

# The American dream of Rafael Guastavino (1842–1908)

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MANY MILLIONS OF IMMIGRANTS TO THE United States passed through Ellis Island, in Upper New York Bay, from 1892 to 1954, and millions of visitors have seen it since it was made part of the Statue of the Liberty National Monument in 1965. When in 1916, an explosion caused serious structural damages to the great Registry Hall, it was restored and a new vault was built in a style that had been taken to America in the late 19th century (Fig. 1). The owners of the company that built it—Guastavino Brothers—were the children of Rafael Guastavino (1842–1908), Valencian architect and builder that, after having had a great success in Catalonia, moved to the United States in 1881. There he founded his own family business and patented the “tile arch system” of his vaulting sys-

tem of construction, which was based on a centuries-old Catalan building technique. The Guastavinos were the builders of many public spaces in the United States between 1881 and 1962, and revolutionized architectural design and construction in the country. Differently from most immigrants arriving in the United States due to the poor conditions in which they lived in their home countries, in 1881 Guastavino was already well known both as architect and builder in Barcelona, and his work had been present at first-rank exhibitions and competitions, including the World Exposition of Vienna (1873) and the Philadelphia Exhibition (1876) that commemorated the Centennial of the United States and was the first major World's Fair held in that country, attracting around nine million visitors.

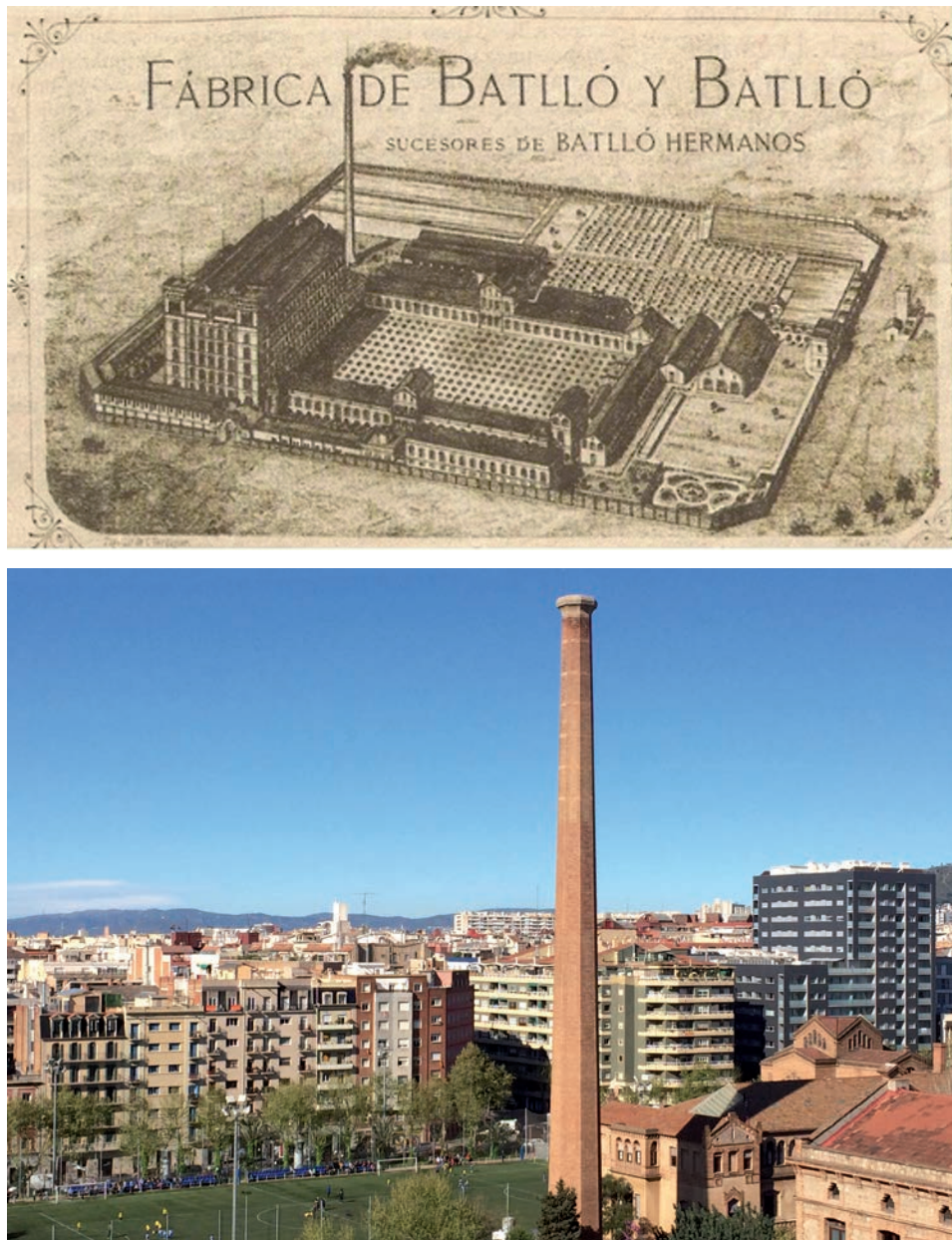
Rafael Guastavino was born in Valencia, Spain on March 1, 1842, the fourth of fourteen children of Pascuala Moreno and Rafael Guastavino, the son of an Italian immigrant that



**Fig. 1.** Current view of Ellis Island Registry Room, where immigrants went through medical and legal inspections. It was restored to host the Ellis Island Immigration Museum. (Image courtesy of Flodigrip's world, "The Registry Room" March 29, 2011 via Flickr, Creative Commons Attribution).

had settled in Barcelona in the late 18th century. Young Guastavino moved to Barcelona to study at the *Escola Especial de Mestres d'Obres* (Master Builder's School), the only institution that offered degree studies in architecture and art building at that time in Spain, along with that in Madrid. He started working on his own as a builder in Barcelona and soon received commissions from wealthy owners to build both industrial buildings and private residences. Among his major

works of that period is the factory for the Batlló brothers (Fig. 2). The factory included a 60-m octagonal brick chimney and a loom room containing several spherical vaults that rested on metallic supports, and was built using what Guastavino himself called “cohesive construction”, based on a Catalan technique that had been used for centuries and that allowed to span wide spaces and produce fireproof vaults strong enough to support a floor above them. The so-called



**Fig. 2.** Overview of Fàbrica de Batlló & Batlló (Batlló Brothers), a textile factory built by Rafael Guastavino between 1868 and 1870 in Les Corts de Sarrià, at the time an independent village and nowadays a quarter in the *Eixample* of Barcelona, occupying ca. six hectares. **Top:** An advertising card from 1870. **Bottom:** Current view of a part of the premises, now a teaching and services complex of the Technical University of Catalonia. At the bottom left, a soccer field (green) for young students covers a large underground rainwater storage tank, aimed at retaining runoff water from sudden storms, typical of the Mediterranean region, during the rainy seasons (spring and autumn). The water collected is used for watering trees and green areas. (Photo by Mercedes Berlanga).

Catalan vault (*volta catalana*) or timber vault had been traditionally constructed interlocking thin terracotta tiles over a wood pattern and holding them together with mortar, which allowed gentler and longer curves than other techniques. Guastavino replaced mortar by materials that were common at his time such as Portland cement. The Australian chronicler and historian Robert Hugue, author of a monumental guide of Barcelona and its history [*Barcelona*, Vintage Books, NY, 1992], describes the chimney in the Batlló Factory as “a high octagonal pipe that rises from a flaring base, tapering slightly toward the top, and finished with a small cornice. It has a breathtaking simplicity and the beauty of ancient Persian prayer towers.” The Batlló factory was a landmark in industrial architecture, and Guastavino was soon commissioned other projects including other factories (Vidal i fills, Martí i Rius, Carreras i fills, Modest Casademunt); a monument to “La Gloriosa” (the revolution that took place in Spain in 1868 and resulted in the deposition of Queen Isabella II) in plaça Nacional (currently plaça Reial); private houses in the Eixample (a city quarter whose main features are its grid pattern and square blocks; it was constructed during the second half of the 19th century between the old city and what were once surrounding small towns); and a theatre (Teatre La Massa) in Vilassar de Mar (a seaside village 25-km north from Barcelona), with a ca. 17-m-diameter flattened dome.

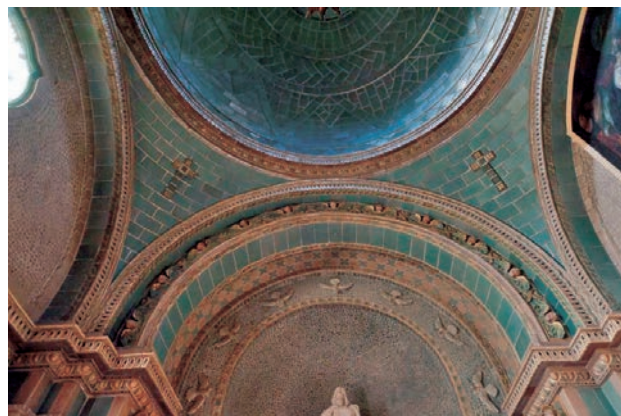
In 1876, Guastavino presented the project “Improving Public Health in Industrial Towns” at the Exposition held in Philadelphia to commemorate the Centennial of the United States. His work was awarded a prize due to the advantages of the proposed technique, which was unexpensive and fire resistant. That recognition of his work encouraged him to migrate to the United States when his marriage broke down and his wife decided to leave for Argentina with three of their four children. Guastavino could see many opportunities in the United States, and in February 1881 he sailed from Marseille to New York with his nine-year-old Rafael Jr. (1872-1950) and the nanny, with whom it seems he had an affair, and her two children. Years later, he established a relationship with a Mexican woman, Francisca Ramírez, whom he described as his housekeeper. He married her when he learnt his first wife had died.

Guastavino settled in the United States at the right moment, when the mark left by the Great Chicago Fire in 1871 stirred the use of fireproof building materials such as Portland cement, laminated steel and concrete to replace traditional wooden structures. Guastavino took advantage of that trend and patented fire-resistant building techniques and materials; by 1885 he had even registered the name “Construction of Fireproof Buildings”. In 1889 he founded the Guastavino Fireproof Construction Company, which soon had offices also in Boston and Chicago and collaborated with the major teams of architects in the Boston and New York

areas. Since then, the term *Guastavino vaults* have identified a complex building process that outlived its founder, who was replaced by his son Rafael Guastavino Jr to take charge of the company. In addition, in the 1870s, neo-Romanesque and neo-Gothic architecture, based on large vaults, had become popular in the United States thanks to the work by architect Henry Hobson Richardson. However, there was not any tradition in using stone or bricks and most of the vaults in the buildings designed in those styles were made of plasterboard or plaster. Guastavino’s cohesive construction was thus a competitive alternative, but American architects were first reluctant to accept that construction system, even if it was guaranteed by the many works that Guastavino had carried out in the Barcelona area, and by letters of support he took with him from Barcelona. Guastavino was a tenacious man and publicized himself through his monthly contributions to a magazine on architecture and decoration (*Decorator and Furnisher*, 1881–1883) and by winning the competitions to construct several buildings in New York.



**Fig. 3.** Guastavino standing up on a newly built arch during the construction of the Boston Public Library, 1889. (Image courtesy of Boston Public Library, “Boylston Street” August 31, 2006 via Flickr, Creative Commons Attribution).



**Fig. 4.** View of a vault in the Basilica of St. Lawrence in Asheville, NC (Image courtesy of Jacqueline Poggi, “Basilica of St Lawrence” October 16, 2011 via Flickr, Creative Commons Attribution).

Guastavino's first major project in the United States was the Boston Public Library (1889, Fig. 3), which he carried out in collaboration with the architectural firm McKim, Mead and White and brought him great prestige. When he died in 1908—in his home in Asheville, North Carolina, where he had bought a estate—the company, which had already become “Guastavino and Company”, was about to start building the great 40-m-diameter dome of Saint John the Divine Cathedral in New York. Guastavino and Company was a thriving firm until the 1930s, when it started a gradual decline due to several factors including the growing use of reinforced concrete, architectural trends that favoured an angular style, and the fact that the tile arched system was labour intensive and expensive. The company eventually closed in 1962, and its archive was transferred to the Avery Library, in Columbia University.

More than 600 vaults built in the United States by the company funded by Guastavino have survived, including those of the two above mentioned Boston Public Library and the Ellis Island Registry Hall, and those of the New York University, Bronx, New York; Institute of Art and Sciences, Brooklyn, New York; Bank of Montreal, Canada; Madison Square Presbyterian Church, New York; City Hall Subway Station, New York; St. Paul's Chapel, Columbia University, New York; Rodef Sholem Synagogue, Pittsburgh, Pennsylvania; McKinley National Memorial, Canton, Ohio Oyster Bar in Grand Central Terminal, New York; Basilica of St. Lawrence, in Asheville, North Carolina (Fig. 4); Elephant House, Bronx Park, New York; the Smithsonian Museum, Washington D.C.; Girard Trust and Company, Philadelphia, Pennsylvania; and Cathedral of St. John the Divine, New York. When, in 1967, the American Institute of Architects listed the most important buildings in Manhattan built over the previous thirty years, more than half of the 22 that had been built before War World II were works by Guastavino and Company.

Rafael Guastavino was not only a builder, he was a man of science. He did theoretical and empirical studies, which he made public mostly through lectures, which were later pub-

lished. In his seminal book *Essay on the theory and history of cohesive construction, applied especially to the timber vault* (Ticknor, Boston, 1892), he described this technique, its history and the theory in which it was based, its advantages and its potential applications to all kinds of buildings.

Immigrants that entered the United States from 1916 to 1954 through Ellis Island surely did not know that the Registry Hall of that immigrant inspection station had been constructed by a company funded by a man that, like themselves, arrived once to the United States with a dream. Guastavino's dream was of another kind, however. Whereas they wanted to find in America a way of life, sometimes even just surviving, Guastavino dreamt of introducing in the United States a construction style that had been in use for centuries in the Mediterranean region. He succeeded indeed in his dream, and his name and work are now part of the history of the United States architecture. ■

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## Websites on Guastavino's work

- Guastavino.net, web of the Guastavino Project at the Massachusetts Institute of Technology, dedicated to documenting and preserving the tile vaulted works of the Guastavino Company. <http://architecture.mit.edu/class/guastavino>
- “The reinvention of public space in New York City”, website of the exhibition held in Valencia, Guastavino's hometown, in 2009, promoted by the Autonomous Government of Valencia. <http://www.rafaelguastavino.com/en/>