# Santiago Calatrava

## Spotlight on Design Lecture
## National Building Museum
## March 9, 2003

For a quarter of a century Santiago Calatrava has integrated architecture and engineering to produce dynamic and beautiful architectural forms. On March 9, Calatrava presented a number of projects by his firm, which has offices in Zurich, Paris, and Valencia, Spain. His talk focused on the theories that have inspired his work as a designer and engineer.

Calatrava's first years of higher education were at an art school in Valencia. After studying art and architecture, he earned a doctorate in civil engineering at the Swiss Federal Institute of Technology (ETH) in Zürich. It was not until he had worked in pure mechanics that he began "learning the job of working as an architect." Observing physics in everyday life, particularly the skeletal system in animals, Calatrava developed a sensibility about elemental mechanics that has inspired his work over the last 24 years.

Calatrava's approach early in his career, as seen in the Water Sculpture at the Swiss Federal Institute of Technology (1980) and the high school in Wohlen, Switzerland (1988), was "about trying to learn from nature, to re-observe, to define how things work, like a palm tree…or like a flower." In 1992, he exhibited a shadow machine at the Museum of Modern Art in New York. This project was composed of ribs that moved in a pulsating manner, reminiscent of the act of breathing. The project also "was interesting because the ribs in the ground have shadows, and the shadows moved a little bit like the branches of a weeping willow."

BCE Place, Toronto, Canada, 1987-92

During the late 1980s, Calatrava designed BCE Place in Toronto, Canada (1992). Much of the architectural vocabulary and ideas for this steel-and-glass galleria used the formal vocabulary he introduced in some of his earlier projects, such as the school and the shadow machine. According to him, "There is a constant in the works that I have done. Whenever I get an opportunity to introduce something mechanical and moveable, I have done so. Why? Because in terms of physics, the discipline of mechanics includes two branches, aesthetics and dynamics, but they are all the same. It is very important to understand that forces are the crystallized, still representation of movement."

With several bridges that he has designed in Europe, Calatrava introduced another set of ideas responsible for his developing architectural vocabulary. The Alamillo Bridge in Seville, Spain (1992), he said, is "minimalist, approaching the problem of equilibrium by using a minimum of elements," allowing an onlooker "to see a pattern of readability and reflection of those objects." In discussing the Alameda Bridge in Valencia, Spain (1995), Calatrava talked about the difficulty of using arches, an ancient form, in innovative ways.

Alamillo Bridge,Seville, Spain, 1987-1992

"New materials like steel, welding and other techniques, combined with our modern understanding of torsion, allow us a lot of new possibilities."

A confident grasp of torsion has influenced Calatrava's designs extensively. With the Alameda Bridge, for example, all the vehicular and pedestrian traffic is on one side of the bridge. "This is possible because of the torsional stiffness of the bridge itself. It drives the vocabulary of bridging and gives a little more sensibility in terms of orientation and placement, and in creating a kind of sculptural effect for the bridge."

Lyon Airport Station, Lyon, France, 1989-94

Observing the formal character of the landscape is another important aspect of Calatrava's design ideas. Although he struggles with the question of whether to build in a beautiful landscape, "risking spoiling it," he purports that it is possible to "bring a cultural contribution" by placing "an artificial sign" into the scene, "complementing and completing the landscape in our eyes." In the case of the Sondika Airport in Bilbao, Spain (1999), which is located in a rather mountainous part of the country, "the hills are running down almost into the airport." He "wanted to get this idea of movement in the airport itself" and achieves this in the structure of the building with a series of advancing arches. The Lyon Railway Station, France (1994) is a 1,500-foot-long building composed of wings that stretch out into the almost flat landscape, blending into the horizon.

Calatrava's attitude about working in an urban environment parallels his sensitivity to the landscape context surrounding his buildings. "It is important to understand that whatever you do in a city has to do with the city in a natural way. It is very important to conform things and to understand that even the smallest project, even if it is a bus shelter, is an important piece in the whole development of the city." The City of Arts and Sciences in Valencia (1996) is an example of a piece of urban fabric that serves as a "model of development." The site for the project had been a late-industrial landscape with abandoned buildings and a polluted riverbed, and was surrounded by several degraded neighborhoods. Calatrava's intervention in this part of Valencia, however, has "promoted a revaluation of all the surrounding areas" and made this region more interesting to private developers. His firm's goal of connecting the city with the harbor has not yet happened, but should "in the next five to ten years."

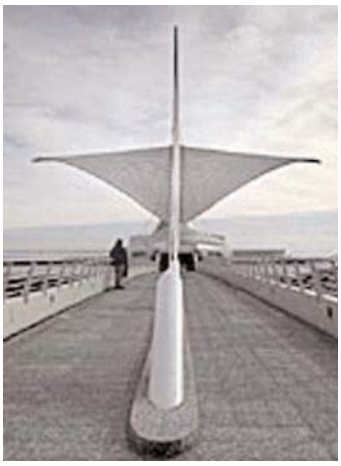
Planetarium, City of Arts and Sciences, Valencia, Spain, 1996

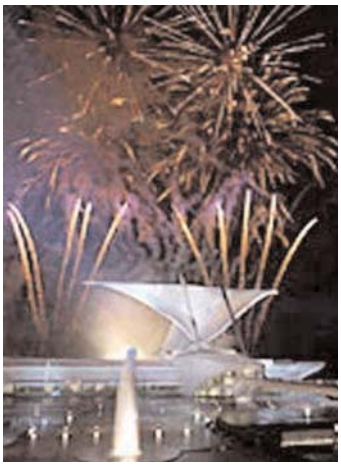
The recently completed Milwaukee Art Museum (2001) is Calatrava's first building in the United States. For him, the larger landscape of Lake Michigan drove the way that he considered the project. The strong horizontality of the lake, the grandiose sky, the way in which the light changes several times over the course of a day, and the visual power of lake storms make it "a very impressive place." He tried to respect this with his siting of the museum and its design.

Milwaukee Art Museum, Wisconsin, 1994-2001

"We wanted to give a certain vanity to this place. Through the gardens and the plazas, we created a kind of transition from the gardens. We tried, in a way, to extend the city as much as possible. We wanted to make a transparent building with a contrast that comes from the open wings and the

shadows and the light and the building itself." The design of the roof glazing and shading structure, or brise soleil, allows someone inside the museum to observe the changing light of the site, something very important to Calatrava's sense of the experience of this place. "To be in front of this lake means to have sometimes a gray light, blue light, sometimes a dark atmosphere or a very bright one with beige tones."


Milwaukee Art Museum


Milwaukee Art Museum

Calatrava finished his discussion of the Milwaukee Art Museum with a short video that presented the cinematic qualities of the museum as well as other built works that could not be observed in a static image. Never forgetting that "we are living in a universe dictated by movement," Calatrava used the film to illustrate again how his work over the last quarter of a century has been based on the "idea of a transgressive understanding of the petrified nature of architecture." The film further showed how he introduces into his work "something lighter and more natural, [such] as flowers that open or trees that move."

-- Kirin Makker