Nineteenth-Century Realism

Nineteenth century was an age of revolution. Contemporary ideas about human rights can be traced to the eighteenth-century Enlightenment. Resulting conflicts between different classes of society were often implicit in works of art-usually depicted from the view point of those rebelling against political oppression.

England led the Industrial Revolution, which transformed economies, first of Western Europe, then of United States and other parts of the world, from an agricultural to a primarily industrial base. The process of industrialization continued at breakneck speed. Inventions such as the steam engine and new materials such as iron and steel made mass manufacturing possible. Factories were established, mainly in urban areas, and people moved to the cities in search of work. New social class divisions arose between factory owners and workers. Demands for individual freedom and citizens’ rights were accompanied in many European countries by social and political movements for workers’ rights. In 1848 Karl Marx and Friedrich Engels [see Box] published the most influential of all political tracts on behalf of workers—The Communist Manifesto. The same year, the first convention for women’s rights was held in New York.

Karl Marx and The Communist Manifesto

The political theory of communism was set out by Karl Marx (1818-83) and Friedrich Engels (1820-95) in The Communist Manifesto, published in England in 1848.

Marxism views history as a struggle to master the laws of nature and apply them to humanity. The Manifesto outlines the stages of human evolution, from primitive society to feudalism and then to capitalism, each phase being superseded by a higher one. Marxists believed that bourgeois society had reached a period of decline; it was now time for the working class (or “proletariat”) to seize power from the capitalist class and organize society in the interests of the majority. The next stage would be socialism under the rule of the working-class majority (“dictatorship of the proletariat”). This, in turn, would be followed by true communism, in which the guiding principle “from each according to his ability, to each according to his needs” would be realized. Part analysis, part rhetoric, the Manifesto ends: “The proletarians have nothing to lose but their chains. They have a world to win. Working men of all countries, unite!”

In his Introduction to the Critique of Political Economy (1857-59), Marx argued that art is linked to its social context, and should not be regarded in purely aesthetic terms. His primary interest was in the relationship of art production to the proletarian base of society, and its exploitation by the superstructure (the bourgeoisie). For Marx, the arts were part of the superstructure, which comprises the patrons of art, while the artists were “workers.” As a result, he believed that artists had become alienated from their own productions. His view of the class struggle has led to various so-called “Marxist” theories of art history, in which art is interpreted as a reflection of conflict between proletariat and bourgeoisie.

Realism in Literature

The current of Realism and its related “-ism,” Naturalism, flows through nineteenth-century literature, science, and the arts. In England, Charles Dickens (1812-70) described the dismal conditions of lower-class life. He drew on direct observation and personal experience, for as a boy he had worked in a factory while his father was in debtors’ prison. His opening sentence for A Tale of Two Cities reflects his ambivalence toward contemporary society: “It was the best of times, it was the worst of times, it was the age of wisdom, it was the age of foolishness, it was the epoch of belief, it was the epoch of incredulity, it was the season of Light, it was the season of Darkness.”

In France, Honore de Balzac (1799-1850) wrote eighty novels, making up The Human Comedy a sweeping panorama of nineteenth-century French life. The novelists Gustave Flaubert (1821-80) and Emile Zola (1840-92) also focused on society and personality. In 1857 Flaubert published Madame Bovary, the story of the unfaithful wife of a French country doctor. The description of her suicide by arsenic poisoning is a classic example of naturalistic observation. Zola not only championed a Realist approach to the arts but was also a staunch defender of political and social justice.

French Realist Painting

The Gleaners (fig. 135), by Jean-Francois Millet (1814-75), illustrates the transition between Romanticism and Realism in painting. The heroic depiction of the three peasants in the foreground and their focus on their task recalls the Romantic sense of oneness with nature. Two peasants in particular are monumentalized by their foreshortened forms, which convey a sense of powerful energy. Contrasted with the laborers gleaning the remains of the harvest is the prosperous farm in the background. The emphasis on class distinctions—the hard physical labor of the poor as opposed to the comfortable lifestyle of the wealthy—is characteristic of Realism. In addition to social observation, Millet uses light to highlight economic differences—the farm is ported scientific discoveries and also carried cartoons and caricatures satirizing political leaders, the professions, actors, and artists. The proliferation of newspapers reflected the expanding communications technology, and advances in printing and photography made articles and images ever more accessible to a wider public. Inventions such as the telegraph (1837) and telephone (1876) increased the speed with which news could be delivered. Travel was also accelerated; the first passenger railroad, powered by steam, went into service in 1830. Paralleling the more general social changes in the 19th century was the change in the social and economic structure of the art world that had begun in the previous century. Crafts were replaced by manufactured goods. Guilds were no longer important to an artist’s training, status or economic well-being. A new figure on the art scene was the critic, whose opinions, published in newspapers and journals, influenced buyers. Patronage became mainly the province of dealers, museums, and private collectors. Both the art gallery and the museum as they exist today originated in the nineteenth century.

The artistic style that corresponded best to the new social awareness is called Realism, term coined in 1840, although the style itself appeared well before that date. Its primary concerns in art were direct observation of society and nature, and political and social satire.
illuminated in a golden glow of sunlight, while the three foreground figures and the earth from which they glean are in shadow.

Jean-Francois Millet, *The Gleaners*, 1857. Oil on canvas, 0.84 X 1.12 m. Musee d'Orsay, Paris. Because of their powerful paintings of rural labor, Millet and his contemporary Courbet were suspected of harboring anarchist views. Both were members of the Barbizon School, a group of French artists who settled in the village of that name in the Fontainebleau Forest. They painted directly from nature, producing landscapes tinged with nostalgia for the countryside, which was receding before the advance of the Industrial Revolution.

The painter most directly associated with Realism was Gustave Courbet (1819-77), who believed that artists could accurately represent only their own experience. He rejected historical painting, as well as the Romantic depiction of exotic locales and revivals of the past. Although he had studied the history of art, he claimed to have drawn from it only a greater sense of himself and his own experience. In 1861, he wrote that art could not be taught. One needed individual inspiration, he believed, fueled by study and observation. Courbet's Realist approach to his subject matter is expressed in the statement "Show me an angel and I'll paint one."

Gustave Courbet, *The Stonebreakers*, 1849. Oil on canvas, 1.6 X 2.6 m. Location unknown since World War II. Courbet's *Stonebreakers* (fig. 136) reflects the impact of socialist ideas on his iconography. It depicts 2 workers, one breaking up stones with a hammer and the other lifting a heavy rock. Like Millet's *Gleaners*, these figures evoke the Romantic nostalgia for a simple existence, but also show the mindless, repetitive character of physical labor born of poverty. Both the *Gleaners* and the *Stonebreakers* are rendered anonymously -their faces are lost in shadow-and this allies them with a class of work rather than accentuating their human individuality.

Courbet's huge and complex *My Studio: A Real Allegory Summing up Seven Years of My Life as an Artist from 1848 to 1855* (fig. 137) can be considered a "manifesto" in its own right. The seven-year period cited in the title begins with the February Revolution of 1848, and the proclamation of the Second Republic. Over this period, Courbet struggled to free himself from the style of his Romantic predecessors. He wanted to embark on a new artistic phase, in which his subject matter would reflect the reality of French society.

*My Studio: A Real Allegory Summing up Seven Years of My Life as an Artist from 1848 to 1855*, 1855. Oil on canvas 3.61 X 5.99 m. Musée d’Orsay, Paris. The Studio was offered to the International Exhibition of 1855 but was rejected by the jury. Courbet rented an exhibition space nearby, where he hung forty of his own paintings -the first one-man show in the history of art The sign over the entrance read "Realism, G. Courbet" The public ignored the show, and most critics derided it. Courbet took the picture back to his studio and exhibited it only twice more. It remained unsold until after his death.

The *Studio* depicts Courbet's broad view of society on the one hand, and his relationship to the art of painting on the other. In his own words, the painting showed "society at its best, its worse, and its average". The 30 figures portrayed cover the spectrum of society, from the intelligentsia to the lower classes. On the left there are anonymous working-class types. They consist mainly of country folk and include laborers, an old soldier with a begging bag, a Jew, a peddler, a fairground strongman, a clown, and a woman sprawled on the ground, suckling a
child. On the floor are the paraphernalia of Romanticism—a dagger, a guitar, a plumed hat. A skull rests on a newspaper, symbolizing the death of journalism. Behind the easel, as if invisible to the artist, is a nude male figure whose pose is in the tradition of Academic art.

On the right, and more brightly illuminated, are portraits of friends, members of Courbet’s artistic and literary coterie, an art collector and his fashionable wife, and a pair of lovers. Many of these are recognizable, including Courbet’s patron, J. L. Alfred Bruyas, who financed the Realist exhibition (see caption). Seated at the far right, reading a book, is Baudelaire. The boy lying on the floor sketching has been interpreted as an allusion to Courbet himself as a child, as well as to the ideal of freedom in learning.

The central group illustrates Courbet’s concept of himself as an artist, and of his place in the history of Western European painting. Having come from a provincial background himself, he identifies the group on the left with his past. Those on the right refer to his present and future role in the sophisticated world of Parisian society. He himself is at work on a rural landscape, characteristically building up the paint with brushes and a palette knife in order to create the material textures of “reality.” He displays the unformed paint by tilting his palette toward the observer while also extending his arm to place a daub of paint on the landscape. In this gesture, he has appropriated the creative hand of Michelangelo’s God in The Creation of Adam (see fig. 76). Courbet shows himself observing nature and re-creating it with his brush. The creative hand of the artist, echoing an ancient tradition, is a metaphor for the creating hand of God.

Courbet also had in mind Velázquez’s Las Meninas (see fig. 112), in which the artist paints in company. Whereas Velázquez placed himself in the same room as the royal family, but off to one side, Courbet places himself at the center within the spectrum of society, midway between the workers and the intellectual elite. In contrast to Velázquez’s unseen canvas, Courbet the artist is “enthroned” before his picture.

A nude woman inspires the painter-king. She is a king of artistic “power behind the throne,” or muse. In this role, she fulfills Courbet’s stated relationship to earlier art that is, he studies and absorbs it but then transforms it according to his inspiration in the “real,” present world. The further significance in the woman’s placement behind Courbet is that the artist “turns his back” on her, rejecting the Academic tradition in the form of a Classical nude.

A small boy stands at Courbet’s knee and stares raptly at his work, perhaps personifying the untrained, childlike admiration that Courbet hoped to arouse in his public. The boy wears sabots, or clogs, to indicate his rural origin. To his right is a white cat looking up at Courbet. This detail recalls the sixteenth-century saying, “A cat may look at a king.” The adage as represented here combines Courbet’s egalitarian “socialism” with his self-portrait as an artist king.

Honore Daumier (1808-79), one of the most direct portrayers of social injustice, has been called both a Romantic and a Realist. Here, his Third-Class Carriage (fig. 138) is discussed because of the attention to Realist concerns. A section of society seems to have been framed unawares. Strong contrasts of light and dark, notably in the silhouetted top hats, create clear edges, in opposition to the looser brushwork elsewhere. The very setting, the interior of a railroad car, exemplifies the new industrial subject matter of nineteenth-century painting.

138. Honore Daumier, Third-Class Carriage, c. 1862. Oil on canvas. 65.4 X 90.2 cm. Metropolitan Museum of Art. Lower-class figures crowd together in a dark, confined space. The three drably dressed passengers in the foreground slump slightly on a hard wooden bench. They seem resigned to their status and turn inward, as if to retreat from harsh economic reality. Their psychological isolation defends them from the crowded conditions in which they live.

Although Daumier had painted for much of his life, he was not recognized as a painter before his first one-man show at the age of 70. He earned his living by selling satirical drawings and cartoons to the Paris press and reproducing them in large numbers by lithography [see box]. His works usually appeared in La Caricature, a weekly paper founded in 1830 and suppressed by the government in 1835, and La Charivary a daily paper started in 1832. Daumier satirized corrupt politicians, judges, lawyers, doctors, businessmen, actors, and even the king himself.

In 1834 La Caricature published Daumier’s protest against censorship, entitled The Freedom of the Press: don’t Meddle with it. So great was the impact of Daumier’s caricatures that in 1835 France passed a law limiting freedom of the press to verbal rather than pictorial expression. The French authorities apparently felt that drawings were more apt to incite rebellion than

Lithography

A lithograph, literally a stone writing or drawing, is a print technique first used at the end of the 18th century in France. In the 19th century, lithography became the most widely used print medium for illustrating books, periodicals, and newspapers, and for reproducing posters.

To create a lithograph, the artist makes a picture with a grease crayon on a limestone surface. Alternatively, a pen or brush is used to apply ink to the stone. Since limestone is porous, it “holds” the image. The artist then adds water, which adheres only to the ungreased areas of the stone, because the greasy texture of the image repels the moisture. The entire stone is rolled with a greasy ink that sticks only to the image.

When a layer of damp paper is placed over the stone and both are pressed together, the image is transferred from the stone to the paper, creating the lithograph. This original print can then be reproduced relatively cheaply and quickly, making it suitable for mass distribution. Since the stone does not wear out in the printing process, an almost unlimited number of impressions can be taken from it.

In transfer lithography, a variant used by Daumier, the artist draws the image on paper and fixes it to the stone before printing. This retains the texture of the paper in the print and is more convenient for mass production.
words. Such laws, which are reminiscent of the ninth-century Iconoclastic Controversy, are another reflection of the power of images.

**Photography**

Another method of creating multiple images—and one that struggled to become an art form in its own right in the 19th century—was photography. It achieved great popularity, and its potential use for both portraiture and journalism was widely recognized. Many painters were also photographers, and from the 19th century the mutual influence of photography and painting has grown steadily.

**Photography** means literally "drawing with light". The basic principles may have been known in China as early as the 5th century B.C. The first recorded account of the *camera obscura* (fig. 140), literally a “dark room” is by Leonardo da Vinci. He described how, when light is admitted through a small hole into a darkened room, an inverted image appears on the opposite wall or on any surface (for ex., a piece of paper) interposed between the wall and the opening. In the early 17th century, the astronomer Johannes Kepler devised a portable *camera obscura*. It has since been refined and reduced to create the modern camera.

From the 17th century, discoveries in photochemistry accelerated the development of modern photography. It was found that silver salts, for example, were sensitive to light, and that an image could therefore be made with light on a surface coated with silver. In the 1820s a Frenchman, Joseph-Nicphore Niepce (1765-1833), discovered a way to make the image remain on the surface. This process was called fixing the image; however, the need for a long exposure time (eight hours) made it impractical.

In the late 1830s the French, Louis Daguerre (1789-1851), discovered a procedure that reduced the exposure time to 15 minutes. He inserted a copper plate coated with silver and chemicals into a *camera obscura* and focused through a lens onto a subject. The plate was then placed in a chemical solution (or "bath"), which "fixed" the image. Daguerre’s photographs, called *daguerreotypes*, could not be reproduced, and each one was therefore unique. The final image reversed the real subject, however, and also contained a glare from the reflected light. In 1839 the French state purchased Daguerre’s process and made the technical details public.

Improvements and refinements quickly followed. Contemporaneously with the development of the daguerreotype, the English photographer William Henry Fox Talbot (1800-77) invented “negative” film, which permitted multiple prints. The negative also solved the problem of Daguerre’s reversed print image: since the negative was reversed, reprinting the negative onto light-sensitive paper reversed the image back again. By 1858 a shortened exposure time made it possible to capture motion in a still picture.

During the 20th century, color photography developed. Still photography inspired the invention of "movies". Today, photography and the cinema are considered art forms in their own right. From its inception, photography has influenced artists. Italian Renaissance artists used the *camera obscura* to study perspective. Later artists, including Vermeer, are thought to have used it to enhance their treatment of light. In the mid 19th century, artists such as Ingres and Delacroix used photographs to reduce the sitting time for portraits. Eakins was an expert photographer who used photographic experiments to clarify the nature of locomotion.

Black-and-white photography has an abstract character quite distinct from painting, which, like nature itself, usually has color. The black-and-white photograph creates an image with tonal ranges of gray rather than line or color. Certain photographic genres, such as the close-up, the candid shot, and the aerial view, have influenced painting considerably.

In France, the photographic portraits taken by the novelist and caricaturist Gaspard-Felix Tournachon, known as Nadar (1820-1910), were particularly insightful. His portrait of Sarah Bernhardt (fig. 141), the renowned French actress, illustrates the subtle gradations of light and dark that are possible in the photographic medium.

Nadar has captured her in a pensive mood. Her dark, piercing eyes stare at nothing in particular, but seem capable of deep penetration. In addition to portraiture, Nadar was a pioneer of aerial photography. He took the first pictures from a balloon in 1856, which demonstrated the potential of photography for creating panoramic vistas and new viewpoints. Nadar then built his own balloon, which he named *Le Geant* (*The Giant*).

In 1870, when France declared war on Prussia, Nadar helped organize the Paris balloon service for military observation.

![Diagonal view of a camera obscura](image)

140. Diagram of a *camera obscura*. Here the *camera obscura* has been reduced to a large box. Light reflected from the object enters the camera through the lens and is reflected by the mirror onto the glass ground where, it is traced onto paper by the artist/photographer.

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From 1850 a new "quarrel" arose in the French art world over the status of photography. "Is it ART?" became a controversial issue, with the "nays" arguing that its mechanical technology made it an automatic, rather than an artistic, process. Because the artist's hand did not create the image directly, it was not "ART." The exhibition of photography also became an issue, which was exemplified by the International Exhibition of 1855 in Paris. On the one hand, photography was brought before a wide public, and its advantages were recognized in commerce, journalism. But on the other hand, because it was not shown in the *Palais des Beaux-Arts* (Palace of Fine Arts), photography was allied with industry and science rather than with the arts.

In the 1860s, several books were published that argued that photography should be accorded artistic status. To some extent, this debate continues even today. Its irony can be seen in the light of the 16th- and 17th century quarrels-in Venice and Spain, respectively-over the status of painting as a liberal art. In those instances, because the artist's hand did create the work, it was considered a craft, and not an art. With photography, the absence of the hand is used as an argument against artistic status.

This ongoing quarrel did not escape Daumier's penchant for satire. In 1862 he executed the caricature of Nadar *Elevating Photography to the Height of Art* (fig. 142), showing Nadar inside *Le Geant* photographing the rooftops of Paris. Each roof is inscribed with the word PHOTOGRAPHIE. Daumier emphasizes Nadar's precarious position by a series of sharp diagonals-from his hat to his camera, which is parallel to his legs, and the line of his back, which repeats the basket and rim of the balloon. The force of the wind is indicated by the flying drapery, flowing hair, and hat about to be blown away. Height, in this image, is satirically equated with the lofty aspirations of photography to the status of ART.

In England, the portrait photographer Julia Margaret Cameron (1815-79) insisted on the aesthetic qualities of photography. She manipulated techniques in order to achieve certain effects, preferring blurred edges and a dreamy atmosphere to precise outlines. In the United States, the photographs of Mathew Brady (c. 1822-96) combine portraiture with on-the-spot journalistic reportage. Of the one hundred or so known photographs of Lincoln, more than a third were taken by Brady. In April 1865, Brady photographed the Confederate general Robert E. Lee (fig. 143). He portrayed the formally dressed and neatly groomed Lee as proud and dignified, despite defeat. Only a few creases in his clothing and under his eyes betray the years of suffering he has witnessed. His house in Richmond, like Lee himself, is shown still standing at the end of the war—he is framed by the rectangle of his back door. The elegant upholstered chair, half out of the picture, is a memento of the passing civilization for which he fought.

The work of Edouard Manet (1832-83) in Paris formed a transition from Realism to Impressionism (see next chapter). By and large, Manet's paintings of the 1860s are consistent with the principles of Realism, whereas in the 1870s and early 1880s he adopted a more Impressionist style.
In 1863, Manet shocked the French public by exhibiting his *Dejeuner sur l’Herbe* ("Luncheon on the Grass", fig. 145). It is not a Realist painting in the social or political sense of Daumier, but it is a statement in favor of the artist’s individual freedom. The shock value of a nude woman casually lunching with two fully dressed men, which was an affront to the propriety of the time, was accentuated by the recognizability of the figures. The nude, Manet’s model Victorine Meurend, stares directly at the viewer. The two men are Manet’s brother Gustave and his future brother-in-law, Ferdinand Leenhoff. In the background, a lightly clad woman wades in a stream.

Although Manet’s *Dejeuner* contains several art-historical echoes of well-known Renaissance pictures by Raphael and Titian, they have been transformed in a way that was unacceptable to the 19th-century French public. The figures were not sufficiently Classical, or even close enough to their Renaissance prototypes, to pass muster with the prevailing taste. Certain details, such as the bottom of Victorine’s bare foot and the unidealized rolls of fat around her waist, aroused the hostility of the critics. The seemingly cavalier application of paint also annoyed viewers, with one complaining, “I see fingers without bones and heads without skulls. I see sideburns painted like two strips of black cloth glued on the cheeks.”

45. Edouard Manet, *Dejeuner sur l’Herbe*, 1863. Oil on canvas, 2.13 X 2.69 m. Musee d’Orsay, Paris. The visual impact of the painting is partly a result of the shallow perspective. Rather than creating the illusion of a distant space, Manet like Courbet and Eakins, builds up areas of color so that the forms seem to advance toward the viewer. The final effect of this technique is a direct confrontation between viewer and image, allowing little of the relief, or “breathing space,” that comes with distance.

**Manet’s Olympia**

Manet created an even more direct visual impact in the *Olympia* (fig. 146), which also caused a scandal when first exhibited in 1865. Here again, Manet is inspired by the past-most obviously by Giorgione’s *Sleeping Venus* and Titian’s *Venus of Urbino* (see fig. 85 and 86). But whereas the Italian Renaissance nudes are psychologically “distanced” from the viewer’s everyday experience by their designation as Classical deities, Manet’s figure (the same Victorine who posed for the *Dejeuner*) was widely assumed to represent a prostitute. As such, she raised the specter of venereal disease, which was rampant in Paris at the time. The reference to “Olympia” in such a context only served to accentuate the contrast between the social reality of 19th-century Paris and the more comfortably removed Classical ideal. Titian had also relieved the viewer’s confrontation with his Venus by the spatial recession. In *Olympia*, however, the back wall of the room approaches the picture plane, and is separated from it only by the bed and the black servant. Olympia is harshly illuminated, in contrast to the soft light and gradual sensual shading of Titian’s Venus. Furthermore, *Olympia* shows none of the traditional signs of modesty but instead stares boldly at the viewer.

146. Edouard Manet, *Olympia*, 1865. Oil on canvas, 1.3 X 1.9 m. Musee d’Orsay, Paris. Olympia is naked rather than nude, an impression emphasized by her bony, unclassical proportions. The sheets are slightly rumpled, and the flowers that her maid delivers have clearly been sent by a client. Olympia’s shoes may refer to “streetwalking,” and the alert black cat is a symbol of sexuality. No doubt because of the popular reputation of the alley cat. The term cathouse is commonly used for a brothel.

In 1863, the Salon rejected the *Dejeuner*, but two years later it accepted the *Olympia*. It is impossible to overestimate not only the depth of feeling that surrounded the decisions of the Salon juries, but also the hostile criticism that generally greeted avant-garde, or modernist,
works. The subsequent outcry following the rejection of over 4,000 canvases by the Salon jury prompted Napoleon III to authorize a special exhibition, the “Salon des Refuses,” for the rejected works. Among the rejected were many artists who later gained international recognition. Manet’s Olympia caused dissension even among the ranks of the so-called Realists. It offended Courbet, who pronounced it “as flat as a playing card.”

Courbet’s Woman with a Parrot
In 1866 Courbet exhibited Woman with a Parrot (fig. 147). She is set in a deeper space than Olympia and does not confront the viewer directly. Her head falls back onto the bed and her self-consciously wavy hair corresponds to the ripples of the bedcover. Courbet softens her impact on the viewer by turning her face toward the parrot perched on her hand. Her sexuality is less threatening than Olympia’s because she is somewhat idealized and turns from the viewer. The woman with the parrot is voluptuous, her shading more gradual than Olympia’s. She is nude rather than naked.

147. Gustave Courbet, Woman with a Parrot, 1866, oil on canvas, 1.3 X 1.96, Metropolitan Museum of Art, New York. In response to Courbet’s criticism of his Olympia, Manet accused Courbet of “billiard ball aesthetics” a reference to the voluptuous proportions of the nude. Other critics described the figure as “ungainly” and her hair as “disheveled”. Napoleon III’s Superintendent of Fine Arts reneged on a contract to purchase the picture.

148. Joseph Paxton, Crystal Palace, London, 1850-51. Cast iron, wrought iron, and glass. Engraving. Drawings Collection, Royal Institute of British Architects. London. The Crystal Palace was 1850 feet (564 m) long (perhaps an architect’s pun on the year in which it was built) and 400 feet (122 m) wide. It covered an area of 18 acres (7.3 ha, enclosed 33 million cubic feet (934,000 m3)) of space (the largest enclosed space up to that time), and contained more than 10,000 exhibits of technology and handicrafts from all over the world. In 1936 the it was destroyed in a fire.

Architecture

By and large, 19th-century architects were not quick to adopt iron and steel, both of which had been recently developed, as building materials. The first major project making extensive use of iron was thus considered a utilitarian structure rather than a work of art. In 1851 the “Great Exhibition of the Works of Industry of All Nations” was held in London. This was the first in a series of Universal, or International, Expositions and World’s Fairs which continue to this day. Architects were invited to submit designs for a building in Hyde Park to house the exhibition.

The landscape gardener Joseph Paxton, submitted a successful proposal, made from iron and glass. Not only was it less expensive than the others, but it could be completed within the 9-month deadline. The individual components of the project were “prefabricated,” made in advance and assembled on the actual site. More over, it could be treated as a temporary structure, dismantled, and be reassembled everywhere. Because of its extensive use of glass, the structure was dubbed the Crystal Palace (fig. 148).

Other buildings done with the same modern materials followed. In particular we want to remember here, the iron bridges (such as the Brooklyn Bridge, 1869-83, in New York by the Roebling family of constructors) and the Eiffel Tower, built in 1887-89, and named after its designer, Alexandre Gustave Eiffel.

At the same time America was experimenting the first skyscrapers, made possible not only for the extensive use of modern materials (iron, steel, glass, concrete), but also by the by now extensive use of electricity for the elevators.