Megaspace structure
Yona Friedman and Eckhard Schulze-Fielitz

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ABSTRACT
Equally fascinated by the space frame, Yona Friedman and Eckhard Schulze-Fielitz came up with one of the most powerful alternative answers to the international crisis of urbanism and architecture in the late fifties and through the sixties. Megaspace structure will be the portmanteau forged to encompass their common and distinctive view. The blended word subsumes the overriding features of their production, which impacted the theory of architecture and still question – up until this reassessment of their work – the “future of the city” as both project and fiction.

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The exhibition of Yona Friedman and Eckhard Schulze-Fielitz’s works, for the first time brought together in one show, makes us ponder on the reason for their current relevance and success, beyond architecture, to reach a large public and appeal to the artistic and media worlds. Revealingly, the exhibition is not held in a museum of architecture. Paradoxically, answering this question requires revisiting the contribution made by their projects to the theory of architecture, as they were coming up with one of the most powerful answers to the international crisis of urbanism and architecture in the late fifties and through the sixties. Their works carried a project of society, a vision of the world, in other words, a piece of utopia – and people are now once again ready to listen to their narrative of the future world, because the “Future is back.”

Thus, today Eckhard Schulze-Fielitz, as an architect who built a lot, can say that the Raum Stadt is the unique regret of his brilliant career. Yona Friedman shares that feeling, and is now more active than ever – too late for building, but not to give advice, to show “the right direction,” as he has often said.

Eckhard Schulze-Fielitz still hopes that the spatial city may incarnate the dream of the future for young generations of architects. What does that mean for architecture, but also for our society in its relationship with architecture and cities, as well as with the architects themselves?

With this in mind, as an analytic exercise I propose to slice up their work (and their world) into five theoretical cities in order to single out the original and main features of each. All five cities pertain to what I call the Megaspacestructure, a portmanteau combining megastructure and space frame. All the megastructures of the period borrowed something from the space frame, but Yona Friedman and Eckhard Schulze-Fielitz are the first and most talented heroes of the space frame epic that saw the notion migrate from engineering to architecture.
1/ Structure / Infill in the age of the space frame.

A mutual fascination with the spatial frame was the starting point of Friedman and Schulze-Fielitz's common story.

Both have repeatedly stated their admiration for Konrad Wachsmann's work [Fig.1]. Friedman met him in Haifa in 1953, Schulze-Fielitz in 1957. They were neither the only nor the first young architects to be captivated by the infinite and spatial construction generated by Wachsmann, who soon began to publish his work in the middle of the fifties, subsequently disseminated all over the world. But Friedman and Schulze-Fielitz were unquestionably among the first to think about transforming a building system to allow for large-span construction in a living structure.

Let us keep in mind that Wachsmann, neither a licensed architect nor an engineer, was resuscitating an old idea by Alexander Graham Bell dating
back to the very early 20th century, as he himself acknowledged. Bell, the true inventor of the three-dimensional structure, was obsessed with the problem of flying machines. The term “three-dimensional strength,” which he coined, described the property of an assemblage of cells made of four equilateral triangles: a structure made of hollow members, so light that it could fly in the air; a kite structure that could be replicated for building houses or bridges. However, Bell didn’t pursue the project. Airplanes would be his next invention after the telephone.

Bell, Fuller, Wachsmann, Schulze-Fielitz. We can trace the genealogy of their fascination with light structures and diagonal trusses, exchanging compression for the tension of the structure [Figg. 2-5]. They all seemed to be captivated by their models of light structures, with a strange effect of scale and comparison with nature. We understand by these photos that there is a relationship between the economy of the structure and that of the Earth: the lightness of the former would ensure the future of the latter. The inflatable structure of the sixties shared the ambition of exploiting lightness for the benefit of the Earth and Humanity, albeit with a complete different idea in mind.

Two pictures can illustrate one of the differences between the two architects: Schulze-Fielitz revealed his concern for the lightness of the spatial by setting his Raum Stadt project and model on its toes, on the corner of triangles [Fig. 6]; Friedman, in turn, hangs his city from traditional vertical poles [Fig. 7]. No pictures exist of Friedman contemplating his structural models, the very constructive dimension of the space frame. In
fact, Friedman’s cities were not real three-dimensional ones, despite some diagonals having been added just to evoke the notion. In fact, Friedman’s spatial cities obeyed a traditional system of huge bi-dimensionnal trusses, of which Mies van der Rohe produced the most fantastic models, built and unbuilt, for living inside or not.

But this “false” three-dimensional structure is actually not relevant, because for Friedman the space frame is like an “objet trouvé” (a found object), something gifted by the engineer to the architect, whose mission would consist in doing something with it, in translating it from engineering to architecture. Moreover, diagonals are a big constraint with respect to the possibility of housing anything inside the structure. The space frame is in itself a myth, a utopia (By the way, on this point we could say that contrary to what has become a frequent assumption, Friedman was in fact more pragmatic than Schulze-Fielitz.) This may be one of the reasons why Schulze-Fielitz later introduced another version of the Raum Stadt in 1966, which had a quadrangular structure, as he would call it later, “A pragmatic ‘Raumstadt,’ a homage to Yona”6 [Fig. 8]. Quite possibly,
by abandoning the diagonal as symbol of the real space frame, Schulze-Fielitz was also giving up a part of utopia. But the opposite could also be ventured: that by abandoning the diagonalization of the structure, he was seeking to achieve a definitive and so to speak “neutral” grid, one that would no longer bear any expression of the “structure.” This is a question I’d very much like to ask him.

Let’s go back to Wachsmann. In his fantastic hangars, the inner structure is never thought of as a place to live, and even less as a city. His goal is to span, to reduce the supports, or even eliminate them around the building, and to use standardized and transportable elements as well as hollow fixtures. For Wachsmann, the future of architecture, of cities, and of the world itself was based on the universal 20 directions of an articulated node, a magical node. He was deeply fascinated by “the texture and character of a space structure,” a space never considered for living “inside.” In the words of the Italian historian Carlo Argan, Wachsmann structures are “not in the space, they are space.”

With Friedman and Schulze-Fielitz, the structure itself evolved from being a matter of voids, nodes, weight, and space (an engineering matter) to one touching upon the question of living. That was the focus of Friedman’s Spatial City and Schulze-Fielitz’s Raum Stadt, as well as Constant’s New Babylon where the diagonal direction of the floor recalled the spatial character of the structure [Fig. 9].

The distinction between structure and filling is obviously not something completely new, Le Corbusier’s Obus projet for Algiers (1930) remains the acknowledged harbinger, “the true ancestor” of megastructure, as Banham pointed out. But the idea was again in the forefront in the fifties. In 1957, Alison and Peter Smithson conceived urban planning “within” the opposition between long-span time infrastructures, the permanent, such as motorways, and transient elements, architecture that can be changed as needed; or to infill an existing village with new elements [Fig. 10]. But the Smithsons didn’t really come up with a new expression of that dual system. Megaspacestructure, in turn, was going to bring the permanent and the transient together into a total system, into a global image.

So how to infill the (spatial) structure, and with which elements?

The diversity suggested by the Corbusean structure was in fact a false
one. If we look attentively at the Obus plan, we can see that the grid welcomes only two styles of architecture: the modernist, and the Arabian or, more accurately, the architecture of the Casbah, most likely doomed to be demolished in the process. The project was envisioned as a kind of a rebuilding, not as a structure meant to embrace diversity and freedom of choice.

Friedman expressed the changing ideals: inside the grid, whether in a space structure or otherwise, the infill is made of people, as in a simple collage of photos, an early representation of so-called “participation” [Fig. 11]. This infilling by human faces also symbolizes the fact that the architect is no longer necessary to achieve certain kind of jobs, such as the facade! In another collage, he brings together various styles of architectural orders and “ornamentations,” suspended in the air, flying. The collage thus becomes an allegory for the diversity and mobility of people, as well as for their desires and tastes. Constant used a similar approach in a photomontage (1969), but rather for advocating a kind of a self construction or do-it yourself method, recycling existing or used pieces of facade, possibly prefiguring the collapse of existing cities.

The neutral structure claimed by Schulze-Fielitz was based on the concept of “free infilling,” which means the possibility of leaving it up to the people to fulfill the “primary system” according to their own desires and their preferred ways of life, leisure and personal expression, as well as individual tastes in materials, heating and cooling options, style, and so on. The representation of this totally open structure would find its expression in the drawing of a grid filled with elements coming from any movement or style in the history of architecture; the only way, he said, to avoid “aesthetic entropy” [Fig. 12]. Schulze-Fielitz, and also Friedman when he resorted to the comparison with animals, were looking for a kind of organized anarchy, pursuing an oxymoron similar to that which Aldo van Eyck was seeking in the fifties: the quest for diversity within order, now achieved through the ideal neutral grid. A few years later,

Charles Jencks would envision this plurality as a system, as a “structure” made of a temporal and thematic grid that became the foundation of his post-modern analysis (“Evolutionary Tree to the Year 2000”). The neutral-open megastructural grid is thus an expression of the nascent pluralism of the period, in others words, the end of the theory of architecture.

2/ The multi-layered city

The second idea resulting from the space structure conceived as total urbanization and as a re-organization of society is what we can translate as urban layer, urban sheet, “covered city” in Constant’s words: layers of urbanization superimposed in a horizontal structural canvas with an adequate balance between empty and built spaces in the grid, to allow mobility and light underneath [Fig. 13-14]. The horizontal spatial structure deeply altered the modernist statements of functionalist architecture, which had been massively put into practice during the post-war reconstruction. Inhabited spatial structures generated or participated in three radical changes or upheavals.

*The end of the “building”*

The layer pattern homogenizes the living space and departs from the fixation with the “barre” model, the profile and the narrow silhouette of the Corbusian Unité d’habitation, including the articulated Team Ten’s versions. In others words, it heralds the disappearing of the building. For Schulze-Fielitz, more dominated than Friedman by the figure of Mies van der Rohe, the aim was the same: how to back out from all the glass and the boring boxes of the fifties?

With the space frame enshrined into architecture and city planning, there was no more building, no more architecture, and thus no more town, just layers. Overcoming the “barre” model was probably the most difficult task/challenge for architects deeply entrenched in the Modern Movement (let us just remember Friedman’s difficulty with projecting anything without the narrow profile of the Unité in his first drawings of the fifties, before succeeding in bringing closer two models of space structures and finally substituting the layer for the “barre” [Fig. 15].

The end of zoning and typological distinctions

The second effect or consequence of the multi-layer structure having homogenized the living space is the disappearance of functionalist zoning. In the megaspace structure everything cohabits and intermingles: activities, people, housing and factory, shops and agriculture, humans and animals. Even roads and freeways are brought into the structure. One can also speak of the disappearance of typological distinctions. The mythical mixed fabric of the traditional city – if not medieval – is reinvented, recreated inside the mesh of endless horizontal plans coexisting in free and joyful diversity and proximity. This blending of functions bears no more relationship with the timid (limited) superimposition of functions proposed by the Corbusian Unité d’habitation meant to occupy a plan based on space distribution zoning.

We know how this image of inhabited spatial layers immediately inspired Kenzo Tange for his Tokyo Bay project, so different from the Kikutake’s Marina towers that he presented one year earlier at Otterlo (1959). The impact on Kurokawa’s projects is equally obvious (Agricultural City). Team Ten rehashed the idea under the name of web (at Francfort, Berlin, Toulouse, Meudon, Fort Lamy, and so on), and later in mat building (by Smithson for Koweit). A whole generation of architects believed in this new tool of a unique structure as the means to generate an entire city (Le Vaudreuil). Le Corbusier himself saw in it a way to get out of his own invention (in his hospital project for Venice).

Throughout the sixties, for architects from the Japanese Metabolists to Team Ten and even to Le Corbusier, the superimposing of layers, well balanced and with the appropriate density of holes and empty spaces, was
going to become the Babel Tower of urbanism, an organism spreading out and covering an entire district, a city, a territory, disregarding for a while the form and existence of buildings, streets, skyline, facades, architecture and city.

**The city that never ends**

With the Megaspace-structure, the growing metropolis is kept under control thanks to its open structure: a growing organic fabric in which the links themselves give shape to the city, where horizontal plans or towers are no longer isolated. The trope of growth permeates the project. Horizontal layers and vertical towers are linked together in the true manner of a metaphorical cluster: Kurokawa's Helix City looks like a waterlilly pond, in Isozaki's city his Clusters in the air city hold hands with each other 50 meters above ground level, the Babylonian layers are an endless suspended Golden Lane, and Schulze-Fielitz's spatial structure itself stands with no beginning or end. Arrows on plans point towards four directions.

In short, the model is a city that never ends, with no more formal distinction between functions, between the built and the unbuilt, rejecting composition in favour of a free infilling or occupation by people: such will be the model for the negative or counter megastructural Archizoom project [Fig. 16].
3. The city above the city

The Megaspacestructure achieved a concentration of activities and population by the superimposition of layers. But this idea is reinforced, doubled-up by a superimposition of the existing city itself, of the buildings already there. The idea was initiated by Smithsons’ plan for the Haupstadt Berlin competition. But it is with a completely different meaning and scale that the superimposition is re-used in Friedman’s spectacular collages.
The structure stepping over the existing city, respecting the balance between voids and built spaces of the grid, sidestepped the constraints of land regulation and made it possible to build without waiting for new permits in existing districts that consequently no longer needed to be demolished. In this spirit, Friedman achieved for Tunis a counter-project to that of Olivier Clément Cacoub, the French Grand Prix de Rome which entailed building a motorway inside the Medina, a current approach at that time [Fig. 17-18]. This was also a way to build in unplanned negative space, as we would say today – places, streets, boulevards – in a manner blending a “strategy of the void” and of the immediate city, the city in its current state, even if the old urban fabric gets plunged into the dark shadow of huge structures. Essentially, Megaspace structures ignore the existing city. But reluctantly or not, they are forced to somehow deal with what is already there (no more time lost to changing things or to restoring them either). No more substitution but simultaneity. As a matter of fact, the Megaspace structure, at least through its photomontages, introduced the idea of “the city over the city” as a cadavre exquis, as a giant collage, the main credo of the seventies and later.

Tschumi would find a new opportunity to relaunch the idea in 2003, in China, a country where the demolition of the existing fabric is not (yet) a problem. Nonetheless, he did not succeed in convincing Chinese authorities to keep the factory that he suggested to restore [Fig. 19]. The city over the city is probably condemned to remain an architectural goodwill gesture towards cultural heritage, if not just a mere metaphor.
4. The Interior City (int friedman)

With the Megaspacestructure there are no more buildings or streets, nor beautiful isolated architectural objects settled in a park, no more facades, no more exterior viewpoints from which to admire the city, or at least none of those is any longer the point. The question now lies elsewhere: INSIDE. Megastructure represents the first body of projects and theories for thinking of the city as an interior. It deeply modified the traditional paradigms of architecture, the relationship between outside and inside, public and private, architecture and city.

Urban layers mold the city as an environment to live in. During the sixties, "environment" was replacing “architecture,” a word excessively associated with building and hard fabric, tradition, order or a modernist sense of space. The Megaspacestructure pushes the boundary of interior climate to the scale of the urban atmosphere, so, in a sense, structure has no more importance. As Friedman put it, “the planning of the city becomes the planning of furniture.” Megaspacestructure offered an ambiance, no more for urban users with tabulated needs, but for liberated, uncontrolled bodies. The plan of New Babylon (Group of Sectors) perfectly embodies that idea. No stop City will be entirely made of such liquid ambiance, and, consequently, a place where we could again live naked. Artificial climate against architecture.  

Far more attached to the subject than Friedman, Schulze-Fielitz spent 20 years studying the air-conditioning of “urban systems.” His concept of “Polyclimate” went hand in hand with Raumstadt: to each activity its space and its climate. So I feel confident saying that Schulze-Fielitz invented the “Raum Klima” (there is insufficient space here to develop his later Ecotecture project) [Fig. 20]. In this context, the Megaspacestructure doesn’t appear as a pretentious structure but as a first expression of what we could call today an “urban design of sensations.”


The three stages of the desintegration of cities pictured by Friedman prefigure a scenario that Schulze-Fielitz, as an architect and engineer involved in construction, never envisioned. After the disappearing of the megastructure, only antennas will remain, with reception transistors scattered across a connected landscape. A similar vision was upheld by Frei Otto who once said, as in a dream (maybe a nightmare): “One day we won’t need any more building materials.”

The project of a technological park in an open space would be relaunched at the end of the sixties by Archigram, who year after year progressively abandoned the bulky megastructure that was in such deep conflict with ideas of mobility and change. A discrete technology of service would infiltrate the territory (L.A.W.U.N). A similar statement was made by Superstudio, advocating the flattening of the structure to achieve a Supersurface.

Considering such projects, we realize that our way of planning towns today hinges on a notion of the city as an ensemble of furnished and comfortable interiors, or something like the beach, or Monte Carlo (Berlin, sols, picnic, beach/Archigram).

Our present urban design no longer ensues from architectural values of its own, but from a narrative aimed at fulfilling desires and pleasures, and the sensation-seeking drives of individuals.

5. An interactive city?

Computer technology, or at least its lexicon, was part of the mega space-mobile project. Friedman and Schulze-Fielitz, as Constant or the Metabolists, in around 1958 -1960 introduced new words into the theory of architecture, what they called at that time "electronic computing device", "automation", "robotic", "calculator" and so on. Information technology appeared as a possible tool for the control, organization and complex management promised by the endless possibilities of the space structure in terms of mobility and change. “Computer exceeds human capacity,” said Friedman. For Schulze-Fielitz, it facilitates “the organization of change.”

Both were very close to imagining the interactive city, but they couldn’t achieve it because they were still attached to the idea of the structure, in a structuralist period. In this context, the three-dimensional structure appeared to be a sufficiently complex network. In their cities, computer technology was only a tool, whereas the revolution would have required putting it at the center of the project, making the core element of the project itself. This would have implied abandoning the structure, something that was absolutely unthinkable for Schulze-Fielitz who still believed in the timeless value of the Raumstadt (“something beyond fashion”16). For his part, as we suggested Friedman might have been ready to leave the structure behind, but not yet! The Flatwriter introduced at the international

exhibition Osaka ’70 resembled what might have been expected from a computer in terms of changeability and choices, but it was in fact a simple typewriter, where letter keys had been replaced by a few other criteria such as the orientation of the building, its location inside the city, or access to nearby facilities, and so on, very far from what Archigram had already foreshadowed in 1964 with Computer City: a “real” vision of the city colonized by invisible computers, where the structure, replaced by computers, would fade away into a landscape filled by computers imitating nature (Rok Plug).

Archigram understood that computer technology could be the best solution to meet individual requirements, despite the size of computers at the time. “Electronic changeability” was seen as a means for adjusting the city in real time to the needs and desires of the inhabitants, for allowing them to listen, receive and exchange information with each other, as well as to move from one house to another, tailor them to their needs and broadly navigate within the system. It was exactly what Friedman and Schulze-Fielitz, on the other hand, were seeking through the space structure.

TODAY

Friedman and Schulze-Fielitz are coming back after decades of oblivion or depreciation. While he himself always built a lot throughout his career, Schulze-Fielitz often wondered what Yona lived on.17 Yona was never allowed to teach in a French school of architecture and for many years he and his wife Denise were actually making a living creating cartoon movies and thanks to allocations granted by UN programs to developing countries.

Today, while Schulze-Fielitz still remains pretty unknown, publications and exhibitions dedicated to Friedman are countless, partly perhaps due to Friedman’s ability to replicate his drawings in any situation, all over the world, endlessly. It is still amazing to see how people can be fascinated by listening to him explain his drawings, how his simple collages are seen as the bearers of a new message that could save the next urban civilization.

17. Ibid., 24.
Two main explanations may account for this late recognition. Mainly Friedman, and to a lesser extent Schulze-Fielitz, but both much more than Constant or the Metabolists – although that Japanese generation is currently having its own retrospective – gave center stage to the participation of inhabitants in the making and transformation of the city, even though, as I tried to show, they didn’t have the right instrument to achieve their goal. The notion of participation, introduced at the beginning of the 20th century by Patrick Geddes, has become a preeminent creed of our time, and people are nowadays hugely receptive to projects that promise them the possibility of making decisions about almost everything.

A second explanation concerns the shifting meaning of utopia, which until the sixties was a real project of society grounded on the assumption of a positive and progressive future, and has now become a narrative and a tool of communication for promoting the future city. To some extent, this can be seen as “the fault” of Superstudio and Archizoom who transformed the seriously unconstructible megastructure into a narrative fiction, at that time for criticizing it.

In a sense, today most people understand Friedman’s projects as if they had been written by Superstudio. That is, as if Friedman had designed his Spatial City at the end of the sixties, when architecture was entering the world of fiction, as did design, fashion, advertising, film making, and so on.

For Schulze-Fielitz the situation is quite different: it seems as if the reappraisal of his early research and of the period when it took place gave people the opportunity to discover, arguably, one of the most prolific architects of his time, who succeeded in managing utopia and reality through his ability to change strategy as he went along, for example by abandoning the space structure for the “ecotecture,” that is to say a high construction for a low one, which probably stands as the most up-to-date vision of the future [Fig. 22]

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