

The Importance of Steel

The rise of the steel industry in the United States drove America's growth as a world economic power. Although ironworks had been established in the North American colonies shortly after European settlement began, it wasn't until the 19th century, when technological advances decreased the cost and increased the quality, that steel manufacturing became a dominant industry. With the abundant iron ore deposits around Lake Superior, the rich coal veins of Pennsylvania and the easy access to cheap water transportation routes on the Great Lakes, the Midwest became the center of American heavy industry. In the years after the Civil War, the American steel industry grew with astonishing speed as the nation's economy expanded to become the largest in the world. Between 1880 and the turn of the century, steel production increased from 1.25 million tons to more than 10 million tons. By 1910 America was producing more than 24 million tons, by far the greatest of any country.

Iron has been a vital material in technology for well over three thousand years. But until the [Industrial Revolution](#), its mining, smelting, and working were largely done by individuals and small groups. Each mine, forge, and blacksmith usually employed only a few dozen men at most.

Iron mining and working began in British North America almost as soon as settlement began, the first ironworks being set up at [Jamestown, Virginia](#), in 1621. [John Winthrop, Jr.](#), established an ironworks on the Saugus River in Lynn, [Massachusetts](#), as early as 1646. It was an elaborate enterprise for its time and place, but it was never a profitable business and soon collapsed into bankruptcy.

As late as the year 1700, mines in the colonies were producing less than 2 percent of the world's iron. The eighteenth century, however, saw a great increase in American production of pig iron, the crude product that comes from the blast furnace. In 1750 Britain passed the [Iron Act](#), one of the first of the Trade and [Navigation Acts](#) that were to be a major cause of the [Revolution](#). The act forbade the building of mills in the colonies but admitted American pig iron into Britain duty-free under some circumstances. After 1757, as British demand grew quickly, American pig iron was admitted duty-free in all cases.

Soon the American colonies had more blast furnaces and forges than [England](#) and Wales, and the export of pig iron increased accordingly. In 1723 only fifteen tons were exported, all from Virginia and [Maryland](#). In 1771 more than five thousand tons were shipped abroad, about half from Virginia and Maryland and most of the rest from [Pennsylvania](#) and [New York](#). By the time of the outbreak of the Revolution, the colonies were producing thirty thousand tons of pig iron a year, one-seventh of the world's supply. When the war ended, the manufacture of iron products increased markedly, and mills producing nails, hinges, plows, and other products were established in several states.

Steel, however, was another matter. Known since ancient times, steel is made by alloying iron with carbon to produce a harder, stronger metal that will take a much keener edge. But steel was very expensive to manufacture by the primitive methods then available, and its use was largely

confined to high-value specialty products such as swords and precision instruments. The [United States](#) imported almost all its steel until after the [Civil War](#).

The coming of the steam age transformed the iron industry. The demand for rolled iron for boilers increased exponentially. And between 1830 and 1861 more than thirty thousand miles of railroad were built in the United States, providing an enormous market for iron rails and allowing the creation of a national market for manufactured goods. This vast increase in demand caused iron mills to grow quickly into major enterprises.

Pennsylvania had been a leader in the American iron industry since revolutionary days. With the discovery of very large deposits of anthracite coal in that state and its substitution for charcoal in smelting after 1840, Pennsylvania solidified its position as the nation's leading state in the iron industry.

In 1844 U.S. government surveyors discovered the first of the great iron ore deposits in the [Great Lakes](#) states. By the late 1850s these were being aggressively exploited. The abundance of rich iron ore around [Lake Superior](#), the anthracite of Pennsylvania, and the cheap water transport available on the Great Lakes ensured that this area would be the center of the American iron and steel industry thereafter. As the production of iron and steel became the driving force of the Industrial Revolution, the Midwest became the center of American heavy industry.

In 1856 the British engineer Henry (later Sir Henry) Bessemer developed the Bessemer process for making steel. Two years later the Siemens-Martin open-hearth method was developed. Once perfected, these processes greatly lowered the cost of steel production and allowed the increasingly lavish use of steel for railroads, construction, and other industrial purposes.

The first Bessemer converter in the United States was established in 1864. Four years later Abram S. Hewitt built the first open-hearth furnace, which was better suited to most American iron ore. Steel production increased rapidly thereafter. In 1873 the United States, which had produced no steel rails before the Civil War, produced nearly 115,000 tons, one-eighth of all American rail production. As the price of steel continued to drop, iron rails, brittle and requiring frequent replacement, disappeared. The iron age was over.

In the years after the Civil War, the American steel industry grew with astonishing speed as the nation's economy expanded to become the largest in the world. Between 1880 and the turn of the century, steel production increased from 1.25 million tons to more than 10 million tons. By 1910 America was producing more than 24 million tons, by far the greatest of any country.

The industry also consolidated during this era as mill owners sought economies of scale, guaranteed sources of raw materials, and stable market conditions. [Andrew Carnegie](#), [Henry Clay Frick](#), Charles Schwab, and others shaped the modern industry in these years. The period was also often wracked by violent labor disputes such as the [Homestead strike](#) in 1892, and the industry would not be fully unionized until the [1930s](#).

In 1901, under the leadership of J. Pierpont Morgan and Elbert H. Gary, the [United States Steel Corporation](#), the largest industrial enterprise on earth, was established. Capitalized at \$1.4 billion, it controlled more than 60 percent of the American market.

The steel industry continued to be the measure of the size and strength of national economies until well after [World War II](#). American steel production peaked in 1969 when the country produced 141,262,000 tons. But new, more efficient steel plants with much lower labor costs were being built abroad, and these, helped by a sharp drop in transportation expenses, began to give American steel companies increasing competition.

A major shakeout of the industry ensued. By 1975 American steel production had plunged by 37 percent to only 89 million tons. The industry, however, still employed 457,000 workers at very high wages. By 1988 production had rebounded to 102,700,000 tons, but the number of steelworkers had declined to 169,000. Annual steel production per worker had more than tripled in thirteen years.

American steel was once again competitive on world markets. But steel would never again hold the central place in the economy it had held for a hundred years. The age of steel had ended; the age of the computer had begun.

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