

Technological Innovations

The rapid growth of the urban population caused by the arrival of immigrants necessitated new advances in technology. Resulting from land shortage and technological breakthroughs, the high-rise building was one of the most significant engineering developments at the time. The introduction of steel in construction and the use of electric elevators made high-rise buildings feasible. These innovations sought to alleviate the dense urban landscape by creating more space for people to live and work.

In 1896 artist Childe Hassam proclaimed that “New York is the most wonderful and most beautiful city in the world. All life is in it . . . No street, no section of Paris or any other city I have seen equal to New York.” When he returned to New York City in 1910 after a stay in Europe, the city had changed dramatically. Previously, the New York City skyline consisted mainly of church spires and the towers of public buildings. But with the dawn of the skyscraper, the skyline took on a drastically modern appearance. Gone was the picturesque city made of brick and timber, its streets filled with horse drawn carriages. In its place was a metropolis laden with soaring steel towers and streets teeming with noisy streetcars and crowds of new immigrants.

Before the high rise, buildings in New York City were made of iron, timber or brick. Due to the weight of these materials, buildings could only reach up to ten stories in height. As the city’s population steadily increased and these older buildings became less efficient. More people needed more space to live and work, having reached the outer limits of Manhattan Island, there was no land available for construction and expansion. Consequently engineers were tasked with constructing buildings upward, freeing up infinite space. This was achieved by replacing the older, heavier construction materials with steel, a lighter and stronger material.

The modern era of steelmaking began in the mid-nineteenth century with the **Bessemer steel process**. Named for its inventor, Englishman Henry Bessemer, the process turned iron into large, inexpensive quantities of steel. By 1910, the United States became the leading producer



[*Chrysler Building \(Chrysler Building in Construction\)*](#)
1930, Howard Cook, wood engraving on paper,
Smithsonian American Art Museum

of steel in the world, producing 24 million tons annually. Scottish immigrant and American steel magnate **Andrew Carnegie** revolutionized the American steel industry by capitalizing on Bessemer's cheap and efficient process. Carnegie realized that steel, a cheaper and stronger material, would eventually replace iron as the preferred material not only for skyscrapers but also for bridges and railroads.

Along with a structural steel beam framework, the use of plate glass windows and lighter masonry walls enabled architects and engineers to build structures that towered over anything that had been built before. The first building in New York to use these construction materials was the Woolworth Building. Completed in 1913, the building soared to an impressive 760 feet in height, or 55 stories. For a short time it was the tallest building in the world until surpassed by the Chrysler Building, constructed in 1929, and the Empire State Building, built in 1931.

Tall buildings expanded the physical space in New York City, but they were useless unless people and goods could be transported from top to bottom. The introduction of the electric elevator to high-rise construction was essential as buildings over six stories would have been virtually unusable without them. Mechanical elevators had been in use for centuries but with the addition of electricity, people and goods could move from floor to floor with ease and speed. Further modern technologies like electric light, modern plumbing and heating, and the telephone all made high-rise buildings habitable.

American Impressionists like Hassam avoided depicting these new innovations in their artworks. Hassam viewed the skyscraper as "a wildly formed architectural freak," and not a "marvel of art." Some contemporary literary figures, like British-American writer Henry James, remarked in 1907 that New York City's, "multitudinous skyscrapers" resembled "extravagant pins in a cushion already overplanted." The more progressive looking the building, the less appealing it was to Hassam. He preferred suggestions of skyscrapers, as seen through the window in *Tanagra*, as evidence of the city's evolving modern character.

Hassam associated the constant construction of skyscrapers with the wave of immigrants permeating the city that he idealized in his artwork. His concentration on the more refined views of New York City was not accidental. He specifically depicted genteel, cheerful scenes of the city to please his affluent clientele, all the while ignoring the presence of the heterogeneous immigrant population.

Traditionalists like Hassam viewed high-rises as ugly, representative of an ever-expanding heterogeneous immigrant population. Yet proponents like photographer **Alfred Stieglitz** extolled them as symbols of American spirit and power, divergent from European culture. Indeed, prior to the twentieth-century the graphic representation of America's progress and

expansion had been visualized as a horizontal line, epitomized by wagon trains and railroads that plunged westward. With the West settled in the previous century, artists reoriented the line of progress vertically, positioning skyscrapers as the new emblems of American expansion and progress.

Glossary

Alfred Stieglitz: (1864-1946) American photographer and modern art exhibitions organizer.

Andrew Carnegie: (1835-1919) One of the most successful industrialists of the 19th century, after making a fortune in the steel industry he donated much of his wealth to scientific, cultural, and educational institutions.

Bessemer steel process: A process of making steel from pig iron by burning out impurities (as carbon) by means of a blast of air forced through the hot liquid metal.