Appropriate Means to an Appropriate End: Industry, Modernism, and Preservation

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This paper examines the role of industry and changing attitudes toward material conservation and the nature of authenticity as we take up the challenge of rehabilitating the vast legacy of the Modern movement.

Preservation has traditionally focused upon issues of materials conservation to validate the authenticity of approaches to intervention in historic buildings. In traditional building restoration, value is often directly linked to success in sustaining or reviving material through craft, and while this approach has resulted in an admirable improvement in both the variety and quality of craftsmanship in the marketplace, much of it is carried out by small (and very costly) operations tailored to a particular custom-made product.

Is it appropriate to apply these same values to the preservation of the works of the modern built environment? At its essence, the Modern movement celebrated innovative building technology and the harnessing of contemporary means of industrial production to foster economy and efficiency in building. As we develop criteria for preserving and sustaining the works of Modernism, we must also be prepared to rethink many of our traditional notions about architectural conservation. This reassessment includes taking the values that shaped the original works into account, such as:

- the purpose-built nature of many of the works, whose builders consequently imagined that once the program for which they were built was exhausted, the building would likely be demolished.
- the value placed upon experimentation in design and fabrication, which resulted in the development and use of many materials that had been inadequately tested and consequently have proved to lack durability over time. The materials themselves were often experimental or insufficiently understood substances whose conservation is either impractical or impossible, and the value of their conservation is highly questionable from the standpoint of sustaining the integrity of the artifact.
- the importance of the structure's newness to the impact of the work.

Modernism has produced many buildings that utilize material assemblies that have become technologically obsolete or no longer meet contemporary performance, life-safety, or sustainability standards and whose conservation therefore can become problematic.

Modern architecture has always been inextricably linked with the idea and the promise, if not the reality, of industrial production. The abstraction of the Modernist aesthetic allowed and even showcased the potential of the machine to deliver a product with precision and economy that could be produced on a large scale. Although these ideas were for the most part an illusion in the early years of the Modern movement — iconic works such as Le Corbusier's

Fig. 1. Ludwig Mies van der Rohe, Barcelona Pavilion, Barcelona, Spain, 1929, as reconstructed by Ignasi de Solà Morales, Cristian Cirici, and Fernando Ramos, 1983-1988. Photograph 2004. All photographs by author unless otherwise noted.

Fig. 2. William Welles Bosworth, Building 7, MIT Main Group, Cambridge, Massachusetts, 1938; restoration by Einhorn Yaffee Prescott, 2002. Photograph courtesy of A. J. Martini Construction, 2002.

Villa Savoye and Mies van der Rohe's Barcelona Pavilion were largely handmade — by the end of World War II, the construction industry realized that it no longer had to mask the potential of the machine-made product but could instead feature it as a critical component of the new aesthetic (Fig. 1). The building industry had been using mass-produced components for many years before the onset of the hegemony of Modernism, but these elements usually had their industrial nature obscured by both designer and fabricator alike and were made to appear as though they were in fact traditional architectural elements. A late example is William Welles Bosworth's monumental 1938 Beaux-Arts lobby for Building 7 at Massachusetts Institute of Technology (MIT), the last component to be constructed of the original MIT Main Group. The cast-stone interior is virtually indistinguishable from natural limestone (to the point where two professors of architecture who had been at the school for more than 30 years were not aware that the material was cast stone), and the balcony railings are filigreed metal panels in cast aluminum that are detailed and painted to imitate bronze (Fig. 2).

By mid-century the architecture of the Modern movement, in the guise of what is popularly understood as the International Style, had established itself as the accepted mode of building in corporate, institutional, and government circles. As tastes changed and the construction industry embraced the technology necessary to detail and build to this new aesthetic, industrial products became features and in many instances, along with the parallel decline in the use of ornamentation, came to define the essential character of a work of architecture.

Age and Newness

The value placed upon age of an artifact is something that has been recognized philosophically since the Renaissance rediscovery of classical antiquity, but it has particularly grown since the Enlightenment and the advent of the Industrial Revolution, when nostalgia for an idealized past became increasingly to be embodied in old buildings, which display, in Ruskin's words, the "golden stain of time."[1] Alois Riegl, writing in "The Modern Cult of Monuments" in the early twentieth century, identifies age value as one of three essential components — along with historic value and use value — that should be used as criteria for assessing the cultural value of the built environment.[2] Age value is achieved through the power of memory, which is produced at least partly through the encounter with materials that have acquired patina, the natural product of weathering and use that enables the material to be seen as having withstood the passage of time, thereby attaining heritage value. Whether it is cultural conditioning or an instinctive affinity, contemporary taste (at least in the West) appreciates and therefore values the patina acquired by most traditional building materials, such as wood, stone, and nonferrous metals like lead and copper.

Does age value have the same meaning when extended to the products of industry? In one sense there should be no difference, as the qualities of distance and remove will still be found in these products and nostalgia and the veneration of antiquity know no material bounds. There are many aged industrial products that are capable of engendering powerful emotional response (and financial value, as anyone with an interest in vintage automobiles is acutely aware). There is, however, a direct linkage in contemporary perception between the unblemished condition of an industrially produced artifact and its perceived value. Riegl recognized that newness was also an essential ideological component of many Modern artifacts and that the maintenance of this appearance of newness was essential to the ability of a work to sustain its value.[3] This theory is consistent with our view of vintage industrial products, as they are almost always more valuable when they appear new, rather than aged through use or weathering.

The theoretical writings that announced and promoted the work of the Modern movement used Riegl's notion of newness to great polemical effect. As much of the value of Modernism was posited as a contrast to the crowded, decrepit, and aged urban centers of Europe in the early twentieth century, the value of using industrial materials — in some cases precisely because it was perceived that they would not be subject to weathering — was part of the effort to promote the vision of a new, clean, healthy city, which would uplift the human condition through the deployment of contemporary technology and planning. In this case the material itself was of less importance than the values it represented as a product of industry. The Villa Savoye, for example, like other early works of Le Corbusier, utilizes steel sash, large expanses of glass, and metal-pipe railings set off against a seamless, neutral white field (in this case rendered masonry or painted steel), which defines the mass and sculptural articulation of the house (Fig. 3). The intent is that the white surface could be anything, so long as it appears to have been wrought by a machine. The pristine aesthetic of the industrial artifact — regardless of the ambiguity about the precise nature of the material — gave a particular meaning to the work, one that required constant maintenance in order to continue to communicate its modernity.

Over time, this ethos places a premium value on materials such as glass, stainless steel, or aluminum that can,

Fig. 3. Le Corbusier, Villa Savoye, Poissy-sur-Seine, France, 1929. Photograph 1987.

Fig. 4. Perry Dean Stahl and Rogers, Wellesley College Science Center, Wellesley, Massachusetts, 1974-77. Photograph 2005.

with routine maintenance, continue to be perceived as being untouched by the weathering process. Where Modern architecture utilizes natural materials beautifully finished in one-off applications, as may be found in the work of Frank Lloyd Wright, Alvar Aalto, or Carlo Scarpa, there is more of a focus on the quality and the inevitability of weathering, and it is one of the characteristics that distinguishes their architecture from mainstream International Style Modernism. But we be should wary of heralding these works as merely continuing the crafts of traditional building, as it is the extension of the notion of fine workmanship into the realm of industry, steps removed from the actual hand of the craftsperson, that renders quality and significance to the works of Modernism.

Modern Materials and Patina

Can modern materials acquire age value through patina? The inability of modern materials to age gracefully is a commonly held assumption — in which there is much truth — but is this really in some part a product of our own aesthetic prejudice? There is no question that aluminum, fiberglass, composition board, and polymers do not have the longevity of many traditional building materials, but in some cases the effects of weathering can yield unexpected results.

A case in point is the 1974 Wellesley College Science Center by Perry Dean Stahl and Rogers (Fig. 4). Here is a classic rendition of Leo Marx's "Machine in the Garden," with its exposed concrete frame, vigorously expressed steel-and-glass fire stairs, and stainless-steel laboratory flues. The Science Center is clad in many areas with prefabricated Kalwall panels, a material developed in the 1960s consisting of translucent, reinforced-glass-fiber sheets stretched over the interior and exterior sides of an aluminum frame. The fiberglass panels soon began to yellow due to their exposure to ultraviolet (UV) light. Initially, this change was a cause for great consternation on the part of the architect, owner, and manufacturer, and Kalwall has since refined the composition of the fiberglass sheets to better resist UV deterioration. One can, however, walking across the Wellesley campus on a late afternoon, come to appreciate the warm, tawny quality of these panels, not unlike the very tactile quality of aged celluloid one appreciates in the early constructions of Naum Gabo and Antoine Pevsner or even in the pick guard and binding of an old guitar. In this context, a case can be advanced that the aged panels in fact lend dignity to the overall appearance of the structure, especially as they are stable and remain structurally sound. The concrete frame, too, with all of its problems as an exposed material in a northern climate, has taken on a warm quality with age that is virtually impossible to duplicate (in a manner that will also be sustained through its own process of aging) with fresh material.

This situation then begs the argument as to whether these materials should be conserved, rather than being coated (concrete) or replaced (Kalwall), as part of any preservation strategy for the building. As has been noted, this decision is partially a function of taste — our culture does not consider oxidized, pitted aluminum to be beautiful, whereas copper, having been subjected to the same weathering, acquires a patina that is generally considered to be appealing — but we cannot today predict how taste might evolve in the future, nor can we say that better methods for the care of aged aluminum will not emerge over time.

Time has clearly transformed this building — but this transformation, in diminishing the newness value that was so much a part of the quality of the original structure, has also increased its age value. It has also altered our perception and hence, in some minor though fundamental way, our interpretation of the building. This change reflects the power of art to re-present materials, natural or synthetic, in ways that imbue them with latent cultural meaning, extending the view, which runs from Plato to Le Corbusier, that material is mute until it "receives its meaning from the human subject, e.g., the builder or form-giving artist."[4] With the passage of time and the attendant material changes, the preservationist must acknowledge the altered state of the resource in strategizing how to re-present the material, and hence the artifact itself, yet again with new meaning.

Fig. 5. The United Nations Headquarters Board of Design (Wallace K. Harrison, Director of Planning), the United Nations Headquarters, New York, 1952. The corridor outside the Council Chambers typifies the lack of ornamentation throughout the building's interior. Photograph 2003.

Repair or Replace

There are many instances, however, where the conservation of modern materials and systems is both impractical and uneconomical due to the realities of production and the scale of work to be undertaken. In these circumstances we must often confront and challenge accepted protocols, like the Secretary of the Interior's Standards, that place high priority on the conservation of original material in setting out a program for the renewal of a resource. The standards and the charters upon which they are based are correct in asserting the primacy of original material where those materials remain such that they retain value with age or are materials whose replacement with new fabric would diminish the aura, and hence the quality, of the original work. However, it is also true that in many instances where it is possible to rebuild a particular component and original material needs to be refurbished, the cost to conserve the original fabric is often considerable relative to the replacement value of the original work. This equation becomes particularly problematic when we are faced with rehabilitating industrial building components that range in scale from exit signs and recessed light fixtures up to entire curtain-wall systems. It is here that close collaboration with industry can often yield optimal results.

There is no common rule, nor perhaps should there be, as to how the decision is made to replace rather than conserve any building component: particular situations will dictate specific needs. All of us are familiar with the common assumption within the building industry that it is often easier or less expensive to replace something than to conserve it, and we are trained as preservationists to continually challenge this notion. In the case of most traditional materials, there is usually a real and perceptible difference between a restored original and a replacement, which gives credence to the assumption under which most of us work: that a restoration that conserves most of the original material, if done well, still embodies and communicates an authentic original character that can never exactly be duplicated with new materials. This assumption is not always true in the case of certain metals, where alloys of copper or bronze, for instance, can be duplicated and will weather over time and be indistinguishable to most observers from older examples of the same material. These alloys may in fact be considered industrial products today by their methods of controlled production, despite their being materials that were also used in traditional building. In the case of many industrial products, however, the argument for replacement can be based both upon the economics of the reduced cost of replacement versus restoration and upon the idea that there is considerable newness value in an industrial product that cannot always be captured in a restored element.

There is also a philosophical argument for using the products of contemporary industry and technology to refresh and augment buildings of the Modern movement. Many Modern buildings were meant to express the cutting-edge technology of their time, and we may argue that, as this technology is transient by its very nature, it is appropriate to periodically update building systems and components in accordance with contemporary standards of performance and sustainability. While we routinely provide these kinds of systems upgrades in all kinds of buildings, the expression of the systems is much less a part of the architectural expression in traditional construction than is typical in a mid-century Modern structure. This is particularly true in buildings, such as the United Nations Headquarters, that are largely devoid of architectural ornament beyond the definition of the space itself and where components such as recessed downlights, diffusers, door hardware, signage, and escalator housings become important character-defining elements (Fig. 5). In these instances the goal is typically to upgrade, often through considerable design effort, those elements necessary to meet contemporary performance and life-safety standards while keeping the scale and material type of the feature consistent throughout the project.

One of the most vulnerable elements in modern building construction is the curtain-wall assembly, and it is instructive to briefly compare two recent curtain-wall refurbishment projects and how they were affected by varying ideas of significance, newness, and authenticity.

The first of these is the well-known replacement of the curtain wall at Lever House in New York. Designed by Gordon Bunshaft of Skidmore, Owings, and Merrill (SOM) and completed in 1952, the original curtain wall was an early system (Fig. 6), rivaled only by the wall of the United Nations Secretariat tower (completed 1950) in its prototypical qualities. By the late 1990s the wall and its attachments to the structural frame had deteriorated to the point where the best option in terms of safety, longevity, and performance was to replace the entire system. This was done (by SOM, as well) with an eye to replicating the appearance of the original wall to the greatest possible degree so as not to disturb the primary character-defining element of the building, while providing a system that thoroughly embraces contemporary standards of curtain-wall construction and reinforces the quality of newness embodied in this building.

While well executed and generally commended as quality work, the project nonetheless has caused many preservation professionals to question whether the replacement is in fact authentic or if, as a simulacrum of the original curtain wall, it should have been somehow made to seem different from the original so that it might more truly represent the course of its replacement. Given the significance of Lever House to the history of mid-twentieth-century architecture and the iconic quality of the curtain wall as its essential, character-defining

Fig. 6. Skidmore Owings and Merrill, Lever House, New York, 1952. Photograph by Ezra Stoller, ESTO, 1952.

feature, a strong argument can certainly be advanced that this replacement was the correct course of action to preserve both the spirit of newness and industry embodied in this system and the appearance of the building.

The second example retains more of the original fabric but makes a conscious effort to express newness as change. Designed by Holabird, Root and Burgee and constructed in 1956, the International Union of Operating Engineers (IUOE) headquarters is a mid-rise urban office building in Washington, D.C., with a stainless-steel curtain wall originally glazed with green-tinted glass in alternating clear vision lights and opaque spandrel panels (Fig. 7). In outlining the program for a renovation in the late 1990s, the client stated a desire to update and "modernize" the appearance of the building, to recapture the sparkling quality that the building had in 1956, while "giving it a new look" and improving its comfort and energy performance. To the client, this goal initially meant the replacement of the curtain wall. It was fortunate, however, that the design of this particular curtain-wall system was sufficiently robust in profile, structural attachment, and gauge of material to permit an option to reglaze the wall with a redesigned glazing stop and insulated glazing units (IGUs) and to allow for improvements to be made in the flashing and drainage of the system without its wholesale replacement. In the end the owner was convinced that the original framing system could be retained in large part because the renovation architects, Einhorn, Yaffee, Prescott (EYP), were able to demonstrate that cleaning and restoring the stainless-steel wall would result, with the installation of new glazing (of a different color, at the owner's request), in a wall that appeared new (Fig. 8).

The IUOE building demonstrates a case where, on the one hand, concerns to maximize material conservation enabled the curtain-wall system to be retained, but the expressed desire of the (still original) owner for a fresh, contemporary, "new" look dictated an aesthetic change to an element — the glass — that would in any case have to be replaced for performance reasons. Although the appearance of the building has changed, the logic of its renovation is more readily apparent than it is at Lever House and is perhaps a more honest expression of what the building stands for today.

In the case of both Lever House and the IUOE headquarters, industry was brought in as a partner to help craft solutions appropriate to the problem at hand. Whether the intent is to reconceptualize the entire system, as at Lever House, with the goal of providing a visual replacement in kind or to modify an existing system with changes meant to intentionally distinguish it from the original component, it is often necessary to develop a new product — modifying profiles on an existing commercially available system in the case of Lever House or developing new glazing beads and drainage weeps at the IUOE. It follows that in seeking the best solution to these or any particular problem, the design team should use the opportunity to work with industry on the development of a product that the fabricator can then incorporate into its product line. This approach is practical in that it creates an incentive for the fabricator to control costs in order to have the opportunity to bring a new product to market, which consequently reduces the cost of the renovation through moving away from the idea of the work being a custom product. It also has the effect of sustaining the idea that to be modern (in the active rather than stylistic sense of the word) is to acknowledge and embrace change and with it a willingness to be constantly reinvented in order to reflect the state of the art. Within this paradigm, the concept of the power of newness heightens the Modernist character, which in turn contributes to the philosophical authenticity of the work.

At this point one may legitimately be concerned that we are entering into a realm in which preservation is marginalized, but such a trend may merely be one sign that preservation itself, as we have understood its general philosophy and practice since the Venice Charter, is in fact changing as part of the normal course of history. Here we return to the concepts of the appropriate versus the authentic. *Authenticity* is a word fraught with anguish and difficulty when applied to historic preservation — debates over what constitutes an authentic approach to rehabilitation have been with us as long as people have been conscious of trying to preserve cultural resources — yet it is a concept that must be defended in absolute terms once a position is taken (something is either authentic or it is not). It may be sufficient in our post-modern condition, where absolutes are rare and viewed with dangerous skepticism, to acknowledge that a given approach to a preservation project is merely one alternative among many representing a range of relative positions and that seeking what is appropriate and assuming an attitude that acknowledges the possibility and the value of both choice and change represents the more practical and stabilizing position as we husband the vast legacy of Modernism into the twenty-first century.

Postscript on Sustainability

The ever-increasing drive toward sustainable design and construction adds significant complexity to the equation of repair versus replacement and returns us to the simple mantra that to re-use something rather than to replace it conserves the energy embodied within an object: i.e., the energy to produce and deliver its replacement, as well as the additional energy that would be required to remove and dispose of the original. There are many practical situations that we are confronting in

Fig. 7. Holabird, Root and Burgee, International Union of Operating Engineers headquarters, Washington D.C., 1956-58.

Fig. 8. International Union of Operating Engineers headquarters, after renovation was completed by Einhorn Yaffee Prescott, 1998. Photograph courtesy of Einhorn Yaffee Prescott.

rehabilitating works of mid-century Modernism that address building elements that either affect energy consumption (curtain-wall assemblies, light fixtures, diffusers, etc.) or provide a specific life-safety or accessibility function (elevators, escalators, stair and guard-rail assemblies, exit signs, etc.) where, as is noted above, substantial change to the component may be dictated by code or performance standards. In weighing the decision as to whether saving an element is the best solution — from the standpoint of both design/preservation and sustainability — the ecological cost of refurbishing the existing component must also be evaluated relative to the energy consumed and lost if the component is to be replaced, if it becomes necessary to move the element any distance off site for refurbishment, and if the process of renewal must use either excessive energy or chemicals that may damage the environment.

Although many regional building traditions embody sustainable building practices in their siting and design strategies, the Modern movement nonetheless introduced the idea of sustainability as a scientific aspect of building design. Calculated orientation to the sun and breezes, roof overhangs, the use of Trombe walls, and other features of passive solar design began to be taught in the 1930s and employed for the first time in the immediate post-war era. It can be argued, therefore, that the sensitive incorporation of sustainability upgrades into a building whose generative philosophy included a mandate to be technologically and environmentally up-to-date is not only ecologically the right thing to do, but it is also compatible with the original intent of the work.

Sustainability should then become one more element in the matrix of criteria created to evaluate appropriate treatments for each of the character-defining elements of a Modern building. The quality of each element as an artifact unto itself and as a part of the whole and the relative importance of age and newness value to the overall aesthetic and meaning of the work all have to be factored into a complex equation with the economics of production and the sustainability goals of the project to determine the design and preservation strategies that will provide maximum benefit to the long-term viability of the resource. Early engagement and dialogue with industry is an important part of dealing with the design of any industrial component, and through this process we cannot only work to make our existing cultural resources more sustainable, but we can help to encourage more environmentally sound practices out of our partners in industry.

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Notes

1. John Ruskin, "The Lamp of Memory," in *The Seven Lamps of Architecture* (New York: Noonday Press, 1961), 184–185.

2. Alois Riegl, "The Modern Cult of Monuments — On Age Value" (1902), quoted in Demetri Porphyrios, *Porphyrios Associates* (London: Andreas Papadakis, 1999), 203.

3. Alois Riegl, "The Modern Cult of Monuments," quoted in *Oppositions* 25 (1982): 49.

4. Karsten Harries, "Is Stone Today More Stone than it Used to Be?" in *Matter, Mind and Architecture, Proceedings of the 7th Alvar Aalto Symposium, Jyvaskala, Finland, 1997* (Helsinki: The Alvar Aalto Foundation, 2000).