

The Industrial Revolution

Economic effects

Undergirding the development of modern Europe between the 1780s and 1849 was an unprecedented economic transformation that embraced the first stages of the great Industrial Revolution and a still more general expansion of commercial activity. Articulate Europeans were initially more impressed by the screaming political news generated by the French Revolution and ensuing Napoleonic Wars, but in retrospect the economic upheaval, which related in any event to political and diplomatic trends, has proved more fundamental.

Major economic change was spurred by western Europe's tremendous [population growth](#) during the late 18th century, extending well into the 19th century itself. Between 1750 and 1800, the populations of major countries increased between 50 and 100 percent, chiefly as a result of the use of new food crops (such as the potato) and a temporary decline in epidemic disease. Population growth of this magnitude compelled change. Peasant and artisanal children found their paths to inheritance blocked by sheer numbers and thus had to seek new forms of paying labour. Families of businessmen and landlords also had to innovate to take care of unexpectedly large surviving broods. These pressures occurred in a society already attuned to market transactions, possessed of an active merchant class, and blessed with considerable capital and access to overseas markets as a result of existing dominance in world trade.

Heightened commercialization showed in a number of areas. Vigorous peasants increased their landholdings, often at the expense of their less fortunate neighbours, who swelled the growing ranks of the near-propertyless. These peasants, in turn, produced food for sale in growing urban markets. [Domestic](#) manufacturing soared, as hundreds of thousands of rural producers worked full- or part-time to make thread and cloth, nails and tools under the sponsorship of urban merchants. Craft work in the cities began to shift toward production for distant markets, which encouraged artisan-owners to treat their journeymen less as fellow workers and more as wage labourers. Europe's social structure changed toward a basic division, both rural and urban, between owners and nonowners. Production expanded, leading by the end of the 18th century to a first wave of consumerism as rural wage earners began to purchase new kinds of commercially produced clothing, while urban middle-class families began to indulge in new tastes, such as uplifting books and educational toys for children.

In this context an outright industrial revolution took shape, led by [Britain](#), which retained leadership in [industrialization](#) well past the middle of the 19th century. In 1840, British steam engines were generating 620,000 horsepower out of a European total of 860,000. Nevertheless, though delayed by the chaos of the French Revolution and Napoleonic Wars, many western European nations soon followed suit; thus by 1860 British steam-generated horsepower made up less than half the European total, with France, Germany, and Belgium gaining ground rapidly. Governments and private entrepreneurs worked hard to imitate British technologies after 1820, by which time an intense industrial revolution was taking shape in many parts of western Europe, particularly in coal-rich regions such as Belgium, northern France, and the Ruhr area of Germany. German pig iron production, a mere 40,000 tons in 1825, soared to 150,000 tons a

decade later and reached 250,000 tons by the early 1850s. French coal and iron output doubled in the same span—huge changes in national capacities and the material bases of life.

Technological change soon spilled over from manufacturing into other areas. Increased production heightened demands on the [transportation](#) system to move raw materials and finished products. Massive road and canal building programs were one response, but [steam engines](#) also were directly applied as a result of inventions in Britain and the United States. Steam shipping plied major waterways soon after 1800 and by the 1840s spread to oceanic transport. [Railroad](#) systems, first developed to haul coal from mines, were developed for intercity transport during the 1820s; the first commercial line opened between Liverpool and Manchester in 1830. During the 1830s local rail networks fanned out in most western European countries, and national systems were planned in the following decade, to be completed by about 1870. In communication, the invention of the telegraph allowed faster exchange of news and commercial information than ever before.

New organization of [business](#) and [labour](#) was intimately linked to the new technologies. Workers in the industrialized sectors laboured in factories rather than in scattered shops or homes. Steam and water power required a concentration of labour close to the power source. Concentration of labour also allowed new discipline and specialization, which increased productivity.

The new machinery was expensive, and businessmen setting up even modest factories had to accumulate substantial capital through partnerships, loans from banks, or joint-stock ventures. While relatively small firms still predominated, and managerial bureaucracies were limited save in a few heavy industrial giants, a tendency toward expansion of the business unit was already noteworthy. Commerce was affected in similar ways, for new forms had to be devised to dispose of growing levels of production. Small shops replaced itinerant peddlers in villages and small towns. In Paris, the [department store](#), introduced in the 1830s, ushered in an age of big business in the trading sector.

[Urbanization](#) was a vital result of growing commercialization and new industrial technology. Factory centres such as Manchester grew from villages into [cities](#) of hundreds of thousands in a few short decades. The percentage of the total population located in cities expanded steadily, and big cities tended to displace more scattered centres in western Europe's urban map. Rapid city growth produced new hardships, for housing stock and sanitary facilities could not keep pace, though innovation responded, if slowly. Gas lighting improved street conditions in the better neighbourhoods from the 1830s onward, and sanitary reformers pressed for underground sewage systems at about this time. For the better-off, rapid suburban growth allowed some escape from the worst urban miseries.

Rural life changed less dramatically. A full-scale technological revolution in the [countryside](#) occurred only after the 1850s. Nevertheless, factory-made tools spread widely even before this time, as scythes replaced sickles for harvesting, allowing a substantial improvement in productivity. Larger estates, particularly in commercially minded Britain, began to introduce newer equipment, such as seed drills for planting. Crop rotation, involving the use of nitrogen-fixing plants, displaced the age-old practice of leaving some land fallow, while better seeds and

livestock and, from the 1830s, chemical fertilizers improved yields as well. Rising agricultural production and market specialization were central to the growth of cities and factories.

The speed of western Europe's Industrial Revolution should not be exaggerated. By 1850 in Britain, far and away the leader still, only half the total population lived in cities, and there were as many urban craft producers as there were factory hands. Relatively traditional economic sectors, in other words, did not disappear and even expanded in response to new needs for housing construction or food production. Nevertheless, the new economic sectors grew most rapidly, and even other branches displayed important new features as part of the general process of commercialization.

Geographic disparities complicate the picture as well. Belgium and, from the 1840s, many of the German states were well launched on an industrial revolution that brought them steadily closer to British levels. France, poorer in coal, concentrated somewhat more on increasing production in craft sectors, converting furniture making, for example, from an artistic endeavour to standardized output in advance of outright factory forms. Scandinavia and The Netherlands joined the industrial parade seriously only after 1850.

Southern and eastern Europe, while importing a few model factories and setting up some local rail lines, generally operated in a different economic orbit. City growth and technological change were both modest until much later in the 19th century, save in pockets of northern Italy and northern Spain. In eastern areas, western Europe's industrialization had its greatest impact in encouraging growing conversion to market agriculture, as Russia, Poland, and Hungary responded to grain import needs, particularly in the British Isles. As in eastern Prussia, the temptation was to impose new obligations on peasant serfs labouring on large estates, increasing the work requirements in order to meet export possibilities without fundamental technical change and without challenging the hold of the landlord class.

Social upheaval

In western Europe, economic change produced massive social consequences during the first half of the 19th century. Basic aspects of daily life changed, and [work](#) was increasingly redefined. The intensity of change varied, of course—with factory workers affected most keenly, labourers on the land least—but some of the pressures were widespread.

For wage labourers, the autonomy of work declined; more people worked under the daily direction of others. Early textile and metallurgical factories set shop rules, which urged workers to be on time, to stay at their machines rather than wandering around, and to avoid idle singing or chatter (difficult in any event given the noise of the equipment). These rules were increasingly enforced by foremen, who mediated between owners and ordinary labourers. Work speeded up. Machines set the pace, and workers were supposed to keep up: one French factory owner, who each week decorated the most productive machine (not its operators) with a garland of flowers, suggested where the priorities lay. Work, in other words, was to be fast, coordinated, and intense, without the admixture of distractions common in preindustrial labour. Some of these pressures

spilled over to nonfactory settings as well, as craft directors tried to urge a higher productivity on journeymen artisans. Duration of work everywhere remained long, up to 14 hours a day, which was traditional but could be oppressive when work was more intense and walking time had to be added to reach the factories in the first place. Women and children were widely used for the less skilled operations; again, this was no novelty, but it was newly troubling now that work was located outside the home and was often more dangerous, given the hazards of unprotected machinery.

The nature of work shifted in the propertied classes as well. [Middle-class](#) people, not only factory owners but also merchants and professionals, began to trumpet a new [work ethic](#). According to this ethic, work was the basic human good. He who worked was meritorious and should prosper, he who suffered did so because he did not work. Idleness and frivolity were officially frowned upon. Middle-class stories, for children and adults alike, were filled with uplifting tales of poor people who, by dint of assiduous work, managed to better themselves. In Britain, Samuel Smiles authored this kind of mobility literature, which was widely popular between the 1830s and 1860s. Between 1780 and 1840, Prussian school reading shifted increasingly toward praise of hard work as a means of social improvement, with corresponding scorn for laziness.

Shifts in work context had important implications for [leisure](#). Businessmen who internalized the new work ethic felt literally uncomfortable when not on the job. Overall, the European middle class strove to redefine leisure tastes toward personal improvement and family cohesion; recreation that did not conduce to these ends was dubious. Family reading was a common pastime. Daughters were encouraged to learn piano playing, for music could draw the family together and demonstrate the refinement of its women. Through piano teaching, in turn, a new class of professional musicians began to emerge in the large cities. Middle-class people, newly wealthy, were willing to join in sponsorship of certain cultural events outside the home, such as symphony concerts. Book buying and newspaper reading also were supported, with a tendency to favour serious newspapers that focused on political and economic issues and books that had a certain classic status. Middle-class people also attended informative public lectures and night courses that might develop new work skills in such areas as applied science or management.

Middle-class pressures by no means totally reshaped popular urban leisure habits. [Workers](#) had limited time and means for play, but many absented themselves from the factories when they could afford to (often preferring free time over higher earnings, to the despair of their managers). The sheer intensity of work constrained leisure nevertheless. Furthermore, city administrations tried to limit other traditional popular amusements, ranging from gambling to animal contests (bear-baiting, cockfighting) to popular festivals. Leisure of this sort was viewed as unproductive, crude, and—insofar as it massed urban crowds—dangerous to political order. Urban police forces, created during the 1820s in cities like London to provide more professional control over crime and public behaviour, spent much of their time combating popular leisure impulses during the middle decades of the 19th century. Popular habits did not fully accommodate to middle-class standards. [Drinking](#), though disapproved of by middle-class critics, was an important recreational outlet, bringing men together in a semblance of community structure. Bars sprouted throughout working-class sections of town. On the whole, however, the early decades of the Industrial Revolution saw a massive decline of popular leisure traditions; even in the

countryside, festivals were diluted by importing paid entertainers from the cities. Leisure did not disappear, but it was increasingly reshaped toward respectable family pastimes or spectatorship at inexpensive concerts or circuses, where large numbers of people paid professional entertainers to take their minds away from the everyday routine.

The growth of cities and industry had a vital impact on [family](#) life. The family declined as a production unit as work moved away from home settings. This was true not only for workers but also for middle-class people. Many businessmen setting up a new store or factory in the 1820s initially assumed that their wives would assist them, in the time-honoured fashion in which all family members were expected to pitch in. After the first generation, however, this impulse faded, in part because fashionable homes were located at some distance from commercial sections and needed separate attention. In general, most urban groups tended to respond to the separation of home and work by redefining [gender roles](#), so that married men became the family breadwinners (aided, in the working class, by older children) and [women](#) were the domestic specialists.

In the typical working-class family, women were expected to work from their early teens through marriage a decade or so later. The majority of women workers in the cities went into domestic service in middle-class households, but an important minority laboured in factories; another minority became prostitutes. Some women continued working outside the home after marriage, but most pulled back to tasks, such as laundering, that could be done domestically. Their other activities concentrated on shopping for the family (an arduous task on limited budgets), caring for children, and maintaining contacts with other relatives who might support the family socially and provide aid during economic hardships.

Few middle-class women worked in paid employment at any point in their lives. Managing a middle-class household was complex, even with a servant present. Standards of child rearing urged increased maternal attention, and women were also supposed to provide a graceful and comfortable tone for family life. Middle-class ideals held the family to be a sacred place and women its chief agents because of their innate morality and domestic devotion. Men owed the family good manners and the provision of economic security, but their daily interactions became increasingly peripheral. Many middle-class families also began, in the early 19th century, to limit their birth rate, mainly through increasing sexual abstinence. Having too many children could complicate the family's economic well-being and prevent the necessary attention and support for the children who were desired. The middle class thus pioneered a new definition of family size that would ultimately become more widespread in European society.

New family arrangements, both for workers and for middle-class people, suggested new [courtship](#) patterns. As wage earners having no access to property, urban workers were increasingly able to form liaisons early in life without waiting for inheritance and without close supervision by a watchful community. [Sexual](#) activity began earlier in life than had been standard before the 1780s. Marriage did not necessarily follow, for many workers moved from job to job and some unquestionably exploited female partners who were eager for more durable arrangements. Rates of illegitimate births began to rise rapidly throughout western Europe from about 1780 (from 2 to 4 up to 10 percent of total births) among young rural as well as urban workers. Sexual pleasure, or its quest, became more important for young adults. Similar

symptoms developed among some middle-class men, who exploited female servants or the growing numbers of brothels that dotted the large cities and that often did exceptional business during school holidays. Respectable young middle-class women held back from these trends. They were, however, increasingly drawn to beliefs in a romantic [marriage](#), which became part of the new family ideal. Marriage age for middle-class women also dropped, creating an age disparity between men and women in the families of this class. Economic criteria for family formation remained important in many social sectors, but young people enjoyed more freedom in courtship, and other factors, sexual or emotional or both, gained increasing legitimacy.

Changes in family life, rooted in shifts in modes of livelihood and methods of work, had substantial impact on all family members. Older people gained new roles, particularly in working-class families, where they helped out as baby-sitters for grandchildren. Women's economic power in the family decreased. Many groups of men argued vigorously that women should stick to family concerns. By the 1830s and '40s one result was the inception of laws that regulated women's hours of work (while leaving men free from protection or constraints); this was a humanitarian move to protect women's family roles, but it also reduced women's economic opportunities on grounds of their special frailty. The position of [children](#) also began to be redefined. Middle-class ideals held that children were innocents, to be educated and nurtured. Most working-class families urged a more traditional view of children as contributors to the family economy, but they too could see advantages in sending their children to school where possible and restricting their work in dangerous factories. Again, after the first decades of industrialization, reform laws began to respond. Legislation in Britain, France, and Prussia during the 1830s restricted the employment of young children in the factories and encouraged school attendance.

Along with its impact on daily patterns of life and family institutions, economic change began to shift Europe's social structure and create new [antagonisms among urban social classes](#). The key division lay between the members of the middle class, who owned businesses or acquired professional education, and those of the working class, who depended on the sale of labour for a wage. Neither group was homogeneous. Many middle-class people criticized the profit-seeking behaviour of the new factory owners. Artisans often shunned factory workers and drew distinctions based on their traditional prestige and (usually) greater literacy. Some skilled workers, earning good wages, emulated middle-class people, seeking education and acquiring domestic trappings such as pianos.

Nevertheless, the social divide was considerable. It increasingly affected residential patterns, as wealthier classes moved away from the crowded slums of the poor, in contrast to the greater mixture in the quarters of preindustrial cities. Middle-class people deplored the work and sexual habits of many workers, arguing that their bad behaviour was the root cause of poverty. City governments enacted harsh measures against beggars, while new national laws attempted to make charity harder to obtain. The British [Poor Law](#) Reform of 1834, in particular, tightened the limits on relief in hopes of forcing able-bodied workers to fend for themselves.

Class divisions manifested themselves in [protest movements](#). Middle-class people joined political protests hoping to win new rights against aristocratic monopoly. [Workers increasingly organized](#) on their own despite the fact that new laws banned craft organizations and outlawed

unions and strikes. Some workers attacked the reliance on machinery in the name of older, more humane traditions of work. Luddite protests of this sort began in Britain during the decade 1810–20. More numerous were groups of craft workers, and some factory hands, who formed incipient trade unions to demand better conditions as well as to provide mutual aid in cases of sickness or other setbacks. National union movements arose in Britain during the 1820s, though they ultimately failed. Huge strikes in the silk industry around Lyon, Fr., in 1831 and 1834 sought a living minimum wage for all workers. The most ambitious worker movements tended to emphasize a desire to turn back the clock to older work systems where there was greater equality and a greater commitment to craft skill, but most failed. Smaller, local unions did achieve some success in preserving the conditions of the traditional systems. Social protest was largely intermittent because many workers were too poor or too disoriented to mount a larger effort, but it clearly signaled important tensions in the new economic order.