

SURFACE LIBERATED FROM CONSTRUCTION: SOME SIDE EFFECTS OF ABSTRACTION

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*No mouldings, no frills, were permitted to distract one's attention from true architectural values: the relations of wall to window, solid to void, volume to space, block to block.*¹
Nikolaus Pevsner

The decade between Gropius' and Adler's Werkbund Pavilion in Cologne of 1914 and Gropius's Bauhaus in Dessau of 1926 witnessed a revolutionary change in attitudes toward the vertical surface. These two buildings display some overt similarities of massing and construction, but they are worlds apart in terms of the architect's attitude toward surface. The details of the Werkbund Pavilion are still rather traditional; they articulate the construction process: we see pilasters and window sills, recalling the architecture of Frank Lloyd Wright which influenced Europe in the immediate pre-WWI period. In the Bauhaus the details have been ironed out, all the "frills" are gone. Only the metal mullions holding the glazing remain; they too might have been eliminated had Gropius had the technology. The Bauhaus building nicely portrays the liberation of surface from the building process, from construction.

Because traditional facades represented traditional building assembly, decorative elements could be acceptable to a "Bauhaus" sensibility as being endemic to the more traditional methods of construction. But because modern-movement buildings were to be produced by the technical processes of an industrialized society and assembled in the factory, the addition of construction details was considered inexpressive and spurious. The notion of the registration of the details in the final product, what Kenneth Frampton calls the ligaments of the construction process, would be hopelessly craft-oriented. The work could no longer appear to have been manipulated after it was in place. The idea of ornamentation, conceived as the element of detail invented to cover a joint or make the building water-tight, was eliminated as much out of its being rendered unnecessary as out of any Loosian moral proscription.

Moreover, the surfaces of the exterior were to be as abstract and seamless as possible, in imitation of the de Stijl exercises of the preceding decade. They were icons of a benign and magical future, where no seams or joints would be needed. This is not to say that the elegance of smooth, unbroken, well-crafted surfaces is the exclusive province of the modern architectural sensibility. An unrelieved surface is "proof" of the solidity and quality of materials and workmanship, whether handcraft or machine-produced. The 16 monolithic porphyry columns of the Pantheon, rough-cut in Egypt, shipped across the Mediterranean to Italy, floated up the Tiber in barges, polished to a reflective finish and installed, are the ancient embodiment of an ironic variant of Mies' most famous dictum: Less costs more.

Parallels to architecture abound in other design disciplines. In *haute couture* of the 1960's, women's dresses were made without darts on the bodice, distinguishing high fashion from ready-to-wear. Italian automobile coach work of the same period displayed a similar trait. The side elevations of Ferraris and Maseratis were perfectly smooth, with no creases to prevent "oil canning," with no mouldings to cover seams or make the car look lower. The car was lower, the metal was thicker, and all of one piece.

Roland Barthes incisively dissected the aesthetic substructure of this concept in his short article on the Citroen DS automobile, written in 1957, the year the car was introduced. Comparing the smooth body of the DS to other, more culturally-loaded "design" objects, Barthes wrote, "Christ's robe was seamless, just as the airships of science-fiction are made of unbroken metal."² To "Less is More" we may add, "Seamlessness is next to Godliness."

In traditional architecture distressed surfaces, (e.g., rustication), represent the difficulty of carving an expanse of stone to be perfectly smooth. Smooth surfaces will also show any deformation caused by injury. Door-jambes are covered with mouldings to hide the articulated joints. In modern architectural and industrial design, however, the unbroken surface is associated with machine production and streamlining. The reveal-joint replaces the moulding. It is not surprising, then, that avant-garde architects in the 1920's should have adapted a streamlined aesthetic for their buildings.

By the late 1920s, when construction had been generalized into planes of pure color (or non-color) and glazed "voids," the only variables left to the architect were massing and solid-void ratios. Functional identification and scale were assumed to be the result of this process. For Siegfried Giedion, the historian and apologist of the Modern Movement, to have practiced in the late 1920s and not have indulged in abstract planes was most certainly a transgression. He even gratuitously condemned W.M. Dudok, an architect whose compositions were as "modern" as those of Rietveld and Van t'Hoff, but who built in brick and often used pitched roofs.³ (The entire Amsterdam School, one of the most important contributions to the language of Modernism, was omitted from some histories of Modern Architecture because of these attitudes).

Pevsner's directive quoted above, presuming that "true architectural values" are abstract, is a direct reflection of Le Corbusier's definition of architecture as, "...the masterly, correct and magnificent play of masses brought together in light"⁴ and the abstract theories of Van Doesburg. These are attitudes that allow the separation of the act of building (and even the act of inhabitation) from the finished product. (The Grand Canyon

may also be the magnificent play of masses brought together in light, and while it may be called architecture by way of metaphor, it is not literally architecture.)

The abstraction of surface, however, does not preclude a symbolic reading for form in the more general sense. On the contrary, by simplifying the surface, functional expression might be even more transparent. By conventionalizing the surface so that the surface itself was not an index to pragmatic differences, the variables were reduced. The index to program variations, i.e., the institutional identification of the building, resided in solid-void ratios and massing. We were encouraged to detect the function of the building solely by its volumetric distribution and its windows.

For 200 years these ideas were developing in social, cultural, and technical thought. Concerning the vertical surface, for the avant-garde architects of the 1920s, the dominant themes perfectly reflect Le Corbusier's definition and Pevsner's values.

THE LIBERATION OF SPACE AND VOLUME FROM STRUCTURE

A comparison between two facades by Le Corbusier may serve as an entree into the problem outlined above. In the unbuilt house for M. X in Brussels, the garden facade displays the internal volumes explicitly. The great room at the top of the house is covered by a huge window-wall, while the more modular and smaller-scaled windows below express the modularity of the rooms behind.

In the front facade of Corbusier's Villa Stein at Garches no such telegraphing of internal volume occurs. The ribbon windows which stretch across the piano nobile are the same as those of the less important floor above. Nor do the horizontal rhythms vary to distinguish differences in the rooms behind. The kitchen on the left side of the piano nobile receives the same window treatment as the library in the center and stair-landing on the right. The double-height of the entry hall is not expressed. Further, the one element that is accentuated on the facade is rather low on the programmatic hierarchy: a bathroom.

The facade of the Villa at Garches is clearly telling us something very different about its contents (and "content") from the House for M. X, referring back—via its composition if not its style—to the tradition of the piano nobile houses of the Italian Renaissance and the French Rococo.

The important question for us here is which aspects of the inside are reasonable to bring to the outside, and what are the various ways in which inside and outside can be interrelated? The opposites implied by the above comparison are analogous to the diametrically opposite methods of design fostered by two of the most influential teachers of architecture in American in the 20th century: Ludwig Mies van der Rohe and Walter Gropius.

For the (hypothetical) student of Gropius the design process starts with the particulars of the functional program. (S)he takes the various space requirements and makes little squares to scale, arranges them according reasonable adjacencies and connections, raises up the walls and adds fenestration to taste.

For the (hypothetical) student of Mies the process is reversed. The analysis of the program provides the structural module. (S)he then chooses column-sections, develops the horizontal members and encases the volume (usually a simple object) with an appropriate number of units to fit the space

needed.

The "method" I am ascribing to Gropius was characterized by Reyner Banham as the method of design common to most avant-garde architects of the 1920s. Banham traced the origins of this idea to the influence of Guadet's theories of elementary composition on those architects, averring, "...it may be taken as a general characteristic of the progressive architecture of the early twentieth century that it was conceived in terms of a separate and defined volume for each separate and defined function, and composed in such a way that this separation and definition was made plain."⁵ This idea leads directly to Le Corbusier's famous dictum, "The outside is the result of an inside."⁶

That the internal organization of building spaces ought to provide the norm of external expression, and that any variation from this norm is understandable (and justifiable) only as a deviation from the norm, was by the 1940s tacitly accepted by architects worldwide. The concept finds its paradigm with the Bauhaus-inspired didactic exercises popular in architecture schools in the 1950s and 1960s, commonly dubbed the "exploded cube project." The "exploded cube project" is composed of abstractly structured elements either within a pre-formed envelope (urban, party-wall contexts) or as a picturesque assembly of wings or pavilions (open sites).

The exploded cube was made possible by recognition of structural advances combined with an interest in abstraction. Only when volume (liberated from construction), program (liberated from shelter), and space (liberated from structure) could all be viewed abstractly—with each read as an independent variable in the design process—could the exploded cube have been developed.

Space, before the turn of the 20th century, was itself an idea subsumed under structure. As Peter Collins suggested,

...whereas the Rationalists, such as Violet-le-Duc, could conceive only of the structure...as providing the archetype for a new way of building, Wright took the space, and it is this that distinguishes Wright from the other great architects of his generation...Henceforth, space was regarded as the twin partner with structure in the creation of architectural composition.⁷

But even for Wright, an architect working within a craft tradition and consciously rejecting the overt machine aesthetic of the International Style, space remained dependent on structure, despite his rhetoric. In his work through the 1920s, the articulation of the various of the various elements of construction was never lost. Nor was Wright particularly interested in the articulation of the program, as were many of the Europeans. Although the various wings of the early houses vaguely represented divisions of functional zones, all the external surfaces were articulated in roughly the same manner, based on ideas of construction and spatial overlap, not function. And while he was interested in achieving clear functional separation in the plan, on the exterior Wright was more interested in expressing Democracy than living-rooms, kitchens, and bedrooms.

For the architects committed to the expression of program-function, however, both space and structure could now operate in the service of that function. Pre-modern hierarchy had derived from ideas of permanence, the difficulty of construction, and the spanning of great distances, all creating

changes in *scale*. Long Spans meant thick walls, buttresses, or side-aisles. The exterior surfaces of buildings, when they registered anything of the internal organization, registered the struggle to create the clear span. With the advent of the new materials this changed. It was now possible to span virtually any distance with a flat ceiling and enclose the volume with thin membranes. No longer did the intermediate element of construction intervene to give concrete form to the expressive intent; construction was generalized.

H.R. Hitchcock and Philip Johnson characterized this shift in expressive intention as the difference between the expression of mass and the expression of volume.⁸ In American architectural education after WWII, program-expressed-through-volume was one of the more consistent aesthetic assumptions (outside Chicago and the ambiance of IIT). Students were given exploded cube projects in early design studio courses. One of the rules of the game was the volumetric correspondence between inside and outside. This, coupled with the idea of continuity between inside and outside, further specified the architects' attitude toward the exterior surface.

To the generations of architects educated in this manner, terms like "transparent plane" replaced window, and "glass line" replaced doorway. (One hardly imagines Stanford White being asked, "Where's the glass line?") Even today, if one asks a student to account for some "aberrant" opening on the facade of, say, a Renaissance building, the answer is usually that the architect must have been trying to project some internal inconsistency of volume onto the outside wall.

Le Corbusier is often held responsible for having created the common wisdom that the norm of facade expression be internal volume, and his distinction between *free facade* and *ribbon window* (two of his five points for the New Architecture) seems to support this interpretation. Both *free facade* and *ribbon window* are made possible by the separation of structure and enclosure itself engendered by the concrete or steel frame. The ribbon window announces the existence of the frame by the visible absence of vertical support on the exterior. The free facade, more inchoate and abstract, might seem to imply some other expressive intent. But Le Corbusier described both elements in precisely the same manner in the *Oeuvre Complete*: "...The windows...can run from edge to edge."⁹ Le Corbusier had never specified that his 'soap bubble' analogy meant that the volume of air in the soap bubble is the perfect equivalent of the spaces of the rooms of the building. Even in his most plastic buildings, such as the Shodan house in Amedebad of the middle 1950s, the volumes of the interior are never literally projected onto the exterior. Rather, the plasticity of the facade is a more general adumbration of the idea of the frame.

That so many architects have misinterpreted Le Corbusier's theory is perhaps a testament to the seductiveness of Van Doesburg's abstract experiments and Hitchcock and Johnson's definitions.

The expression of volume in Le Corbusier's House for M. X is also related to the idea of the expression of program independent of other variables. Only when function could be seen as potentially independent of the more general idea of shelter could it be assumed that functions were directly accessible in the design process and directly expressible on the facade of the finished work.¹⁰

THE LIBERATION OF FUNCTION AND PROGRAM FROM SHELTER

To the architects of the 17th and 18th centuries it was common to contrast a regular exterior, expressive of the "function" of constructive and environmental control, with an interior with great variations of room size, scale and proportion. Starting at the very beginning of the 17th century with Carlo Maderno¹¹ and then moving to France in the 18th century, arrangement of space for increasingly specific uses (called the art of *Distribution* in French) was beginning to overtake *Composition* as a primary activity of the architectural design process. We see this process best in the theories and practice of J.F. Blondel, an architect at the forefront of the development of modern distribution and hierarchy in the plan. To Blondel the facade did not express this hierarchy directly or volumetrically, but rather through scale and regularity. Richard Etlin has explained it this way:

*While the decoration of the interior required an individuality for each type of room as well as a hierarchy between the sizes of rooms, the decoration of the exterior prescribed uniformity along the facade. The difficulty resided in combining a facade with regularly spaced windows all the same size with correctly proportioned rooms of different dimensions.*¹²

As the variety of room (and building) types proliferated in the 18th and 19th centuries the architects sought to reconcile regular exteriors (or at least an exterior not determined by interior arrangement and volumes) with irregular interiors. Happily, the same Romanticism that relished images of a Classical past also appreciated the Medieval picturesque. In asymmetrical picturesque architecture, the combination of rooms of wildly different contour could easily be accommodated. But, while the picturesque tradition made it easier for individual rooms to assert themselves, this did not mean that the bulges, wings, pavilions and protuberances regularly corresponded to the specific spaces behind. Sometimes they did, and sometimes they didn't.

The route to an architecture that seeks to express program-function via abstract surface treatment and massing-relationships was a slow one throughout the nineteenth century. The increasing dominance of the social realm over the tectonic has many causes in the 19c, but among the most important are: 1) the sheer increase in the number of institutions and building purposes, implying a greater practical need than before for communicative expression, and 2) the gradual estrangement of the architect from the engineer and the artist in the late 18th and 19th centuries. This estrangement created a void in the way the architect rationalized his mission. Simply stated, the engineer took the technical expertise and the artist took the aesthetic expertise. Architecture, left dangling, borrowed from social theory and began to be viewed as the environmental independent variable upon which behavior depended. A corollary of this idea was that one of the primary expressive intentions of buildings be social identification.

We see this development in a comparison of two seminal theorists: Marc-Antoine Laugier, writing in 1753,¹³ and Gottfried Semper, writing exactly 100 years later.¹⁴ Laugier conceived a wholly constructive rationale for the origins of architecture. He assumed the programmatic need for shelter to

be important, but generalized. For him the manipulation of the primary elements to make that shelter—the column and the architrave—is the first act of man the architect.

Gottfried Semper wrote his treatise in 1853, after the intervention of the seminal social ideas of the Enlightenment and their application to architecture by Ledoux, Fourier, Bentham and others. Further, Semper was strongly influenced by the biologist Georges Cuvier, whose scientific innovation, according to Joseph Rykwert, "...was to shift emphasis from description by the identifiable members of an organism, and classification by description, to classification by the function performed."¹⁵ This led to a classification of building by social, not formal or constructive criteria. Rosemarie Bletter has written that Semper, "...insists that style be seen as the reflection of socio-political conditions."¹⁶ Semper, reviving a Vitruvian myth of origins, divided the primary elements of architecture into four independent forms: the hearth, the platform, the roof (including the vertical structure) and the enclosure ("infill"). The hearth is the first and most elemental of his forms. "What is exceptional in Semper's schema of classification," Bletter continues, "is that he begins with a non-architectural element—the fire—and element without spatial dimension but one that bestows social significance on the site."¹⁷ Further to this, Semper's, "...roof, with its supporting member is read as a continuous unit..."¹⁸ thereby unifying two of the discrete elements of all (including Laugier's) previous systems.

Both of these theoretical changes 1), the introduction of the anthropological setting as the architectural prime determinant, and 2), the destruction of one of architecture's most lasting structural conventions, i.e., the linguistic distinction between vertical and horizontal members, are symptomatic of the further abstraction of traditional and conventional architectonic 'parts' during the post-Bauhaus period of the modern movement. Program would now take its place alongside Structure and Space as the generators of architectural form and surface.

Sir John Summerson has explained the sequence of changes to theory in his essay, "The Case for a Theory of Modern Architecture," where he states, "The source of unity in Modern Architecture is in the social sphere, on other words in the architect's program."¹⁹ Summerson then traces the route toward 20th-century function/program expression.

From the antique (a world of form) to the program (a local fragment of social pattern); this suggests a swing in the architect's psychological orientation almost too violent to be credible. Yet in theory at least, it has come about; and how it has come about could very well be demonstrated historically. First the rationalist attack on the authority of the antique; then the displacement of the classical antique by the mediaeval; then the introduction into mediaevalist authority of purely social factors (Ruskin); then the evaluation of purely vernacular architectures because of their social realism (Morris); and finally the concentration of interest on the social factors themselves and the conception of the architect's program as the source of unity—the source not precisely of forms but of adumbrations of forms of undeniable validity. The program as the source of unity is, so far as I can see, the one new principle involved in modern architecture.²⁰

The slow and arduous development of the art of "distribution" that began in Italy and France, then, finally reached a high point in the programmatic involvement of the post-Bauhaus architects of the 30's, 40's and 50's. The apex of

its arc is found in Christopher Alexander's influential 1964 book *Notes on the Synthesis of Form*. For Alexander in the early 1960s, and for the "user needs" architects wedded to social concerns, the task of the designer was assumed to reside solely in space-arrangement.²¹

While I am substituting Semper for Summerson's example of Ruskin as the agent of the "anthropological model," the important point here is that the anthropological view of function has come to dominate architectural theory, and together with ideas of abstraction, it has often eclipsed the expression of construction on the vertical surface.

NOTES

1. Pevsner, Nikolaus, *Outline of European Architecture*, Pelikan, London, 1958, p.285
2. Barthes, R., "The New Citroen", reprinted in Barthes, R., *Mythologies*, Hill and Wang, NY, 1972, p.88
3. Giedeon, Siegfried, *Space, Time and Architecture*, Harvard University Press, Cambridge, 1963, p.423
4. Le Corbusier, *Towards a New Architecture*, London, The Architectural Press, 1927, p.31
5. Banham, R. *Theory and Design in the First Machine Age*, New York, Praeger, 1960, p.20
6. Le Corbusier, *Towards a New Architecture*, op. cit., p.127
7. Collins, Peter, *Changing Ideals in Modern Architecture*, MOMA, NY, 1966, p.71
8. Hitchcock, H.R., and Johnson, P., *The International Style*, New York, Norton, p. 40-49
9. Le Corbusier, *Oeuvre Complete, 1910-29*, Les Editions d'Architecture, Zurich, 1964, p.128
10. While the tendencies I have described are surely widespread, it would be wrong to assume that all modern architecture falls into the categories etter, Rosemarie, 'Gottfried Semper', biography in the MacMillan Encyclopedia of Architects, NY, 1982, vol. 4., p.27
11. ibid
12. ibid
13. Summerson, John, "A Case for the Theory of Modern Architecture", *RIBA Journal*, June 1957, p.309
14. Ibid. I have enumerated. Mies' work in America and Kahn's architecture after the Salk Center certainly do not fall into these categories.
15. See Waddy, Patricia, *Seventeenth Century Roman Palaces, Use and the Art of the Plan*, Cambridge, The MIT Press, 1990.
16. Etlin, Richard, "Les Dedans: J.F. Blondel and the System of the Home", *Gazette des Beaux Arts*, Paris, April, 1978, p.140
17. Laugier, Marc-Antoine, "An Essay on Architecture," (translation of the 1753 edition), Hennessey and Ingalls, Los Angeles, 1977.
18. Semper, de Stil, London, 1853.
19. Rykwert, Joseph, "Gottfried Semper and the Problem of Style." *Architectural Design Profile: On the Methodology of Architectural History*, D. Porphyrios ed., London, 1981, p.12
20. Bletter, Rosemarie, "Gottfried Semper," biography in the *MacMillan Encyclopedia of Architects*, NY, 1982, vol. 4, p.27
21. ibid
22. ibid
23. Summerson, John, "A Case for the Theory of Modern Architecture," *RIBA Journal*, June 1957, p.309
24. ibid
25. Alexander, Christopher, *Notes on the Synthesis of Form*, Cambridge, Harvard University Press, 1964