britain

(1%), France (1.06%), and Germany (1.51%). However, in a comparison with Germany and Britain: the Austro-Hungarian economy as a whole still lagged considerably, as sustained modernization had begun much later.

Belgium

Belgium was the second country in which the Industrial Revolution took place and the first in continental Europe: Wallonia (French-speaking southern Belgium) took the lead. Starting in the middle of the 1820s, and especially after Belgium became an independent nation in 1830, numerous works comprising coke blast furnaces as well as puddling and rolling mills were built in the coal mining areas around Liège and Charleroi. The leader was a transplanted Englishman John Cockerill. His factories at Seraing integrated all stages of production, from engineering to the supply of raw materials, as early as 1825.

Wallonia exemplified the radical evolution of industrial expansion. Thanks to coal (the French word "houille" was coined in Wallonia), the region geared up to become the 2nd industrial power in the world after Britain. But it is also pointed out by many researchers, with its *Sillonindustriel*, 'Especially in the Haine, Sambre and Meuse valleys, between the Borinage and Liège...there was a huge industrial development based on coal-mining and iron-making...'. Philippe Raxhon wrote about the period after 1830: "It was not propaganda but a reality the Walloon regions were becoming the second industrial power all over the world after Britain." "The sole industrial centre outside the collieries and blast furnaces of Walloon was the old cloth-making town of Ghent."

Professor Michel De Coster stated: "The historians and the economists say that Belgium was the second industrial power of the world, in proportion to its population and its territory [...] But this rank is the one of Wallonia where the coal-mines, the blast furnaces, the iron and zinc factories, the wool industry, the glass industry, the weapons industry... were concentrated." Many of the 19th century coal mines in Wallonia are now protected as World Heritage sites

Wallonia was also the birthplace of a strong Socialist party and strong trade-unions in a particular sociological landscape. At the left, the *Sillonindustriel*, which runs from Mons in the west, to Verviers in the east (except part of North Flanders, in another period of the industrial revolution, after 1920). Even if Belgium is the second industrial country after Britain, the effect of the industrial revolution there was very different. In 'Breaking stereotypes', Muriel Neven and Isabelle Devious say:

The industrial revolution changed a mainly rural society into an urban one, but with a strong contrast between northern and southern Belgium. During the Middle Ages and the Early Modern Period, Flanders was characterised by the presence of large urban centres [...] at the beginning of the nineteenth century this region (Flanders), with an urbanisation degree of more than 30 per cent, remained one of the most urbanised in the world. By comparison, this proportion reached only 17 per cent in Wallonia, barely 10 per cent in most West European countries, 16 per cent in France and 25 per cent in Britain. Nineteenth century industrialisation did not affect the traditional urban infrastructure, except in Ghent....Also, in Wallonia the traditional urban network was largely unaffected by the industrialisation process, even though the proportion of

city-dwellers rose from 17 to 45 per cent between 1831 and 1910. Especially in the Haine, Sambre and Meuse valleys, between the Borinage and Liège, where there was a huge industrial development based on coal-mining and iron-making, urbanisation was fast. During these eighty years the number of municipalities with more than 5,000 inhabitants increased from only 21 to more than one hundred, concentrating nearly half of the Walloon population in this region. Nevertheless, industrialisation remained quite traditional in the sense that it did not lead to the growth of modern and large urban centres, but to a conurbation of industrial villages and towns developed around a coal-mine or a factory. Communication routes between these small centres only became populated later and created a much less dense urban morphology than, for instance, the area around Liège where the old town was there to direct migratory flows.

France

The industrial revolution in France followed a particular course as it did not correspond to the main model followed by other countries. Notably, most French historians argue France did not go through a clear *take-off*. Instead, France's economic growth and industrialisation process was slow and steady through the 18th and 19th centuries. However, some stages were identified by Maurice Lévy-Leboyer:

- French Revolution and Napoleonic wars (1789–1815),
- industrialisation, along with Britain (1815–1860),
- economic slowdown (1860–1905),
- renewal of the growth after 1905.

Germany

Based on its leadership in chemical research in the universities and industrial laboratories, Germany, which was unified in 1871, became dominant in the world's chemical industry in the late 19th century. At first the production of dyes based on aniline was critical.

Germany's political disunity—with three dozen states—and a pervasive conservatism made it difficult to build railways in the 1830s. However, by the 1840s, trunk lines linked the major cities; each German state was responsible for the lines within its own borders.

Lacking a technological base at first, the Germans imported their engineering and hardware from Britain, but quickly learned the skills needed to operate and expand the railways. In many cities, the new railway shops were the centres of technological awareness and training, so that by 1850,

Germany was self-sufficient in meeting the demands of railroad construction, and the railways were a major impetus for the growth of the new steel industry. Observers found that even as late as 1890, their engineering was inferior to Britain's. However, German unification in 1870 stimulated consolidation, nationalisation into state-owned companies, and further rapid growth. Unlike the situation in France, the goal was support of industrialisation, and so heavy lines crisscrossed the Ruhr and other industrial districts, and provided good connections to the major ports of Hamburg and Bremen. By 1880, Germany had 9,400 locomotives pulling 43,000 passengers and 30,000 tons of freight, and pulled ahead of France.

Sweden

During the period 1790–1815 Sweden experienced two parallel economic movements: an *agricultural revolution* with larger agricultural estates, new crops and farming tools and a commercialisation of farming, and a *protoindustrialisation*, with small industries being established in the countryside and with workers switching between agricultural work in summer and industrial production in winter. This led to economic growth benefiting large sections of the population and leading up to a *consumption revolution* starting in the 1820s. Between 1815 and 1850, the protoindustries developed into more specialised and larger industries. This period witnessed increasing regional specialisation with mining in Bergslagen, textile mills in Sjuhäradsbygden and forestry in Norrland. Several important institutional changes took place in this period, such as free and mandatory schooling introduced in 1842 (as the first country in the world), the abolition of the national monopoly on trade in handicrafts in 1846, and a stock company law in 1848.

From 1850 to 1890, Sweden experienced its "first" Industrial Revolution with a veritable explosion in export, dominated by crops, wood and steel. Sweden abolished most tariffs and other barriers to free trade in the 1850s and joined the gold standard in 1873. Large infrastructural investments were made during this period, mainly in the expanding rail road network, which was financed in part by the government and in part by private enterprises. From 1890 to 1930, new industries developed with their focus on the domestic market: mechanical engineering, power utilities, papermaking and textile.

Japan

The industrial revolution began about 1870 as Meiji period leaders decided to catch up with the West. The government built railroads, improved roads, and inaugurated a land reform programme to prepare the country for further development. It inaugurated a new Western-based education system for all young people, sent thousands of students to the United States and Europe, and hired more than 3,000 Westerners to teach modern science, mathematics, technology, and foreign languages in Japan (Foreign government advisors in Meiji Japan).

In 1871, a group of Japanese politicians known as the Iwakura Mission toured Europe and the United States to learn western ways. The result was a deliberate state-led industrialisation policy to enable Japan to quickly catch up. The Bank of Japan, founded in 1882, used taxes to fund model steel and textile factories. Education was expanded and Japanese students were sent to study in the west.

Modern industry first appeared in textiles, including cotton and especially silk, which was based in home workshops in rural areas.

United States

During the late 18th and early 19th centuries when the UK and parts of Western Europe began to industrialise, the US was primarily an agricultural and natural resource producing and processing economy. The building of roads and canals, the introduction of steamboats and the building of railroads were

important for handling agricultural and natural resource products in the large and sparsely populated country of the period.

Important American technological contributions during the period of the Industrial Revolution were the cotton gin and the development of a system for making interchangeable parts, the latter aided by the development of the milling machine in the US. The development of machine tools and the system of interchangeable parts were the basis for the rise of the US as the world's leading industrial nation in the late 19th century.

Oliver Evans invented an automated flour mill in the mid-1780s that used control mechanisms and conveyors so that no labour was needed from the time grain was loaded into the elevator buckets until flour was discharged into a wagon. This is considered to be the first modern materials handling system an important advance in the progress toward mass production.

The United States originally used horse-powered machinery for small scale applications such as grain milling, but eventually switched to water power after textile factories began being built in the 1790s. As a result, industrialisation was concentrated in New England and the Northeastern United States, which has fast-moving rivers. The newer water-powered production lines proved more economical than horse-drawn production. In the late 19th century steam-powered manufacturing overtook water-powered manufacturing, allowing the industry to spread to the Midwest.

Thomas Somers and the Cabot Brothers founded the Beverly Cotton Manufactory in 1787, the first cotton mill in America, the largest cotton mill of its era, and a significant milestone in

the research and development of cotton mills in the future. This mill was designed to use horse power, but the operators quickly learned that the horse-drawn platform was economically unstable, and had economic losses for years. Despite the losses, the Manufactory served as a playground of innovation, both in turning a large amount of cotton, but also developing the water-powered milling structure used in Slater's Mill.

In 1793, Samuel Slater (1768–1835) founded the Slater Mill at Pawtucket, Rhode Island. He had learned of the new textile technologies as a boy apprentice in Derbyshire, England, and defied laws against the emigration of skilled workers by leaving for New York in 1789, hoping to make money with his knowledge. After founding Slater's Mill, he went on to own 13 textile mills. Daniel Day established a wool carding mill in the Blackstone Valley at Uxbridge, Massachusetts in 1809, the third woollen mill established in the US (The first was in Hartford, Connecticut, and the second at Watertown, Massachusetts.) The John H. Chafee Blackstone River Valley National Heritage Corridor retraces the history of "America's Hardest-Working River', the Blackstone. The Blackstone River and its tributaries, which cover more than 70 kilometres (45 mi) from Worcester, Massachusetts to Providence, Rhode Island, was the birthplace of America's Industrial Revolution. At its peak over 1,100 mills operated in this valley, including Slater's mill, and with it the earliest beginnings of America's Industrial and Technological Development.

Merchant Francis Cabot Lowell from Newburyport, Massachusetts memorised the design of textile machines on his tour of British factories in 1810. Realising that the War of

1812 had ruined his import business but that a demand for domestic finished cloth was emerging in America, on his return to the United States, he set up the Boston Manufacturing Company. Lowell and his partners built America's second cotton-to-cloth textile mill at Waltham, Massachusetts, second to the Beverly Cotton Manufactory. After his death in 1817, his associates built America's first planned factory town, which they named after him. This enterprise was capitalised in a public stock offering, one of the first uses of it in the United States. Lowell, Massachusetts, using nine kilometres (5+1⁄2 miles) of canals and 7,500 kilowatts (10,000 horsepower) delivered by the Merrimack River, is considered by some as a major contributor to the success of the American Industrial Revolution. The short-lived utopia-like Waltham-Lowell system was formed, as a direct response to the poor working conditions in Britain. However, by 1850, especially following the Great Famine of Ireland, the system had been replaced by poor immigrant labour.

A major U.S. contribution to industrialisation was the development of techniques to make interchangeable parts from metal. Precision metal machining techniques were developed by the U.S. Department of War to make interchangeable parts for small firearms. The development work took place at the Federal Arsenals at Springfield Armory and Harpers Ferry Armory. Techniques for precision machining using machine tools included using fixtures to hold the parts in proper position, jigs to guide the cutting tools and precision blocks and gauges to measure the accuracy. The milling machine, a fundamental machine tool, is believed to have been invented by Eli Whitney, who was a government contractor who built firearms as part of this program. Another important invention was the Blanchard

lathe, invented by Thomas Blanchard. The Blanchard lathe, or pattern tracing lathe, was actually a shaper that could produce copies of wooden gun stocks. The use of machinery and the techniques for producing standardised and interchangeable parts became known as the American system of manufacturing.

Precision manufacturing techniques made it possible to build machines that mechanised the shoe industry. and the watch industry. The industrialisation of the watch industry started 1854 also in Waltham, Massachusetts, at the Waltham Watch Company, with the development of machine tools, gauges and assembling methods adapted to the micro precision required for watches.

Second Industrial Revolution

- Steel is often cited as the first of several new areas for industrial mass-production, which are said to characterise a "Second Industrial Revolution", beginning around 1850, although a method for mass manufacture of steel was not invented until the 1860s, when Sir Henry Bessemer invented a new furnace which could convert molten pig iron into steel in large quantities. However, it only became widely available in the 1870s after the process was modified to produce more uniform quality. Bessemer steel was being displaced by the open hearth furnace near the end of the 19th century.

This Second Industrial Revolution gradually grew to include chemicals, mainly the chemical industries, petroleum (refining and distribution), and, in the 20th century, the automotive

industry, and was marked by a transition of technological leadership from Britain to the United States and Germany.

The increasing availability of economical petroleum products also reduced the importance of coal and further widened the potential for industrialisation.

A new revolution began with electricity and electrification in the electrical industries. The introduction of hydroelectric power generation in the Alps enabled the rapid industrialisation of coal-deprived northern Italy, beginning in the 1890s.

By the 1890s, industrialisation in these areas had created the first giant industrial corporations with burgeoning global interests, as companies like U.S. Steel, General Electric, Standard Oil and Bayer AG joined the railroad and ship companies on the world's stock markets.

Causes

The causes of the Industrial Revolution were complicated and remain a topic for debate. Geographic factors include Britain's vast mineral resources. In addition to metal ores, Britain had the highest quality coal reserves known at the time, as well as abundant water power, highly productive agriculture, and numerous seaports and navigable waterways.

Some historians believe the Industrial Revolution was an outgrowth of social and institutional changes brought by the end of feudalism in Britain after the English Civil War in the 17th century, although feudalism began to break down after

the Black Death of the mid 14th century, followed by other epidemics, until the population reached a low in the 14th century. This created labour shortages and led to falling food prices and a peak in real wages around 1500, after which population growth began reducing wages. Inflation caused by coinage debasement after 1540 followed by precious metals supply increasing from the Americas caused land rents (often long-term leases that transferred to heirs on death) to fall in real terms.

The Enclosure movement and the British Agricultural Revolution made food production more efficient and less labour-intensive, forcing the farmers who could no longer be self-sufficient in agriculture into cottage industry, for example weaving, and in the longer term into the cities and the newly developed factories.

The colonial expansion of the 17th century with the accompanying development of international trade, creation of financial markets and accumulation of capital are also cited as factors, as is the scientific revolution of the 17th century. A change in marrying patterns to getting married later made people able to accumulate more human capital during their youth, thereby encouraging economic development.

Until the 1980s, it was universally believed by academic historians that technological innovation was the heart of the Industrial Revolution and the key enabling technology was the invention and improvement of the steam engine. However, recent research into the Marketing Era has challenged the traditional, supply-oriented interpretation of the Industrial Revolution.

Lewis Mumford has proposed that the Industrial Revolution had its origins in the Early Middle Ages, much earlier than most estimates. He explains that the model for standardised mass production was the printing press and that "the archetypal model for the industrial era was the clock". He also cites the monastic emphasis on order and time-keeping, as well as the fact that medieval cities had at their centre a church with bell ringing at regular intervals as being necessary precursors to a greater synchronisation necessary for later, more physical, manifestations such as the steam engine.

The presence of a large domestic market should also be considered an important driver of the Industrial Revolution, particularly explaining why it occurred in Britain. In other nations, such as France, markets were split up by local regions, which often imposed tolls and tariffs on goods traded among them. Internal tariffs were abolished by Henry VIII of England, they survived in Russia until 1753, 1789 in France and 1839 in Spain.

Governments' grant of limited monopolies to inventors under a developing patent system (the Statute of Monopolies in 1623) is considered an influential factor. The effects of patents, both good and ill, on the development of industrialisation are clearly illustrated in the history of the steam engine, the key enabling technology. In return for publicly revealing the workings of an invention the patent system rewarded inventors such as James Watt by allowing them to monopolise the production of the first steam engines, thereby rewarding inventors and increasing the pace of technological development. However, monopolies bring with them their own inefficiencies which may counterbalance, or even overbalance, the beneficial effects of publicising

ingenuity and rewarding inventors. Watt's monopoly prevented other inventors, such as Richard Trevithick, William Murdoch, or Jonathan Hornblower, whom Boulton and Watt sued, from introducing improved steam engines, thereby retarding the spread of steam power.

Causes in Europe

One question of active interest to historians is why the Industrial Revolution occurred in Europe and not in other parts of the world in the 18th century, particularly China, India, and the Middle East (which pioneered in shipbuilding, textile production, water mills, and much more in the period between 750 and 1100), or at other times like in Classical Antiquity or the Middle Ages. A recent account argued that Europeans have been characterized for thousands of years by a freedom-loving culture originating from the aristocratic societies of early Indo-European invaders. Many historians, however, have challenged this explanation as being not only Eurocentric, but also ignoring historical context. In fact, before the Industrial Revolution, "there existed something of a global economic parity between the most advanced regions in the world economy." These historians have suggested a number of other factors, including education, technological changes (see Scientific Revolution in Europe), "modern" government, "modern" work attitudes, ecology, and culture.

China was the world's most technologically advanced country for many centuries; however, China stagnated economically and technologically and was surpassed by Western Europe before the Age of Discovery, by which time China banned imports and denied entry to foreigners. China was also a

totalitarian society. China also heavily taxed transported goods. Modern estimates of per capita income in Western Europe in the late 18th century are of roughly 1,500 dollars in purchasing power parity (and Britain had a per capita income of nearly 2,000 dollars) whereas China, by comparison, had only 450 dollars. India was essentially feudal, politically fragmented and not as economically advanced as Western Europe.

Historians such as David Landes and sociologists Max Weber and Rodney Stark credit the different belief systems in Asia and Europe with dictating where the revolution occurred. The religion and beliefs of Europe were largely products of Judaeo-Christianity and Greek thought. Conversely, Chinese society was founded on men like Confucius, Mencius, Han Feizi (Legalism), Lao Tzu (Taoism), and Buddha (Buddhism), resulting in very different worldviews. Other factors include the considerable distance of China's coal deposits, though large, from its cities as well as the then unnavigable Yellow River that connects these deposits to the sea.

Regarding India, the Marxist historian Rajani Palme Dutt said: "The capital to finance the Industrial Revolution in India instead went into financing the Industrial Revolution in Britain." In contrast to China, India was split up into many competing kingdoms after the decline of the Mughal Empire, with the major ones in its aftermath including the Marathas, Sikhs, Bengal Subah, and Kingdom of Mysore. In addition, the economy was highly dependent on two sectors—agriculture of subsistence and cotton, and there appears to have been little technical innovation. It is believed that the vast amounts of

wealth were largely stored away in palace treasuries by monarchs prior to the British take over.

Economic historian Joel Mokyr argued that political fragmentation (the presence of a large number of European states) made it possible for heterodox ideas to thrive, as entrepreneurs, innovators, ideologues and heretics could easily flee to a neighboring state in the event that the one state would try to suppress their ideas and activities.

This is what set Europe apart from the technologically advanced, large unitary empires such as China and India by providing "an insurance against economic and technological stagnation".

China had both a printing press and movable type, and India had similar levels of scientific and technological achievement as Europe in 1700, yet the Industrial Revolution would occur in Europe, not China or India. In Europe, political fragmentation was coupled with an "integrated market for ideas" where Europe's intellectuals used the *lingua franca* of Latin, had a shared intellectual basis in Europe's classical heritage and the pan-European institution of the Republic of Letters.

In addition, Europe's monarchs desperately needed revenue, pushing them into alliances with their merchant classes. Small groups of merchants were granted monopolies and tax-collecting responsibilities in exchange for payments to the state. Located in a region "at the hub of the largest and most varied network of exchange in history," Europe advanced as the leader of the Industrial Revolution. In the Americas, Europeans found a windfall of silver, timber, fish, and maize, leading

historian Peter Stearns to conclude that "Europe's Industrial Revolution stemmed in great part from Europe's ability to draw disproportionately on world resources."

Modern capitalism originated in the Italian city-states around the end of the first millennium. The city-states were prosperous cities that were independent from feudal lords. They were largely republics whose governments were typically composed of merchants, manufacturers, members of guilds, bankers and financiers.

The Italian city-states built a network of branch banks in leading western European cities and introduced double entry bookkeeping. Italian commerce was supported by schools that taught numeracy in financial calculations through abacus schools.

Causes in Britain

Great Britain provided the legal and cultural foundations that enabled entrepreneurs to pioneer the Industrial Revolution. Key factors fostering this environment were:

- The period of peace and stability which followed the unification of England and Scotland
- There were no internal trade barriers, including between England and Scotland, or feudal tolls and tariffs, making Britain the "largest coherent market in Europe"
- The rule of law (enforcing property rights and respecting the sanctity of contracts)
- A straightforward legal system that allowed the formation of joint-stock companies (corporations)

- Free market (capitalism)
- Geographical and natural resource advantages of Great Britain were the fact that it had extensive coastlines and many navigable rivers in an age where water was the easiest means of transportation and Britain had the highest quality coal in Europe. Britain also had a large number of sites for water power.

There were two main values that really drove the Industrial Revolution in Britain. These values were self-interest and an entrepreneurial spirit. Because of these interests, many industrial advances were made that resulted in a huge increase in personal wealth and a consumer revolution. These advancements also greatly benefitted the British society as a whole. Countries around the world started to recognise the changes and advancements in Britain and use them as an example to begin their own Industrial Revolutions.

The debate about the start of the Industrial Revolution also concerns the massive lead that Great Britain had over other countries. Some have stressed the importance of natural or financial resources that Britain received from its many overseas colonies or that profits from the British slave trade between Africa and the Caribbean helped fuel industrial investment. However, it has been pointed out that slave trade and West Indian plantations provided only 5% of the British national income during the years of the Industrial Revolution. Even though slavery accounted for so little, Caribbean-based demand accounted for 12% of Britain's industrial output.

- Instead, the greater liberalisation of trade from a large merchant base may have allowed Britain to produce and use emerging scientific and technological developments more effectively than countries with stronger monarchies, particularly China and Russia. Britain emerged from the Napoleonic Wars as the only European nation not ravaged by financial plunder and economic collapse, and having the only merchant fleet of any useful size (European merchant fleets were destroyed during the war by the Royal Navy). Britain's extensive exporting cottage industries also ensured markets were already available for many early forms of manufactured goods. The conflict resulted in most British warfare being conducted overseas, reducing the devastating effects of territorial conquest that affected much of Europe. This was further aided by Britain's geographical position—an island separated from the rest of mainland Europe.

Another theory is that Britain was able to succeed in the Industrial Revolution due to the availability of key resources it possessed. It had a dense population for its small geographical size. Enclosure of common land and the related agricultural revolution made a supply of this labour readily available. There was also a local coincidence of natural resources in the North of England, the English Midlands, South Wales and the Scottish Lowlands. Local supplies of coal, iron, lead, copper, tin, limestone and water power resulted in excellent conditions for the development and expansion of industry. Also, the damp, mild weather conditions of the North West of England provided

ideal conditions for the spinning of cotton, providing a natural starting point for the birth of the textiles industry.

The stable political situation in Britain from around 1688 following the Glorious Revolution, and British society's greater receptiveness to change (compared with other European countries) can also be said to be factors favouring the Industrial Revolution. Peasant resistance to industrialisation was largely eliminated by the Enclosure movement, and the landed upper classes developed commercial interests that made them pioneers in removing obstacles to the growth of capitalism. (This point is also made in Hilaire Belloc's *The Servile State*.)

The French philosopher Voltaire wrote about capitalism and religious tolerance in his book on English society, *Letters on the English* (1733), noting why England at that time was more prosperous in comparison to the country's less religiously tolerant European neighbours. "Take a view of the Royal Exchange in London, a place more venerable than many courts of justice, where the representatives of all nations meet for the benefit of mankind. There the Jew, the Mahometan [Muslim], and the Christian transact together, as though they all professed the same religion, and give the name of infidel to none but bankrupts. There the Presbyterian confides in the Anabaptist, and the Churchman depends on the Quaker's word. If one religion only were allowed in England, the Government would very possibly become arbitrary; if there were but two, the people would cut one another's throats; but as there are such a multitude, they all live happy and in peace."

Britain's population grew 280% 1550–1820, while the rest of Western Europe grew 50–80%. Seventy percent of European urbanisation happened in Britain 1750–1800. By 1800, only the Netherlands was more urbanised than Britain. This was only possible because coal, coke, imported cotton, brick and slate had replaced wood, charcoal, flax, peat and thatch. The latter compete with land grown to feed people while mined materials do not. Yet more land would be freed when chemical fertilisers replaced manure and horse's work was mechanised. A workhorse needs 1.2 to 2.0 ha (3 to 5 acres) for fodder while even early steam engines produced four times more mechanical energy.

In 1700, five-sixths of the coal mined worldwide was in Britain, while the Netherlands had none; so despite having Europe's best transport, lowest taxes, and most urbanised, well-paid, and literate population, it failed to industrialise. In the 18th century, it was the only European country whose cities and population shrank. Without coal, Britain would have run out of suitable river sites for mills by the 1830s. Based on science and experimentation from the continent, the steam engine was developed specifically for pumping water out of mines, many of which in Britain had been mined to below the water table. Although extremely inefficient they were economical because they used unsaleable coal. Iron rails were developed to transport coal, which was a major economic sector in Britain.

Economic historian Robert Allen has argued that high wages, cheap capital and very cheap energy in Britain made it the ideal place for the industrial revolution to occur. These factors made it vastly more profitable to invest in research and development, and to put technology to use in Britain than

other societies. However, two 2018 studies in *The Economic History Review* showed that wages were not particularly high in the British spinning sector or the construction sector, casting doubt on Allen's explanation.

Transfer of knowledge

Knowledge of innovation was spread by several means. Workers who were trained in the technique might move to another employer or might be poached. A common method was for someone to make a study tour, gathering information where he could. During the whole of the Industrial Revolution and for the century before, all European countries and America engaged in study-touring; some nations, like Sweden and France, even trained civil servants or technicians to undertake it as a matter of state policy. In other countries, notably Britain and America, this practice was carried out by individual manufacturers eager to improve their own methods. Study tours were common then, as now, as was the keeping of travel diaries. Records made by industrialists and technicians of the period are an incomparable source of information about their methods.

Another means for the spread of innovation was by the network of informal philosophical societies, like the Lunar Society of Birmingham, in which members met to discuss 'natural philosophy' (*i.e.* science) and often its application to manufacturing. The Lunar Society flourished from 1765 to 1809, and it has been said of them, "They were, if you like, the revolutionary committee of that most far reaching of all the eighteenth century revolutions, the Industrial Revolution". Other such societies published volumes of proceedings and

transactions. For example, the London-based Royal Society of Arts published an illustrated volume of new inventions, as well as papers about them in its annual *Transactions*.

There were publications describing technology. Encyclopaedias such as Harris's *Lexicon Technicum* (1704) and Abraham Rees's *Cyclopaedia* (1802–1819) contain much of value. *Cyclopaedia* contains an enormous amount of information about the science and technology of the first half of the Industrial Revolution, very well illustrated by fine engravings. Foreign printed sources such as the *Descriptions des Arts et Métiers* and Diderot's *Encyclopédie* explained foreign methods with fine engraved plates.

Periodical publications about manufacturing and technology began to appear in the last decade of the 18th century, and many regularly included notice of the latest patents. Foreign periodicals, such as the *Annales des Mines*, published accounts of travels made by French engineers who observed British methods on study tours.

Protestant work ethic

Another theory is that the British advance was due to the presence of an entrepreneurial class which believed in progress, technology and hard work. The existence of this class is often linked to the Protestant work ethic (see Max Weber) and the particular status of the Baptists and the dissenting Protestant sects, such as the Quakers and Presbyterians that had flourished with the English Civil War. Reinforcement of confidence in the rule of law, which followed establishment of the prototype of constitutional monarchy in Britain in the

Glorious Revolution of 1688, and the emergence of a stable financial market there based on the management of the national debt by the Bank of England, contributed to the capacity for, and interest in, private financial investment in industrial ventures.

Dissenters found themselves barred or discouraged from almost all public offices, as well as education at England's only two universities at the time (although dissenters were still free to study at Scotland's four universities). When the restoration of the monarchy took place and membership in the official Anglican Church became mandatory due to the Test Act, they thereupon became active in banking, manufacturing and education. The Unitarians, in particular, were very involved in education, by running Dissenting Academies, where, in contrast to the universities of Oxford and Cambridge and schools such as Eton and Harrow, much attention was given to mathematics and the sciences – areas of scholarship vital to the development of manufacturing technologies.

Historians sometimes consider this social factor to be extremely important, along with the nature of the national economies involved. While members of these sects were excluded from certain circles of the government, they were considered fellow Protestants, to a limited extent, by many in the middle class, such as traditional financiers or other businessmen. Given this relative tolerance and the supply of capital, the natural outlet for the more enterprising members of these sects would be to seek new opportunities in the technologies created in the wake of the scientific revolution of the 17th century.

Criticisms

The Industrial revolution has been criticised for complete ecological collapse, causing mental illness, pollution and unnatural systems of organizing for humanity. Since the start of the industrial revolution people have criticised it by stating the Industrial Revolution turned humanity and nature into slaves and destroying the world. It has also been criticised by valuing profits and corporate growth over life and wellbeing, multiple movements have arose philosophically against the Industrial revolution and include groups such as the Amish and Primitivism.

Individualism humanism and industrial slavery

Humanists, and individualists criticise the Industrial revolution for turning humans into Industrial slaves, that humans lack autonomy in a modern industrialised world. Critics of the Industrial revolution state that humanity is perpetually controlled by technology and commanded by technology such as the computer mandated work, and that any individual freedom is destroyed by industrialisation.

Primitivism

Primitivism argues that the Industrial Revolution have created an un-natural frame of society and the world in which humans need to adapt to an un-natural urban landscape in which humans are perpetual cogs without personal autonomy.

Certain primitivists argue for a return to pre-industrial society, while others argue that technology such as modern

medicine, and agriculture are all positive for humanity assuming they controlled and serve humanity and have no effect on the natural environment.

Pollution and ecological collapse

The Industrial revolution has been criticised for leading to immense ecological and habitat destruction, certain studies state that over 95% of species have gone extinct since humanity became the dominant species on earth. It has also led to immense decrease in the biodiversity of life on earth. The Industrial revolution has been stated as is inherently unsustainable and will lead to eventual collapse of society, mass hunger, starvation, and resource scarcity.

The Anthropocene

The Anthropocene is a proposed epoch or mass extinction coming from humanity (Anthro is the Greek root for humanity). Since the start of the Industrial revolution humanity has permanently changed the earth, such as immense decrease in biodiversity, and mass extinction caused by the Industrial revolution. The effects include permanent changes to the earth's atmosphere and soil, forests, the mass destruction of the Industrial revolution has led to catastrophic impacts on the earth. Most organisms are unable to adapt leading to mass extinction with the remaining undergoing evolutionary rescue, as a result of the Industrial revolution.

Permanent changes in the distribution of organisms from human influence will become identifiable in the geologic record. Researchers have documented the movement of many

species into regions formerly too cold for them, often at rates faster than initially expected. This has occurred in part as a result of changing climate, but also in response to farming and fishing, and to the accidental introduction of non-native species to new areas through global travel. The ecosystem of the entire Black Sea may have changed during the last 2000 years as a result of nutrient and silica input from eroding deforested lands along the Danube River.

Opposition from Romanticism

During the Industrial Revolution, an intellectual and artistic hostility towards the new industrialisation developed, associated with the Romantic movement. Romanticism revered the traditionalism of rural life and recoiled against the upheavals caused by industrialization, urbanization and the wretchedness of the working classes. Its major exponents in English included the artist and poet William Blake and poets William Wordsworth, Samuel Taylor Coleridge, John Keats, Lord Byron and Percy Bysshe Shelley. The movement stressed the importance of "nature" in art and language, in contrast to "monstrous" machines and factories; the "Dark satanic mills" of Blake's poem "And did those feet in ancient time". Mary Shelley's *Frankenstein* reflected concerns that scientific progress might be two-edged. French Romanticism likewise was highly critical of industry.

Chapter 2

British Empire

The **British Empire** was composed of the dominions, colonies, protectorates, mandates, and other territories ruled or administered by the United Kingdom and its predecessor states. It began with the overseas possessions and trading posts established by England between the late 16th and early 18th centuries. At its height it was the largest empire in history and, for over a century, was the foremost global power. By 1913 the British Empire held sway over 412 million people, 23 per cent of the world population at the time, and by 1920 it covered 35,500,000 km (13,700,000 sq mi), 24 percent of the Earth's total land area. As a result, its constitutional, legal, linguistic, and cultural legacy is widespread. At the peak of its power, it was described as "the empire on which the sun never sets", as the sun was always shining on at least one of its territories.

During the Age of Discovery in the 15th and 16th centuries, Portugal and Spain pioneered European exploration of the globe, and in the process established large overseas empires. Envious of the great wealth these empires generated, England, France, and the Netherlands began to establish colonies and trade networks of their own in the Americas and Asia. A series of wars in the 17th and 18th centuries with the Netherlands and France left England (Britain, following the 1707 Act of Union with Scotland) the dominant colonial power in North America. Britain became the dominant power in the Indian subcontinent after the East India Company's conquest of Mughal Bengal at the Battle of Plassey in 1757.

The American War of Independence resulted in Britain losing some of its oldest and most populous colonies in North America by 1783. British attention then turned towards Asia, Africa, and the Pacific. After the defeat of France in the Napoleonic Wars (1803–1815), Britain emerged as the principal naval and imperial power of the 19th century and expanded its imperial holdings. The period of relative peace (1815–1914) during which the British Empire became the global hegemon was later described as *"Pax Britannica"* ("British Peace"). Alongside the formal control that Britain exerted over its colonies, its dominance of much of world trade meant that it effectively controlled the economies of many regions, such as Asia and Latin America. Increasing degrees of autonomy were granted to its white settler colonies, some of which were reclassified as dominions.

By the start of the 20th century, Germany and the United States had begun to challenge Britain's economic lead. Military and economic tensions between Britain and Germany were major causes of the First World War, during which Britain relied heavily on its empire. The conflict placed enormous strain on its military, financial, and manpower resources. Although the empire achieved its largest territorial extent immediately after World War I, Britain was no longer the world's pre-eminent industrial or military power. In the Second World War, Britain's colonies in East Asia and Southeast Asia were occupied by the Empire of Japan. Despite the final victory of Britain and its allies, the damage to British prestige helped accelerate the decline of the empire. India, Britain's most valuable and populous possession, achieved independence as part of a larger decolonisation movement, in which Britain granted independence to most territories of the empire. The

Suez Crisis confirmed Britain's decline as a global power, and the transfer of Hong Kong to China in 1997 marked for many the end of the British Empire. Fourteen overseas territories remain under British sovereignty. After independence, many former British colonies joined the Commonwealth of Nations, a free association of independent states. Sixteen of these, including the United Kingdom, retain a common monarch, currently Queen Elizabeth II.

Origins (1497–1583)

The foundations of the British Empire were laid when England and Scotland were separate kingdoms. In 1496, King Henry VII of England, following the successes of Spain and Portugal in overseas exploration, commissioned John Cabot to lead a voyage to discover a route to Asia via the North Atlantic. Cabot sailed in 1497, five years after the European discovery of America, and made landfall on the coast of Newfoundland. He believed he had reached Asia, and there was no attempt to found a colony. Cabot led another voyage to the Americas the following year but he did not return from this voyage and it is unknown what happened to his ships.

No further attempts to establish English colonies in the Americas were made until well into the reign of Queen Elizabeth I, during the last decades of the 16th century. In the meantime, the 1533 Statute in Restraint of Appeals had declared "that this realm of England is an Empire". The Protestant Reformation turned England and Catholic Spain into implacable enemies. In 1562, the English Crown encouraged the privateers John Hawkins and Francis Drake to engage in slave-raiding attacks against Spanish and

Portuguese ships off the coast of West Africa with the aim of establishing an Atlantic slave trade. This effort was rebuffed and later, as the Anglo-Spanish Wars intensified, Elizabeth I gave her blessing to further privateering raids against Spanish ports in the Americas and shipping that was returning across the Atlantic, laden with treasure from the New World. At the same time, influential writers such as Richard Hakluyt and John Dee (who was the first to use the term "British Empire") were beginning to press for the establishment of England's own empire. By this time, Spain had become the dominant power in the Americas and was exploring the Pacific Ocean, Portugal had established trading posts and forts from the coasts of Africa and Brazil to China, and France had begun to settle the Saint Lawrence River area, later to become New France.

Although England tended to trail behind Portugal, Spain, and France in establishing overseas colonies, it established its first overseas colony in 16th century Ireland by settling it with Protestants from England drawing on precedents dating back to the Norman invasion of Ireland in 1169. Several people who helped establish colonies in Ireland later played a part in the early colonisation of North America, particularly a group known as the West Country men.

English overseas possessions (1583–1707)

In 1578, Elizabeth I granted a patent to Humphrey Gilbert for discovery and overseas exploration. That year, Gilbert sailed for the Caribbean with the intention of engaging in piracy and establishing a colony in North America, but the expedition was

aborted before it had crossed the Atlantic. In 1583, he embarked on a second attempt. On this occasion, he formally claimed the harbour of the island of Newfoundland, although no settlers were left behind. Gilbert did not survive the return journey to England and was succeeded by his half-brother, Walter Raleigh, who was granted his own patent by Elizabeth in 1584. Later that year, Raleigh founded the Roanoke Colony on the coast of present-day North Carolina, but lack of supplies caused the colony to fail.

In 1603, James VI of Scotland ascended (as James I) to the English throne and in 1604 negotiated the Treaty of London, ending hostilities with Spain. Now at peace with its main rival, English attention shifted from preying on other nations' colonial infrastructures to the business of establishing its own overseas colonies. The British Empire began to take shape during the early 17th century, with the English settlement of North America and the smaller islands of the Caribbean, and the establishment of joint-stock companies, most notably the East India Company, to administer colonies and overseas trade. This period, until the loss of the Thirteen Colonies after the American War of Independence towards the end of the 18th century, has been referred to by some historians as the "First British Empire".

Americas, Africa and the slave trade

The Caribbean initially provided England's most important and lucrative colonies, but not before several attempts at colonisation failed. An attempt to establish a colony in Guiana in 1604 lasted only two years and failed in its main objective to find gold deposits. Colonies in St Lucia (1605) and

Grenada (1609) rapidly folded, but settlements were successfully established in St. Kitts (1624), Barbados (1627) and Nevis (1628). The colonies soon adopted the system of sugar plantations successfully used by the Portuguese in Brazil, which depended on slave labour, and—at first—Dutch ships, to sell the slaves and buy the sugar. To ensure that the increasingly healthy profits of this trade remained in English hands, Parliament decreed in 1651 that only English ships would be able to ply their trade in English colonies. This led to hostilities with the United Dutch Provinces—a series of Anglo-Dutch Wars—which would eventually strengthen England's position in the Americas at the expense of the Dutch. In 1655, England annexed the island of Jamaica from the Spanish, and in 1666 succeeded in colonising the Bahamas.

England's first permanent settlement in the Americas was founded in 1607 in Jamestown, led by Captain John Smith and managed by the Virginia Company. Bermuda was settled and claimed by England as a result of the 1609 shipwreck of the Virginia Company's flagship, and in 1615 was turned over to the newly formed Somers Isles Company. The Virginia Company's charter was revoked in 1624 and direct control of Virginia was assumed by the Crown, thereby founding the Colony of Virginia. The London and Bristol Company was created in 1610 with the aim of creating a permanent settlement on Newfoundland, but was largely unsuccessful. In 1620, Plymouth was founded as a haven for Puritan religious separatists, later known as the Pilgrims. Fleeing from religious persecution would become the motive of many English would-be colonists to risk the arduous trans-Atlantic voyage: Maryland was founded as a haven for Roman Catholics (1634), Rhode Island (1636) as a colony tolerant of all religions and

Connecticut (1639) for Congregationalists. The Province of Carolina was founded in 1663. With the surrender of Fort Amsterdam in 1664, England gained control of the Dutch colony of New Netherland, renaming it New York. This was formalised in negotiations following the Second Anglo-Dutch War, in exchange for Suriname. In 1681, the colony of Pennsylvania was founded by William Penn. The American colonies were less financially successful than those of the Caribbean, but had large areas of good agricultural land and attracted far larger numbers of English emigrants who preferred their temperate climates.

In 1670, Charles II incorporated by royal charter the Hudson's Bay Company (HBC), granting it a monopoly on the fur trade in the area known as Rupert's Land, which would later form a large proportion of the Dominion of Canada. Forts and trading posts established by the HBC were frequently the subject of attacks by the French, who had established their own fur trading colony in adjacent New France.

Two years later, the Royal African Company was inaugurated, receiving from King Charles a monopoly of the trade to supply slaves to the British colonies of the Caribbean. From the outset, slavery was the basis of the Empire in the West Indies. Until the abolition of its slave trade in 1807, Britain transported a third of all slaves shipped across the Atlantic—3.5 million Africans. To facilitate this trade, forts were established on the coast of West Africa, such as James Island, Accra and Bunce Island. In the British Caribbean, the percentage of the population of African descent rose from 25 per cent in 1650 to around 80 per cent in 1780, and in the Thirteen Colonies from 10 per cent to 40 per cent over the

same period (the majority in the southern colonies). For the slave traders, the trade was extremely profitable, and became a major economic mainstay for such western British cities as Bristol, Glasgow and Liverpool, which formed the third corner of the triangular trade with Africa and the Americas. For the transported, harsh and unhygienic conditions on the slaving ships and poor diets meant that the average mortality rate during the Middle Passage was one in seven.

Rivalry with other European empires

At the end of the 16th century, England and the Netherlands began to challenge Portugal's monopoly of trade with Asia, forming private joint-stock companies to finance the voyages—the English, later British, East India Company and the Dutch East India Company, chartered in 1600 and 1602 respectively. The primary aim of these companies was to tap into the lucrative spice trade, an effort focused mainly on two regions: the East Indies archipelago, and an important hub in the trade network, India. There, they competed for trade supremacy with Portugal and with each other. Although England eclipsed the Netherlands as a colonial power, in the short term the Netherlands' more advanced financial system and the three Anglo-Dutch Wars of the 17th century left it with a stronger position in Asia. Hostilities ceased after the Glorious Revolution of 1688 when the Dutch William of Orange ascended the English throne, bringing peace between the Netherlands and England. A deal between the two nations left the spice trade of the East Indies archipelago to the Netherlands and the textiles industry of India to England, but textiles soon overtook spices in terms of profitability.

Peace between England and the Netherlands in 1688 meant that the two countries entered the Nine Years' War as allies, but the conflict—waged in Europe and overseas between France, Spain and the Anglo-Dutch alliance—left the English a stronger colonial power than the Dutch, who were forced to devote a larger proportion of their military budget to the costly land war in Europe.

The death of Charles II of Spain in 1700 and his bequeathal of Spain and its colonial empire to Philip V of Spain, a grandson of the King of France, raised the prospect of the unification of France, Spain and their respective colonies, an unacceptable state of affairs for England and the other powers of Europe. In 1701, England, Portugal and the Netherlands sided with the Holy Roman Empire against Spain and France in the War of the Spanish Succession, which lasted for thirteen years.

Scottish attempt to expand overseas

In 1695, the Parliament of Scotland granted a charter to the Company of Scotland, which established a settlement in 1698 on the Isthmus of Panama. Besieged by neighbouring Spanish colonists of New Granada, and afflicted by malaria, the colony was abandoned two years later.

The Darien scheme was a financial disaster for Scotland—a quarter of Scottish capital was lost in the enterprise—and ended Scottish hopes of establishing its own overseas empire. The episode had major political consequences, helping to persuade the government of Scotland of the merits of turning the personal union with England into a political and economic one.

"First" British Empire (1707–1783)

The 18th century saw the newly united Great Britain rise to be the world's dominant colonial power, with France becoming its main rival on the imperial stage. Great Britain, Portugal, the Netherlands, and the Holy Roman Empire continued the War of the Spanish Succession, which lasted until 1714 and was concluded by the Treaty of Utrecht. Philip V of Spain renounced his and his descendants' claim to the French throne, and Spain lost its empire in Europe. The British Empire was territorially enlarged: from France, Britain gained Newfoundland and Acadia, and from Spain Gibraltar and Menorca. Gibraltar became a critical naval base and allowed Britain to control the Atlantic entry and exit point to the Mediterranean. Spain ceded the rights to the lucrative *asiento* (permission to sell African slaves in Spanish America) to Britain. With the outbreak of the Anglo-Spanish War of Jenkins' Ear in 1739, Spanish privateers attacked British merchant shipping along the Triangle Trade routes. In 1746, the Spanish and British began peace talks, with the King of Spain agreeing to stop all attacks on British shipping; however, in the Treaty of Madrid Britain lost its slave-trading rights in South and Central America.

In the East Indies, British and Dutch merchants continued to compete in spices and textiles. With textiles becoming the larger trade, by 1720, in terms of sales, the British company had overtaken the Dutch. During the middle decades of the 18th century, there were several outbreaks of military conflict on the Indian subcontinent, as the English East India Company and its French counterpart, struggled alongside local

rulers to fill the vacuum that had been left by the decline of the Mughal Empire. The Battle of Plassey in 1757, in which the British defeated the Nawab of Bengal and his French allies, left the British East India Company in control of Bengal and as the major military and political power in India. France was left control of its enclaves but with military restrictions and an obligation to support British client states, ending French hopes of controlling India. In the following decades the British East India Company gradually increased the size of the territories under its control, either ruling directly or via local rulers under the threat of force from the Presidency Armies, the vast majority of which was composed of Indian sepoys, led by British officers. The British and French struggles in India became but one theatre of the global Seven Years' War (1756–1763) involving France, Britain, and the other major European powers.

The signing of the Treaty of Paris of 1763 had important consequences for the future of the British Empire. In North America, France's future as a colonial power effectively ended with the recognition of British claims to Rupert's Land, and the ceding of New France to Britain (leaving a sizeable French-speaking population under British control) and Louisiana to Spain. Spain ceded Florida to Britain. Along with its victory over France in India, the Seven Years' War therefore left Britain as the world's most powerful maritime power.

Loss of the Thirteen American Colonies

During the 1760s and early 1770s, relations between the Thirteen Colonies and Britain became increasingly strained, primarily because of resentment of the British Parliament's

attempts to govern and tax American colonists without their consent. This was summarised at the time by the slogan "No taxation without representation", a perceived violation of the guaranteed Rights of Englishmen. The American Revolution began with a rejection of Parliamentary authority and moves towards self-government. In response, Britain sent troops to reimpose direct rule, leading to the outbreak of war in 1775. The following year, in 1776, the United States declared independence. The entry of French and Spanish forces into the war tipped the military balance in the Americans' favour and after a decisive defeat at Yorktown in 1781, Britain began negotiating peace terms. American independence was acknowledged at the Peace of Paris in 1783.

The loss of such a large portion of British America, at the time Britain's most populous overseas possession, is seen by some historians as the event defining the transition between the "first" and "second" empires, in which Britain shifted its attention away from the Americas to Asia, the Pacific and later Africa. Adam Smith's *Wealth of Nations*, published in 1776, had argued that colonies were redundant, and that free trade should replace the old mercantilist policies that had characterised the first period of colonial expansion, dating back to the protectionism of Spain and Portugal. The growth of trade between the newly independent United States and Britain after 1783 seemed to confirm Smith's view that political control was not necessary for economic success.

The war to the south influenced British policy in Canada, where between 40,000 and 100,000 defeated Loyalists had migrated from the new United States following independence. The 14,000 Loyalists who went to the Saint John and Saint

Croix river valleys, then part of Nova Scotia, felt too far removed from the provincial government in Halifax, so London split off New Brunswick as a separate colony in 1784. The Constitutional Act of 1791 created the provinces of Upper Canada (mainly English speaking) and Lower Canada (mainly French-speaking) to defuse tensions between the French and British communities, and implemented governmental systems similar to those employed in Britain, with the intention of asserting imperial authority and not allowing the sort of popular control of government that was perceived to have led to the American Revolution.

Tensions between Britain and the United States escalated again during the Napoleonic Wars, as Britain tried to cut off American trade with France and boarded American ships to impress men into the Royal Navy. The US declared war, the War of 1812, and invaded Canadian territory. In response, Britain invaded the US, but the pre-war boundaries were reaffirmed by the 1814 Treaty of Ghent, ensuring Canada's future would be separate from that of the United States.

Rise of the "Second" British Empire (1783–1815)

Exploration of the Pacific

Since 1718, transportation to the American colonies had been a penalty for various offences in Britain, with approximately one thousand convicts transported per year. Forced to find an alternative location after the loss of the Thirteen Colonies in 1783, the British government turned to Australia. The coast of

Australia had been discovered for Europeans by the Dutch in 1606, but there was no attempt to colonise it. In 1770 James Cook charted the eastern coast while on a scientific voyage, claimed the continent for Britain, and named it New South Wales. In 1778, Joseph Banks, Cook's botanist on the voyage, presented evidence to the government on the suitability of Botany Bay for the establishment of a penal settlement, and in 1787 the first shipment of convicts set sail, arriving in 1788. Unusually, Australia was claimed through proclamation. Indigenous Australians were considered too uncivilised to require treaties, and colonisation brought disease and violence that together with the deliberate dispossession of land and culture were devastating to these peoples. Britain continued to transport convicts to New South Wales until 1840, to Tasmania until 1853 and to Western Australia until 1868. The Australian colonies became profitable exporters of wool and gold, mainly because of gold rushes in Victoria, making its capital Melbourne for a time the richest city in the world.

During his voyage, Cook visited New Zealand, known to Europeans due to the 1642 voyage of Dutch explorer Abel Tasman, and claimed both the North and the South islands for the British crown in 1769 and 1770 respectively. Initially, interaction between the indigenous Māori population and Europeans was limited to the trading of goods. European settlement increased through the early decades of the 19th century, with numerous trading stations established, especially in the North. In 1839, the New Zealand Company announced plans to buy large tracts of land and establish colonies in New Zealand. On 6 February 1840, Captain William Hobson and around 40 Maori chiefs signed the Treaty of Waitangi. This treaty is considered to be New Zealand's

founding document, but differing interpretations of the Maori and English versions of the text have meant that it continues to be a source of dispute.

War with Napoleonic France

Britain was challenged again by France under Napoleon, in a struggle that, unlike previous wars, represented a contest of ideologies between the two nations.

It was not only Britain's position on the world stage that was at risk: Napoleon threatened to invade Britain itself, just as his armies had overrun many countries of continental Europe.

The Napoleonic Wars were therefore ones in which Britain invested large amounts of capital and resources to win. French ports were blockaded by the Royal Navy, which won a decisive victory over a Franco-Spanish fleet at Trafalgar in 1805. Overseas colonies were attacked and occupied, including those of the Netherlands, which was annexed by Napoleon in 1810. France was finally defeated by a coalition of European armies in 1815.

Britain was again the beneficiary of peace treaties: France ceded the Ionian Islands, Malta (which it had occupied in 1797 and 1798 respectively), Mauritius, St Lucia, the Seychelles, and Tobago; Spain ceded Trinidad; the Netherlands ceded Guyana and the Cape Colony. Britain returned Guadeloupe, Martinique, French Guiana, and Réunion to France, and Java and Suriname to the Netherlands, while gaining control of Ceylon (1795–1815) and Heligoland.

Abolition of slavery

With the advent of the Industrial Revolution, goods produced by slavery became less important to the British economy. Added to this was the cost of suppressing regular slave rebellions. With support from the British abolitionist movement, Parliament enacted the Slave Trade Act in 1807, which abolished the slave trade in the empire. In 1808, Sierra Leone Colony was designated an official British colony for freed slaves. Parliamentary reform in 1832 saw the influence of the West India Committee decline. The Slavery Abolition Act, passed the following year, abolished slavery in the British Empire on 1 August 1834, finally bringing the Empire into line with the law in the UK (with the exception of the territories administered by the East India Company and Ceylon, where slavery was ended in 1844). Under the Act, slaves were granted full emancipation after a period of four to six years of "apprenticeship". Facing further opposition from abolitionists, the apprenticeship system was abolished in 1838. The British government compensated slave-owners.

Britain's imperial century (1815–1914)

- Between 1815 and 1914, a period referred to as Britain's "imperial century" by some historians, around 10 million sq mi (26 million km) of territory and roughly 400 million people were added to the British Empire. Victory over Napoleon left Britain without any serious international rival, other than

Russia in Central Asia. Unchallenged at sea, Britain adopted the role of global policeman, a state of affairs later known as the *Pax Britannica*, and a foreign policy of "splendid isolation". Alongside the formal control it exerted over its own colonies, Britain's dominant position in world trade meant that it effectively controlled the economies of many countries, such as China, Argentina and Siam, which has been described by some historians as an "Informal Empire".

British imperial strength was underpinned by the steamship and the telegraph, new technologies invented in the second half of the 19th century, allowing it to control and defend the empire. By 1902, the British Empire was linked together by a network of telegraph cables, called the All Red Line.

East India Company rule and the British Raj in India

The East India Company drove the expansion of the British Empire in Asia. The Company's army had first joined forces with the Royal Navy during the Seven Years' War, and the two continued to co-operate in arenas outside India: the eviction of the French from Egypt (1799), the capture of Java from the Netherlands (1811), the acquisition of Penang Island (1786), Singapore (1819) and Malacca (1824), and the defeat of Burma (1826).

From its base in India, the Company had been engaged in an increasingly profitable opium export trade to China since the 1730s. This trade, illegal since it was outlawed by the Qing dynasty in 1729, helped reverse the trade imbalances resulting

from the British imports of tea, which saw large outflows of silver from Britain to China. In 1839, the confiscation by the Chinese authorities at Canton of 20,000 chests of opium led Britain to attack China in the First Opium War, and resulted in the seizure by Britain of Hong Kong Island, at that time a minor settlement, and other Treaty Ports including Shanghai.

During the late 18th and early 19th centuries, the British Crown began to assume an increasingly large role in the affairs of the Company. A series of Acts of Parliament were passed, including the Regulating Act of 1773, Pitt's India Act of 1784 and the Charter Act of 1813 which regulated the Company's affairs and established the sovereignty of the Crown over the territories that it had acquired. The Company's eventual end was precipitated by the Indian Rebellion in 1857, a conflict that had begun with the mutiny of sepoys, Indian troops under British officers and discipline.

The rebellion took six months to suppress, with heavy loss of life on both sides. The following year the British government dissolved the Company and assumed direct control over India through the Government of India Act 1858, establishing the British Raj, where an appointed governor-general administered India and Queen Victoria was crowned the Empress of India. India became the empire's most valuable possession, "the Jewel in the Crown", and was the most important source of Britain's strength.

A series of serious crop failures in the late 19th century led to widespread famines on the subcontinent in which it is estimated that over 15 million people died. The East India Company had failed to implement any coordinated policy to

deal with the famines during its period of rule. Later, under direct British rule, commissions were set up after each famine to investigate the causes and implement new policies, which took until the early 1900s to have an effect.

Rivalry with Russia

During the 19th century, Britain and the Russian Empire vied to fill the power vacuums that had been left by the declining Ottoman Empire, Qajar dynasty and Qing dynasty. This rivalry in Central Asia came to be known as the "Great Game".

As far as Britain was concerned, defeats inflicted by Russia on Persia and Turkey demonstrated its imperial ambitions and capabilities and stoked fears in Britain of an overland invasion of India. In 1839, Britain moved to pre-empt this by invading Afghanistan, but the First Anglo-Afghan War was a disaster for Britain.

When Russia invaded the Turkish Balkans in 1853, fears of Russian dominance in the Mediterranean and the Middle East led Britain and France to invade the Crimean Peninsula to destroy Russian naval capabilities. The ensuing Crimean War (1854–1856), which involved new techniques of modern warfare, was the only global war fought between Britain and another imperial power during the *Pax Britannica* and was a resounding defeat for Russia.

The situation remained unresolved in Central Asia for two more decades, with Britain annexing Baluchistan in 1876 and Russia annexing Kirghizia, Kazakhstan, and Turkmenistan. For a while, it appeared that another war would be inevitable, but the two countries reached an agreement on their respective

spheres of influence in the region in 1878 and on all outstanding matters in 1907 with the signing of the Anglo-Russian Entente.

The destruction of the Russian Navy by the Japanese at the Battle of Port Arthur during the Russo-Japanese War of 1904–1905 limited its threat to the British.

Cape to Cairo

The Dutch East India Company had founded the Cape Colony on the southern tip of Africa in 1652 as a way station for its ships travelling to and from its colonies in the East Indies. Britain formally acquired the colony, and its large Afrikaner (or Boer) population in 1806, having occupied it in 1795 to prevent its falling into French hands during the Flanders Campaign.

British immigration began to rise after 1820, and pushed thousands of Boers, resentful of British rule, northwards to found their own—mostly short-lived—independent republics, during the Great Trek of the late 1830s and early 1840s. In the process the Voortrekkers clashed repeatedly with the British, who had their own agenda with regard to colonial expansion in South Africa and to the various native African polities, including those of the Sotho and the Zulu nations. Eventually, the Boers established two republics that had a longer lifespan: the South African Republic or Transvaal Republic (1852–1877; 1881–1902) and the Orange Free State (1854–1902). In 1902 Britain occupied both republics, concluding a treaty with the two Boer Republics following the Second Boer War (1899–1902).

In 1869 the Suez Canal opened under Napoleon III, linking the Mediterranean with the Indian Ocean. Initially the Canal was opposed by the British; but once opened, its strategic value was quickly recognised and became the "jugular vein of the Empire". In 1875, the Conservative government of Benjamin Disraeli bought the indebted Egyptian ruler Isma'il Pasha's 44 per cent shareholding in the Suez Canal for £4 million (equivalent to £380 million in 2019). Although this did not grant outright control of the strategic waterway, it did give Britain leverage. Joint Anglo-French financial control over Egypt ended in outright British occupation in 1882. Although Britain controlled Egypt into the 20th century, it was officially part of the Ottoman Empire and not part of the British Empire. The French were still majority shareholders and attempted to weaken the British position, but a compromise was reached with the 1888 Convention of Constantinople, which made the Canal officially neutral territory.

With competitive French, Belgian and Portuguese activity in the lower Congo River region undermining orderly colonisation of tropical Africa, the Berlin Conference of 1884–85 was held to regulate the competition between the European powers in what was called the "Scramble for Africa" by defining "effective occupation" as the criterion for international recognition of territorial claims. The scramble continued into the 1890s, and caused Britain to reconsider its decision in 1885 to withdraw from Sudan. A joint force of British and Egyptian troops defeated the Mahdist Army in 1896 and rebuffed an attempted French invasion at Fashoda in 1898. Sudan was nominally made an Anglo-Egyptian condominium, but a British colony in reality.

British gains in Southern and East Africa prompted Cecil Rhodes, pioneer of British expansion in Southern Africa, to urge a "Cape to Cairo" railway linking the strategically important Suez Canal to the mineral-rich south of the continent. During the 1880s and 1890s, Rhodes, with his privately owned British South Africa Company, occupied and annexed territories named after him, Rhodesia.

Changing status of the white colonies

The path to independence for the white colonies of the British Empire began with the 1839 Durham Report, which proposed unification and self-government for Upper and Lower Canada, as a solution to political unrest which had erupted in armed rebellions in 1837. This began with the passing of the Act of Union in 1840, which created the Province of Canada. Responsible government was first granted to Nova Scotia in 1848, and was soon extended to the other British North American colonies. With the passage of the British North America Act, 1867 by the British Parliament, the Province of Canada, New Brunswick and Nova Scotia were formed into Canada, a confederation enjoying full self-government with the exception of international relations. Australia and New Zealand achieved similar levels of self-government after 1900, with the Australian colonies federating in 1901. The term "dominion status" was officially introduced at the Colonial Conference of 1907.

The last decades of the 19th century saw concerted political campaigns for Irish home rule. Ireland had been united with Britain into the United Kingdom of Great Britain and Ireland with the Act of Union 1800 after the Irish Rebellion of 1798,

and had suffered a severe famine between 1845 and 1852. Home rule was supported by the British Prime minister, William Gladstone, who hoped that Ireland might follow in Canada's footsteps as a Dominion within the empire, but his 1886 Home Rule bill was defeated in Parliament.

Although the bill, if passed, would have granted Ireland less autonomy within the UK than the Canadian provinces had within their own federation, many MPs feared that a partially independent Ireland might pose a security threat to Great Britain or mark the beginning of the break-up of the empire. A second Home Rule bill was defeated for similar reasons. A third bill was passed by Parliament in 1914, but not implemented because of the outbreak of the First World War leading to the 1916 Easter Rising.

World wars (1914–1945)

By the turn of the 20th century, fears had begun to grow in Britain that it would no longer be able to defend the metropole and the entirety of the empire while at the same time maintaining the policy of "splendid isolation".

Germany was rapidly rising as a military and industrial power and was now seen as the most likely opponent in any future war. Recognising that it was overstretched in the Pacific and threatened at home by the Imperial German Navy,

Britain formed an alliance with Japan in 1902 and with its old enemies France and Russia in 1904 and 1907, respectively.

First World War

Britain's fears of war with Germany were realised in 1914 with the outbreak of the First World War. Britain quickly invaded and occupied most of Germany's overseas colonies in Africa. In the Pacific, Australia and New Zealand occupied German New Guinea and German Samoa respectively. Plans for a post-war division of the Ottoman Empire, which had joined the war on Germany's side, were secretly drawn up by Britain and France under the 1916 Sykes–Picot Agreement. This agreement was not divulged to the Sharif of Mecca, who the British had been encouraging to launch an Arab revolt against their Ottoman rulers, giving the impression that Britain was supporting the creation of an independent Arab state.

The British declaration of war on Germany and its allies committed the colonies and Dominions, which provided invaluable military, financial and material support. Over 2.5 million men served in the armies of the Dominions, as well as many thousands of volunteers from the Crown colonies. The contributions of Australian and New Zealand troops during the 1915 Gallipoli Campaign against the Ottoman Empire had a great impact on the national consciousness at home and marked a watershed in the transition of Australia and New Zealand from colonies to nations in their own right. The countries continue to commemorate this occasion on Anzac Day. Canadians viewed the Battle of Vimy Ridge in a similar light. The important contribution of the Dominions to the war effort was recognised in 1917 by the British Prime Minister David Lloyd George when he invited each of the Dominion Prime Ministers to join an Imperial War Cabinet to co-ordinate imperial policy.

Under the terms of the concluding Treaty of Versailles signed in 1919, the empire reached its greatest extent with the addition of 1,800,000 square miles (4,700,000 km) and 13 million new subjects.

The colonies of Germany and the Ottoman Empire were distributed to the Allied powers as League of Nations mandates. Britain gained control of Palestine, Transjordan, Iraq, parts of Cameroon and Togoland, and Tanganyika. The Dominions themselves acquired mandates of their own: the Union of South Africa gained South West Africa (modern-day Namibia), Australia gained New Guinea, and New Zealand Western Samoa. Nauru was made a combined mandate of Britain and the two Pacific Dominions.

Inter-war period

The changing world order that the war had brought about, in particular the growth of the United States and Japan as naval powers, and the rise of independence movements in India and Ireland, caused a major reassessment of British imperial policy. Forced to choose between alignment with the United States or Japan, Britain opted not to renew its Japanese alliance and instead signed the 1922 Washington Naval Treaty, where Britain accepted naval parity with the United States. This decision was the source of much debate in Britain during the 1930s as militaristic governments took hold in Germany and Japan helped in part by the Great Depression, for it was feared that the empire could not survive a simultaneous attack by both nations. The issue of the empire's security was a serious concern in Britain, as it was vital to the British economy.

In 1919, the frustrations caused by delays to Irish home rule led the MPs of Sinn Féin, a pro-independence party that had won a majority of the Irish seats in the 1918 British general election, to establish an independent parliament in Dublin, at which Irish independence was declared. The Irish Republican Army simultaneously began a guerrilla war against the British administration. The Irish War of Independence ended in 1921 with a stalemate and the signing of the Anglo-Irish Treaty, creating the Irish Free State, a Dominion within the British Empire, with effective internal independence but still constitutionally linked with the British Crown. Northern Ireland, consisting of six of the 32 Irish counties which had been established as a devolved region under the 1920 Government of Ireland Act, immediately exercised its option under the treaty to retain its existing status within the United Kingdom.

A similar struggle began in India when the Government of India Act 1919 failed to satisfy the demand for independence. Concerns over communist and foreign plots following the Ghadar conspiracy ensured that war-time strictures were renewed by the Rowlatt Acts. This led to tension, particularly in the Punjab region, where repressive measures culminated in the Amritsar Massacre. In Britain, public opinion was divided over the morality of the massacre, between those who saw it as having saved India from anarchy, and those who viewed it with revulsion. The non-cooperation movement was called off in March 1922 following the ChauriChaura incident, and discontent continued to simmer for the next 25 years.

In 1922, Egypt, which had been declared a British protectorate at the outbreak of the First World War, was granted formal

independence, though it continued to be a British client state until 1954. British troops remained stationed in Egypt until the signing of the Anglo-Egyptian Treaty in 1936, under which it was agreed that the troops would withdraw but continue to occupy and defend the Suez Canal zone. In return, Egypt was assisted in joining the League of Nations. Iraq, a British mandate since 1920, gained membership of the League in its own right after achieving independence from Britain in 1932. In Palestine, Britain was presented with the problem of mediating between the Arabs and increasing numbers of Jews. The 1917 Balfour Declaration, which had been incorporated into the terms of the mandate, stated that a national home for the Jewish people would be established in Palestine, and Jewish immigration allowed up to a limit that would be determined by the mandatory power. This led to increasing conflict with the Arab population, who openly revolted in 1936. As the threat of war with Germany increased during the 1930s, Britain judged the support of Arabs as more important than the establishment of a Jewish homeland, and shifted to a pro-Arab stance, limiting Jewish immigration and in turn triggering a Jewish insurgency.

The right of the Dominions to set their own foreign policy, independent of Britain, was recognised at the 1923 Imperial Conference. Britain's request for military assistance from the Dominions at the outbreak of the Chanak Crisis the previous year had been turned down by Canada and South Africa, and Canada had refused to be bound by the 1923 Treaty of Lausanne. After pressure from the Irish Free State and South Africa, the 1926 Imperial Conference issued the Balfour Declaration of 1926, declaring the Dominions to be "autonomous Communities within the British Empire, equal in

status, in no way subordinate one to another" within a "British Commonwealth of Nations". This declaration was given legal substance under the 1931 Statute of Westminster. The parliaments of Canada, Australia, New Zealand, the Union of South Africa, the Irish Free State and Newfoundland were now independent of British legislative control, they could nullify British laws and Britain could no longer pass laws for them without their consent. Newfoundland reverted to colonial status in 1933, suffering from financial difficulties during the Great Depression. In 1937 the Irish Free State introduced a republican constitution renaming itself *Ireland*.

Second World War

Britain's declaration of war against Nazi Germany in September 1939 included the Crown colonies and India but did not automatically commit the Dominions of Australia, Canada, New Zealand, Newfoundland and South Africa. All soon declared war on Germany. While Britain continued to regard Ireland as still within the British Commonwealth, Ireland chose to remain legally neutral throughout the war.

After the Fall of France in June 1940, Britain and the empire stood alone against Germany, until the German invasion of Greece on 7 April 1941. British Prime Minister Winston Churchill successfully lobbied President Franklin D. Roosevelt for military aid from the United States, but Roosevelt was not yet ready to ask Congress to commit the country to war. In August 1941, Churchill and Roosevelt met and signed the Atlantic Charter, which included the statement that "the rights of all peoples to choose the form of government under which they live" should be respected. This wording was ambiguous as

to whether it referred to European countries invaded by Germany and Italy, or the peoples colonised by European nations, and would later be interpreted differently by the British, Americans, and nationalist movements.

For Churchill, the entry of the United States into the war was the "greatest joy". He felt that Britain was now assured of victory, but failed to recognise that the "many disasters, immeasurable costs and tribulations [which he knew] lay ahead" in December 1941 would have permanent consequences for the future of the empire. The manner in which British forces were rapidly defeated in the Far East irreversibly harmed Britain's standing and prestige as an imperial power, including, particularly, the Fall of Singapore, which had previously been hailed as an impregnable fortress and the eastern equivalent of Gibraltar. The realisation that Britain could not defend its entire empire pushed Australia and New Zealand, which now appeared threatened by Japanese forces, into closer ties with the United States and, ultimately, the 1951 ANZUS Pact. The war weakened the empire in other ways: undermining Britain's control of politics in India, inflicting long term economic damage, and irrevocably changing geopolitics by pushing the Soviet Union and the United States to the centre of the global stage.

Decolonisation and decline (1945–1997)

Though Britain and the empire emerged victorious from the Second World War, the effects of the conflict were profound, both at home and abroad. Much of Europe, a continent that

had dominated the world for several centuries, was in ruins, and host to the armies of the United States and the Soviet Union, who now held the balance of global power. Britain was left essentially bankrupt, with insolvency only averted in 1946 after the negotiation of a $US 4.33 billion loan from the United States, the last installment of which was repaid in 2006. At the same time, anti-colonial movements were on the rise in the colonies of European nations.

The situation was complicated further by the increasing Cold War rivalry of the United States and the Soviet Union. In principle, both nations were opposed to European colonialism.

In practice, American anti-communism prevailed over anti-imperialism, and therefore the United States supported the continued existence of the British Empire to keep Communist expansion in check. At first British politicians believed it would be possible to maintain Britain's role as a world power at the head of a re-imagined Commonwealth, but by 1960 they were forced to recognise that there was an irresistible "wind of change" blowing.

Their priorities changed to maintaining an extensive zone of British influence and ensuring that stable, non-Communist governments were established in former colonies. In this context, while other European powers such as France and Portugal waged costly and unsuccessful wars to keep their empires intact, Britain generally adopted a policy of peaceful disengagement from its colonies. In reality, this was rarely peaceable or altruistic. Between 1945 and 1965, the number of people under British rule outside the UK itself fell from 700 million to 5 million, 3 million of whom were in Hong Kong.

Initial disengagement

The pro-decolonisationLabour government, elected at the 1945 general election and led by Clement Attlee, moved quickly to tackle the most pressing issue facing the empire: Indian independence. India's two major political parties—the Indian National Congress (led by Mahatma Gandhi) and the Muslim League (led by Muhammad Ali Jinnah)—had been campaigning for independence for decades, but disagreed as to how it should be implemented. Congress favoured a unified secular Indian state, whereas the League, fearing domination by the Hindu majority, desired a separate Islamic state for Muslim-majority regions. Increasing civil unrest and the mutiny of the Royal Indian Navy during 1946 led Attlee to promise independence no later than 30 June 1948. When the urgency of the situation and risk of civil war became apparent, the newly appointed (and last) Viceroy, Lord Mountbatten, hastily brought forward the date to 15 August 1947. The borders drawn by the British to broadly partition India into Hindu and Muslim areas left tens of millions as minorities in the newly independent states of India and Pakistan. Millions of Muslims crossed from India to Pakistan and Hindus vice versa, and violence between the two communities cost hundreds of thousands of lives. Burma, which had been administered as part of the British Raj, and Sri Lanka gained their independence the following year in 1948. India, Pakistan and Sri Lanka became members of the Commonwealth, while Burma chose not to join.

The British Mandate in Palestine, where an Arab majority lived alongside a Jewish minority, presented the British with a similar problem to that of India. The matter was complicated

by large numbers of Jewish refugees seeking to be admitted to Palestine following the Holocaust, while Arabs were opposed to the creation of a Jewish state. Frustrated by the intractability of the problem, attacks by Jewish paramilitary organisations and the increasing cost of maintaining its military presence, Britain announced in 1947 that it would withdraw in 1948 and leave the matter to the United Nations to solve. The UN General Assembly subsequently voted for a plan to partition Palestine into a Jewish and an Arab state. It was immediately followed by the outbreak of a civil war between the Arabs and Jews of Palestine, and British forces withdrew amid the fighting. The British Mandate for Palestine officially terminated at midnight on 15 May 1948 as the State of Israel declared independence and the 1948 Arab-Israeli War broke out, during which the territory of the former Mandate was partitioned between Israel and the surrounding Arab states. Amid the fighting, British forces continued to withdraw from Israel, with the last British troops departing from Haifa on 30 June 1948.

Following the surrender of Japan in the Second World War, anti-Japanese resistance movements in Malaya turned their attention towards the British, who had moved to quickly retake control of the colony, valuing it as a source of rubber and tin. The fact that the guerrillas were primarily Malayan-Chinese Communists meant that the British attempt to quell the uprising was supported by the Muslim Malay majority, on the understanding that once the insurgency had been quelled, independence would be granted. The Malayan Emergency, as it was called, began in 1948 and lasted until 1960, but by 1957, Britain felt confident enough to grant independence to the Federation of Malaya within the Commonwealth. In 1963, the 11 states of the federation together with Singapore, Sarawak

and North Borneo joined to form Malaysia, but in 1965 Chinese-majority Singapore was expelled from the union following tensions between the Malay and Chinese populations and became an independent city-state. Brunei, which had been a British protectorate since 1888, declined to join the union.

Suez and its aftermath

In 1951, the Conservative Party returned to power in Britain, under the leadership of Winston Churchill. Churchill and the Conservatives believed that Britain's position as a world power relied on the continued existence of the empire, with the base at the Suez Canal allowing Britain to maintain its pre-eminent position in the Middle East in spite of the loss of India. Churchill could not ignore Gamal Abdul Nasser's new revolutionary government of Egypt that had taken power in 1952, and the following year it was agreed that British troops would withdraw from the Suez Canal zone and that Sudan would be granted self-determination by 1955, with independence to follow. Sudan was granted independence on 1 January 1956.

In July 1956, Nasser unilaterally nationalised the Suez Canal. The response of Anthony Eden, who had succeeded Churchill as Prime Minister, was to collude with France to engineer an Israeli attack on Egypt that would give Britain and France an excuse to intervene militarily and retake the canal. Eden infuriated US President Dwight D. Eisenhower by his lack of consultation, and Eisenhower refused to back the invasion. Another of Eisenhower's concerns was the possibility of a wider war with the Soviet Union after it threatened to intervene on the Egyptian side. Eisenhower applied financial leverage by

threatening to sell US reserves of the British pound and thereby precipitate a collapse of the British currency. Though the invasion force was militarily successful in its objectives, UN intervention and US pressure forced Britain into a humiliating withdrawal of its forces, and Eden resigned.

The Suez Crisis very publicly exposed Britain's limitations to the world and confirmed Britain's decline on the world stage and its end as a first-rate power, demonstrating that henceforth it could no longer act without at least the acquiescence, if not the full support, of the United States. The events at Suez wounded British national pride, leading one Member of Parliament (MP) to describe it as "Britain's Waterloo" and another to suggest that the country had become an "American satellite". Margaret Thatcher later described the mindset she believed had befallen Britain's political leaders after Suez where they "went from believing that Britain could do anything to an almost neurotic belief that Britain could do nothing", from which Britain did not recover until the successful recapture of the Falkland Islands from Argentina in 1982.

While the Suez Crisis caused British power in the Middle East to weaken, it did not collapse. Britain again deployed its armed forces to the region, intervening in Oman (1957), Jordan (1958) and Kuwait (1961), though on these occasions with American approval, as the new Prime Minister Harold Macmillan's foreign policy was to remain firmly aligned with the United States. Although Britain granted Kuwait independence in 1961, it continued to maintain a military presence in the Middle East for another decade. On 16 January 1968, a few weeks after the devaluation of the pound, Prime Minister Harold Wilson and

his Defence Secretary Denis Healey announced that British troops would be withdrawn from major military bases East of Suez, which included the ones in the Middle East, and primarily from Malaysia and Singapore by the end of 1971, instead of 1975 as earlier planned. By that time over 50,000 British military personnel were still stationed in the Far East, including 30,000 in Singapore. The British granted independence to the Maldives in 1965 but continued to station a garrison there until 1976, withdrew from Aden in 1967, and granted independence to Bahrain, Qatar, and the United Arab Emirates in 1971.

Wind of change

Macmillan gave a speech in Cape Town, South Africa in February 1960 where he spoke of "the wind of change blowing through this continent". Macmillan wished to avoid the same kind of colonial war that France was fighting in Algeria, and under his premiership decolonisation proceeded rapidly. To the three colonies that had been granted independence in the 1950s—Sudan, the Gold Coast and Malaya—were added nearly ten times that number during the 1960s.

Britain's remaining colonies in Africa, except for self-governing Southern Rhodesia, were all granted independence by 1968. British withdrawal from the southern and eastern parts of Africa was not a peaceful process. Kenyan independence was preceded by the eight-year Mau Mau uprising, in which tens of thousands of suspected rebels were interned by the colonial government in detention camps. In Rhodesia, the 1965 Unilateral Declaration of Independence by the white minority resulted in a civil war that lasted until the Lancaster House

Agreement of 1979, which set the terms for recognised independence in 1980, as the new nation of Zimbabwe.

In Cyprus, a guerrilla war waged by the Greek Cypriot organisation EOKA against British rule, was ended in 1959 by the London and Zürich Agreements, which resulted in Cyprus being granted independence in 1960. The UK retained the military bases of Akrotiri and Dhekelia as sovereign base areas. The Mediterranean colony of Malta was amicably granted independence from the UK in 1964 and became the country of Malta, though the idea had been raised in 1955 of integration with Britain.

Most of the UK's Caribbean territories achieved independence after the departure in 1961 and 1962 of Jamaica and Trinidad from the West Indies Federation, established in 1958 in an attempt to unite the British Caribbean colonies under one government, but which collapsed following the loss of its two largest members. Jamaica attained independence in 1962, as did Trinidad and Tobago. Barbados achieved independence in 1966 and the remainder of the eastern Caribbean islands, including the Bahamas, in the 1970s and 1980s, but Anguilla and the Turks and Caicos Islands opted to revert to British rule after they had already started on the path to independence. The British Virgin Islands, The Cayman Islands and Montserrat opted to retain ties with Britain, while Guyana achieved independence in 1966. Britain's last colony on the American mainland, British Honduras, became a self-governing colony in 1964 and was renamed Belize in 1973, achieving full independence in 1981. A dispute with Guatemala over claims to Belize was left unresolved.

British territories in the Pacific acquired independence in the 1970s beginning with Fiji in 1970 and ending with Vanuatu in 1980. Vanuatu's independence was delayed because of political conflict between English and French-speaking communities, as the islands had been jointly administered as a condominium with France. Fiji, Papua New Guinea, Solomon Islands and Tuvalu became Commonwealth realms.

End of empire

By 1981, aside from a scattering of islands and outposts, the process of decolonisation that had begun after the Second World War was largely complete. In 1982, Britain's resolve in defending its remaining overseas territories was tested when Argentina invaded the Falkland Islands, acting on a long-standing claim that dated back to the Spanish Empire. Britain's successful military response to retake the islands during the ensuing Falklands War contributed to reversing the downward trend in Britain's status as a world power.

The 1980s saw Canada, Australia, and New Zealand sever their final constitutional links with Britain. Although granted legislative independence by the Statute of Westminster 1931, vestigial constitutional links had remained in place. The British Parliament retained the power to amend key Canadian constitutional statutes, meaning that effectively an act of the British Parliament was required to make certain changes to the Canadian Constitution. The British Parliament had the power to pass laws extending to Canada at Canadian request. Although no longer able to pass any laws that would apply as Australian Commonwealth law, the British Parliament retained the power to legislate for the individual Australian states. With

regard to New Zealand, the British Parliament retained the power to pass legislation applying to New Zealand with the New Zealand Parliament's consent. In 1982, the last legal link between Canada and Britain was severed by the Canada Act 1982, which was passed by the British parliament, formally patriating the Canadian Constitution. The act ended the need for British involvement in changes to the Canadian constitution. Similarly, the Australia Act 1986 (effective 3 March 1986) severed the constitutional link between Britain and the Australian states, while New Zealand's Constitution Act 1986 (effective 1 January 1987) reformed the constitution of New Zealand to sever its constitutional link with Britain.

On 1 January 1984, Brunei, Britain's last remaining Asian protectorate, was granted independence. Independence had been delayed due to the opposition of the Sultan, who had preferred British protection.

In September 1982 the Prime Minister, Margaret Thatcher, travelled to Beijing to negotiate with the Chinese government, on the future of Britain's last major and most populous overseas territory, Hong Kong. Under the terms of the 1842 Treaty of Nanking and 1860 Convention of Peking, Hong Kong Island and Kowloon Peninsula had been respectively ceded to Britain *in perpetuity*, but the majority of the colony consisted of the New Territories, which had been acquired under a 99-year lease in 1898, due to expire in 1997. Thatcher, seeing parallels with the Falkland Islands, initially wished to hold Hong Kong and proposed British administration with Chinese sovereignty, though this was rejected by China. A deal was reached in 1984—under the terms of the Sino-British Joint Declaration, Hong Kong would become a special administrative

region of the People's Republic of China, maintaining its way of life for at least 50 years. The handover ceremony in 1997 marked for many, including Charles, Prince of Wales, who was in attendance, "the end of Empire".

Legacy

Britain retains sovereignty over 14 territories outside the British Isles. In 1983, the British Nationality Act 1981 renamed the existing Crown Colonies as "British Dependent Territories", and in 2002 they were renamed the British Overseas Territories. Most former British colonies and protectorates are members of the Commonwealth of Nations, a voluntary association of equal members, comprising a population of around 2.2 billion people. Sixteen Commonwealth realms voluntarily continue to share the British monarch, Queen Elizabeth II, as their head of state. These sixteen nations are distinct and equal legal entities – the United Kingdom, Australia, Canada, New Zealand, Antigua and Barbuda, The Bahamas, Barbados, Belize, Grenada, Jamaica, Papua New Guinea, Saint Kitts and Nevis, Saint Lucia, Saint Vincent and the Grenadines, Solomon Islands and Tuvalu.

Decades, and in some cases centuries, of British rule and emigration have left their mark on the independent nations that arose from the British Empire. The empire established the use of the English language in regions around the world. Today it is the primary language of up to 460 million people and is spoken by about 1.5 billion as a first, second or foreign language. Individual and team sports developed in Britain; particularly football, cricket, lawn tennis, and golf were exported. British missionaries who travelled around the globe

often in advance of soldiers and civil servants spread Protestantism (including Anglicanism) to all continents. The British Empire provided refuge for religiously persecuted continental Europeans for hundreds of years.

Political boundaries drawn by the British did not always reflect homogeneous ethnicities or religions, contributing to conflicts in formerly colonised areas. The British Empire was responsible for large migrations of peoples. Millions left the British Isles, with the founding settler populations of the United States, Canada, Australia and New Zealand coming mainly from Britain and Ireland. Tensions remain between the white settler populations of these countries and their indigenous minorities, and between white settler minorities and indigenous majorities in South Africa and Zimbabwe. Settlers in Ireland from Great Britain have left their mark in the form of divided nationalist and unionist communities in Northern Ireland. Millions of people moved to and from British colonies, with large numbers of Indians emigrating to other parts of the empire, such as Malaysia and Fiji, and Chinese people to Malaysia, Singapore and the Caribbean. The demographics of Britain itself were changed after the Second World War owing to immigration to Britain from its former colonies.

In the 19th century, innovation in Britain led to revolutionary changes in manufacturing, the development of factory systems, and the growth of transportation by railway and steam ship. British colonial architecture, such as in churches, railway stations and government buildings, can be seen in many cities that were once part of the British Empire. The British choice of system of measurement, the imperial system, continues to be

used in some countries in various ways. The convention of driving on the left hand side of the road has been retained in much of the former empire.

The Westminster system of parliamentary democracy has served as the template for the governments for many former colonies, and English common law for legal systems. International commercial contracts are often based on English common law. The British Judicial Committee of the Privy Council still serves as the highest court of appeal for twelve former colonies.

Chapter 3

Pax Britannica

Pax Britannica (Latin for "British Peace", modelled after *PaxRomana*) was the period of relative peace between the Great Powers during which the British Empire became the global hegemonic power and adopted the role of a "global policeman".

Between 1815 and 1914, a period referred to as Britain's "imperial century", around 10,000,000 square miles (26,000,000 km) of territory and roughly 400 million people were added to the British Empire. Victory over Napoleonic France left the British without any serious international rival, other than perhaps Russia in central Asia. When Russia tried expanding its influence in the Balkans, the British and French defeated them in the Crimean War (1853–1856), thereby protecting the Ottoman Empire.

Britain's Royal Navy controlled most of the key maritime trade routes and enjoyed unchallenged sea power. Alongside the formal control exerted over its own colonies, Britain's dominant position in world trade meant that it effectively controlled access to many regions, such as Asia and Latin America.

The British also, much to the dismay of other colonial empires, helped the United States uphold the Monroe Doctrine which upheld its economic dominance in the Americas. British merchants, shippers and bankers had such an overwhelming advantage over those of other empires that in addition to its colonies it had an informal empire.

History

- After losing the Thirteen Colonies, a significant part of British America, in the American Revolution, Britain turned towards Asia, the Pacific and later Africa with subsequent exploration leading to the rise of the Second British Empire (1783–1815). The Industrial Revolution began in Great Britain in the late 1700s and new ideas emerged about free markets, such as Adam Smith's *The Wealth of Nations* (1776). Free trade became a central principle that Britain practiced by the 1840s. It played a key role in Britain's economic growth and financial dominance.

From the end of the Napoleonic Wars in 1815 until World War I in 1914, the United Kingdom played the role of global hegemon (most powerful actor). Imposition of a "British Peace" on key maritime trade routes began in 1815 with the annexation of British Ceylon (now Sri Lanka). Under the British Residency of the Persian Gulf, local Arab rulers agreed to a number of treaties that formalised Britain's protection of the region. Britain imposed an anti-piracy treaty, known as the General Maritime Treaty of 1820, on all Arab rulers in the region. By signing the Perpetual Maritime Truce of 1853, Arab rulers gave up their right to wage war at sea in return for British protection against external threats. The global superiority of British military and commerce was aided by a divided and relatively weak continental Europe, and the presence of the Royal Navy on all of the world's oceans and seas. Even outside its formal empire, Britain controlled trade with many countries

such as China, Siam, and Argentina. Following the Congress of Vienna, the British Empire's economic strength continued to develop through naval dominance and diplomatic efforts to maintain a balance of power in continental Europe.

In this era, the Royal Navy provided services around the world that benefited other nations, such as the suppression of piracy and blocking the slave trade. The Slave Trade Act 1807 had banned the trade across the British Empire, after which the Royal Navy established the West Africa Squadron and the government negotiated international treaties under which they could enforce the ban. Sea power, however, did not project on land.

Land wars fought between the major powers include the Crimean War, the Franco-Austrian War, the Austro-Prussian War and the Franco-Prussian War, as well as numerous conflicts between lesser powers. The Royal Navy prosecuted the First Opium War (1839–1842) and Second Opium War (1856–1860) against Imperial China. The Royal Navy was superior to any other two navies in the world, combined. Between 1815 and the passage of the German naval laws of 1890 and 1898, only France was a potential naval threat.

The most decisive event emerged from the Anglo-Egyptian War, which resulted in the British occupation of Egypt for seven decades, even though the Ottoman Empire retained nominal ownership until 1914. Historian A.J.P. Taylor says that this "was a great event; indeed, the only real event in international relations between the Battle of Sedan and the defeat of Russia in the Russo-Japanese war". Taylor emphasizes the long-term impact:

- The British occupation of Egypt altered the balance of power. It not only gave the British security for their route to India; it made them masters of the Eastern Mediterranean and the Middle East; it made it unnecessary for them to stand in the front line against Russia at the Straits....And thus prepared the way for the Franco-Russian Alliance ten years later.

Britain traded goods and capital extensively with countries around the world, adopting a free trade policy after 1840. The growth of British imperial strength was further underpinned by the steamship and the telegraph, new technologies invented in the second half of the 19th century, allowing it to control and defend the empire. By 1902, the British Empire was linked together by a network of telegraph cables, the so-called All Red Line.

The *Pax Britannica* was weakened by the breakdown of the continental order which had been established by the Congress of Vienna. Relations between the Great Powers of Europe were strained to breaking point by issues such as the decline of the Ottoman Empire, which led to the Crimean War, and later the emergence of new nation states in the form of Italy and Germany after the Franco-Prussian War. Both of these wars involved Europe's largest states and armies. The industrialisation of Germany, the Empire of Japan, and the United States contributed to the relative decline of British industrial supremacy in the late 19th century. The start of World War I in 1914 marked the end of the *Pax Britannica*. However, the British Empire remained the biggest colonial empire until the start of decolonization after World War II

ended in 1945, and Britain remained one of the leading powers until the Suez Canal crisis in 1956, during which British and French troops were forced to withdraw from Egypt under pressure from the United States and (to a lesser extent) the Soviet Union.

Chapter 4

Constitutional Monarchy

A **constitutional monarchy**, **parliamentary monarchy**, or **democratic monarchy** is a form of monarchy in which the monarch exercises authority in accordance with a written or unwritten constitution. Constitutional monarchies differ from absolute monarchies (in which a monarch holds absolute power as both head of state and head of government) in that they are bound to exercise powers and authorities within limits prescribed by an established legal framework. Constitutional monarchies range from countries such as Liechtenstein, Monaco, Morocco, Jordan, Kuwait and Bahrain, where the constitution grants substantial discretionary powers to the sovereign, to countries such as the United Kingdom, the Netherlands, Spain, Belgium, Sweden, Malaysia and Japan, where the monarch retains significantly less personal discretion in the exercise of their authority.

Constitutional monarchy may refer to a system in which the monarch acts as a non-party political head of state under the constitution, whether written or unwritten. While most monarchs may hold formal authority and the government may legally operate in the monarch's name, in the form typical in Europe the monarch no longer personally sets public policy or chooses political leaders. Political scientist Vernon Bogdanor, paraphrasing Thomas Macaulay, has defined a constitutional monarch as "A sovereign who reigns but does not rule".

In addition to acting as a visible symbol of national unity, a constitutional monarch may hold formal powers such as

dissolving parliament or giving royal assent to legislation. However, the exercise of such powers may largely be exercises strictly in accordance with either written constitutional principles or unwritten constitutional conventions, rather than any personal political preference imposed by the sovereign. In *The English Constitution*,

British political theorist Walter Bagehot identified three main political rights which a constitutional monarch may freely exercise: the right to be consulted, the right to encourage, and the right to warn. Many constitutional monarchies still retain significant authorities or political influence, however, such as through certain reserve powers and who may also play an important political role.

The United Kingdom and the other Commonwealth realms are all constitutional monarchies in the Westminster system of constitutional governance. Two constitutional monarchies – Malaysia and Cambodia – are elective monarchies, wherein the ruler is periodically selected by a small electoral college.

Strongly limited constitutional monarchies have been referred to as crowned republics by writers H.G. Wells and Glenn Patmore.

The concept of **semi-constitutional monarch** identifies constitutional monarchies where the monarch retains substantial powers, on a par with a president in the semi-presidential system. As a result, constitutional monarchies where the monarch has a largely ceremonial role may also be referred to as '**parliamentary monarchies**' to differentiate them from semi-constitutional monarchies.

History

The oldest constitutional monarchy dating back to ancient times was that of the Hittites. They were an ancient Anatolian people that lived during the Bronze Age whose king or queen had to share their authority with an assembly, called the *Panku*, which was the equivalent to a modern-day deliberative assembly or a legislature. Members of the *Panku* came from scattered noble families who worked as representatives of their subjects in an adjutant or subaltern federal-type landscape.

Constitutional and absolute monarchy

England, Scotland and the United Kingdom

In the Kingdom of England, the Glorious Revolution of 1688 led to a constitutional monarchy restricted by laws such as the Bill of Rights 1689 and the Act of Settlement 1701, although limits on the power of the monarch ("a limited monarchy") are much older than that (see Magna Carta). At the same time, in Scotland, the Convention of Estates enacted the Claim of Right Act 1689, which placed similar limits on the Scottish monarchy.

Although Queen Anne was the last monarch to veto an Act of Parliament when, on 11 March 1708, she blocked the Scottish Militia Bill, Hanoverian monarchs continued to selectively dictate government policies. For instance King George III constantly blocked Catholic Emancipation, eventually

precipitating the resignation of William Pitt the Younger as prime minister in 1801. The sovereign's influence on the choice of prime minister gradually declined over this period, King William IV being the last monarch to dismiss a prime minister, when in 1834 he removed Lord Melbourne as a result of Melbourne's choice of Lord John Russell as Leader of the House of Commons. Queen Victoria was the last monarch to exercise real personal power, but this diminished over the course of her reign.

In 1839, she became the last sovereign to keep a prime minister in power against the will of Parliament when the Bedchamber crisis resulted in the retention of Lord Melbourne's administration.

By the end of her reign, however, she could do nothing to block the unacceptable (to her) premierships of William Gladstone, although she still exercised power in appointments to the Cabinet, for example in 1886 preventing Gladstone's choice of Hugh Childers as War Secretary in favour of Sir Henry Campbell-Bannerman.

Today, the role of the British monarch is by convention effectively ceremonial. Instead, the British Parliament and the Government – chiefly in the office of Prime Minister of the United Kingdom – exercise their powers under "Royal (or Crown) Prerogative": on behalf of the monarch and through powers still formally possessed by the Monarch.

No person may accept significant public office without swearing an oath of allegiance to the Queen. With few exceptions, the monarch is bound by constitutional convention to act on the advice of the Government.

Continental Europe

Poland developed the first constitution for a monarchy in continental Europe, with the Constitution of May 3, 1791; it was the second single-document constitution in the world just after the first republican Constitution of the United States. Constitutional monarchy also occurred briefly in the early years of the French Revolution, but much more widely afterwards. Napoleon Bonaparte is considered the first monarch proclaiming himself as an embodiment of the nation, rather than as a divinely appointed ruler; this interpretation of monarchy is germane to continental constitutional monarchies. German philosopher Georg Wilhelm Friedrich Hegel, in his work *Elements of the Philosophy of Right* (1820), gave the concept a philosophical justification that concurred with evolving contemporary political theory and the Protestant Christian view of natural law. Hegel's forecast of a constitutional monarch with very limited powers whose function is to embody the national character and provide constitutional continuity in times of emergency was reflected in the development of constitutional monarchies in Europe and Japan.

Executive monarchy versus ceremonial monarchy

There exist at least two different types of constitutional monarchies in the modern world — executive and ceremonial. In executive monarchies, the monarch wields significant (though not absolute) power. The monarchy under this system of government is a powerful political (and social) institution. By contrast, in ceremonial monarchies, the monarch holds little or no actual power or direct political influence, though

they frequently have a great deal of social and cultural influence. Executive constitutional monarchies: Bhutan, Bahrain, Jordan, Kuwait, Liechtenstein, Monaco, Morocco, and Tonga.

Ceremonial constitutional monarchies (Crowned Democracy): Andorra, Antigua and Barbuda, Australia, The Bahamas, Barbados, Belgium, Belize, Cambodia, Canada, Denmark, Grenada, Jamaica, Japan, Lesotho, Luxembourg, Malaysia, the Netherlands, New Zealand, Norway, Papua New Guinea, Saint Kitts and Nevis, Saint Lucia, Saint Vincent and the Grenadines, Solomon Islands, Spain, Sweden, Thailand, Tuvalu and the United Kingdom.

Ceremonial and executive monarchy, should not be confused with democratic and non-democratic monarchical systems. For example, in Liechtenstein and Monaco, the ruling monarchs wield significant executive power. However, they are *not* absolute monarchs, and these countries are generally reckoned as democracies.

Modern constitutional monarchy

As originally conceived, a constitutional monarch was head of the executive branch and quite a powerful figure even though his or her power was limited by the constitution and the elected parliament. Some of the framers of the U.S. Constitution may have envisioned the president as an elected constitutional monarch, as the term was then understood, following Montesquieu's account of the separation of powers.

The present-day concept of a constitutional monarchy developed in the United Kingdom, where the democratically

elected parliaments, and their leader, the prime minister, exercise power, with the monarchs having ceded power and remaining as a titular position. In many cases the monarchs, while still at the very top of the political and social hierarchy, were given the status of "servants of the people" to reflect the new, egalitarian position. In the course of France's July Monarchy, Louis-Philippe I was styled "King of the French" rather than "King of France."

Following the Unification of Germany, Otto von Bismarck rejected the British model. In the constitutional monarchy established under the Constitution of the German Empire which Bismarck inspired, the Kaiser retained considerable actual executive power, while the Imperial Chancellor needed no parliamentary vote of confidence and ruled solely by the imperial mandate.

However, this model of constitutional monarchy was discredited and abolished following Germany's defeat in the First World War. Later, Fascist Italy could also be considered a constitutional monarchy, in that there was a king as the titular head of state while actual power was held by Benito Mussolini under a constitution. This eventually discredited the Italian monarchy and led to its abolition in 1946. After the Second World War, surviving European monarchies almost invariably adopted some variant of the constitutional monarchy model originally developed in Britain.

Nowadays a parliamentary democracy that is a constitutional monarchy is considered to differ from one that is a republic only in detail rather than in substance. In both cases, the titular head of state—monarch or president—serves the

traditional role of embodying and representing the nation, while the government is carried on by a cabinet composed predominantly of elected Members of Parliament.

However, three important factors distinguish monarchies such as the United Kingdom from systems where greater power might otherwise rest with Parliament. These are: the Royal Prerogative under which the monarch may exercise power under certain very limited circumstances; Sovereign Immunity under which the monarch may *do no wrong* under the law because the responsible government is instead deemed accountable; and the monarch may not be subject to the same taxation or property use restrictions as most citizens. Other privileges may be nominal or ceremonial (e.g., where the executive, judiciary, police or armed forces act on the authority of or owe allegiance to the Crown).

Today slightly more than a quarter of constitutional monarchies are Western European countries, including the United Kingdom, Spain, the Netherlands, Belgium, Norway, Denmark, Luxembourg, Monaco, Liechtenstein and Sweden. However, the two most populous constitutional monarchies in the world are in Asia: Japan and Thailand. In these countries, the prime minister holds the day-to-day powers of governance, while the monarch retains residual (but not always insignificant) powers.

The powers of the monarch differ between countries. In Denmark and in Belgium, for example, the Monarch formally appoints a representative to preside over the creation of a coalition government following a parliamentary election, while in Norway the King chairs special meetings of the cabinet.

In nearly all cases, the monarch is still the nominal chief executive but is bound by convention to act on the advice of the Cabinet. Only a few monarchies (most notably Japan and Sweden) have amended their constitutions so that the monarch is no longer even the nominal chief executive.

There are sixteen constitutional monarchies under Queen Elizabeth II, which are known as Commonwealth realms. Unlike some of their continental European counterparts, the Monarch and her Governors-General in the Commonwealth realms hold significant "reserve" or "prerogative" powers, to be wielded in times of extreme emergency or constitutional crises, usually to uphold parliamentary government. An instance of a Governor-General exercising such power occurred during the 1975 Australian constitutional crisis, when the Australian Prime Minister, Gough Whitlam, was dismissed by the Governor-General.

The Australian Senate had threatened to block the Government's budget by refusing to pass the necessary appropriation bills. On November 11, 1975, Whitlam intended to call a half-Senate election in an attempt to break the deadlock. When he sought the Governor-General's approval of the election, the Governor-General instead dismissed him as Prime Minister. Shortly after that installed leader of the opposition Malcolm Fraser in his place. Acting quickly before all parliamentarians became aware of the government change, Fraser and his allies secured passage of the appropriation bills, and the Governor-General dissolved Parliament for a double dissolution election. Fraser and his government were returned with a massive majority. This led to much speculation among Whitlam's supporters as to whether this use of the

Governor-General's reserve powers was appropriate, and whether Australia should become a republic. Among supporters of constitutional monarchy, however, the experience confirmed the monarchy's value as a source of checks and balances against elected politicians who might seek powers in excess of those conferred by the constitution, and ultimately as a safeguard against dictatorship.

In Thailand's constitutional monarchy, the monarch is recognized as the Head of State, Head of the Armed Forces, Upholder of the Buddhist Religion, and Defender of the Faith. The immediate former King, BhumibolAdulyadej, was the longest-reigning monarch in the world and in all of Thailand's history, before passing away on 13 October 2016. Bhumibol reigned through several political changes in the Thai government. He played an influential role in each incident, often acting as mediator between disputing political opponents. (See Bhumibol's role in Thai Politics.) Among the powers retained by the Thai monarch under the constitution, lèsemajesté protects the image of the monarch and enables him to play a role in politics. It carries strict criminal penalties for violators. Generally, the Thai people were reverent of Bhumibol. Much of his social influence arose from this reverence and from the socioeconomic improvement efforts undertaken by the royal family.

In the United Kingdom, a frequent debate centres on when it is appropriate for a British monarch to act. When a monarch does act, political controversy can often ensue, partially because the neutrality of the crown is seen to be compromised in favour of a partisan goal, while some political scientists champion the idea of an "interventionist monarch" as a check against

possible illegal action by politicians. For instance, the monarch of the United Kingdom can theoretically exercise an absolute veto over legislation by withholding royal assent. However, no monarch has done so since 1708, and it is widely believed that this and many of the monarch's other political powers are lapsed powers.

There are currently 43 monarchies worldwide.

Former constitutional monarchies

- The Anglo-Corsican Kingdom was a brief period in the history of Corsica (1794–1796) when the island broke with Revolutionary France and sought military protection from Great Britain. Corsica became an independent kingdom under George III of the United Kingdom, but with its own elected parliament and a written constitution guaranteeing local autonomy and democratic rights.
- Brazil from 1822, with the proclamation of independence and rise of the Empire of Brazil by Pedro I of Brazil to 1889, when Pedro II was deposed by a military coup.
- Kingdom of Bulgaria until 1946 when Tsar Simeon was deposed by the communist assembly.
- Many Commonwealth republics were constitutional monarchies for some period after their independence, including South Africa (1910-1964), Ceylon from 1948 to 1972 (now Sri Lanka), Fiji (1970–1987), Gambia (1965–1970), Ghana (1957–1960), Guyana (1966–1970), and Trinidad and Tobago (1962–1976).

- The Grand Principality of Finland was a constitutional monarchy though its ruler, Alexander I, was simultaneously an autocrat and absolute ruler in Russia.
- France, several times from 1789 through the 19th century. The transformation of the Estates General of 1789 into the National Assembly initiated an ad-hoc transition from the absolute monarchy of the *Ancien Régime* to a new constitutional system. France formally became an executive constitutional monarchy with the promulgation of the French Constitution of 1791, which took effect on 1 October of that year. This first French constitutional monarchy was short-lived, ending with the overthrow of the monarchy and establishment of the French First Republic after the Insurrection of 10 August 1792. Several years later, in 1804, Napoleon Bonaparte proclaimed himself Emperor of the French in what was ostensibly a constitutional monarchy, though modern historians often call his reign as an absolute monarchy. The Bourbon Restoration (under Louis XVIII and Charles X), the July Monarchy (under Louis-Philippe), and the Second Empire (under Napoleon III) were also constitutional monarchies, although the power of the monarch varied considerably between them and sometimes within them.
- The German Empire from 1871 to 1918, (as well as earlier confederations, and the monarchies it consisted of) was also a constitutional monarchy—see Constitution of the German Empire.

- Greece until 1973 when Constantine II was deposed by the military government. The decision was formalized by a plebiscite December 8, 1974.
- Hawaii, which was an absolute monarchy from its founding in 1810, transitioned to a constitutional monarchy in 1840 when King Kamehameha III promulgated the kingdom's first constitution. This constitutional form of government continued until the monarchy was overthrown in an 1893 coup.
- The Kingdom of Hungary. In 1848–1849 and 1867–1918 as part of Austria-Hungary. In the interwar period (1920–1944) Hungary remained a constitutional monarchy without a reigning monarch.
- Iceland. The Act of Union, a December 1, 1918 agreement with Denmark, established Iceland as a sovereign kingdom united with Denmark under a common king. Iceland abolished the monarchy and became a republic on June 17, 1944 after the Icelandic constitutional referendum, May 24, 1944.
- India was a constitutional monarchy, with George VI as head of state and the Earl Mountbatten as governor-general, for a brief period between gaining its independence from the British on August 15, 1947 and becoming a republic when it adopted its constitution on January 26, 1950, henceforth celebrated as Republic Day.
- Iran under Mohammad Reza Shah Pahlavi was a constitutional monarchy, which had been originally established during the Persian Constitutional Revolution in 1906.

- Italy until June 2, 1946, when a referendum proclaimed the end of the Kingdom and the beginning of the Republic.
- The Kingdom of Laos was a constitutional monarchy until 1975, when SisavangVatthana was forced to abdicate by the communist Pathet Lao.
- Malta was a constitutional monarchy with Elizabeth II as Queen of Malta, represented by a Governor-General appointed by her, for the first ten years of independence from 21 September 1964 to the declaration of the Republic of Malta on 13 December 1974.
- Mexico was twice an Empire. The First Mexican Empire was from May 19, 1822, to March 19, 1823, with Agustín de Iturbide serving as emperor. Then, with the help of the Austrian and Spanish crowns, Napoleon III of France installed Maximilian of Austria as Emperor of Mexico. This attempt to create a European-style monarchy lasted three years, from 1864 to 1867.
- Montenegro until 1918 when it merged with Serbia and other areas to form Yugoslavia.
- Nepal until May 28, 2008, when King Gyanendra was deposed, and the Federal Democratic Republic of Nepal was declared.
- Ottoman Empire from 1876 until 1878 and again from 1908 until the dissolution of the empire in 1922.
- Pakistan was a constitutional monarchy for a brief period between gaining its independence from the British on August 14, 1947 and becoming a republic when it adopted the first Constitution of Pakistan on

March 23, 1956. The Dominion of Pakistan had a total of two monarchs (George VI and Elizabeth II) and four Governor-Generals (Muhammad Ali Jinnah being the first). Republic Day (or Pakistan Day) is celebrated every year on 23 March to commemorate the adoption of its Constitution and the transition of the Dominion of Pakistan to the Islamic Republic of Pakistan.

- The Kingdom of Afghanistan was a constitutional monarchy under Mohammad Zahir Shah until 1973.
- The Polish–Lithuanian Commonwealth, formed after the Union of Lublin in 1569 and lasting until the final partition of the state in 1795, operated much like many modern European constitutional monarchies (into which it was officially changed by the establishment of the Constitution of May 3, 1791, which historian Norman Davies calls "the first constitution of its kind in Europe"). The legislators of the unified state truly did not see it as a monarchy at all, but as *a republic under the presidency of the King* . Poland–Lithuania also followed the principle of *Rex regnat et non gubernat*, had a bicameral parliament, and a collection of entrenched legal documents amounting to a constitution along the lines of the modern United Kingdom. The King was elected, and had the duty of maintaining the people's rights.
- Kingdom of Albania from 1928 until 1939, Albania was a Constitutional Monarchy ruled by the House of Zogu, King Zog I.
- Portugal was a monarchy since 1139 and a constitutional monarchy from 1822 to 1828, and

again from 1834 until 1910, when Manuel II was overthrown by a military coup. From 1815 to 1825 it was part of the United Kingdom of Portugal, Brazil and the Algarves which was a constitutional monarchy for the years 1820–23.

- Kingdom of Romania From its establishment in 1881 until 1947 when Michael I was forced to abdicate by the communists.
- Kingdom of Serbia from 1882 until 1918, when it merged with the State of Slovenes, Croats and Serbs into the unitary Yugoslav Kingdom, that was led by the Serbian Karadjordjevic dynasty.
- Trinidad and Tobago was a constitutional monarchy with Elizabeth II as Queen of Trinidad and Tobago, represented by a Governor-General appointed by her, for the first fourteen years of independence from 31 August 1962 to the declaration of the Republic of Trinidad and Tobago on 1 August 1976. Republic Day is celebrated every year on 24 September.
- Yugoslavia from 1918 (as Kingdom of Serbs, Croats and Slovenes) until 1929 and from 1931 (as Kingdom of Yugoslavia) until 1944 when under pressure from the Allies Peter II recognized the communist government.

Unique constitutional monarchies

- Andorra is a diarchy, being headed by two co-princes: the bishop of Urgell and the president of France.

- Andorra, Monaco and Liechtenstein are the only countries with reigning princes.
- Belgium is the only remaining explicit popular monarchy, the formal title of its king being *king of the Belgians* rather than *king of Belgium*. Historically, several defunct constitutional monarchies followed this model; the Belgian formulation is recognized to have been modelled on the title "King of the French" the Charter of 1830 granted the monarch of the July Monarchy.
- Japan is the only country remaining with an emperor.
- Luxembourg is the only country remaining with a grand duke.
- Malaysia is a federal country with an elective monarchy, the Yang di-PertuanAgong, being selected from among nine state rulers who are also constitutional monarchs themselves.
- Spain. The Constitution of Spain does not even recognize the monarch as *sovereign*, but just as the head of state, per Article 56. Article 1, Section 2, states that "the national sovereignty is vested in the Spanish people".
- United Arab Emirates is a federal country with an elective monarchy, the President or Ra'is, being selected from among seven emirates rulers who are absolute monarchs.
- Yogyakarta Sultanate and Pakualaman Principality are two monarchies that remain in power within the presidential republic of Indonesia. When Indonesia proclaimed independence from the Netherlands, both kingdoms gave up their state status and joined the

Republic of Indonesia, then the two kingdoms merged into the Special Region of Yogyakarta. The region is governed by Sultan Hamengkubuwono as the Governor and Prince PakuAlam as the Vice Governor.

Chapter 5

Abolitionism in the United Kingdom

Abolitionism in the United Kingdom was the movement in the late 18th and early 19th centuries to end the practice of slavery, whether formal or informal, in the United Kingdom, the British Empire and the world, including ending the Atlantic slave trade. It was part of a wider abolitionism movement in Western Europe and the Americas.

The buying and selling of slaves was made illegal across the British Empire in 1807, but owning slaves was permitted until it was outlawed completely in 1833, beginning a process where from 1834 slaves became indentured "apprentices" to their former owners until emancipation was achieved for the majority by 1840 and for remaining exceptions by 1843. Former slave owners received formal compensation for their losses from the British government, known as compensated emancipation.

Origins

In the 17th and early 18th centuries, English Quakers and a few evangelical religious groups condemned slavery (by then applied mostly to Africans) as un-Christian. A few secular thinkers of the Enlightenment criticised it for violating the rights of man. James Edward Oglethorpe was the first to operationalize the Enlightenment case against slavery, banning

slavery in his Province of Georgia on humanistic grounds, arguing against it in Parliament and eventually encouraging his friends Granville Sharp and Hannah More vigorously to pursue the cause. Soon after his death in 1785, they joined with William Wilberforce and others in forming the Clapham Sect. Oglethorpe's prohibition was reversed and all the American colonies rapidly built up slave systems.

The slave trade had been banned in England in 1102. In a 1569 court case involving Cartwright, who had bought a slave from Russia, the court ruled that English law could not recognise slavery, as it was never established officially. This ruling was overshadowed by later developments. It was upheld in 1700 by Lord Chief Justice Sir John Holt when he ruled that "As soon as a man sets foot on English ground he is free".

English colonists imported slaves to the North American colonies and by the 18th century, traders began to import slaves from Africa, India and East Asia (where they were trading) to London and Edinburgh to work as servants. Men who migrated to the North American colonies often took their East Indian slaves or servants with them, as East Indians have been documented in colonial records. Historian David Olusoga wrote of the sea change that had taken place:

To fully understand how remarkable the rise of British abolitionism was, both as a political movement and as a popular sentiment, it is important to remember how few voices were raised against slavery in Britain until the last quarter of the eighteenth century.

Some of the first freedom suits, court cases in Britain to challenge the legality of slavery, took place in Scotland in 1755

and 1769. The cases were *Montgomery v. Sheddan* (1755) and *Spens v. Dalrymple* (1769). Each of the slaves had been baptised in Scotland and challenged the legality of slavery. They set the precedent of legal procedure in British courts that would later lead to success for the plaintiffs. In these cases, deaths of the plaintiff and defendant, respectively, brought an end to the action before a court decision could be rendered.

African slaves were not bought or sold in London itself but were brought by masters from other places. Together with people from other nations, especially non-Christian ones, Africans were considered foreigners and thus ineligible to be English subjects. At the time, England had no naturalisation procedure. The African slaves' legal status was unclear until the 1772 Somersett's Case, when the fugitive slave James Somersett forced a decision by the courts. Somersett had escaped and his master, Charles Steuart, had him captured and imprisoned on board a ship, intending to ship him to Jamaica to be resold into slavery. While in London, Somersett had been baptised and three godparents issued a writ of *habeas corpus*. As a result, Lord Mansfield, Chief Justice of the Court of the King's Bench, had to judge whether Somersett's abduction was lawful or not under English Common Law. No legislation had ever been passed to establish slavery in England. The case received national attention and five advocates supported the action on behalf of Somersett.

In his judgment of 22 June 1772, Mansfield held

The state of slavery is of such a nature that it is incapable of being introduced on any reasons, moral or political, but only by positive law, which preserves its force long after the

reasons, occasions, and time itself from whence it was created, is erased from memory. It is so odious, that nothing can be suffered to support it, but positive law. Whatever inconveniences, therefore, may follow from a decision, I cannot say this case is allowed or approved by the law of England; and therefore the black must be discharged.

Although the legal implications of the judgement are unclear when analysed by lawyers, the judgement was generally taken at the time to have determined that slavery did not exist under English common law and was thus prohibited in England. As a result, by 1774, between 10,000 and 15,000 slaves gained freedom in England.

The decision did not apply to British overseas territories; e.g. the American colonies had established slavery by positive laws. Somersett's case became a significant part of the common law of slavery in the English-speaking world and it helped launch the movement to abolish slavery.

After reading about Somersett's Case, Joseph Knight, an enslaved African who had been purchased by his master John Wedderburn in Jamaica and brought to Scotland, left him. Married and with a child, he filed a freedom suit, on the grounds that he could not be held as a slave in Great Britain. In the case of *Knight v. Wedderburn* (1778), Wedderburn said that Knight owed him "perpetual servitude". The Court of Session of Scotland ruled against him, saying that chattel slavery was not recognised under the law of Scotland, and slaves could seek court protection to leave a master or avoid being forcibly removed from Scotland to be returned to slavery in the colonies.

At this point the plantocracy became concerned, and got organised, setting up the London Society of West India Planters and Merchants to represent their views. From its inception in 1780, the organisation played a major role in resisting the abolition of the slave trade and that of slavery itself. The Society brought together three different groups: British sugar merchants, absentee planters and colonial agents.

Writing critically of English altruism in abolishing the slave trade, African-American historian W. E. B. Du Bois in 1948 said,

The rise of liberal and philanthropic thought in the latter part of the eighteenth century accounts, of course, for no little of the growth of opposition to slavery and the slave trade; but it accounts for only a part of it. Other and dominant factors were the diminishing returns of the African slave trade itself, the bankruptcy of the West Indian sugar economy through the Haitian revolution, the interference of Napoleon and the competition of Spain. Without this pressure of economic forces, Parliament would not have yielded so easily to the abolition crusade. Moreover, new fields of investment and profit were being opened to Englishmen by the consolidation of the empire in India and by the acquisition of new spheres of influence in China and elsewhere. In Africa, British rule was actually strengthened by the anti-slavery crusade, for new territory was annexed and controlled under the aegis of emancipation. It would not be right to question for a moment the sincerity of Sharpe, Wilberforce, Buxton and their followers. But the moral force they represented would have met with greater resistance had it not been working along lines favorable to English investment and colonial profit.

Activists organize

Antislavery sentiment may have grown in the British Isles in the first few years after the *Somersett* case. In 1774, influenced by the case and by the writings of Quaker abolitionist Anthony Benezet, John Wesley, the leader of the Methodist tendency in the Church of England, published *Thoughts Upon Slavery*, in which he passionately criticised the practice. In his 1776 *A Dissertation on the Duty of Mercy and Sin of Cruelty to Brute Animals*, the clergyman Humphry Primatt wrote, "the *white* man (notwithstanding the barbarity of custom and prejudice), can have no right, by virtue of his *colour*, to enslave and tyrannise over a *black* man." In 1781 the Dublin Universal Free Debating Society challenged its members to consider if "enslaving the Negro race [is] justifiable on principles of humanity of [sic] policy?"

Despite the ending of slavery in Great Britain, the West Indian colonies of the British Empire continued to practice it. British banks continued to finance the commodities and shipping industries in the colonies they had earlier established which still relied upon slavery, despite the legal developments in Great Britain. In 1785, the English poet William Cowper wrote,

We have no slaves at home.—Then why abroad? And they themselves once ferried o'er the wave That parts us, are emancipate and loos'd. Slaves cannot breathe in England; if their lungs Receive our air, that moment they are free, They touch our country and their shackles fall. That's noble, and bespeaks a nation proud And jealous of the blessing. Spread it then, And let it circulate through ev'ry vein Of all your empire. That where Britain's power Is felt, mankind may feel her mercy

too. In 1783, an anti-slavery movement began in Britain. That year a group of Quakers founded their first abolitionist organisation. The Quakers continued to be influential throughout the lifetime of the movement, in many ways leading the campaign. On 17 June 1783, Sir Cecil Wray (one of the Members of Parliament for Westminster) presented the Quaker petition to parliament. Also in 1783, DrBeilbyPorteus, Bishop of Chester, issued a call to the Church of England to cease its involvement in the slave trade and to formulate a policy to improve the conditions of Afro-Caribbean slaves. The exploration of the African continent by such British groups as the African Association (1788) promoted the abolitionists' cause. Such expeditions highlighted the sophistication of African social organisation; before this, Europeans had considered them 'other' and uncivilised. The African Association had close ties with William Wilberforce, who became known as a prominent figure in the campaign for abolition in the British Empire.

Africans themselves played a visible role in the abolition movement. In Britain, Olaudah Equiano, whose autobiography was published in nine editions in his lifetime, campaigned tirelessly against the slave trade. More important were horrific images such as the famous Wedgwood medallion of 1787 and the engraving showing the ghastly layout of the slave ship, the *Brookes*.

Growth of the movement

After the formation of the Committee for the Abolition of the Slave Trade in 1787, William Wilberforce led the cause of abolition through the parliamentary campaign. It finally

abolished the slave trade in the British Empire with the Slave Trade Act 1807. He continued to campaign for the abolition of slavery in the British Empire, which he lived to see in the Slavery Abolition Act 1833.

The Atlantic slave trade, also called Triangle trade, encompassed the trafficking in slaves by British merchants who exported manufactured goods from ports such as Bristol and Liverpool, sold or exchanged these for slaves in West Africa (where the African chieftain hierarchy was tied to slavery), and shipped the slaves to British colonies and other Caribbean countries or the American colonies. There traders sold or exchanged the slaves for rum and sugar (in the Caribbean) and tobacco and rice (in the American South), which they took back to British ports. The merchants traded in three places with each round-trip. Political influence against the inhumanity of the slave trade grew strongly in the late 18th century.

Europeans and Africans worked for abolition of the slave trade and slavery. Well-known abolitionists in Britain included James Ramsay, who had seen the cruelty of the trade at first hand; the Unitarian William Roscoe who courageously campaigned for parliament in the port city of Liverpool for which he was briefly M.P., Granville Sharp, Thomas Clarkson, Josiah Wedgwood, who produced the "*Am I Not A Man And A Brother?*" medallion for the Committee; and other members of the Clapham Sect of evangelical reformers, as well as Quakers.

Quakers made up most of the Committee for the Abolition of the Slave Trade and were the first to present a petition against the slave trade to the British Parliament. As Dissenters,

Quakers were not eligible to become British MPs in the late 18th and early 19th centuries. The Anglican evangelist William Wilberforce led the parliamentary campaign. Clarkson became the group's most prominent researcher, gathering vast amounts of data and gaining first-hand accounts by interviewing sailors and former slaves at British ports such as Bristol, Liverpool and London.

Mainly because of Clarkson's efforts, a network of local abolition groups was established in England. They campaigned through public meetings and the publication of pamphlets and petitions. One of the earliest books promoted by Clarkson and the Committee for the Abolition of the Slave Trade was the autobiography of the freed slave Olaudah Equiano. The movement had support from such freed slaves, from many denominational groups such as Swedenborgians, Quakers, Baptists, Methodists and others. They reached out for support from the new industrial workers of the cities in the Midlands and north of England. Even women and children, previously un-politicised groups, became involved in the campaign. At this time, women often had to hold separate meetings as there were social rules against their appearing in public meetings. They could not vote, nor could the majority of the men in Britain at the time.

The abolitionists negotiated with chieftains in West Africa to purchase land to establish 'Freetown' – a settlement for former slaves of the British Empire (the Poor Blacks of London) and the United States. Great Britain had promised freedom to American slaves who left rebel owners to join its cause during the American Revolutionary War. It evacuated thousands of slaves together with its troops and transported 3,000 Black

Loyalists to Nova Scotia for resettlement. About a decade later, they were offered a chance to resettle in Freetown and several hundred made the move. Freetown was the first settlement of the colony of Sierra Leone, which was protected under a British Act of Parliament in 1807–08. British influence in West Africa grew through a series of negotiations with local chieftains to end trading in slaves. These included agreements to permit British navy ships to intercept chieftains' ships to ensure their merchants were not carrying slaves.

Also from 1800 the Royal African Corps was recruited from West African volunteers, and eventually included freed slaves from the Caribbean before it was disbanded in 1819.

In 1796, John Gabriel Stedman published the memoirs of his five-year voyage to the Dutch-controlled Surinam in South America as part of a military force sent out to subdue bosnegers, former slaves living in the interior. The book is critical of the treatment of slaves and contains many images by William Blake and Francesco Bartolozzi depicting the cruel treatment of runaway slaves. It was an example of what became a large body of abolitionist literature.

Slave Trade Act 1807

The Slave Trade Act was passed by the British Parliament on 25 March 1807, making the slave trade illegal throughout the British Empire. The Act imposed a fine of £100 for every slave found aboard a British ship. At a time when Napoleon decided to revive slavery, which had been abolished during the French Revolution and to send his troops to re-enslave the people of Haiti, Guadeloupe and the other French Caribbean

possessions, the British took the moral high ground with their prohibition of the slave trade.

Slave Trade Felony Act 1811

The 1807 act's intention was to entirely outlaw the slave trade within the British Empire, but the lucrative trade continued through smuggling. Sometimes captains at risk of being caught by the Royal Navy would throw slaves into the sea to reduce their fines. Abolitionist Henry Brougham realized that trading would continue, and so as a new MP successfully introduced the Slave Trade Felony Act 1811. This law at last made slave trading a criminal felony throughout the empire, and for British subjects worldwide. This proved far more effective and ended the trade across the Empire, as the Royal Navy ruthlessly pursued slave ships. In 1827, Britain defined participation in the slave trade as piracy and punishable by death. Between 1808 and 1860, the Royal Navy's West Africa Squadron seized approximately 1,600 slave ships and freed 150,000 Africans who were aboard. Britain used its influence to coerce other countries to agree to treaties to end their slave trade and allow the Royal Navy to seize their slave ships. Action was also taken against African leaders who refused to agree to British treaties to outlaw the trade. For example, in 1851 it deposed "the usurping King of Lagos". Britain signed anti-slavery treaties with more than 50 African rulers.

Slavery Abolition Act 1833

After the 1807 Act, enslaved persons could still be held, though not sold, within the British Empire. In the 1820s, the

abolitionist movement may have revived the campaign against the institution of slavery. In 1823 the first Anti-Slavery Society was founded in Britain. The Society's members consisted of a union of non-conformist churches and many had previously campaigned against the slave trade. In 1831, enslaved man Sam Sharpe led the Christmas Rebellion (Baptist War) in Jamaica, an event that catalyzed anti-slavery sentiment. This combination of political pressure and popular uprisings convinced the British government that there was no longer any middle ground between slavery and emancipation.

On 28 August 1833, the Slavery Abolition Act received Royal Assent, paving the way for the abolition of slavery within the British Empire and its colonies. On 1 August 1834, all enslaved persons in the British Empire (except for India) were emancipated, but they were indentured to their former owners in an apprenticeship system that meant gradual abolition: the first set of apprenticeships came to an end on 1 August 1838, while the final apprenticeships were scheduled to cease on 1 August 1840, two years later.

- The apprenticeship system was deeply unpopular with enslaved persons. On 1 August 1834, as the Governor in Port of Spain, Trinidad addressed an audience about the new laws, the mostly elderly, unarmed enslaved persons began chanting: "Pas de six ans. Point de six ans" ("Not six years. No six years"), drowning out his voice. Peaceful protests continued until the government passed a resolution to abolish apprenticeship and the enslaved persons gained *de facto* freedom. Full emancipation for all enslaved persons was legally granted on 1 August

> 1838, ahead of schedule, making Trinidad the first British slave society to fully end slavery. The government set aside £20 million for compensation of slave owners for their "property" across the Empire, but it did not offer formerly enslaved people compensation or reparations. This was because abolitionists had not planned for much more than the long-awaited reform of the law, and felt that freedom along with the option of returning to Africa to live in Freetown, or the nearby state of Liberia, was infinitely preferable to continued chattel slavery.

In context, the £20 million voted by Parliament to compensate slave owners under the 1833 Act can be compared with the Gross Domestic Product of the UK in 1832, which was £459 million.

Campaigning after the act

In 1839, the British and Foreign Anti-Slavery Society was formed. At the time, the British economy continued to import cotton and other commodities from the U.S. Deep South, which relied on slavery for cotton production, to fuel the spinning and weaving mills in Manchester and other northern cities. The finished goods furnished Britain's low-wage, export, manufacturing economy with surpluses exported to Europe and India. London merchant-banks made loans throughout the supply-chain to planters, factors, ware-housers, carters, shippers, spinners, weavers, and exporters.

The British and Foreign Anti-Slavery Society campaigned to outlaw slavery in other countries and pressured the British

government to do more to enforce the suppression of the slave trade, by declaring slave traders to be pirates and pursuing them as such. It is in operation today as Anti-Slavery International, the world's oldest international human rights organisation.

On 20 December 1841, the first multilateral treaty for the suppression of the slave trade, the Treaty for the Suppression of the African Slave Trade, was signed in London by the representatives of Austria, Britain, France, Prussia and Russia.

Chapter 6

Louisiana Purchase

The **Louisiana Purchase** (French: *Vente de la Louisiane* 'Sale of Louisiana') was the acquisition of the territory of Louisiana by the United States from France in 1803. In return for fifteen million dollars, or approximately eighteen dollars per square mile, the United States nominally acquired a total of 828,000 sq mi (2,140,000 km; 530,000,000 acres). However, France only controlled a small fraction of this area, most of it inhabited by Native Americans; for the majority of the area, what the United States bought was the "preemptive" right to obtain "Indian" lands by treaty or by conquest, to the exclusion of other colonial powers. The total cost of all subsequent treaties and financial settlements over the land has been estimated to be around 2.6 billion dollars.

The Kingdom of France had controlled the Louisiana territory from 1699 until it was ceded to Spain in 1762. In 1800, Napoleon, the First Consul of the French Republic, regained ownership of Louisiana as part of a broader project to re-establish a French colonial empire in North America. However, France's failure to put down a revolt in Saint-Domingue, coupled with the prospect of renewed warfare with the United Kingdom, prompted Napoleon to consider selling Louisiana to the United States. Acquisition of Louisiana was a long-term goal of President Thomas Jefferson, who was especially eager to gain control of the crucial Mississippi River port of New Orleans. Jefferson tasked James Monroe and Robert R. Livingston with purchasing New Orleans. Negotiating with French Treasury Minister François Barbé-Marbois (who was

acting on behalf of Napoleon), the American representatives quickly agreed to purchase the entire territory of Louisiana after it was offered. Overcoming the opposition of the Federalist Party, Jefferson and Secretary of State James Madison persuaded Congress to ratify and fund the Louisiana Purchase.

The Louisiana Purchase extended United States sovereignty across the Mississippi River, nearly doubling the nominal size of the country. The purchase included land from fifteen present U.S. states and two Canadian provinces, including the entirety of Arkansas, Missouri, Iowa, Oklahoma, Kansas, and Nebraska; large portions of North Dakota and South Dakota; the area of Montana, Wyoming, and Colorado east of the Continental Divide; the portion of Minnesota west of the Mississippi River; the northeastern section of New Mexico; northern portions of Texas; New Orleans and the portions of the present state of Louisiana west of the Mississippi River; and small portions of land within Alberta and Saskatchewan. At the time of the purchase, the territory of Louisiana's non-native population was around 60,000 inhabitants, of whom half were African slaves. The western borders of the purchase were later settled by the 1819 Adams–Onís Treaty with Spain, while the northern borders of the purchase were adjusted by the Treaty of 1818 with Britain.

Background

Throughout the second half of the 18th century, the French colony of Louisiana became a pawn for European political intrigue. The colony was the most substantial presence of France's overseas empire, with other possessions consisting of

a few small settlements along the Mississippi and other main rivers. France ceded the territory to Spain in 1762 in the secret Treaty of Fontainebleau. Following French defeat in the Seven Years' War, Spain gained control of the territory west of the Mississippi, and the British received the territory to the east of the river.

Following the establishment of the United States, the Americans controlled the area east of the Mississippi and north of New Orleans. The main issue for the Americans was free transit of the Mississippi to the sea. As the lands were being gradually settled by American migrants, many Americans, including Jefferson, assumed that the territory would be acquired "piece by piece." The risk of another power taking it from a weakened Spain made a "profound reconsideration" of this policy necessary. New Orleans was already important for shipping agricultural goods to and from the areas of the United States west of the Appalachian Mountains. Pinckney's Treaty, signed with Spain on October 27, 1795, gave American merchants "right of deposit" in New Orleans, granting them use of the port to store goods for export. The treaty also recognized American rights to navigate the entire Mississippi, which had become vital to the growing trade of the western territories.

In 1798, Spain revoked the treaty allowing American use of New Orleans, greatly upsetting Americans. In 1801, Spanish Governor Don Juan Manuel de Salcedo took over from the Marquess of Casa Calvo, and restored the American right to deposit goods. However, in 1800 Spain had ceded the Louisiana territory back to France as part of Napoleon's secret Third Treaty of San Ildefonso. The territory nominally remained under Spanish control, until a transfer of power to France on

November 30, 1803, just three weeks before the formal cession of the territory to the United States on December 20, 1803.

Negotiation

While the transfer of the territory by Spain back to France in 1800 went largely unnoticed, fear of an eventual French invasion spread across America when, in 1801, Napoleon sent a military force to secure New Orleans. Southerners feared that Napoleon would free all the slaves in Louisiana, which could trigger slave uprisings elsewhere.

Though Jefferson urged moderation, Federalists sought to use this against Jefferson and called for hostilities against France. Undercutting them, Jefferson threatened an alliance with the United Kingdom, although relations were uneasy in that direction. In 1801, Jefferson supported France in its plan to take back Saint-Domingue (present-day Haiti), which was then under control of Toussaint Louverture after a slave rebellion. Jefferson sent Livingston to Paris in 1801 with the authorization to purchase New Orleans.

In January 1802, France sent General Charles Leclerc on an expedition to Saint-Domingue to reassert French control over a colony that had become essentially autonomous under Louverture. Louverture, as a French general, had fended off incursions from other European powers, but had also begun to consolidate power for himself on the island. Before the revolution, France had derived enormous wealth from St. Domingue at the cost of the lives and freedom of the slaves. Napoleon wanted its revenues and productivity for France restored. Alarmed over the French actions and its intention to

re-establish an empire in North America, Jefferson declared neutrality in relation to the Caribbean, refusing credit and other assistance to the French, but allowing war contraband to get through to the rebels to prevent France from regaining a foothold.

In 1803, Pierre Samuel du Pont de Nemours, a French nobleman, began to help negotiate with France at the request of Jefferson. Du Pont was living in the United States at the time and had close ties to Jefferson as well as the prominent politicians in France. He engaged in back-channel diplomacy with Napoleon on Jefferson's behalf during a visit to France and originated the idea of the much larger Louisiana Purchase as a way to defuse potential conflict between the United States and Napoleon over North America.

Throughout this time, Jefferson had up-to-date intelligence on Napoleon's military activities and intentions in North America. Part of his evolving strategy involved giving du Pont some information that was withheld from Livingston. Desperate to avoid possible war with France, Jefferson sent James Monroe to Paris in 1803 to negotiate a settlement, with instructions to go to London to negotiate an alliance if the talks in Paris failed.

Spain procrastinated until late 1802 in executing the treaty to transfer Louisiana to France, which allowed American hostility to build. Also, Spain's refusal to cede Florida to France meant that Louisiana would be indefensible. Monroe had been formally expelled from France on his last diplomatic mission, and the choice to send him again conveyed a sense of seriousness.

Napoleon needed peace with the United Kingdom to take possession of Louisiana. Otherwise, Louisiana would be an easy prey for a potential invasion from Britain or the U.S. But in early 1803, continuing war between France and the UK seemed unavoidable. On March 11, 1803, Napoleon began preparing to invade Great Britain.

In Saint-Domingue, Leclerc's forces took Louverture prisoner, but their expedition soon faltered in the face of fierce resistance and disease. By early 1803, Napoleon decided to abandon his plans to rebuild France's New World empire. Without sufficient revenues from sugar colonies in the Caribbean, Louisiana had little value to him. Spain had not yet completed the transfer of Louisiana to France, and war between France and the UK was imminent. Out of anger towards Spain and the unique opportunity to sell something that was useless and not truly his yet, Napoleon decided to sell the entire territory.

Although the foreign minister Talleyrand opposed the plan, on April 10, 1803, Napoleon told the Treasury Minister François Barbé-Marbois that he was considering selling the entire Louisiana Territory to the United States. On April 11, 1803, just days before Monroe's arrival, Barbé-Marbois offered Livingston all of Louisiana for $15 million, which averages to less than three cents per acre (7¢/ha). The total of $15 million is equivalent to about $345 million in 2020 dollars, or 65 cents per acre. The American representatives were prepared to pay up to $10 million for New Orleans and its environs but were dumbfounded when the vastly larger territory was offered for $15 million. Jefferson had authorized Livingston only to

purchase New Orleans. However, Livingston was certain that the United States would accept the offer.

The Americans thought that Napoleon might withdraw the offer at any time, preventing the United States from acquiring New Orleans, so they agreed and signed the Louisiana Purchase Treaty on April 30, 1803, at the HôtelTubeuf in Paris. The signers were Robert Livingston, James Monroe, and François Barbé-Marbois.

After the signing Livingston famously stated, "We have lived long, but this is the noblest work of our whole lives... From this day the United States take their place among the powers of the first rank." On July 4, 1803, the treaty was announced, but the documents did not arrive in Washington, D.C. until July 14. The Louisiana Territory was vast, stretching from the Gulf of Mexico in the south to Rupert's Land in the north, and from the Mississippi River in the east to the Rocky Mountains in the west. Acquiring the territory doubled the size of the United States.

In November 1803, France withdrew its 7,000 surviving troops from Saint-Domingue (more than two-thirds of its troops died there) and gave up its ambitions in the Western Hemisphere. In 1804 Haiti declared its independence; but fearing a slave revolt at home, Jefferson and the rest of Congress refused to recognize the new republic, the second in the Western Hemisphere, and imposed a trade embargo against it.

This, together with the successful French demand for an indemnity of 150 million francs in 1825, severely hampered Haiti's ability to repair its economy after decades of war.

Domestic opposition and constitutionality

After Monroe and Livingston had returned from France with news of the purchase, an official announcement of the purchase was made on July 4, 1803.

This gave Jefferson and his cabinet until October, when the treaty had to be ratified, to discuss the constitutionality of the purchase. Jefferson considered a constitutional amendment to justify the purchase; however, his cabinet convinced him otherwise. Jefferson justified the purchase by rationalizing, "it is the case of a guardian, investing the money of his ward in purchasing an important adjacent territory; & saying to him when of age, I did this for your good." Jefferson ultimately came to the conclusion before the ratification of the treaty that the purchase was to protect the citizens of the United States therefore making it constitutional.

Henry Adams and other historians have argued that Jefferson acted hypocritically with the Louisiana Purchase, because of his position as a strict constructionist regarding the Constitution since he stretched the intent of that document to justify his purchase.

The American purchase of the Louisiana territory was not accomplished without domestic opposition. Jefferson's philosophical consistency was in question because of his strict interpretation of the Constitution. Many people believed that he and others, including James Madison, were doing something they surely would have argued against with Alexander

Hamilton. The Federalists strongly opposed the purchase, favoring close relations with Britain over closer ties to Napoleon. Both Federalists and Jeffersonians were concerned over the purchase's constitutionality. Many members of the House of Representatives opposed the purchase. Majority Leader John Randolph led the opposition.

The House called for a vote to deny the request for the purchase, but it failed by two votes, 59–57. The Federalists even tried to prove the land belonged to Spain, not France, but available records proved otherwise. The Federalists also feared that the power of the Atlantic seaboard states would be threatened by the new citizens in the West, whose political and economic priorities were bound to conflict with those of the merchants and bankers of New England. There was also concern that an increase in the number of slave-holding states created out of the new territory would exacerbate divisions between North and South as well. A group of Northern Federalists led by Senator Timothy Pickering of Massachusetts went so far as to explore the idea of a separate northern confederacy.

Another concern was whether it was proper to grant citizenship to the French, Spanish, and free black people living in New Orleans, as the treaty would dictate. Critics in Congress worried whether these "foreigners", unacquainted with democracy, could or should become citizens. The U.S. Government had to use English common law to make them citizens to collect taxes.

Spain protested the transfer on two grounds: First, France had previously promised in a note not to alienate Louisiana to a

third party and second, France had not fulfilled the Third Treaty of San Ildefonso by having the King of Etruria recognized by all European powers.

The French government replied that these objections were baseless since the promise not to alienate Louisiana was not in the treaty of San Ildefonso itself and therefore had no legal force, and the Spanish government had ordered Louisiana to be transferred in October 1802 despite knowing for months that Britain had not recognized the King of Etruria in the Treaty of Amiens.

Henry Adams claimed "The sale of Louisiana to the United States was trebly invalid; if it were French property, Bonaparte could not constitutionally alienate it without the consent of the French Chambers; if it were Spanish property, he could not alienate it at all; if Spain had a right of reclamation, his sale was worthless." The sale of course was not "worthless"—the U.S. actually did take possession. Furthermore, the Spanish prime minister had authorized the U.S. to negotiate with the French government "the acquisition of territories which may suit their interests." Spain turned the territory over to France in a ceremony in New Orleans on November 30, a month before France turned it over to American officials.

Other historians counter the above arguments regarding Jefferson's alleged hypocrisy by asserting that countries change their borders in two ways: (1) conquest, or (2) an agreement between nations, otherwise known as a treaty. The Louisiana Purchase was the latter, a treaty. The Constitution specifically grants the president the power to negotiate treaties (Art. II, Sec. 2), which is just what Jefferson did.

Madison (the "Father of the Constitution") assured Jefferson that the Louisiana Purchase was well within even the strictest interpretation of the Constitution. Treasury Secretary Albert Gallatin added that since the power to negotiate treaties was specifically granted to the president, the only way extending the country's territory by treaty could *not* be a presidential power would be if it were specifically excluded by the Constitution (which it was not). Jefferson, as a strict constructionist, was right to be concerned about staying within the bounds of the Constitution, but felt the power of these arguments and was willing to "acquiesce with satisfaction" if the Congress approved the treaty. The Senate quickly ratified the treaty, and the House, with equal alacrity, authorized the required funding, as the Constitution specifies. The United States Senate advised and consented to ratification of the treaty with a vote of twenty-four to seven on October 20. On the following day, October 21, 1803, the Senate authorized Jefferson to take possession of the territory and establish a temporary military government. In legislation enacted on October 31, Congress made temporary provisions for local civil government to continue as it had under French and Spanish rule and authorized the President to use military forces to maintain order. Plans were also set forth for several missions to explore and chart the territory, the most famous being the Lewis and Clark Expedition.

The opposition of New England Federalists to the Louisiana Purchase was primarily economic self-interest, not any legitimate concern over constitutionality or whether France indeed owned Louisiana or was required to sell it back to Spain should it desire to dispose of the territory. The Northerners were not enthusiastic about Western farmers gaining another

outlet for their crops that did not require the use of New England ports. Also, many Federalists were speculators in lands in upstate New York and New England and were hoping to sell these lands to farmers, who might go west instead, if the Louisiana Purchase went through. They also feared that this would lead to Western states being formed, which would likely be Republican, and dilute the political power of New England Federalists. When Spain later objected to the United States purchasing Louisiana from France, Madison responded that America had first approached Spain about purchasing the property but had been told by Spain itself that America would have to treat with France for the territory.

Formal transfers and initial organization

France turned over New Orleans, the historic colonial capital, on December 20, 1803, at the Cabildo, with a flag-raising ceremony in the Plaza de Armas, now Jackson Square. Just three weeks earlier, on November 30, 1803, Spanish officials had formally conveyed the colonial lands and their administration to France.

On March 9 and 10, 1804, another ceremony, commemorated as Three Flags Day, was conducted in St. Louis, to transfer ownership of Upper Louisiana from Spain to France, and then from France to the United States. From March 10 to September 30, 1804, Upper Louisiana was supervised as a military district, under its first civil commandant, Amos Stoddard, who was appointed by the War Department. Effective October 1, 1804, the purchased territory was organized into the Territory

of Orleans (most of which would become the state of Louisiana) and the District of Louisiana, which was temporarily under control of the governor and judicial system of the Indiana Territory. The following year, the District of Louisiana was renamed the Territory of Louisiana. New Orleans was the administrative capital of the Orleans Territory, and St. Louis was the capital of the Louisiana Territory.

Financing

The American government used $3 million in gold as a down payment and issued bonds for the balance to pay France for the purchase. Earlier that year, Francis Baring and Company of London had become the U.S. government's official banking agent in London following the failure of *Bird, Savage & Bird*. Because of this favored position, the U.S. asked the Baring firm to handle the transaction. Francis Baring's son Alexander was in Paris at the time and helped in the negotiations. Another Baring advantage was a close relationship with Hope and Company of Amsterdam. The two banking houses worked together to facilitate and underwrite the purchase. Although the War of the Third Coalition, which brought France into a war with the United Kingdom, began before the purchase was completed, the UK allowed the deal to proceed as it was better for the neutral Americans to own the territory than the hostile French.

Because Napoleon wanted to receive his money as quickly as possible, the two firms received the American bonds and shipped the gold to France. Napoleon used the money to finance his planned invasion of England, which never took place.

Boundaries

A dispute soon arose between Spain and the United States regarding the extent of Louisiana. The territory's boundaries had not been defined in the 1762 Treaty of Fontainebleau that ceded it from France to Spain, nor in the 1801 Third Treaty of San Ildefonso ceding it back to France, nor the 1803 Louisiana Purchase agreement ceding it to the United States.

The U.S. claimed that Louisiana included the entire western portion of the Mississippi River drainage basin to the crest of the Rocky Mountains and land extending to the Rio Grande and West Florida. Spain insisted that Louisiana comprised no more than the western bank of the Mississippi River and the cities of New Orleans and St. Louis. The dispute was ultimately resolved by the Adams–Onís Treaty of 1819, with the United States gaining most of what it had claimed in the west.

The relatively narrow Louisiana of New Spain had been a special province under the jurisdiction of the Captaincy General of Cuba, while the vast region to the west was in 1803 still considered part of the Commandancy General of the ProvinciasInternas. Louisiana had never been considered one of New Spain's internal provinces. If the territory included all the tributaries of the Mississippi on its western bank, the northern reaches of the purchase extended into the equally ill-defined British possession—Rupert's Land of British North America, now part of Canada. The purchase originally extended just beyond the 50th parallel. However, the territory north of the 49th parallel (including the Milk River and Poplar River watersheds) was ceded to the UK in exchange for parts of the Red River Basin south of 49th parallel in the Anglo-American

Convention of 1818. The eastern boundary of the Louisiana purchase was the Mississippi River, from its source to the 31st parallel, though the source of the Mississippi was, at the time, unknown. The eastern boundary below the 31st parallel was unclear.

The U.S. claimed the land as far as the Perdido River, and Spain claimed that the border of its Florida Colony remained the Mississippi River. The Adams–Onís Treaty with Spain resolved the issue upon ratification in 1821. Today, the 31st parallel is the northern boundary of the western half of the Florida Panhandle, and the Perdido is the western boundary of Florida.

Because the western boundary was contested at the time of the purchase, President Jefferson immediately began to organize three missions to explore and map the new territory.

All three started from the Mississippi River. The Lewis and Clark Expedition (1804) traveled up the Missouri River; the Red River Expedition (1806) explored the Red River basin; the Pike Expedition (1806) also started up the Missouri but turned south to explore the Arkansas River watershed.

The maps and journals of the explorers helped to define the boundaries during the negotiations leading to the Adams–Onís Treaty, which set the western boundary as follows: north up the Sabine River from the Gulf of Mexico to its intersection with the 32nd parallel, due north to the Red River, up the Red River to the 100th meridian, north to the Arkansas River, up the Arkansas River to its headwaters, due north to the 42nd parallel and due west to its previous boundary.

Slavery

Governing the Louisiana Territory was more difficult than acquiring it. Its European peoples, of ethnic French, Spanish and Mexican descent, were largely Catholic; in addition, there was a large population of enslaved Africans made up of a high proportion of recent arrivals, as Spain had continued the transatlantic slave trade. This was particularly true in the area of the present-day state of Louisiana, which also contained a large number of free people of color. Both present-day Arkansas and Missouri already had some slaveholders in the 18th and early 19th century.

During this period, south Louisiana received an influx of French-speaking refugee planters, who were permitted to bring their slaves with them, and other refugees fleeing the large slave revolt in Saint-Domingue. Many Southern slaveholders feared that acquisition of the new territory might inspire American-held slaves to follow the example of those in Saint-Domingue and revolt. They wanted the U.S. government to establish laws allowing slavery in the newly acquired territory so they could be supported in taking their slaves there to undertake new agricultural enterprises, as well as to reduce the threat of future slave rebellions.

The Louisiana Territory was broken into smaller portions for administration, and the territories passed slavery laws similar to those in the southern states but incorporating provisions from the preceding French and Spanish rule (for instance, Spain had prohibited slavery of Native Americans in 1769, but some slaves of mixed African-Native American descent were still being held in St. Louis in Upper Louisiana when the U.S.

took over). In a freedom suit that went from Missouri to the U.S. Supreme Court, slavery of Native Americans was finally ended in 1836. The institutionalization of slavery under U.S. law in the Louisiana Territory contributed to the American Civil War a half century later. As states organized within the territory, the status of slavery in each state became a matter of contention in Congress, as southern states wanted slavery extended to the west, and northern states just as strongly opposed new states being admitted as "slave states." The Missouri Compromise of 1820 was a temporary solution.

Asserting U.S. possession

After the early explorations, the U.S. government sought to establish control of the region, since trade along the Mississippi and Missouri rivers was still dominated by British and French traders from Canada and allied Indians, especially the Sauk and Fox. The U.S. adapted the former Spanish facility at Fort Bellefontaine as a fur trading post near St. Louis in 1804 for business with the Sauk and Fox. In 1808 two military forts with trading factories were built, Fort Osage along the Missouri River in western present-day Missouri and Fort Madison along the Upper Mississippi River in eastern present-day Iowa. With tensions increasing with Great Britain, in 1809 Fort Bellefontaine was converted to a U.S. military fort and was used for that purpose until 1826.

During the War of 1812, Great Britain hoped to annex all or at least portions of the Louisiana Purchase should they successfully defeat the U.S. Aided by their Indian allies, the British defeated U.S. forces in the Upper Mississippi; the U.S. abandoned Forts Osage and Madison, as well as several other

U.S. forts built during the war, including Fort Johnson and Fort Shelby. U.S. ownership of the whole Louisiana Purchase region was confirmed in the Treaty of Ghent (ratified in February 1815) and guaranteed on the battlefield at the decisive Battle of New Orleans when the British sent over 10,000 of the best British Army soldiers to try to take New Orleans in a 5 month long campaign starting from September 1814 (First Battle of Fort Bowyer) to February 1815 (Second Battle of Fort Bowyer). Nobody really knows what post-victory plans for New Orleans and Upper Louisiana were given by the British government to Major General Sir Edward Pakenham and his second-in-command Major General Samuel Gibbs because both generals were killed in action at the Battle of New Orleans. Pakenham was ordered to conduct the New Orleans/Mobile campaign even in the middle of the peace negotiations in late 1814. The British would have likely garrisoned New Orleans and would have occupied it for a very long time because they and their ally Spain did not recognize any treaties and land deals conducted by Napoleon since 1800, especially the Louisiana Purchase. The U.S. later built or expanded forts along the Mississippi and Missouri rivers, including adding to Fort Bellefontaine, and constructing Fort Armstrong (1816) and Fort Edwards (1816) in Illinois, Fort Crawford (1816) in Wisconsin, Fort Snelling (1819) in Minnesota, and Fort Atkinson (1819) in Nebraska.

Impact on Native Americans

The Louisiana Purchase was negotiated between France and the United States, without consulting the various Indian tribes who lived on the land and who had not ceded the land to any

colonial power. The four decades following the Louisiana Purchase was an era of court decisions removing many tribes from their lands east of the Mississippi, culminating in the Trail of Tears.

The purchase of the Louisiana Territory led to the debate over the idea of indigenous land rights leading all the way into the mid 20th century. The many court cases and tribal suits for historical damages following the Louisiana Purchase in the 1930s led to the Indian Claims Commission Act (ICCA) in 1946. Felix S. Cohen, Interior Department Lawyer who helped pass ICCA, is often quoted as saying, "practically all of the real estate acquired by the United States since 1776 was purchased not from Napoleon or any other emperor or czar but from its original Indian owners", roughly estimating that Indians had received twenty times as much as France had for the territory bought by the United States, "somewhat in excess of 800 million dollars". The cost has been more recently estimated as 2.6 billion dollars, but this is nonetheless far lower than the true value of the land.