

As UNESCO Honors Frank Lloyd Wright, A Look at His Works

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UNESCO's World Heritage List has added eight buildings by Frank Lloyd Wright, according to AP reporters. A spokesperson cited Wright's influence on European architecture as being of historical importance. His use of steel and concrete was one-of-a-kind construction.



Frank Lloyd Wright was known for his unique architectural use of steel and concrete. Photo by Michael J Locke / (CC BY-SA 4.0)

According to the AP article, the buildings added to the World Heritage List include the Solomon R. Guggenheim Museum in New York City; the Hollyhock House in Los Angeles; and the Unity Temple in Oak Park, Illinois, near Chicago. Frank Lloyd Wright, the famed American architect who died in 1959, was widely known for his remarkable buildings—especially his unprecedented innovations with concrete and steel. Wright utilized these two seemingly industrial building materials in much of his work, creating a surprising amount of warmth and beauty with them.

Modern Concrete

“The story of modern concrete technology really begins with the invention of Portland cement by Joseph Aspdin in 1824,” said Dr. Stephen Ressler, Professor Emeritus from the United States Military Academy at West Point. “As a manufactured product, Portland cement could be produced in much larger quantities and with much better quality control than that volcanic ash, called ‘pozzolana,’ that had been used by the ancient Romans; and so, soon after Portland cement became available, concrete became popular as a replacement for stone in the foundations of buildings and bridges.”

Dr. Ressler said that by the 1850s, engineers had begun to experiment with concrete arch bridges and aqueducts, but concrete’s “inherent weakness in tension” had to be solved before it could be utilized as fully as it is today. The problem was solved by a French gardener named Joseph Monier. “In 1867, Monier developed a system for making large flower pots using concrete reinforced with iron rods,” he said. “The success of these products led Monier to realize that iron-reinforced concrete might actually be useful in the construction industry.” So, Monier conducted a series of experiments that led him to develop a system of placing iron reinforcements in the weakest structural regions of molded concrete. “That is the most fundamental characteristic of modern reinforced concrete,” Dr. Ressler said.

Frank Lloyd Wright’s “Fallingwater House”



Built by Frank Lloyd Wright, “Fallingwater House” is located in Mill Run, Pennsylvania. Photo by Pablo Sanchez Martin / Flickr (CC BY 2.0)

Built from 1934 to 1937, Frank Lloyd Wright's "Fallingwater House" in Mill Run, Pennsylvania, is often regarded as some of the best American architecture in history. "The most prominent features of Wright's design are the reinforced concrete cantilever balconies that project out from the building in three directions," Dr. Ressler said. "Though these cantilevers were intended to evoke nearby rock formations, Wright didn't try to dress them up with stone facing. Like Robert Maillart, he achieved sincerity of form by leaving the concrete surfaces exposed."

But Fallingwater faced problems by not adhering to Joseph Monier's system of reinforcement. "The building contractor and a consulting engineer had both recommended more steel, but Wright rejected them both," Dr. Ressler said. "Ego triumphed over engineering judgment, and the cantilevers began to sag almost immediately after the formwork was removed in 1937." According to Dr. Ressler, a consultant in 2002 told Fallingwater's caretakers that the cantilevers were on the verge of collapse, so immediate structural repairs were made.

Fortunately, Wright's masterpieces have survived long enough to be honored by UNESCO. While we tend to think of concrete as drab and practical, structures like Fallingwater are anything but. Dr. Ressler offered some advice on this subject: "As you think about this incredible range of structural configurations, I hope you'll begin to think about this common material in an uncommon way; and then, the next time someone uses the word 'concrete,' I hope the first thought that comes to mind is 'versatility.'"

Dr. Stephen Ressler contributed to this article. Dr. Ressler is Professor Emeritus from the United States Military Academy at West Point and a Distinguished Member of the American Society of Civil Engineers (ASCE). He earned a B.S. from West Point and an M.S. and a Ph.D. in Civil Engineering from Lehigh University, as well as a Master of Strategic Studies from the U.S. Army War College.

