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Architecture

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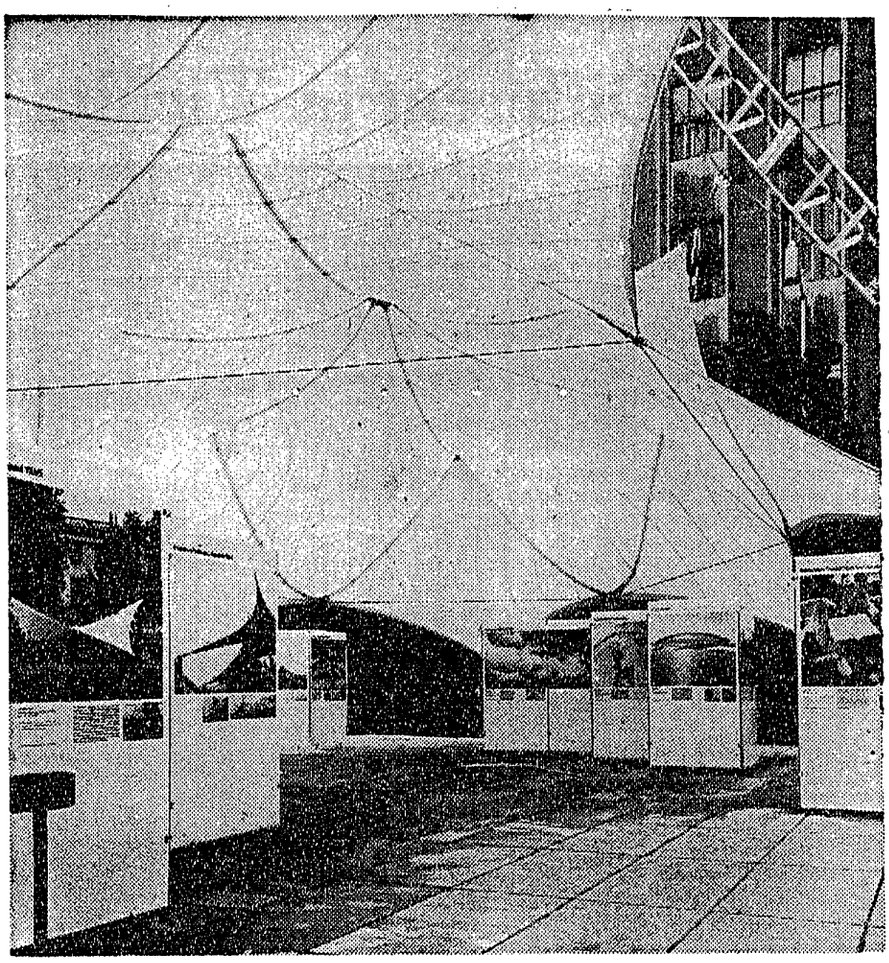

Tent designed by a former associate houses Frei Otto show, Museum of Modern Art
Can these structures do everything but cure the common cold?

THE butterfly-like tent that appears to be floating over the upper part of the Museum of Modern Art garden this summer is not the setting for a garden party. It is banner and shelter for the Frei Otto show, an exhibition of tensile and pneumatic structures by a man who has turned a creative obsession with the techniques of light-weight, minimal construction into high art. It will be there through September 27.

The white tent is suspended from a 50-foot high, V-shaped main mast and two subsidiary masts anchored to the ground by steel suspension cables that reach down, at one point, into the lower garden. The kite-shaped canopy is a pre-stressed, waterproof membrane of vinyl-coated Trevira polyester through which light comes softly. It covers an area approximately 64 by 36 by 21 feet, or about 2,300 square feet, and has been designed by a former Frei Otto associate — Richard Larry Medlin, assistant professor and director of the Light Weight Construction Center of the School of Architecture, Washington University, St. Louis.

Under the tent are photographic panels of a retrospective of Mr. Otto's experimental studies and executed works from 1955 to the present, beginning with a small saddle-shaped bandstand in Kassel and culminating with the huge cable-supported, clear plastic roof for next year's Munich Olympics. Ludwig Glaeser, curator of the museum's Department of Architecture and Design, has directed the show.

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As art, the tent belongs legitimately in the museum garden. It is, indeed, a lovely thing. Its airy, sculptural grace is the direct, visible product of its precise engineering principles. The tensile structures based on these principles — tents, inflatables and thin-skin shelters — are a significant 20th-century advance in the building art. Frei Otto has carried that art to notable limits.

I, for one, stubbornly insist that structural elegance is the real, 22-carat architectural beauty; that it is gut architectural beauty, and nothing except the all-too-rare work of a master can touch it. When the structural solution is matched properly to the problem it makes superb sense, which is nice, and its visual splendor, following physical laws, is unsurpassed by any sculptural invention.

And so I like Mr. Otto's little tent in the museum garden. I liked his much larger tent at Montreal's Expo 67, which served as the West German pavilion, even better, because it showed what he really can do. That superb marriage of art and science in the name of light-weight, large-span shelter was sabotaged by the overreaching complexity of the exhibit system under it. But the marvelous, translucent, membrane-topped network of cables that made an intricate wonderland of soaring shapes and magic, filtered light is an experience impossible to forget.

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However, to like this work is not to agree with the museum's text. I am growing just a little irritated by the apostelic claims that must be put forth for every valid structural development. I am tired of the myth and fallacy of universal applicability, as if each were the structural second coming. I can sympathize with the tendency of students to see domes, tents and inflatables as the world of the future, but the museum is sophisticated enough to know better.

These are noteworthy structures, made possible by the unique technology of this century, developed by a man of genius, suitable for some striking and particular uses. They don't have to be universalized or justified with false pragmatism. For a variety of genuinely pragmatic reasons we are not going to be living under them or covering our cities with them. Why can't we admire them on their own terms?

The implication seems to be (and I've heard this song before) that they can do everything except cure the common cold. They are lauded as light, thin, tough, flexible, movable, expendable, economical all-purpose wonders. "The ease with which tensile structures can be collapsed or moved or adapted for different purposes makes the current revival of the tent unusually relevant for an age of mobility and change," the wall label says. "Membrane structures also hold the greatest promise for a future that will call for ever larger surfaces roofed on this and other planets."

Well, the age of mobility is here, and although most architects don't like it much, it is being served by the mass-produced trailer, with all the comforts of home including TV in the wilderness, not by the complex poetry of tensile structures. Some things, such as sports stadia and cultural centers, don't tend to move much, anyway.

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The rest is one of those solemn pieces of utopian baloney that our culture seems to demand. To suggest that these structures are the answer to the "age-old question of all construction — how to achieve more with less material and effort" — is woefully misleading. The "simplicity" of these lovely forms is complex beyond belief. They are designed through a series of unbelievably elaborate models and testing procedures. This painstaking complexity and the inevitable high development costs are made possible at present by a kind of happy student slave labor at Mr. Otto's Institute of Lightweight Structures at Stuttgart. Transferral of the process to commercial economics would be problematic, to understate it.

And you might just cast your eyes down from the airy membrane above you in the museum garden to look at the really formidable hardware that controls it on the ground. Note how many marble paving blocks have been removed to sink that steel hardware into blocks of heavy concrete (you may not notice because they are tinted gray to match the marble) to hold up that thin skin, and how many steel I-beams, in addition, have been sunk into the planting beds.

The necessity for this hardware and its nature, the realities of anchoring, the extreme intricacy of calculation and elaborate test recording in the design process, often beyond the use of the computer, the prohibitive cost of the process under normal production methods, all make these structures hardly the thing for your summer camp or experimental theater or climate-controlled new town. The way ordinary construction costs are rising, anyway, little extras like environmental climate control are farther off than ever.

So what does that leave? Certainly not the universal shelter. We have some very handsome, highly specialized structures for very specialized functions. They span space dramatically, but for many purposes it is the hard way of doing it. They work well as "covers," less well as interiors. They make superb exposition pavilions and fine permanent or retractable protection for arts and sports centers. The Kuwait Sports Center project with Kenzo Tange is breathtaking. Pneumatic skin structures are suggested for storage and greenhouses. Tensile membranes can make good roofs for swimming pools, skating rinks, and open-air shelters. I'm no sports fan, but I'd love to see that roof at the Munich Olympics.

Tensile structures do their job with exceptional grace, style and structural panache. Frei Otto's work is a remarkable synthesis of architecture, engineering, invention and art. I am much happier because it exists, and happy to see it recorded and honored at the museum.

The chief sponsor of the exhibition is the Graham Foundation for the Advancement of the Fine Arts, and the show becomes a kind of farewell for its imaginative, enlightened director, John Entenza, who will retire this fall. His record of creative projects is one that few foundations can match, and he will be sorely missed.