FUTURE PREVIEWED?: INNOVATIONS OF BUCKMINSTER FULLER COULD TRANSFORM ARCHITECTURE
By ADA LOUISE HUXTABLE
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Innovations of Buckminster Fuller Could Transform Architecture

By ADA LOUISE HUXTABLE

THE world of tomorrow is here today at the Museum of Modern Art. Three revolutionary structures by R. Buckminster Fuller —a "geodesic dome," an "octet truss space frame," and a "tensegrity mast." (Mr. Fuller's inventive engineering is equalled only by his inventive vocabulary)—will share the museum garden with the lovely ladies of Maillol and Lachaise through the winter months. Mr. Fuller's space frames and enclosures represent the greatest advance in building since the invention of the arch. Their building at full size in the heart of Manhattan, is splendid showmanship in the museum's tradition — a tradition that has seemed a little tarnished lately. This is an exhibition with the museum's old flair; a superior blend of the startling and the significant, for a lively presentation of the latest frontiers of art.

Under the enthusiastic supervision of Arthur Drexler, director of the Department of Architecture and Design, these strange structures have been taking shape for the past month.

Both the concept and the method of construction of Mr. Fuller's work are new. By utilizing the forces of tension and compression that are present in all structure, but by doing so in an unusual way, he has invented a new kind of building. The solid, right-angled post and beam that have been the accepted basis of architecture since the beginning of shelter are supplanted by constructions of tetrahedrons (four-sided pyramids) and octahedrons (eight-sided figures), creating lacy frameworks of the widest versatility. Mr. Fuller claims that these are nature's building forms, the efficient shapes of crystals and atoms. Unlike familiar, straight-line construction, these forms can grow in any direction (he calls them "omnidirectional") for an infinite variety of unconventional space-spanning shapes and enclosures, of equally unconventional appearance. Lighter and stronger than any other structures yet conceived, they enclose maximum area with minimum use of material, and they have an unlimited practical potential.

The "geodesic" dome ("geodesics" is a Fuller-term for his patented system of tetrahedron constructions based on his own 'energetic-synergetic" geometry) is a three-quarter sphere in greenish plastic, fifty five feet in diameter. It is composed entirely of triangular and diamond shaped sections, bolted together on the site. These sections, or pans, form the building's complete surface and support; skin and skeleton are one.

The 100-foot-long "octet truss," constructed of aluminum tubes, is an extraordinarily flexible building unit capable of extension in many directions, with supports placed almost at will. What can be seen at the museum is a kind of sample superskeleton; it would be formed to purpose and finished with an outer skin. Construction of airport hangars, shopping centers, sports arenas and factories could be radically altered by its use.

The "tensegrity" mast is a dramatic aluminum and monel column, a purely theoretical demonstration of Mr. Fuller's most remarkable innovation: a system in which the basic load-carrying structure is a lightweight tensile net, totally isolated from its compression rods. Because it utilizes tensile power, which is so much greater than compressine power, this system has unprecedented strength. Its rigidity increases, rather than weakens, as it grows larger; actually, the thirty six foot mast could be built to any height. This accomplishment reverses the history of architecture to date, which has been a step-by-step struggle against the strength limitations of buildings of increasing size. It presents truly astounding possibilities. It could mean building in miles, instead of in feet. Whole cities could be covered by domes; entire geographic areas could be roofed over; theoretically, we could build to the moon.

Architectural Implications

Undoubtedly, this is exciting and astonishing engineering. But its meaning as architecture is even more notable.

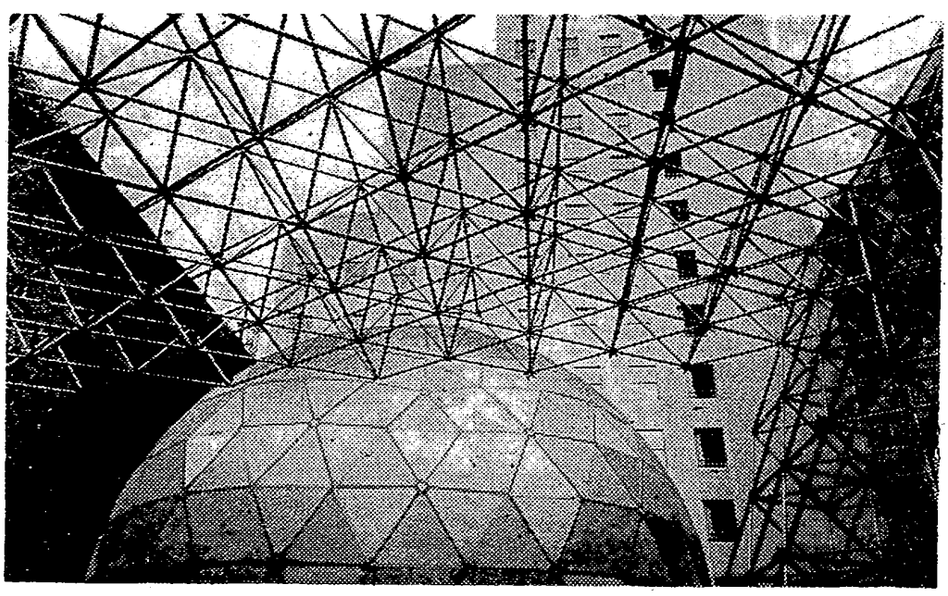
To those concerned with architecture—and this includes the artist, the technician, and the layman who lives with it—the horizons opened stagger belief. Looking far ahead, the museum visualizes a fantastic new world. "This changes all of our notions about architecture," says Mr. Drexler.

"Buildings might no longer be a series of separate boxes, with people moving from one to the other. These infinite clear spans suggest a new kind of shelter—vast domes enclosing entire communities, permitting continuous control of the environment. In effect, the city would be one building, with its necessary functions accommodated quite differently than they are today. We could climate-control and reclaim whole areas of the Sahara, or of the Arctic. We would have to re-think architecture as we know it now."

A Problem Unsolved

Even the immediate, practical application of these structures requires some architectural rethinking. Capitalizing on this efficient and economical engineering for specific needs, like an auditorium or an arena, creates unsual problems. Mr. Fuller's domes rest uneasily on their architect-designed foundations; the substructures, entrances, and other necessary additions are always at esthetic odds with the engineering forms. Like oil and water, radical engineering and conventional architecture just won't mix. The domes alone are beautiful; adapted to ordinary uses, their beauty is aborted. There seems to be no answer in terms of our present architecture; the problem is as yet unsolved.

This conflict between "art" and "structure," however, points an obvious moral. More than ever, it becomes evident that the architecture of the twentieth century is a technological phenomenon—that its "look" cannot be divorced from its techniques. To disguise or reject these expressions of contemporary engineering is to deny the true nature of the art of architecture today.



INNOVATIONS—Portions of Fuller's "Geodesic Dome" and "Octet Truss Space Frame," two of three structures in the garden of the Museum of Modern Art.