

Beihane Nicht: Transparency Versus Ephemerality in Postwar Modernism

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"By the dictionary definition the quality or state of being transparent is a material condition—that of being pervious to light and air, the result of an intellectual imperative—of our inherent demand for that which should be easily detected, perfectly evident; and an attribute of personality—the absence of guile, pretence, or dissimulation; and thus the adjective transparent, by defining a purely physical significance, by functioning as a critical honorific, and in being dignified by far from disagreeable moral overtones, is a word, from the first, richly loaded with the possibilities of both meaning and misunderstanding." (1)

—Colin Rowe & Robert Slutzky, "Transparency:
Literal and Phenomenal"

INTRODUCTION

The rejection of traditional heavy construction in favor of a lighter ideal has been a consistent theme in modern architecture, with implications both aesthetic and corporeal. First, a visual "lightness," or emphasis on volume over mass, was a fundamental tenet of Hitchcock and Johnson's codification of the "International Style." (2) In this guise, the light ideal tended toward a purely visual transparency, which suggested a graphic weightlessness. Second, the notion of "light" construction also led to a *physical* weightlessness, or an emphasis on materially efficient construction. Each of these paths aspired toward a version of what Mies van der Rohe would call *beihane nicht*—or "almost nothing." While the visual instantiation of this "nothing-ness" suggested a perceptual minimalism, its physical manifestation implied a tectonic nihilism, that is, a sense of ephemerality in which the very presence of construction itself appeared to be under challenge.

Two "glass projects" of the 1920s and their post-1945 progeny demonstrated the manifestation and influence of these divergent tectonic models, and suggested the establishment of two material typologies that would largely replace that of bearing construction in modern architecture. First, Mies' Glass Skyscraper projects of 1922 posited new possibilities for glass by exploding the traditional bearing wall into physically separate structure and cladding functions. No longer confined within fenestrative elements, glazing here served as a visually expressive sheath surrounding a lightweight, skeleton structure. Meanwhile, the 1927 4-D/Dymaxion projects of Buckminster Fuller suggested a contrary operation, namely the implosion of structure and skin onto a single, high-performance membrane. This split in the interpretation of a culturally mandated architectural "nothingness" can be described as that between a crystalline tendency, which maintained an aesthetic allegiance to the principles regarding

volumetric delineation over mass, and a diaphanous one, which focused on the performance principle of maximum value for minimum resource. The ideals of transparency and ephemerality thus revealed two dialogically related tendencies in post-war modernism: on the one hand an almost purely aesthetic intent involving the representation of abstract visual principles, on the other an instrumentalist intent involving the presentation of function and structure with minimal architectural resistance.

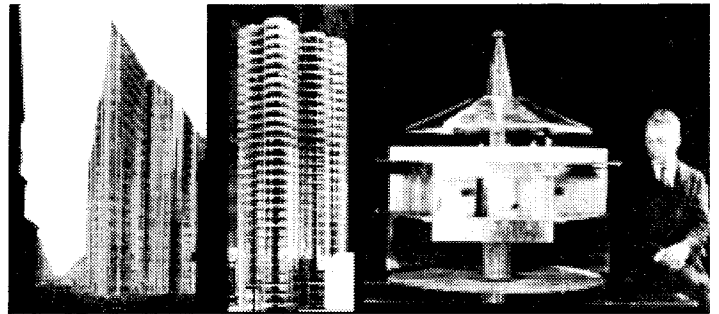


Fig. 1. Two models of modernist "almost nothing-ness." Glass Skyscraper Projects, Berlin; Ludwig Mies van der Rohe, 1919-1922. 4-D ("Dymaxion") House; R. Buckminster Fuller, 1928-1930.

THE CRYSTALLINE VECTOR—GLASS' TRANSITION FROM FENESTRATION TO CLADDING IN THE WORK OF MIES VAN DER ROHE

Mies van der Rohe's Glass Skyscrapers, published in *Fruhlicht* in 1922, presented a paradigmatic instance of the crystalline ideal. The industrialization of glazing lagged significantly behind that of steel and concrete in the formation of a modern architectural technic. However, glass' cultural potential was also explored as both a metaphor for urban hygiene and as a dramatic new material typology able to significantly alter the experience of interior space. The two Glass Skyscraper projects—a gently undulating office in a rural setting and a more angular one tower prosed for Berlin—participated in this mystico-scientific ideal by suggesting both technical advancement, and a self-conscious aim at visual intent. Both skyscraper projects involved a series of free-form planar floor slabs, stacked atop one another prismatically and supported by continuous columns located well back from the slab edges. Draped around the perimeter, an unframed glass sheath provided climatic separation and a transparent physical barrier.

The reduction of the tower's exterior enclosure to a visual minimum suggested the revelation of the "skeletal" concrete cage within and the lucid transmittal of the interior organization. (3)

However, Mies' emphasis on these structures' physically revelatory nature was paired with the surprising admission that the glass skins' visual effect was equally vital:

"I placed the glass walls at slight angles to each other to avoid the monotony of over-large glass surfaces. I discovered by working with actual glass models that the important thing is the play of reflections and not the effect of light and shadow as in ordinary buildings... The curves were determined by three factors: sufficient illumination of the interior, the massing of the building from the street, and lastly the play of reflections." (4)

In other words, parallel to the Glass Skyscrapers' objective goals, these projects were also informed by subjective imperatives, aimed at achieving certain scenographic effects. Intriguingly, the reflections here were precisely those veiling effects that created visual opacity in the glass skin. This process may also be seen as rendering the skyscrapers' skins conceptually opaque, in that the generative principle of these enclosure systems was not only the "clear" revelation of order within, but also the idea of the glass skin itself as a visual presence. Such an ambivalence between the transmission of a planning or structural logic through the skin, and the often simultaneous concealing of the spaces and elements within in order to express an exterior graphic or formal quality would remain a provocative contradiction throughout Mies' later work. (5)

Following the publication of the Glass Skyscraper projects, Mies' work through his departure for Chicago in 1938 consisted primarily of low-rise structures whose technical requirements allowed a syncretic approach to formal and tectonic resolution. However, his subsequent commissions for high-rise apartment towers and academic buildings provided determinant programmatic and budgetary requirements that demanded a pragmatic attitude toward construction and structure. This led to an initial retreat from the tectonically radical propositions of his earlier career, however following the completion of these initial works, and contemporaneous progress in the American building industry, Mies was able to gradually re-engage the ideal of the crystalline skin. The trajectory of glass in Mies' Chicago work marks a path from traditional fenestration to cladding, or the sheathing of a lightweight cage structure. In its most sophisticated incarnations, this deployment fulfilled the potential of his 1922 projects, in particular, their latent conceptual opacity, and in the hands of his followers the inscrutable glass skin would assert a conceptual priority over the revelatory qualities of these towers.

While initial sketches of the IIT campus plan show glass skins similar to those of the Skyscrapers cladding various academic buildings, the first realized structures—Alumni Hall and the Metallurgical and Chemical Engineering Buildings (1940-46)—show a re-conception on Mies' part of the relationship between building process and appearance. These works were apparently influenced in part by the work of Albert Kahn; in particular Kahn's practical hierarchy of frame and infill based on time-sensitive assembly and fabrication. The results at IIT were expressed structures of reinforced concrete with steel edgework, framing infill cladding and fenestration elements arranged according to the spatial organization within; a "clear" rendering of the structural and assembly processes. A ferro-concrete frame with masonry and vitreous infill was also used in the Promontory Apartments on southern Lake Shore Drive (1948-49). Here, the concrete structure was pulled in front of the elevational plane, prioritizing

the bearing elements over the infill skin in exact opposition to the arrangement of the Glass Skyscrapers, illustrating the relatively conventional approach taken by Mies in his earliest large-scale commissions. (6)

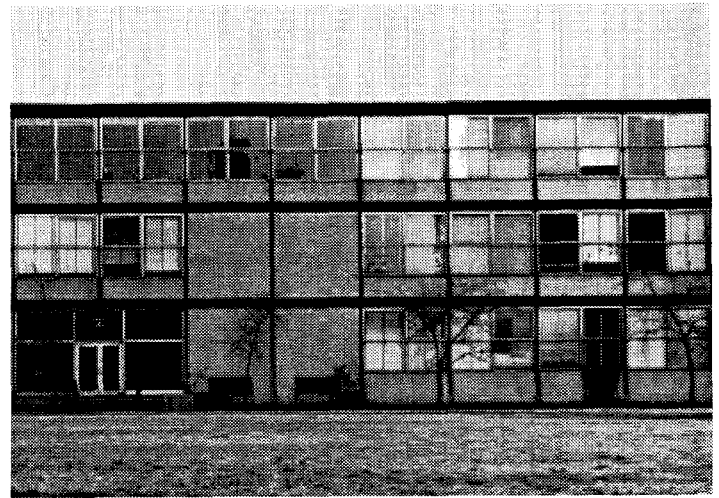


Fig. 2. Chemistry Building, Illinois Institute of Technology; Ludwig Mies van der Rohe, 1945. Glass deployed in a hierarchy of structure and infill, in contrast to the membranous ideal of the Glass Skyscrapers.

From this point on, Mies' treatment of glazing shifted gradually from infill to cladding; from filling voids within a clearly delineated hierarchy of structure and framing to acting as a lightweight membrane with its own intrinsic graphic and sculptural importance. As Kenneth Frampton has noted, the use of glass at IIT in particular assumed greater prominence over time, with the standard glazed element becoming larger and more "monumental" as the campus progressed. (7) This expansion of glass can partly be explained by the rapid evolution of glass technology during and after WWII, however subsequent work by Mies and his heirs reveals a move away from the revelation of structural and constructional logic, back toward the formal and aesthetic ideals of the International Style. As the glass sheath became technically feasible, Mies' designs employed the emergent techniques of the curtain wall to resurrect the stylistic imperatives of minimalist boundary conditions and emphasis on volumetric composition, a conscientious reversion to the conceptual opacity of the 1922 projects.

The 860-880 Lake Shore Drive Apartments (1951) represented a key moment in this trajectory, as their unitized system of construction demonstrated an ambivalence toward the role of glass in composition and construction. While the perimeter columns of each block were displayed on the elevation, in the form of larger vertical elements between framed glazing units, the columns themselves were set inboard from the elevational plane, no longer expressed as sculptural elements as at Promontory Apartments. Rather, their representation on the skin was graphic: a flat metal panel that broadcasted the dimension of the column on to the plane of the elevation. This flattening of the column's expression resulted in an intentionally ambiguous façade rhythm; an oscillation between seeing the column's expression as a wider mullion, and seeing the flanking windows in each four-window measure as narrower than their neighbors. Even this dual reading was contrasted by the use of vertical I-beams set between each window. Used partly to join and stiffen the one-story prefabricated cladding panels, the I-beams added a vertical thrust to the graphic composition while contributing a regular measure to the dynamically accented cadence of the windows and columns. As in the IIT projects, there was here no pretence toward glass' ability to express the structure within. Rather, the concealing, *solid* metal panels were the elements charged with

transmitting the reading of the structural cage, a graphic representation orchestrated within an overriding set of formal effects. The shallow depth of these panels and the careful placement of the windows in plane with the metallic skin elements—conditions not found anywhere else in Mies' work—mark the Lake Shore Drive Apartments as a pivotal moment in the migration of glass toward the ideal of a veiling skin. Here the membrane and the structural frame occupy precisely the same volumetric limit, creating a tension between structural expression and veiling abstraction.



Fig. 3. 860-880 Lake Shore Drive, Chicago; Ludwig Mies van der Rohe, 1951. An elevational richness generated by the ambiguity between frame/infill and space/skin relationships.

Mies' definitive move from the ideal of structural presentation toward a formalist emphasis on Platonic geometry was demonstrated most pointedly in three clear span works—the Farnsworth House at Plano, IL (1950), the Mannheim National Theater Project (1953) and Crown Hall at IIT (1956). In each of these, glass was deployed in both a fenestrative sense, in that it was held between planar floor and ceiling systems, and a membranous one, in that glazing constituted a majority of the elevational planes and was detailed to suggest a visual surface tension. In each of these works, structural elements were pulled outboard of the skin, yet the effects of these moves were radically different than those achieved at Promontory Apartments. Structure in these clear span works was disengaged from the glazed volumes, such that one reads not the interlocking of structure and skin, but rather the support of a delineated glass volume by a subservient structural system. The achievement of a pure geometry, executed in minimally detailed glass, here became at least as vital an issue as the demonstration of structural principles, a conceptually "opaque" interest in the volumetric rendering of form at the expense of a conceptually "transparent" presentation of structure and functional organization.

With the Commonwealth Promenade Apartments, Chicago (1953), the Lafayette Park Development, Detroit (1957) and the Seagram Building, New York (1958), Mies perfected the ideal of a veiling glass skin, detached

formally and conceptually from the structural system and arranged to emphasize abstract composition over tectonic lucidity. The external membranes in these projects served an admittedly technical purpose—the elimination of temperature-driven expansion differential between perimeter and central columns—however their detailing suggests that formal considerations also played a considerable role in their design. (8) In each case, Mies suppressed the structural columnation behind the skins, which now consistently used tinted glass to provide a less visually transparent membrane. Here, the graphic indications of the hidden columns deployed in the 860-880 skin were eliminated in favor of a consistent module across the building elevations. The applied I-beams were now used to emphasize the module of the cladding, not the structure. Similarly, by cutting the corner columns into the overall volume, thus expressing the plane of the structure at these buildings' edges, Mies emphasized the forward thrust of the curtain wall, highlighting its privileging in the elevational composition over the columns behind.

The use of a pre-fabricated skin as a membrane, appearing to be stretched over a concrete or steel frame and veiling the actual mechanisms and functions within, remained Mies' *modus operandi* for high-rise buildings throughout the remainder of his career. While works such as the Chicago Federal Center (1959-73) and the Toronto Dominion Center (1963-69) refined the morphological and tectonic advances of his 1950s work, his assertions of formal imperatives influenced a second generation of modern architects toward more extreme works of vitreous minimalism. In particular, the contemporaneous work of Gordon Bunshaft set a minimalist standard for subsequent curtain wall construction. Bunshaft's use of a relatively flat curtain wall system in buildings for Lever House, Manufacturers Trust, and Pepsi-Cola continued the International Style privileging of surface over mass. In both Lever House, where the clean exterior became a metaphor for the hygienic products manufactured by the company, and Manufacturers Trust, where it symbolized openness in business dealings, the glass skin became a symbol in and of itself, abandoning entirely the transmissive roles imagined in Mies' 1922 projects.

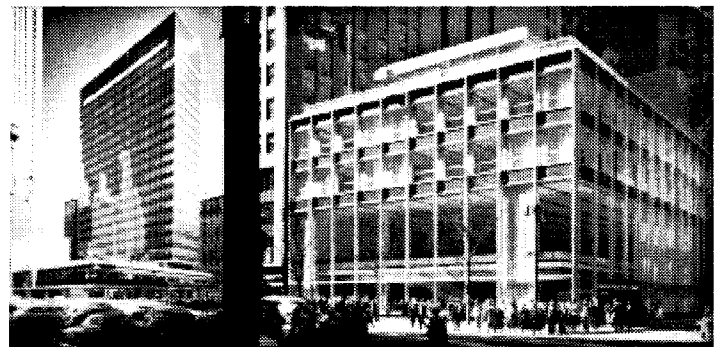


Fig. 4. Lever House, New York; SOM/Gordon Bunshaft, 1951-1952. Manufacturers Trust Branch Office, New York; SOM/Gordon Bunshaft, 1953-1954. Physically transparent, yet conceptually opaque, the glass skin is here deployed partly for its symbolism—cleanliness on the left, and 'guileless' banking practices on the right.

Here, the migration of glass from infill to cladding can be seen most starkly in its physical and conceptual terms. The use of glazing in Mies' early Chicago work was based on its physical, or in the words of Rowe and Slutzky, its "literally" transparent characteristics. That is, it was deployed to take advantage of its visually transmissive nature, to provide light to the interior spaces, and to demonstrate the structure's presence and logic to the exterior world. Where glass was used as fenestration, it participated in a hierarchical dialogue between frame and infill, again revealing an overall

structural or functional scheme. However, in Mies' later work, and in that of Bunshaft, the glass skin was composed to emphasize its delineatory aspects—typically deployed as a modular device, or in crisply detailed planar elements that accentuated Platonic architectural forms. As such, these works fulfilled the ideal of an opaque transparency, latent in the 1922 works' description, in that the constructed meaning of the vitreous skin was not contained within the transmission of an intrinsic logic, but was instead extant within the volumetric indications of the skin itself. Essentially, this process suggests a move from *presentation* to *representation*, a tendency that would become systemic over the following decades.

“IT IS BY NO MEANS CERTAIN THAT A BUILDING AS SUCH IS REQUIRED”—EPHEMERALITY AND INSTRUMENTALIST TRANSPARENCY 1948-1970

If Mies' 1922 projects present us with one archetype of lightweight construction—a perceptual minimalism that emphasized the planes and edges of building volumes in order to represent a stylistic ideal—a contemporary body of work by Buckminster Fuller suggests a materiate “almost nothing” based on an internal, objective logic. Fuller's lifelong emphasis on resource efficiency presents us with a structural ephemerality, in which the architectural intervention's primary directive appears to be the delivery of benefit with minimal physical and formal resistance. This performance vector proposed the conceptual priority of a functional transparency—a clear transmission of the stated programmatic intent—over the aesthetically opaque.

Beginning in 1927, only five years after publication of the *Glass Skyscrapers*, Fuller published and drew up plans for a series of hexagonally planned “4-D” projects, ranging in scale from office towers to homes. The 4-D projects suggested an extreme emphasis on lightweight materials and assemblies, such that Fuller proposed on-site delivery of the completely assembled towers via airship. These projects represented the first applications of Fuller's “Dymaxion” principle—the achievement of the greatest possible gain with the fewest possible resources—in that their essential advance was the use of a central compression mast and a series of radial tension cables to support floor decks and perimeter cladding. In concentrating the heavy compression element, and using lightweight tension elements to span the depth of the floor plates, the system achieved an unusually efficient and flexible floor plate, free of intermediate columns. Fuller's goal in this deployment of material was to attain “maximum advantage of altitude with the least weight of material and effort,” ensuring that the smallest, lightest members would “enclose space with tension,” allowing minimal interference either visually or functionally to the spaces within. (9)

There is, to be fair, little discernible aesthetic intent in Fuller's renderings, suggesting that the 4-D system was conceived free of compositional prejudice, its physical transparency matched by a lack of aesthetic “pretence or guile”, to borrow the words of Rowe and Slutzky. Instead, Fuller's approach was instrumentalist, in that his goal was the provision of packaged residential machines designed to leverage resources into better living standards with minimal architectural intrusion. Where such intervention was required, i.e. partition walls, the schemes provided adjustable units, allowing space to be reconfigured at the owner's convenience. Notably, the windows of both house and tower were to be full-height glass, obscured only by stabilizing cables and by operable solar shading. Fuller would later write that the total transparency of the house was designed to accommodate “freedom of acquisition of information...omni-directional vision, controllable for privacy.” (10) Here there was a unique correspondence between “literal” and “phenomenal” transparency. The ability of the human eye to maximize its “information acquisition” was provided for via completely transparent

glass, while mechanisms for adjusting the transmissive performance of the envelope ensured that in all conditions the greatest desirable effect accrued to the user/operator.

Fuller's projects from the time of the 4-D tower gradually explored an implosion of structure and skin, precisely the opposite approach to the reconfiguration of the fenestrated wall to that taken by Mies and Bunshaft. In projects such as the Wichita House and the Dymaxion Deployment Unit, metal cladding became an intrinsic element in the structural system, realizing the ideal of a multi-functional, lightweight membrane whose configuration was based on performance rather than perception. As if projecting the central mast of the 4-D house onto its tensile glass skin, the curved panels of these two prototypes provided a minimum envelope performing multiple roles—functionally “transparent” if visually opaque. The ultimate structural outcome of this tendency was Fuller's development of the Geodesic principle, in which numerous discrete structural elements were arrayed along segments of a sphere's circumference to achieve an extraordinary ratio of enclosed volume to structural weight. If the Miesian explosion of envelope and frame had the inevitably aesthetic effect of privileging of the graphically expressed skin over the physical structure, the Geodesic synthesis of load resistance and enclosure had profound tectonic consequences in its suggestion of a structure so light as to be functionally absent. Whereas the physical transparency of the curtain wall found favor with corporate clients as a symbol of sophistication and honest dealings, the ephemerality of the Geodesic principle was a natural metaphor for culturally radical designers who recognized it as a potential tool for the transformation of social and urban practice. The quick assembly and disassembly of Geodesic structures created an architecture of minimal resource and environmental impact, with nomadic potential that suggested a culture of dynamism and socio-objective performance. While Fuller's initial clients were the U.S. military and State Department, the instrumentalist approach of the Domes found its most comfortable deployment in the hands of architectural and cultural activists, as a symbol of and mechanism for progressive political action.

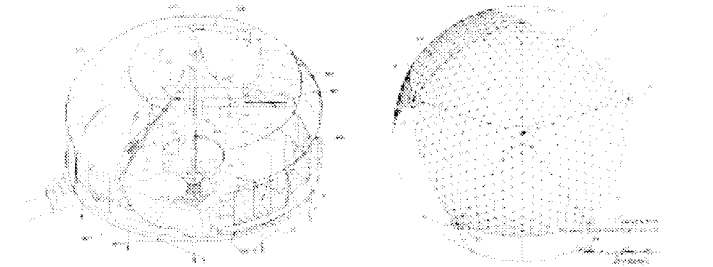


Fig. 5. “Wichita” House; R. Buckminster Fuller, 1945. *Geodesic Dome Patent Document*; R. Buckminster Fuller, 1954. The implosion of structure and skin onto a single, high-performance membrane was part of Fuller's overall instrumentalist *modus operandi*.

Fuller's more radical protégés would suggest the application of his performance-based ephemeral ideal as an integral part of a technologically and politically revolutionary culture. In his 1961 essay “Stocktaking,” Reyner Banham set a radically instrumentalist agenda for architecture, suggesting that Fuller's approach provided a more appropriate direction than that of aesthetically based “tradition.” (11) Codifying the central tenet of the ephemeralist movement, Banham noted that the provision of a functional environment no longer necessarily implied the provision of a traditional building. Rather, the growing presence of services and network engineers indicated that architecture's “monopoly” on environmental intervention was at an end, and that the discipline would need to refocus itself, adopting radical efficiency as its prime directive. (12) Such an approach postulated

precisely the ideal of a functionally transparent architectural agency, over contemporary concerns regarding the aesthetic propriety of contemporary technical innovations.

Banham and French designer Francois Dallegret indicated what this approach might represent in 1965, in a dramatically Fullerian project and essay entitled "A Home is Not a House." (13) Here, Banham noted that the entire history of environmental control via architecture had focused exclusively on the setting up of costly, permanent barriers to the elements. Noting the recent history of mobile architecture in America, especially the Airstream trailer, he and Dallegret laid out plans for an inflatable "enviro-bubble" that would provide only the thinnest of membranes between "inside" and "out." In the center of this absolutely minimal structure, a "standard of living" package would provide active environmental modification, unrooted to any fixed location on earth. While Dallegret's drawings show an apparent physical transparency to the enviro-bubble, this project more importantly represents an extreme functional "clarity," where all non-functional aspects (particularly, in this case, culturally defined domestic norms) were eliminated to allow full provision of perceived physical benefits to the user. The modification or tempering of exterior conditions can be seen as a super-transparency, not only transmitting but also enhancing desired elements across and through the super-lightweight membrane.

This ideal of a diaphanous membrane coupled with carefully engineered mechanisms to provide environmental control played a significant role in the development of an instrumentalist approach during the late 1960s. In particular, English architect and educator Cedric Price proposed a landscape of lightweight, radically functional projects and commissions that pushed Banham's suggestion of an alternative architecture to its practical limits. Price's projects for a "Pop-Up Parliament," a "Fun Palace," and a "World Museum" indicated a shift from architecture as a representational medium to a new role as a gantry for electronics-intensive social events. Pneumatic structures played a key role in these "degree zero" proposals, in that the total implosion of structure and skin onto a hyper-efficient membrane allowed Price to "ignore the necessity of ground anchorage and friction encouragement," proposing nomadic structures whose very siting could be altered to achieve better performance. (14) Indeed, Price's students produced an astonishing array of inflatable proposals in the late 1960s, many of them featured in a special issue of *Architectural Design* in June 1968. Entitled "Pneu World", this manifesto of ephemerality and inflatability included projects ranging in scale from Mike Webb's "cushicle," or wearable dwelling, to civic such as the Travelling Hall by the Parisian socialist group Utopie. Here, the use of ephemeral structures as a socio-political mechanisms implied the fulfillment of Fuller's functional lucidity on an urban, even global, scale. (15)



Fig. 6. *Environment Bubble*; Reyner Banham and Francois Dallegret, 1965. *Dyodon; Utopie*, 1967. Architecture reduced to a performance ratio of mass to function. Functional transparency taken to an extreme degree.

The ultimate deployment of diaphanous, high-performance skins as functional instruments occurred in the 1970 Osaka Expo, where the indeterminate architecture of the festival's main structures by Tange and Kikutake were matched by corporate and national pavilions offering even more extreme tectonic experimentation. Based on a desire to exceed the radicalism of the 1967 Montreal Expo, which had featured a Geodesic Dome by Fuller and a tented structure by Frei Otto, the 1970 festival included the pneumatic/tensile U.S. Pavilion by Davis Brody and the Fuji Pavilion by Yutaka Murata—a bizarrely anthropomorphic structure consisted of sixteen U-shaped airbeams within a fifty-meter diameter circle. A multiscreen electronic projection system in the Fuji pavilion created a media environment so near to the gantry/content ideal envisioned by that critic Martin Pawley was led to speculate on the potential for a "soft" system of architectural content, in which the enclosure and structure would support an entirely projected interior. "The enclosure of the show itself," wrote Pawley, "is analogous to the formwork which temporarily contains a concrete building." (16) In other words, the architecture of the pavilion had become a pure enabling device whose formal presence was negligible compared to the electronic content within.

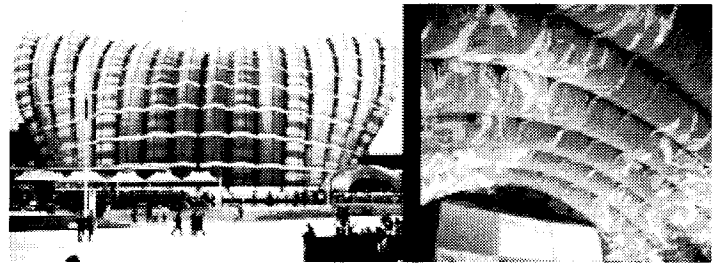


Fig. 7. *Fuji Pavilion*, Osaka; Yutaka Murata, 1970. Electronic imagery inside demonstrated the 'absolute redundancy' of architecture's "static effect." Conceptually transparent, verging on tectonic invisibility in comparison to the high-tech show within.

Such a view of architecture, as pure infrastructure for a projected or transmitted content, provides us with a clear example of the sort of instrumentality, or functional transparency, envisioned by Fuller in the 4-D projects, updated via advanced enclosure and servicing mechanisms. This is in obvious contrast to the conceptual opacity manifest in the monumental glass structures by Mies and Bunshaft, and it neatly frames the essential debate between perceptual minimalism and tectonic nihilism inherent in the postwar era. On the one hand, the glass monuments of the Late International Style suggested a meaning inherent in the surface conditions and volumetric arrangements of architectural mass. This was a representational vector, with the end goal a reference to geometrical ideals extrinsic to the architectural program. On the other hand, the lightweight, diaphanous structures of Fuller and his progeny indicated a syntactic deference to programmatic directives—the "meanings" of these structures can perhaps best be located by their status as "means" to programmatic ends. To return to Rowe and Slutzky's terminology, the example of Lever House can best be described as being opaquely transparent—the essential purpose of the glass curtain wall was its own intrinsic quality, presented at the expense of the function and structural efficiency within. That of the Fuji Pavilion might be described as a transparently ephemeral, in that its light weight, demountability, and extreme integration of structure and enclosure enabled it to function as a media center with no formal or architectural interference. In Pawley's terms, any "static effect" of the architectural form was quickly reduced to "absolute redundancy" by the effect of the infrastructurally supported media and servicing systems. (17)

CONCLUSION—EMPIRICISM AND THE SYNTHESIS OF “SLICK SKIN” AND THE PERFORMANCE MEMBRANE

At the time of the 1970 Expo, the two distinct trends of minimalism and ephemerality were both well established and apparently opposed. The continuation of the crystalline ideal inspired a group of third generation modernists—led initially by Eero Saarinen but later including I. M. Pei, Johnson/Burgee, and John Portman—to push the technology of the glass membrane to its logical aesthetic limit. The so-called “slick skin” approach represented the rapid mechanization of the glass industry, to the point where tinted or mirrored membranes could be produced and specified “off the rack.” With the detailing thus largely determined by production, architectural intent was concentrated on the overall form of these projects, with the increasing lack of visual relief achievable by the commercially produced skins adding to their overall sense of abstraction and sculptural composition. Intriguingly, the parallel development of tinted and mirrored glass led to the universal deployment of a visual opacity or reflectivity, aligning visual experience with the conceptual opacity of the formal intents.

Meanwhile, the alignment of Fuller’s instrumentalist approach with socio-political concerns of the late 1960s led to the growth of a populist, technology-based approach to architectural and urban design, exemplified by the selection of Piano and Rogers for the Beauborg/Pompidou Center commission in 1971. The pairing of membranous performance with progressive social concerns informed similarly conceived works by architects such as James Stirling and Norman Foster in the UK, Hardy Holzman Pfeiffer and Murphy/Jahn in the United States, and Tange and Kikutake in Japan. In each of these cases, expression of technique confirmed an instrumentalist transmission of pure function.

Foster’s work of the era, in particular the headquarters for Willis Faber and Dumas of 1970-75, presents us with a suggestion of ultimate reconciliation between the crystalline and diaphanous, the perceptual and the instrumental. Here, an undulating glass skin, notably detailed not by industry alone but with intensive architectural and engineering input, encloses as minimally as possible a rationally organized system of structure and service, laid out to take maximum advantage of its oddly shaped site. By using technically advanced silicone sealants and maximizing the size of tinted float glass panels, the skin of Willis Faber is in various conditions opaque, reflective, or transparent, yet it allows the functional aspect of the intervention to use the site most efficiently. The provision of a servicing zone underneath the structural floor slabs, and pulled well away from the edge of the building envelope, simultaneously allows a clear telegraphy of the building’s performance aspects when illuminated at night. Willis Faber is thus alternately opaque and transparent during daylight and night, and also alternately opaque and transparent in terms of perception and performance. Critic Arthur Drexler wrote of this dual action that “problem-solving” here replaced “expression,” although the resulting building was in fact strikingly similar, particularly at night, to Mies’ entirely expressive 1922 towers. (18)



Fig. 8. Willis Faber and Dumas Headquarters, Ipswich, England; Foster Associates, 1975. The pairing of visual effect and high performance into a work of literal and conceptual clarity.

As Kenneth Frampton has pointed out, Willis Faber represents the task of the “production of meaning,” and the mastery of the “means of production.” (19) This bivalent conception has become a defining set of polarities as the Productivist school of thought has gained footholds in the mainstream of architectural discussion, in that Foster, Piano, *et al* have subsequently paired a continued emphasis on rationalized function and assembly with an indisputably Miesian aesthetic as a stylistic default. In any event, Frampton’s epigram serves as a convenient summary of the related yet distinct trends of transparency versus ephemerality, each of them proposing a *beihane nicht* relating to individual poles of the mean(ing)/production equation.

NOTES

¹Colin Rowe and Robert Slutzky, “Transparency: Literal and Phenomenal,” in *The Mathematics of the Ideal Villa and Other Essays*. (Cambridge: MIT Press, 1976) 160.

²Henry-Russell Hitchcock and Philip Johnson. *The International Style*. (1932; reprint, New York: Norton, 1966).

³Ludwig Mies van der Rohe, “Working Theses,” G, 1923. Reprinted in Ulrich Conrads, *Programs and Manifestos on 20th Century Architecture*. (Cambridge: MIT Press, 1986) 74-75.

⁴Reyner Banham, *Theory and Design in the First Machine Age*. (London: Architectural Press, 1960) 268.

⁵Kenneth Frampton, *Modern Architecture, A Critical History*. (London: Thames and Hudson 1980) 232.

⁶Henry-Russell. Hitchcock, “The International Style Twenty Years After,” *Architectural Record* (August 1951): 96. See also George Schipporeit, “1955 Was the Year” in *(Re) Viewing the Tectonic: Architecture/Technology/Production*, Proceedings of the ACSA East Regional Conference, Fall 2000; and Oswald W. Grube, *et al*, *100 Years of Architecture in Chicago* (Chicago: Follett, 1976). Albert Kahn was active in Chicago immediately prior to Mies’ immigration from Germany, and in fact on arrival at Chicago (now Midway) airport, Mies would have

been greeted by Kahn's just-completed United Airlines office building. A full accounting of Kahn's influence on the early IIT work remains a question for further study.

⁷Frampton, 233.

⁸Peter Carter, *Mies van der Rohe at Work*. (1974, reprint London: Phaidon, 1999). 46.

⁹R. Buckminster Fuller, "Designing a New Industry," in James Meller, ed., *The Buckminster Fuller Reader* (Harmondsworth: Penguin, 1970.) 205.

¹⁰R. Buckminster Fuller, "R. Buckminster Fuller Talks About Transparency," *House Beautiful* (Sept. 1968) 94.

¹¹Reyner Banham, "Stocktaking," *The Architectural Review*, (Feb. 1960) 93.

¹²*Ibid.* 94-97.

¹³Reyner Banham and Francois Dallegret, "A Home is Not a House," *Art in America* (April, 1965) 70-79.

¹⁴"Cedric Price Supplement." *Architectural Design*, (October, 1970). 510

¹⁵Simon Conolly, Mike Davies, Johnny Devas, David Harrison and Dave Martin, "Pneu World." *Architectural Design* (June, 1968). 271.

¹⁶Martin Pawley, "Architecture Versus the Movies or Form Versus Content: Reports from Osaka." *Architectural Design*, (June 1970) 288.

¹⁷*Ibid.*

¹⁸Arthur Drexler, *Transformations in Modern Architecture*. (New York: The Museum of Modern Art, 1979) 78.

¹⁹Kenneth Frampton, "Place, Production, and Architecture: Towards a Critical Theory of Building," *Modern Architecture and the Critical Present* (London: Architectural Design, 1982) 44.