Robert R. Wilson: Shaping Matter

Robert Rathbun Wilson (1914–2000) was a physicist, best known for building and directing Fermilab, one of the world’s most important centers of high-energy physics [1,2]. Wilson completed his doctoral degree at the University of California at Berkeley with E.O. Lawrence, the inventor of the cyclotron, a machine designed to create subatomic particles. Wilson went on to build some of the most powerful cyclotrons, first with Enrico Fermi at Princeton, then on the Manhattan Project and, after World War II, at Harvard and Cornell. Despite his illustrious career, Wilson nearly left physics in the middle of an Illinois prairie 40 miles west of Chicago. The setting triggered in his mind an interest in sculpture that permitted Wilson to integrate his two passions. It was sited in the same inspiring way, a monument to the greatest cultural achievements of modern science and art.

To achieve his goal, he took an active hand in every aspect of the architecture and cyclotron design [7,8]. After working through seven architectural firms, he conceived the modern cathedral that he wanted, although based on Beauvais rather than Chartres (Fig. 1). He hated the look of standard power-line poles, so he convinced Commonwealth Edison to permit him to use white poles that he had designed to look like the Greek letter pi. A water-pumping station became an Archimedean spiral, swirling out of the ground like the water it pumped. The stairwell to the proton control center was a double helix, in honor of the breakthroughs in molecular biology. Even the elements of the cyclotron were touched by his artistic vision. The collider magnet stands were ornamental as well as functional. A capacitor tree for storing and discharging huge electrical currents literally turned into a work of art. He also designed a huge sculpture called Broken Symmetry—representing the constant interplay between symmetry and asymmetry in the history of physical theory—under which visitors had to drive as they approached the lab.

Wilson used the same artistic design process in building his new cyclotron. “In designing an accelerator,” he wrote,

I proceed very much as I do in making a sculpture. I felt that just as a theory is beautiful, so, too, is a scientific instrument—or that it should be. The lines should be graceful, the volumes balanced. I hoped that the chain of accelerators, the experiments, too, and the utilities would all be strongly but simply expressed as objects of intrinsic beauty [9].

“If one thing is clear,” he said, “it is that there is much in common between what

---

Fig. 1. Robert W. Wilson, Möbius strip sculpture at Fermilab. (© Fermilab) Growing up on a Wyoming cattle ranch, Bob Wilson was no stranger to working in the blacksmith’s shop. He did the welding himself for the Möbius strip mounted atop Ramsey Auditorium in Fermilab. Wilson welded 3×5-in pieces of stainless steel to a tubular form 8 feet in diameter. The main Fermilab building is in the background. The original image can be found at: <www-visualmedia.fnal.gov/VMS_Site/gallery/stillphotos/1992/0400/92-0452.jpg>.

---
the creative artist does and what the scientist does” [10].

Wilson’s colleague Alvin Tollestrup summed up Wilson’s philosophy this way: “Jean Mignot, one of the master masons for Milan Cathedral, is quoted as saying ‘ars sine scienta nihil est’ (‘art without science is nothing’). Bob Wilson certainly believed this—and that science without art is nothing” [11].

**Robert Root-Bernstein**
Department of Physiology
Michigan State University
East Lansing, MI 48824
U.S.A.
E-mail: <rootbern@msu.edu>

**References**
Unedited references as provided by author.


4. McDaniel and Silverman [1].


9. Wilson [7].


---

**CALL FOR PAPERS**

---

Smart Textiles: Science and Technology of Textile Art

Leonardo is pleased to announce a new special project in the topic area of Smart Textiles. This project expands upon Leonardo’s archive of textile art documentation by focusing on textile artists and scientists around the world who work with smart textiles or the new textiles science and technology.

Artists and researchers interested in writing about their work involving the science and technology of smart textiles and clothing arts are invited to view the Leonardo Editorial Guidelines and related information at <http://leonardo.info/Authors> and send in a manuscript proposal to <leonardomanuscripts@gmail.com>.

To view a list of papers published in Leonardo and Leonardo Music Journal on topics related to textile arts, please see: <http://leonardo.info/isast/journal/calls/smarttextiles_call.html>.

*This project is supported by the Marjorie Duckworth Malina Fund, which honors the memory of a key longtime supporter of Leonardo/ISAST. The project recognizes Marjorie’s dedication to the ideals of international cooperation by emphasizing the participation of artists throughout the world. For information on making a donation to Leonardo/ISAST in memory of Marjorie Duckworth Malina, please visit <http://leonardo.info/isast/donations.html>*.