

Geographic Background and Concepts: The Industrial Revolution

Geography played an important role in shaping patterns of early industrialization. Industrialization, in turn, played a major role in reshaping the geography of those regions in which it occurred.

A wide variety of factors played a part in the initial rise of industrialization in Great Britain and northwestern Europe. Particularly important was the local availability of many key resources, such as coal and mineral ores. Coal was the most important of these, since it was used in enormous quantities as a source of power. Great Britain and much of Western Europe were endowed with abundant and easily mined coal resources, and the location of these deposits became the primary sites of heavy industry in the nineteenth century. Those regions in which water power was readily available, such as Switzerland and parts of France, Italy, and Scandinavia, also became important industrial centers through the development of hydroelectric power in the second half of the nineteenth century. Europe as a whole also had the advantage of being well endowed with iron ore, sulfur, and salt.

Another factor that gave Europe an early advantage (especially Great Britain) was the availability of efficient transportation. The large-scale economic production patterns of industrialization required the transportation of bulky, low-value goods (e.g., coal and ores for production, grain to feed the growing urban populations) over ever-increasing distances and in large amounts. Further, finished manufactured goods were no longer sold just locally but also were shipped to distant markets. Cheap, dependable transportation was essential. Great Britain possessed several important transportation advantages: a long coastline, many natural harbors, and navigable rivers that made water transportation readily available and reduced the need for costly overland transportation (a problem in much of continental Europe); a system of inland canals connecting navigable rivers, mines, and markets; and an excellent road system for the time, especially in comparison to the rest of the world.

Perhaps most important, however, was the British development of the railroad in the early nineteenth century. Later in the century, the introduction of the railroad in continental Europe spurred industrialization there, particularly in Belgium, Germany, and France.

Such were the geographic factors that influenced patterns of early industrialization. Conversely, the rise of industrialization had significant consequences for the geography of regions in which it occurred. Resource use, manufacturing patterns, urbanization, and population distribution were especially affected.

With the advent of industrialization, raw materials were required in significantly greater quantities and concentrations than in the past. In addition, new production technologies created a demand for new types and sources of resources. For example, prior to the development of a textile industry, cotton was relatively unimportant to the economy of Great Britain: It was not grown domestically, for environmental reasons, and was greatly exceeded in importance by other fibers, such as wool, flax, and imported silk. In 1700, only 500 tons of cotton were imported by Great Britain. With innovations in spinning and weaving technology and the rise of industrial-scale textile production, the importance of cotton increased dramatically. By 1860, the country was importing 500,000 tons each year. By the early nineteenth century, Manchester, the center of the British textile industry, had acquired the nickname "Cottonopolis."

As the demand for cotton grew, overseas sources became increasingly important to Great Britain; this accounts, in part, for Britain's political and economic interest in places such as Egypt and India and for its early support of the South during the American Civil War. As the demand for new resources arose or as domestic sources were exhausted, the search for new supplies often extended overseas to places such as Latin America, Canada, and the American West. In the late nineteenth century, the search for new sources of raw materials was one of the motives behind European colonial efforts in Asia and Africa.

Industrialization also greatly altered patterns of manufacturing. In pre-industrial societies, manufactured goods were usually produced by individual craftsmen such as weavers or blacksmiths. These goods, in turn, were generally sold locally. Some historians estimate that in preindustrial times, very few manufactured goods were sold more than 20 miles away from where they were made. As a result, production sites were widely scattered or diffused throughout a region, with many small producers serving their local areas.

These patterns changed dramatically with the onset of industrialization. Manufacturing was no longer performed by local craftsmen but took place in large factories that often employed hundreds of workers. Production tended to be concentrated at a few selected sites (e.g. textiles in Manchester, England; iron and steel in Pittsburgh, Pennsylvania). Large-scale production was no longer directed only at local markets but frequently served regional, national, or international markets as well. By the end of the nineteenth century, large regions of concentrated industrial manufacturing known as manufacturing belts had developed.

Nineteenth-century industrialization was closely associated with the rapid growth of European cities during the same period. Cities grew as a result of the influx of people desiring to take advantage of the factory jobs available in urban areas. Urbanization extended industrialization as factories were built to take advantage of urban workforces and markets.

Industrialization changed the relationship that existed between cities and their surrounding rural areas. In pre-industrial times, cities consumed foodstuffs produced in rural areas but produced little that rural areas needed in return. As a result, some historians describe preindustrial cities as "economically parasitic." Following the Industrial Revolution, cities became important centers of production and were able to offer a wide variety of manufactured goods to the rural areas, becoming vital centers of production as well as consumption.

While industrialization alone cannot account for the rapid growth of the European population during the nineteenth century (this growth was underway before industrialization), it is believed to have been responsible for changing patterns of population density on the continent. Between 1750 and 1914, nations that were most industrialized (England, Belgium, France, Germany) also acquired the highest population densities. This correlation reflects not only the rapid urbanization of these countries but also the high population densities of their urban areas and the improved standards of living associated with industrializing economies.

Finally, industrialization illustrates the geographic process of cultural diffusion; that is, the spread of an idea from one geographic location to another. Arising in Great Britain, industrialization later spread to France, following the introduction of British railroad technology, and to Germany, through the introduction of British machinery and capital. It is important to note, however, that the spread of industrialization has not always been the result of simple diffusion. While the industrialization of the northeastern United States in the mid-nineteenth century benefited from British capital and machinery, it was due in large part to independent American innovations, such as Eli Whitney's invention of interchangeable parts. Similarly, in the late nineteenth century, Japan industrialized largely on its own efforts, with little help from abroad.

Concepts

1. *Dispersed and Concentrated geographic patterns*- dispersed pattern refers to a particular feature distributed widely throughout a region; a concentrated geographic pattern refers to features clustered only in selected locations. In preindustrial times, small-scale manufacturing by individual craftsmen displayed a dispersed geographic pattern, taking place in a large number of separate locations. With the advent of industrialization, manufacturing patterns became more concentrated, occurring on a large scale in factories and in comparatively few locations (such as industrial cities or manufacturing belts).
2. *Cultural diffusion and Independent invention*-Cultural diffusion refers to the process by which an idea or culture trait spreads from its source area across a much wider area. The spread of industrialization from Great Britain to other locations in Europe and (in part) to the United States illustrates this process. In contrast, independent invention refers to the process by which a culture or society develops an idea on its own, instead of acquiring it from others. Examples of this process are many of the locally developed innovations that allowed the United States and Japan to industrialize more or less independently of occurrences in Europe.
3. *A manufacturing belt*- broad area in which the industrial manufacturing of a country or region is concentrated. At the end of the Industrial Revolution (ca. 1800-1914), the world's two principal manufacturing belts were located in western Europe and the northeastern United States.
4. *Population density*-Population is not distributed evenly throughout the world or within local regions; some places are home to more people than others. The number of people living in a given area is referred to as its population density, expressed as the number of people per square mile or square kilometer. The two maps of European population density included here illustrate the changing patterns of European population density associated with the Industrial Revolution.
5. *Resources*-These are useful raw materials that are extracted from the natural environment. They are often referred to as natural resources, but this term can be misleading, since no raw material is naturally a resource. It becomes a resource only after a society develops a way of extracting and using it. As a result of the Industrial Revolution, societies thought in new ways about resources. Cotton, discussed above, is one example. Another is petroleum. In 1750, at the beginning of the Industrial Revolution, crude petroleum had little value because there was little use for it. By the beginning of the twentieth century, however, petroleum had become extremely valuable because of new demands: Machinery required lubricating, and engines burned it for fuel.
6. *Site and Situation*-These terms apply to the location of a given place. Site refers to the physical characteristics of a place (e.g., hill, valley, level ground, rocky ground). Situation refers to a place's location relative to other places in the region. Situation became increasingly relevant to economic production following the Industrial Revolution since a place's location in relation to things like resources, transportation routes, and markets became vital to manufacturing.