

# The Museum of Modern Art

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"There is something cheerful about the airy free-form tent that has just been pitched in the sculpture court of the New York Museum of Modern Art. One thinks of garden parties with good champagne, of Mozart under the stars, or really good acrobats performing at a county fair. But that does not lessen its serious importance to the future of architecture. We may see a whole city under shelters like that."

--Wolf Von Eckardt, Washington Post, June 26, 1971

## EXHIBITION OF THE WORK OF FREI OTTO OPENS AT MODERN MUSEUM

The large white tent that floats over The Museum of Modern Art Garden terrace is part of an exhibition devoted to the work of Frei Otto, the German architect who is internationally known for his innovative and dramatic tent-like structures, retractable roofs and pneumatic membrane structures which are used for exhibition areas, outdoor theaters, sports arenas and to meet special industrial needs. The exhibition, on view from July 8 through September 27, was directed by Ludwig Glaeser, Curator, Department of Architecture and Design at the Museum. More than half of the material in the show has never been exhibited or published in detail.

"In pursuing the age-old question of all construction--how to achieve more with less, that is less material and effort, Frei Otto has elevated the traditional tent to a modern building type capable of remarkably large spans," Mr. Glaeser says. Tents, usually associated with wandering tribes, armies or circuses, attracted his interest because high strength steel for masts and cables and long lasting synthetic fibers for membranes guarantee a reasonable life expectancy making these light weight structures most economical. In addition, the ease with which tensile structures can be collapsed and moved or adapted for different purposes or sites makes the current revival of the tent unusually relevant for an age of mobility and change. Membrane structures also hold the greatest promise for a future that will call for ever larger surfaces roofed on this and other planets.

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"During the millennia in which man had to rely on gravity to give buildings stability, the enormous amounts of material used were disproportionate to the actual loads that vaults and domes had to carry," Mr. Glaeser points out. "Even in modern shell structures the dead weight of a dome equals most superimposed loads. Frei Otto arrived at structural solutions that, for the first time, reversed this ratio."

The photographs in the exhibition, mounted on standardized panels with descriptive texts and drawings, are embedded in plastic and arranged in clusters under the tent. They constitute a complete retrospective of Frei Otto's work and projects from a bandstand built in Kassel in 1955 to the roof for the 1972 Olympic stadium now under construction in Munich.

The Bandstand, Frei Otto's first tensile structure to be built, is the prototypical saddle shape. Other cable mast supported membrane structures in the exhibition include exhibition pavilions in Switzerland, a star-shaped Dancing Pavilion in Cologne, and mobile hangars for small aircraft.

From 1959 to 1961 Frei Otto was primarily concerned in studying pneumatic membranes. Among the projects he developed that are in the exhibition are a giant greenhouse envelope, water towers, grain silos, oil storage tanks, and one of his most recent projects, an Arctic City envelope designed to provide a roofed city for 45,000 inhabitants, held up by internal pressures generated by the city's air conditioning system.

Retractable roofs in which a membrane can be moved along its supporting cables by pulleys and winches, or by electric cable tractors, were designed by Frei Otto for many varied uses: A large roof which can be furled and unfurled automatically in minutes for the Open Air Theater in Bad Hersfeld, for swimming pools and ice skating rinks in France.

From the mid-1960s on Frei Otto received an increasing number of commissions for large scale projects. He designed membranes to cover an entire dock in Bremen, a construction site for six-story houses in London, and a huge conical structure to roof a medical academy in Stuttgart. The only executed example of a large-scale structure is the German Pavilion at Expo 67 in Montreal.

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The enormous Olympic Stadia in Munich is now under construction. "The architects of the stadia and supporting facilities for the Olympic Games at Munich attempted to create one environmental entity. According to their concept, Frei Otto developed tent shapes which adhere to the same structural formula and appear as units of one long roof. Like an extended arc, they cover half of the main stadium at one end, the athletic and swimming areas at the other end and the main entrance areas in the center. Saddle-shaped wire rope nets, suspended from masts and anchored to the ground, constitute the primary structure, which supports the protecting membrane of clear plastic sheeting," Mr. Glaeser says.

Among the many collaborators who have worked with Frei Otto is Richard Larry Medlin, who designed the exhibition tent. The exhibition is sponsored by the Graham Foundation for Advanced Studies, Chicago, with contributions by Lily Auchincloss, Gottesman Foundation, Konrad and Gabriele Henkel, Philip Johnson, Phyllis Lambert, Skidmore, Owings and Merrill, Thyssen Steel Corporation, Volkswagen of America. The exhibition structure is sponsored by Farbwerke Hoechst, Frankfurt, with contributions by the Foreign Office of the Federal Republic of Germany and L. Stromeyer and Company, Konstanz.

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Additional information and photographs available from Elizabeth Shaw, Director of Public Information, The Museum of Modern Art, 11 W. 53 St., New York, N.Y. 10019. Phone: (212) 956-7501.