

The 19th century oversaw several art periods: the impressionist movement, the post-impressionism, realist art and others. These art periods have largely contributed to the world that we currently live in many ways, whether they are paintings, photography or other mediums of art. One of the mediums of art that has predominantly been produced is architecture, in which, there are several notable places that stand out from the surrounding buildings, such as The Eiffel Tower of Paris and the Brooklyn Bridge of New York City - both built in the 19th century, in which, though they are in completely different locations and may be built to different purposes, they have several similarities that show how these two structures are actually more alike than we may think.

The Eiffel Tower was constructed for the International Exposition of 1889 (1889 Exposition Universelle) by the French government to celebrate the 100th anniversary of the French revolution. The concept of the Eiffel Tower was designed and submitted by Gustave Eiffel outlining a 300-meter tower. The design illustrates a 300-meter tower with four iron lattice-girder piers separated at the base and gradually coming together at the top where they are joined by metal girders at two levels, which in turn, also provide viewing platform for tourists. The construction began on January 1887 and finished on March 31st, 1889; 150 to 300 workers were involved in the construction. (*Eiffel Tower | History, Height, & Facts | Britannica, 2024; Eiffel Tower History, Architecture, Design & Construction, 2017*)

Figure 1 displays a front view of the Eiffel Tower. The tower, following Eiffel's design, has the four pillars at the base that gradually come together when going upwards the tower and eventually is joined into the single tower top, the highest level of the tower where it is currently occupied by broadcast antennas for public broadcast radio stations. The tower has four sides and each side faces four different views, they are: the hill of Chaillot, the historic center of Paris, the Grenelle neighborhood, and the Champ-de-Mars garden. The tower contains three floors. There are several decorations and features that the tower has, such as, the feet of the tower that contains the names of the scientists and civil engineers that are part of the project (Figure 2), the elevators that ascend along the curve of the tower (Figure 3) (*Eiffel Tower | History, Height, & Facts | Britannica, 2024; Eiffel Tower History, Architecture, Design & Construction, 2017*).

In terms of the design of the architecture. The Eiffel Tower demonstrates a clear departure from neo-gothic, neo-renaissance and neo-baroque architecture styles that were predominant during the 18th and the 19th century and moving towards a modern-style architecture due to the use of iron as well as the glass floor. Due to its breakaway from the historic architecture style, it was met with criticisms from various artists and media; these examples include: the article titled "Protest against the Tower of Monsieur Eiffel" or claims that the tower looks like a "tragic street lamp" or "a belfry skeleton" and "iron gymnasium apparatus, incomplete, confused and deformed." by several satirists However, these criticisms quickly vanished after the completion of the towers' construction and due to its success that it received from visitors. (*Eiffel Tower History, Architecture, Design & Construction, 2017*)

Meanwhile, across the Atlantic Ocean in New York City, four years before the construction of the Eiffel Tower in Paris, the construction of what is now the infamous Brooklyn Bridge had finished. The Brooklyn Bridge is a suspension bridge spanning from the East River of Brooklyn to Manhattan (Figure 4); its total length to be 6,016 feet or 1,834 meters long making it the longest suspension bridge in the world at the time. (*NYC DOT - Brooklyn Bridge, n.d.*) The Brooklyn Bridge was designed by a German immigrant engineer, John Augustus Roebling, in which, he proposed a design of the suspension bridge over the East River in 1857 after the passing of the bill that enabled the construction of the bridge by the New York State's Senate, the construction began on January 2nd 1870, where it was administered by the New York and Brooklyn Bridge company. The construction of the bridge finished in 1883 and finally opened to the public on May 24th, 1883. (*Brooklyn Bridge | History, Construction, & Facts | Britannica, 2024; McCullough, 2012*)

The design of the bridge was a blend or a mix of two different styles of architecture, Gothic architecture was used specifically for the towers that hold up the cables and Modern architecture was used in other areas of the bridge such as the deck and the cables. The towers that hold up the bridge were built of limestone, granite and cement (Figure 6); each of them contains two neo-Gothic pointed arches and was constructed to be 278.25 feet

tall or 84.81 meters fall above water. (McCullough, 2012; United States Department of the Interior, 1966) The use of the said materials created the Gothic-style towers that is similar to ones used in Catholic churches and other buildings such as the *Manchester Town Hall* in the United Kingdom, the *Hungarian Parliament Building* in Hungary, creating a feeling of a palace or a castle when entering the bridge and exiting the bridge when driving by.

In other areas of the bridge, Roebling went for another approach when it comes to the deck and the cables. For the cables (Figure 7), he used steel for the cables that descend from the top of the suspension towers and help hold the deck. These cables are galvanized steel wires wired into 19 individual strands; these cables took several months for the construction workers to tie together. For the deck, Roebling went with a structure that contains multiple trusses, made with steel, enabling the bridge to handle a total load of 18,700 short tons or 16,964 metric tons. Roebling's approach not only created a bridge that has the strength to handle an enormous amount of vehicles his approach also contributed to the new style of architecture where it is now widely known as modernist architecture. (McCullough, 2012)

However, the construction does not come without its criticisms and controversies. During its construction, reports of fatalities became more prevalent due to the dangerous conditions of construction sites. The first construction fatalities happened on 23rd October 1871 where granite blocks on the top of the bridge tower fell and injured multiple workers and several workers died. One of the notable deaths during the construction is the death of the project's designer – John A. Roebling, who died while surveying the location of the bridge tower when his right foot caught on a rope and was crushed by a docking boat, resulting in amputations which several weeks after, he contracted tetanus and passed away. (*Construction of the Brooklyn Bridge Took 14 Years—And Multiple Lives*, 2023) In addition to these controversies, there were several oppositions towards the Brooklyn Bridge, notable ones were opposition from shipbuilders who expressed their concern that the bridge would not provide enough area underneath for ships. (“THE BIG BROOKLYN BRIDGE; THE SUPREME COURT ASKED TO CALL IT AN OBSTRUCTION.,” 1883) and opposition from an investigation into the bridge's calculations regarding height and strengths which led to the U.S. Supreme Court to declare that the Brooklyn Bridge is a legal structure. (“THE BROOKLYN BRIDGE SUIT.; THE UNITED STATES SUPREME COURT DECIDES THAT IT IS A LAWFUL STRUCTURE.,” 1883)

These two structures, though are very far away from each other and are on two completely different continents, they have several similarities and notable differences in many areas. The Eiffel Tower and the Brooklyn Bridge were built in around the same time, both use steel; a relatively new technology / material during that time, they both contain arches but are different in their types; the Eiffel Tower's “arches” are more of “pillars” made with steel and have semi-circular shape while the Brooklyn Bridge's arches or towers that hold up the cables are made of limestone and other materials in a Gothic-style arches / towers. Both of them have exposed steel parts, however, the Eiffel Tower's pillars and towers are fully made in steel while the Brooklyn Bridge's arches still contain the Gothic-style arches (McCullough, 2012), nevertheless, they are still both considered a feat of engineering in their respective locations, however, due to their significant difference from mainstream architecture styles at the time, they are met with similar criticisms of their design. However, one difference between the two is the legislation surrounding the Eiffel Tower, in which, it is illegal to publish a photo of the Eiffel Tower at night due to the copyright laws in regards to the lighting and sparkling lights, however, individuals can still take photos of the Eiffel Tower during nighttime (*Eiffel Tower at Night*, 2020) – compared to the Brooklyn Bridge, there are no significant laws that prohibit the publishing of the Brooklyn Bridge itself in various media such as photography or painting.

In summary, the Eiffel Tower and the Brooklyn Bridge are both regarded as one of the most consequential pieces of architecture in influencing “modernist architecture”, introducing the concept of

“functionalism” where it is viewed that the design of buildings, structures or any architectural entities should follow the “function” or how it is going to be used, the concept of minimalism where the subject is reduced to its necessary elements (Sfetcu, 2014) and the removal of extra decorations such as ornaments. The modernist movement and style then continued to become prominent during the 20th century and is then followed by the postmodern era.

Images and Figures

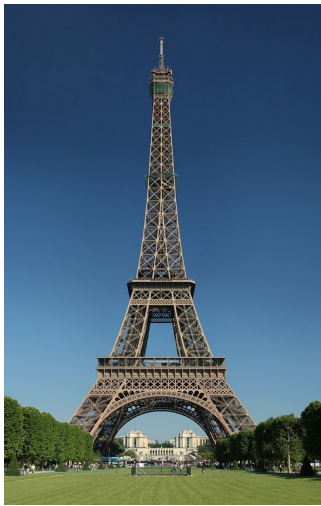


Figure 1: Gustave Eiffel, The Eiffel Tower, 1889, Steel with iron coating, 324 m x 125 m x 125 m



Figure 2: View of the Brooklyn Bridge from below



Figure 3: Close-up on the names of the The Eiffel Tower



Figure 4: Towers of the Present Day Brooklyn Bridge, 2008



Figure 5: The Brooklyn Bridge, New York City



Figure 6: View of suspender cables of the bridge, 2013

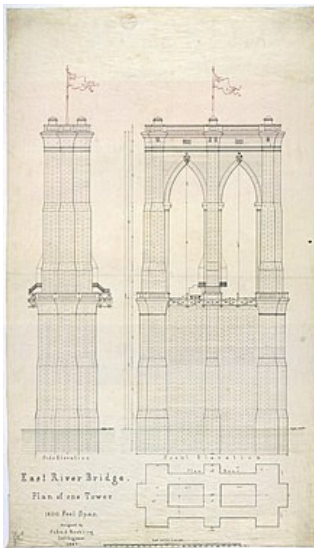


Figure 7: Early Brooklyn Bridge tower plan, 1867

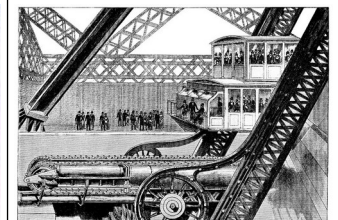


Figure 8: Close-up on the elevator of the Eiffel Tower, Gustave Eiffel, The Eiffel Tower, 1889

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