

Any seeing of an object by me is instantaneously repeated between all those objects in the world which are apprehended as co-existent, because each of them is all that the others "see" of it.

—Maurice Merleau-Ponty, *Phenomenology of Perception*

In front of a window seen from inside a room, I placed a painting representing exactly that portion of the landscape covered by the painting. Thus the tree in the picture hid the tree behind it, outside the room. For the spectator, it was both inside the room within the painting and outside in the real landscape. This is how we see the world. We see it outside of ourselves, and at the same time we only have a representation of it in ourselves.

—René Magritte, "Life Lines"

In contemporary architectural practice, the appearance of buildings largely results from the arrangement and assembly of premade products, a decisive instance of which is the selection of stock windows or glazing systems which give buildings their visual and formal characteristics. When one attempts to use the trade literature that advertises these products, one observes two kinds of information, aesthetic and technical, which give the architect a combined sense of unlimited freedom of choice, reliability, and improved performance. The emphasis on the window's function as a thermal barrier and light source has, indeed, led to advances in performance, but this emphasis has also had aesthetic consequences. For example, many manufacturers and architects select windows that preserve the form, shape, and look of traditional windows. Yet contemporary examples of the traditional sash window reveal variations in detail and function that result less



3.1
Bernasconi et al., Palazzo Olivetti,
Milan, 1955.

from aesthetic decisions than from performance requirements—variations such as mullions that are made thicker and heavier for the purpose of receiving two panes of glass (thermopane glazing) instead of one, or the use of snap-in plastic muntins on the surface of larger panes of glass. These changes in dimension have resulted in changes in proportion and have altered relationships commonly taken to be proper to a window's lineaments.

From the existing trade literature, one gets the impression that the aim is to “save appearances” and consequently save the traditional associations of these elements. In general, the emphasis is on preserving the image of the traditional window, rather than addressing the visual and aesthetic repercussions of technological advancements in window construction. Similarly, the interiors depicted in this literature often stereotype traditional ideals—whether domestic, professional, or industrial. But, given the current advances in window performance together with related changes in contemporary means of production, as well as doubts one might have about the acceptability of these stereotypes, assumptions about the need to save appearances should be reconsidered. Our aim in this chapter is to undertake this reconsideration, and to do so by reflecting on the meanings of the term “performance” when applied to an element such as the window.

DE-VIGNOLIZATION

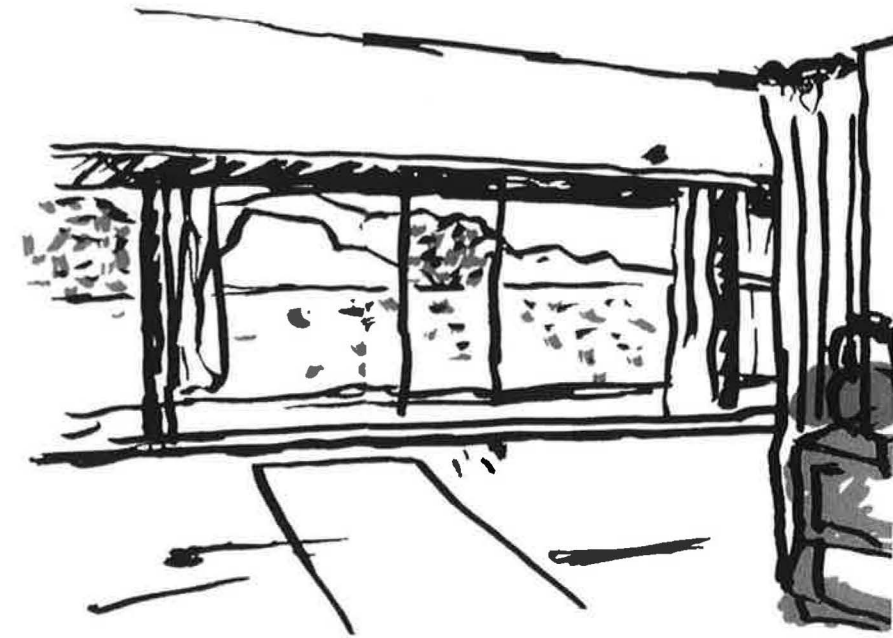
Le Corbusier once claimed that the history of architecture was the same as the history of the window.¹ Before the twentieth century, he argued, architectural history had followed the development of the load-bearing wall punctured by apertures. Accordingly, the rules of this architecture were based on Vignola's codification during the Renaissance of the tenets of Greek and Roman art, then highly honored. Despite his admiration for the Acropolis, Le Corbusier found the idea of eternal rules for expressing “the nobility of the human spirit (the academic profession of faith)” to be false. Thus his proposal to “de-Vignolize” architecture was as much a reaction to the architectural limitations of these rules as it was to the persistent and widespread success of their contemporary practitioners—made more personally acute after the debacle of the League of Nations competition.

While “Vignola” had been concerned with the area between the windows, (walls, pilasters, and columns), Le Corbusier's “de-Vignolization” of architecture, combined with his affirmation of “architecture [as] lighted floors,” proposed a

treatment of the window as an element in itself. The introduction of the horizontal window as one of Le Corbusier and Jeanneret's "five points of a new architecture" was a reflection of their concentration on this element.² They argued that the regular perforations of the surface of the facade were the pure expression of a system of construction; when that system of construction changed, so should the expression. The use of steel and reinforced concrete led Le Corbusier to advocate the long, continuous, horizontal window, a window with no apparent limit, paralleling the landscape's horizon. Windows of this sort were imagined as part of a "free facade," two important aspects of which were its absence of supportive quality and its detachment from interior partitions. As such, the facade and horizontal windows had great geometric clarity and aesthetic significance. The result of allegiance to contemporary constructional possibilities was for Le Corbusier "spiritual enjoyment, [apparent in] proportions . . . thin verticals . . . unbroken surfaces . . . [serving as] the basis of architectural sensations."³

In *Precisions*, the horizontal window was presented as an instrument for increasing the amount of light in a building's interior. Accenting another kind of performance, in *The Radiant City* Le Corbusier celebrated the glass wall as the "lungs" of the building.⁴ Horizontal glazing was also a device for joining the room to the landscape, particularly when the latter was conceived as an extended horizon. Through this instrument the landscape and the building were both sited and sighted. In *Une petite maison*, for example, the building's siting resulted from placing a viewpoint in the landscape (geographically and topographically), and this viewpoint was focused through the horizontal window.⁵ Plan and plot were joined through view: "In my pocket was the plan of a house. A plan without a site? The plan of a house in search of a plot of ground? Yes! [The location] offers an unparalleled view, which cannot be spoiled by building, [a view] of one of the finest horizons in the world . . . the plan is tried out on the site and fits it like a glove."⁶ The house as an instrument for "survey of" is permanently "sited within" the landscape. Thus the window's sheet of glass is self-reflexive; in it and through it, landscape and building collapse into a spatial and visual slippage in which reciprocating views make a continuous horizon.

Le Corbusier broadened this principle in later writings and projects. In *Precisions*, for example, horizon is all-inclusive, making prospect equivalent to nature; hence the striking formula: "composition: geometry + nature = humanity."⁷ This formula served as a commentary on a set of images in which



3.2
Le Corbusier, horizontal window from
Une petite maison (1954).

windows demonstrating different construction techniques were also capable of joining parts of the landscape together: foreground, roads, and trees with background mountains. This joining was neither direct nor traditional, however. With the vertical window, the connections between inside and outside were naturalized in at least two ways: (1) by paralleling the form of the window with the upright posture of the viewer's body, and (2) by instituting an inhabitable space in the thickness of the window wall, making an experiential threshold between street and room.⁸ The horizontal window, on the contrary, instituted a virtual connection and a physical separation between landscape and interior; its thin glass plane served as a mechanism for framing the panorama of nature, rendering it artificial on and through the surface of the ribbon window. The window as an element of separation formed a distance across which connection assumed recollection, or joining presumed memory, so constituting a horizon of yearning.⁹

The building's structure played a particular role in this horizon. Le Corbusier's large buildings of the 1930s developed different variations on the free facade, windows, and load-bearing columns. In the Salvation Army building, for example, concrete columns are recessed behind the front glass plane and the edges of the slabs are tapered, seemingly to escape notice. The load-bearing elements of the Swiss Pavilion, however, approach the outer surface and engage the primary divisions of the window just behind or beneath its surface, rather like the recesses behind the glass plane but also interrupted by the outer edge of the floor slab. The Clarté apartment building represents a third alternative; structural steel columns are coincident with the building's outer surface, in both plan and section. Horizontal ribbon windows, like those developed in the little house on Lake Geneva, still exist on the facade of this third case, but with an important difference. In the Clarté apartments, the stratification of a lower, middle, and upper part of the interior wall is achieved by distinctions between transparent and translucent glass, rather than between solid wall and glass. The transparent surface forms the middle level, which is also the largest and becomes the horizon of viewing. The result of this new treatment of the wall is that two different readings are possible: on the outside the glass wall reads as a continuous surface, and on the inside as an interior horizon. The continuity of surface on the exterior results from the sameness of material (glass) in much of the facade, but also from the regular subdivisions of its parts, fully coincident and coplanar with the intervals of the structural frame. From the apartment interiors, no such comprehensive view is possible; each unit is planned with its long dimension perpendicular



3.3
Le Corbusier and Pierre Jeanneret,
Swiss Pavilion, Cité Universitaire,
Paris, 1932.

to the facade, reducing the linear and horizontal dimension (in contrast to the house on Lake Geneva) and making the interior horizon coordinate with the space of the room. The external balconies extend the space of the room into the exterior, as they subdivide the surface of the facade. Their purposes are many: (1) providing an external room for the apartments, (2) serving as sunscreens on the south side of the building, (3) recalling the typology of local apartment buildings, (4) acting as a permanent scaffolding during construction and after for maintenance, and (5) dividing the facade into two-story units that correspond to the structure of the apartments. As such, these balconies acknowledge the purposes fulfilled by apertures in traditional (thick) wall construction but in this case with thin, lightweight, and industrialized elements. Ironically, this incorporates aspects of the vertical window into its opposite; inhabitable space has been reinterpreted through an assembly of lightweight elements. This "wall" can be seen as infill, window wall, and uniform plane.

VIEWING THE LANDSCAPE

The images of the Clarté building that Le Corbusier published in his *Oeuvre complète* illustrate views through the interior and beyond the balcony, into an open landscape.¹⁰ This type of view recurred in his photographs and drawings; it can be seen in the drawings of the Wanner apartments, the *petite maison* on Lake Geneva, the Villa Cook, and many other projects. Even in the views of his own apartment interior, on Rue Nungesser-et-Coli, this type was significant.¹¹ In very few of these photographs, however, is the immediate adjacency of neighboring buildings apparent; nor, for that matter, is the urban situation. Instead, Le Corbusier develops a photographic version of landscape painting.

A very simple but indicative drawing published in Jules Alazard and Jean-Pierre Herbert's *De la fenêtre au pan de verre dans l'oeuvre de Le Corbusier* represents a window wall made up of its key elements: an outline frame, a horizon, and verticals. While clearly a window, this also appears to be a canvas or a tableau onto which a landscape is displayed, at least a landscape reduced to its representative elements. The figures rendered in this landscape are as few as the lineaments that divide the composition, but they are just as significant. In the middle ground are a modulator man, trees, and the sun. The traditional division of prospect into foreground, middle ground, and background is condensed in this image onto the flat surface of the window/canvas by means of the horizontal and vertical glazing



3.4
Le Corbusier, Clarté apartments,
Geneva, 1932.



3.5
Le Corbusier, Clarté apartments,
balcony, Geneva, 1932.



3.6
Le Corbusier, window wall, 1932,
from Alazard and Herbert, *De la fenêtre
au pan de verre dans l'oeuvre de Le
Corbusier* (1933).

bars, which act as regulating lines on the "canvas" and horizon lines in the landscape. This condensed image is less an interpenetration of inside and outside than an arrangement of lines that denaturalize the landscape by appropriating it into the regulating geometry of the painter's (modulor) eye, thus merging window construction with landscape composition. Pages of *The Modulor* illustrate the applicability of this geometry to buildings, their details, and landscapes, once again condensing the whole into a regular pattern. Modulor geometry governs buildings and landscapes, establishing a law of composition and of perception. Quite apart from its subdivisions, the horizontal frame of this window carries associations with landscape paintings, suggesting landscape siting even when it is located within an urban context. This contradiction between the landscape and the urban condition is, perhaps, most evident in one of Le Corbusier's drawings of the interiors of the Wanner apartments in Geneva, where the view of the suspended garden shows distant hills and a landscape devoid of inhabitation, despite the density of the existing block arrangement and the building's proximity to others.

The use of the horizontal window in Le Corbusier's architecture suggests that this contradiction between intended horizon and existing context can be generalized for much of modern architecture: contrary to what drawings such as this aspire to, the vision of an unlimited natural vista has rarely been achieved in the dense urban projects of modern architecture.¹² In America, for example, many social housing projects utilized the picture window on the ground level as if they were facing a landscape, yet this urban space was hardly pastoral and in fact became, in far too many cases, something of a war zone. Above this level, however, openings onto "nature" allowed for uncontrolled gazing into neighboring windows—which Magritte illustrated ironically in *Eloge de la dialectique* and Alfred Hitchcock portrayed dramatically in *Rear Window*, showing nearby openings as the site of a revealing plot.

One unintended result of the use of the "Corbusian" horizontal window in dense urban settings is that conventional ideas about openness and visibility have been called into question. When the natural landscape is replaced by the urban, the window as a place for viewing out becomes also the place where others peer in. The transformation of the singular (outward) view into potentially reciprocating views (looking at and being looked at) thus destabilized conventional understandings of the function of windows. In films like Hitchcock's, this situa-

tion prompted voyeuristic experiences ranging from titillation to intrigue to surveillance.

OPACITY AND TRANSPARENCY

The potential richness of this dialectical urban situation is apparent in paintings contemporary with Le Corbusier's designs, especially those by Raoul Dufy and Henri Matisse. Dufy's *The Studio in the Impasse de Guelma*, for example, consists of a doubling or multiplication of windows, such that the division between inside and outside is made unclear. Through an open door, in the depth of the interior space, an arrangement of paintings mainly depicting seascapes reflects the appearance of a window. In the middle of the room, behind a foreground canvas, a large window opens onto the upper horizon of an urban scene. Unlike images that simply and unambiguously distinguish inside from outside, Dufy's painting disturbs conventions by exchanging near for far and inviting the viewer to remake topographical distance according to clues of pictorial construction. Rather than recognizing something familiar, we witness the advent of a situation we participate in making.¹³ The painting does not represent a conventional situation but proposes one to be constructed. It is pointless to debate the modernity of this image; what matters instead is the openness of the situation.¹⁴ One could find beneath the objects that fill the space of Dufy's painting the regulating geometry of Le Corbusier's wall window, but, in the absence of the pure "natural" landscape of Le Corbusier, Dufy's landscapes build up a spatial situation as much through transparency as through opacity. This opacity is built up by coordinating all of the things relevant to the situation, akin to a stage set and its "props." Not empty though, nor a space through which vision and action can freely pass, this is a set or setting that is *thickened* by relationships among things, whereby they cover and uncover themselves, each occluding the edge of the other, making points into the distance virtually continuous. In pictorial composition this transforms the window of perspective into a field or horizon of practical affairs.

Even greater opacity exists in the window scenes painted by Matisse.¹⁵ Unlike Dufy, Matisse builds up the density of the image by planes or fields of color and pattern rather than the coordination of "props." The result, however, is the same: a spatial situation in which exterior and interior develop new, or nonperspectival, relationships of coordination and interpenetration. Consider, for



3.7
Raoul Dufy, *The Studio in the Impasse de Guelma*, 1935.

example, Matisse's *Red Interior: Still Life on a Blue Table*. The dominant color and pattern spread themselves across the floor, up the walls, and outside the door/window into the garden without gradation of color intensity or interruption of pattern. Although the absence of conventional perspectival depth flattens the space of the image, the red zigzag joins the parts of the scene together as one "horizon." The blue of the foreground table and the green of the background trees strengthen the unity of the red middle ground by providing strong contrast. The window, which in conventional constructions is viewed as an instance of spatial division, is, in the midst of this expansive red pattern, an instrument for upturning the outdoor terrace, causing the garden itself to advance frontally toward the plane of the tabletop flowers, thereby exchanging its far for a near position—as if the flowers have been returned to the place from which they were taken. Spatial depth is also flattened by the foreground table, which is more or less circular in shape, as if it had been turned so that its top side faces front, not its front edge; the same is true for the apples. Because the space of the room is so thin, the window allows the viewer to variously merge and separate the landscape and the interior. While different from Dufy's painting, Matisse's image likewise allows us to reimagine the nature of the window as an instrument of spatial separation. Rethinking the window in representation leads to reconsidering the "view" or "look" of its setting. This perspective, as a way of seeing settings of this kind, is both a graphic construction and a way of constructing reality through representation.¹⁶ These paintings disavow perspective construction, or at least challenge it, and in so doing serve as the basis for a different construction of reality—at least the reality of residing at the edge of an interior. Linear perspective is not neglected in this challenge but is rediscovered as a topic of seeing, understanding, and imagining the interior and the exterior landscape.

The *locus classicus* of discussions about the early construction of perspectival depth is the drawing by Albrecht Dürer illustrating the construction of a perspective drawing.¹⁷ In this well-known image, the space between the male painter and the female model is interrupted by a grill, which intersects the cone of vision at right angles. The grill is duplicated on the artist's panel and with it the three-dimensional figure of the model depicted in two dimensions. The frontal view Dürer has constructed for us is at right angles to the painter's cone of vision. If our view is legitimate and conventional, the painter's view of the reclining figure is hardly so. Both, however, make up this window scene. The monocular correspondence between what is seen through the grill and what is drawn on the

artist's panel also fixes the "correct" position from which the drawing has to be viewed. From a different and therefore "incorrect" vantage point, another subject would be seen; one obviously irregular in the space of "legitimate constructions," but also, and perhaps because of its illegitimacy, one that could be seen as open and suggestive of other (and new) constructions.

THE OBLIQUE

The perspective frame is productive, then, in two ways: it produces affirmative constructions when used correctly, and it produces aberrations when used obliquely. A preference for the first sort of fiction cannot be sustained—even if thought desirable—because changed vantage points reveal different realities. This was demonstrated in anamorphic constructions from the time of Leonardo onward.¹⁸ These sorts of images emerged in the faithful pursuit of legitimate constructions as an attempt to compensate for distortion resulting from viewing distances that were too short or too long.¹⁹ In anamorphic projection, the figure's outlines are projected beyond themselves so that when viewed frontally they exhibit distortion, so much so that they become virtually unrecognizable. Only when seen obliquely, matching the viewpoint with the point of the (visual) pyramid, does the figure appear correctly. Frontal distortion dislocates viewing, thereby instituting a space between two constructions (the frontal and oblique). The spectator is invited to imagine a view that appears at the margins of the one presently seen. This provides the viewer with the opportunity to imagine contents in the deformed image—bringing forth the recognizable (hills, horses, houses) out of the incomprehensible—together with the possibility of selecting the "correct" view at the margins, which carries within itself traces of the former ("incomprehensible") view. True, correct, and proper in this sort of viewing are always probable, denying fixed and monocular frontality.

Some architects have recognized and utilized the opportunities of oblique views. Alvar Aalto's Baker House (1947–1948) at MIT is an example of a building that inscribes the oblique view. In an effort to escape, as much as possible, the disturbing prospect onto a street with heavy traffic, the facade of the building was curved in plan, avoiding where sensible the placement of windows parallel to the street. Preferred instead was a diagonal line of sight, as in the case of the view onto the landscape from the windows of a moving train.²⁰ Aalto's windows at Baker House are orchestrated so that they form a field that acts in conjunction



3.8
Alvar Aalto, Baker House,
Massachusetts Institute of Technology,
Cambridge, 1947–1948.

with the building's curving wall. The field of the windows and the curve of the wall decelerate the speed of moving objects on the street by expanding the limits of the visible horizon across which objects move. The windows used in this building are conventional, but their oblique placement on the site modifies both the building and the city—the way it is made and is discovered.

Diagonal views also appear in De Stijl architecture, as a result of “centrifugal” plan composition.²¹ In Gerrit Rietveld's Schroeder house, for example, the main points of van Doesburg's “Plastic Architecture” have been realized; it is anticubic, dynamic, and “transformable” in its plan and elements. The windows in the living room of this house occupy the corner of the plan. When they are closed, they conform to the planar, frontal composition that assumes a frontal view, as do the other windows in the house. When they are open, the corner disappears, allowing an oblique view of the landscape and denying their frontality. Furthermore, their placement perpendicular to the facade when open suggests sectional views, extending and destabilizing the virtual limits of the house. This is particularly evident from the balcony, where the open window allows an unexpected view of the landscape from a vantage point within it. In all of this the window serves as the prop for discovering new and unexpected relationships between the inside and outside.

This window, like any other, relies on mechanisms of operation, instruments of opening and closure. As props, these devices also set up one's sense of the way the building will perform. In modern architecture, the picture window opened the interior onto the exterior, but it also, and perhaps as a consequence, led to the development of new devices of enclosure, both moving and fixed. Replacing and reinterpreting traditional elements such as the curtain and shutters were rolling and concealable blinds, as well as sunscreens and different types of glass. These elements allowed for the adjustment of relationships between the interior and exterior, serving as props of performance, not only in the technical or functional sense of (thermal) performance, leading to comfort, but also as the indispensable props of the building's situational performance.²²

Examples such as Baker House or the Schroeder house change the role of the window from a device limited to looking “at” the panorama to one that also includes the making of the building itself—its siting, plan, and section. In these buildings the window performs a function in excess of pictorial visibility. While both window types still prioritize seeing from inside to outside, these examples



3.9

Gerrit Rietveld, Schroeder house,
Utrecht, 1924.

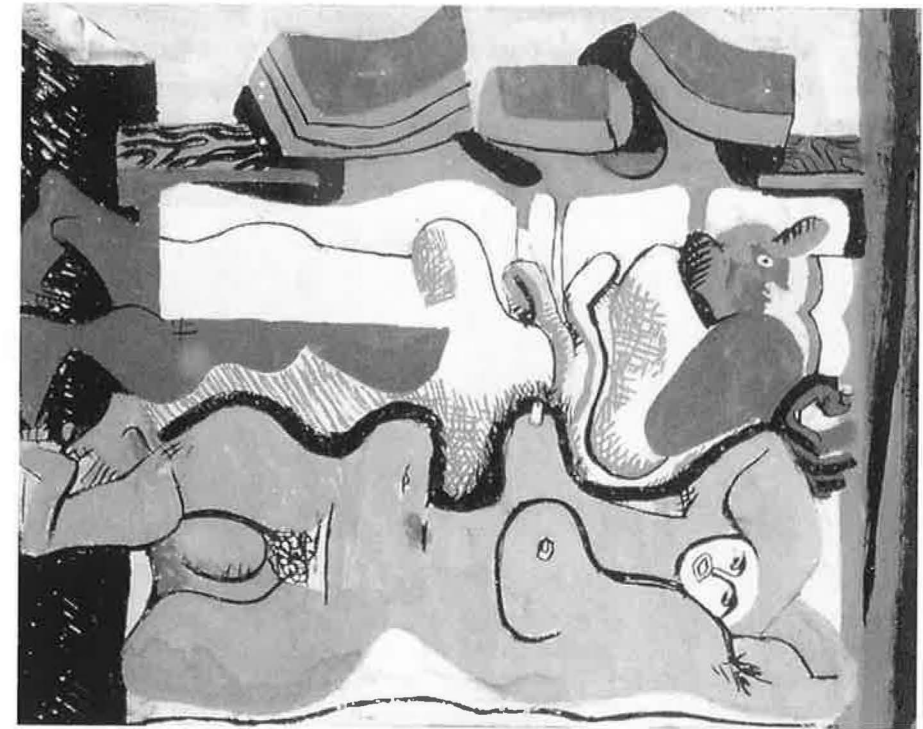
delay the immediate appearance of the “natural” landscape, which was at the heart of the purified and “hygienic” terrains of Le Corbusier’s urbanism.

THE PAINTED VIEW

The connection between the horizontal window and the landscape was further reinforced through the proportional similarities between these windows and the elongated horizontal frames used in paintings of landscape. Historically, much of landscape painting has been reaffirmative, utilizing and representing the social stability associated with nature and the countryside. Seen this way, the horizontal window as “framed landscape” can also be understood as a perpetuation of the morality of the nineteenth century—especially in that century’s opposition to the congested and polluted city. In addition, there are many direct links between the depiction of idyllic nature in nineteenth-century French paintings, for example, and the figure of the rural working mother “as elemental, untutored—hence eminently ‘natural’ female—[and] the ideal signified for the notion of beneficent maternity.”²³ The allegories of woman as nature in Western art have led to the literal juxtaposition of one with the other. According to C. M. Armstrong, “the female nude, when free of narrative situations, is most often constituted frontally and horizontally—as a kind of landscape, its significant part the torso, its limbs merely elongations of the line created by the supine, stretched out torso.”²⁴ The associations between nature and the female body were also explored by Le Corbusier. In a series of drawings dating from 1932, one can see the direct reciprocities between what he saw as nature and the feminine. In one drawing there is a tree that can also be read as a voluptuous woman; in a later painting, *Nu féminin allongé et femme allongée au livre*, a reclining woman is directly juxtaposed with the landscape. Similar images exist in other works, especially the *Poem to the Right Angle*. In all of these images, “landscape” and the female merge as “nature.”

THE DEPTH OF THE WINDOW WALL

All frames have depth, whether horizontal or vertical. For the frame of the window, and especially in modern windows, depth is of great importance. One might argue that Le Corbusier’s development of the *brise-soleil*, the sun-breaking device for creating shade and shadow within the facade, also led to the denial of the frontality of the facade, creating an “in-between” spatiality belonging as



3.10
Le Corbusier,
*Nu féminin allongé et femme allongée au
livre*, 1936.



3.11
Le Corbusier,
Carpenter Center for the Visual Arts,
Harvard University, Cambridge, 1963.

much to the inside as to the outside. Other props of this sort, such as *ondulatoires* or sun shades for the adjustment of light and view, have their equivalents in traditional windows, such as the ingenious designs of the Renaissance window, with its attention to transparency and ventilation as well as its devices for the control of light intensity (blinds, curtains, louvered shutters, etc.). The depth of the frame, in both modern and traditional windows, is as much a space of “adjustment” as it is of view; that is, while it is something seen and seen through, it is also an instrument that simultaneously connects and changes opposite situations. This makes it both passive and active: a receptacle, like the human eye, but also a tool, like a person’s hand. The instrumental or handy nature of the window is often suppressed for the sake of general appearances.

TAKING STOCK

The contemporary residential stock window incorporates many technical advances. For example, it is relatively maintenance free, has a higher U value than traditional windows, and has better sealing details. It has also benefited from designs developed in the industrial and commercial sector. Nevertheless, in the United States there has been little design collaboration between residential and commercial manufacturers, in part because of specialization and differing economies of development. As a result, the residential market has been dominated by manufacturers of wood windows who see the reduction of cost and technical improvement as their main task. Less attention has been paid to the reexamination of these windows, especially their profile but also their use in a series to form a window wall. We have already observed the tendency to “save appearances” in the design and selection of these windows. The use of different types of wood trim to cover up the connections between the premade window and the rough opening also, if inadvertently, reinforces the traditional look of stock windows. Concentration on technical performance in window manufacture has taken for granted aesthetic performance but also, and perhaps more importantly, has taken for granted, or not explored, the window’s *situational* performance. The architecture inscribed in the stock window requires certain details that often preclude the possibility of its use.

Contemporary window manufacturers try to illustrate aesthetic, technical, and situational performance in their marketing literature. Performance in each of these senses is measured against an assumed sense of what is proper. The question

one should ask of this literature is how this suitability is understood, especially in view of the nature of the window as something that can be adjusted. Most stock windows marketed and sold today reaffirm the traditional look, creating a sense of authenticity through appearances. Performance in such an "authentic" situation amounts to the *virtual* reenactment of a routine that is taken to be certain and correct, at least visually so, because it equates "look" with social action. But this kind of reenactment is neither contemporary nor particular, let alone emancipatory.

BORDER ADJUSTMENTS

We have seen that the window is not only an instrument of seeing, or establishing the look of a building; it is also an instrument of adjustment: not only an "eye" but a "hand." When the window's parts—its shades, curtains, shutters, sashes—are moved, the room or settings in which it is placed also changes. These changes are apparent in lighting, temperature, noise, and other qualities that characterize and define the setting. Qualities such as these are not essentially visual; nonetheless, they contribute to the *construction* of the setting's character. Character in this sense is the outcome of the relationship between the social practice of the situation and one of the instruments of its definition.

The same reciprocity exists when considering the building's exterior. The window reframes the exterior at the same time as it remakes the interior. We have seen this already in the case of Le Corbusier's landscape drawings and the paintings of both Dufy and Matisse: the window is both passive and active, a receptacle and an instrument. If marginal (to the exterior view or qualities of interior light), it is also productive, "coming against, beside, and in addition [to the work done], not falling to one side, it touches and cooperates within the operation, from a certain outside . . . like an accessory that one is obliged to welcome on the border, on board [au bord, à bord]." ²⁵ Oblique and anamorphic views had the same consequences.

Accordingly, a ready-made or stock window, whether traditional or modern, is not necessarily "incorrect" in itself. When diverted from the context of its visual (and at times the fixity of its historical) "authenticity," the stock window can be replaced/misplaced into new spatial situations that allow it to "adjust" or construct alternative frameworks for contemporary social practice. As a matter of built fact, this adjustment occurs in the space of tension between the window

itself and its field, the wall, at the border of the building and its sites/sights. Accordingly, the choice does not lie solely in the selection of a modern horizontal or traditional stock window, but rather in the specific and situational modifications that are made to a window's lineaments as part of a constructed location, in order to inscribe architecture with the effects of its particular and circumstantial properties.

VERTICAL AND HORIZONTAL

The correspondence between aesthetic quality and technical possibility is similar to the case of the frame buildings in Chicago; there, too, production led to representation, in particular that of the backs of the buildings. When these frame buildings rose above the heights of traditional buildings, they had a uniformity of skin treatment on all sides, making them objectlike or volumetric. Le Corbusier also argued for a direct correspondence between systems of construction and representation on all sides of a building, although he did differentiate fronts from backs, as in the Salvation Army building, the Swiss Pavilion, and many of his houses, most notably the Villa Stein in Garches. And he did "compose" facades. In this, his stance can be distinguished from the position adopted by Auguste Perret, with whom he quarreled about the qualities of vertical and horizontal openings. ²⁶ Apart from their debates about the quality and quantity of light in the interior, Perret observed that Le Corbusier's intention was primarily aesthetic; this was, he thought, the only conceivable rationale for his "torture" of the windows—their exaggerated lengths and reduced heights. Le Corbusier's purpose, Perret observed, was either decorative or to give the impression of volume. Certainly the exterior compositional geometry of the free facade was important to Le Corbusier, but equally so were some of its other qualities: flatness, lightness, and thinness. Mass-produced elements, which Le Corbusier praised often and insistently, also had these qualities. And obviously, they were produced repetitively, too.

In his rejection of Perret's vertical window, Le Corbusier overstated its traditional character. Indeed, windows of this kind, the kind that linked street, garden, and sky, had existed for centuries. But Perret himself interpreted and transformed this type. While in continuity with the anonymous tradition of Parisian urban architecture and reminiscent of the openings in neighboring buildings, his windows, like the wall into which they were placed, also acknowledged

the possibilities of a new structural rationality. The windows of his apartment building on Rue Franklin (1903) are surrounded by a framework of post and lintel construction that brings to the surface the building's concrete structure.²⁷ No longer a display of decorative motifs on a masklike surface, opened only by "punched" windows, the facade has become the site of an interplay between frame, window, and panel, in which depth is achieved by the spatial carving of volumes within the facade bay by recesses in its central bay. Frame and panel are sharply distinguished, too: contrasted with the smooth and flat planarity of the frame's cladding are the mosaic-faced panels, which have for their surface a compacted depth or sedimented thickness juxtaposed to the smooth qualities of the frame. In Perret's Rue Raynouard apartment buildings (1929–1932) the vertical windows remain, but the strong contrast between frame and panel has been reduced as a result of the similar color and finish of the materials—concrete frame and stone panels. As a consequence, the facade is more planar and the panel appears more like infill. This effect is especially evident on the back facade, where the play of volumes gives way to a flat surface. The alignment between surface and structure on this facade achieves the correspondence between building production and facade articulation that Le Corbusier advocated, as well as an increase in window area, even with vertical windows. While they are typically urban and Parisian, Perret's facades are also able to achieve entirely modern effects, in that they admit more light than traditional types and modify their appearance through new construction methods. More significant than differences between the vertical and horizontal orientation of their windows is the fact that both Le Corbusier and Perret reinvented the wall and its windows; the first by rejecting the figurative or anthropomorphic tradition, and the second by transforming it.

MISALIGNMENTS

The play between vertical and horizontal within a composition of frame, panel, and window was central to the work of Giovanni Muzio in the 1930s, such as his apartment buildings on Piazza della Repubblica in Milan. The Palazzo Bonaiti, the largest of these two buildings, can be seen as an example of the palazzo type, demonstrating compositional geometry through the use of surface ornaments, particularly pilasters and entablatures.²⁸ Both the load-bearing elements and the infill cladding are built out of brick. The distinction between frame and panel, which was reduced in Perret's Rue Raynouard, is in this case reduced



3.12

Auguste Perret,
55 Rue Raynouard, Paris, 1932.
Photo: Charles H. Tashima, 1991.

even further through the use of one material for purposes that could be seen as opposites. Furthermore, the composition of the facade lacks the categorical distinction between vertical and horizontal elements observed in the buildings of Le Corbusier and Perret, showing instead an intermixing or combining of elements in the horizontal balconies with their vertical openings and recessed horizontal surface banding. Even though a structural frame appears across the face of the building, in certain places, such as the entryways, there is a misalignment between the expressed and the structural frame. On the upper levels a clear distinction between walling on the exterior and structure on the interior is apparent; what appears on the outside as the structural frame *represents* the actual load-bearing elements hidden within, but corrected. This use of “structure” as image also makes the “infill” panel ambiguous: it is both integral with a wall and contained within a frame, which also means it is both heavy and lightweight. This hiding and revealing of the frame in Muzio’s Palazzo is, then, distinct from Perret’s use of the frame as the necessary expression of built form. For this reason also, Muzio’s building can be seen as an attempt to reconcile the modern use of the structural frame with the traditional use of the classical orders.²⁹

Misalignment between the openings and intervals of a structural frame is also apparent in Adolf Loos’s building on Michaelerplatz, Vienna (1909–1911). This building has, in fact, given rise to considerable debate and confusion about “rational” building, or the conformity between structure and appearance.³⁰ As in the example from Muzio, the structural frame in the Looshaus is variously hidden and revealed; not, however, in all parts of the facade but according to its three main levels: entry, mezzanine, and residential floors. Behind the facade’s surface is a load-bearing concrete frame. The regularity of this frame is interrupted at the height of the mezzanine floor by an exposed beam—steel clad in copper—that transfers the load of the middle bays to the wide piers at either end. The striking fact about this beam—itself an emblem of modern industrial production, precedent for which can be found in William Le Baron Jenney’s Manhattan Building in Chicago (1889)—is that it *appears* on the surface of the building; it coincides, in fact, with the capitals of the Doric order that defines the entry. The main part of the building’s load-bearing structure, its concrete frame, is by contrast buried within or disassociated from the surface. Further, the entry-level Doric columns are non-load-bearing, for they arrived at the site after the frame had been completed and were inserted into the structural system, not as a supportive part but rather hung from the structure. While the columns may not



3.13

Adolf Loos, Goldman & Salatsch store
(Looshaus), Vienna, 1911.

Photo: Charles H. Tashima, 1991.

belong to the structural system, they do have a place on the site, as Czech and Mistelbauer have shown, marking the building's threshold and imitating the entry porch to Michaelerkirche. In a contemporary cartoon, with Fischer von Erlach in the foreground, yet another aspect of the facade is shown: its modernity, revealed in punched windows, large open expanses without columns, and flat unornamented surfaces. The fact that the building was hotly debated during its construction attests that it represented to Loos's contemporaries a break with tradition, while the use of the facade as a catalyst for the redefinition of the context shows Loos's willingness to hide the building's modernity. As a consequence, the facade is neither modern nor traditional, presenting a selectively exposed frame and a wall. What appears of the frame is contained within the wall. The same distinctions exist among the entry-level picture windows, mezzanine-level bay windows, and residential-level punched windows. Unlike in what exists of the frame in Perret's buildings, no comprehensive or total visual rationality of structural form is attempted here; instead, parts have *local or situated rationality*: the civility of the street entry, the serviceable appropriateness of the mezzanine with daylighting provided by the translucent wall of the tailor's workshop, the typically framed domesticity of the apartments, and the "modernity" of the roof. The building's windows, like its "cladding," situate it in its location.

CLADDING AS CLOTHING

It was within a horizon of social practice and urban experience—the city—that the Looshaus facade was developed, making it both unique as an object with various and particular parts and at the same time commonplace or anonymous, in conformity to an idea of Viennese architecture. Loos expressed his ideas about facade cladding in his commentary on clothing: "To be dressed correctly . . . is to be dressed in such a way that one stands out the least."³¹ This statement bases aesthetic judgment on commonplace cultural interests and social practices: the dressing of an individual is identified or contrasted with the dressing of the collective. This premise generalizes the idea of the "commonplace"; in fact, the "everyday" to which Loos referred was not widely shared in Vienna or any other city—not even in London, which for Loos was the center of contemporary culture. What he hoped would be "unnoticed" was really less "common" than middle-class, especially the dress of the English gentleman, which was itself conservative. Restating the point about anonymity more exactly, Loos wrote: "An

article of clothing is modern when the wearer stands out as little as possible at the center of culture, on a specific occasion, in the best society. This is a very English axiom, to which every fashionable intellectual would probably agree."³² Nevertheless, propriety in architecture as in fashion depended also on location; the plain white surface treatment of the upper floors of the Looshaus belonged in Vienna because, Loos argued, "Vienna is a limewash city."³³ The difficulty of this assertion arose out of the fact that the Vienna to which he referred had been forgotten or neglected in the contemporary devotion to (non-Viennese) "style architecture," the Ringstrasse culture and the "elaborate emptiness" of the dying Hapsburg rule. Loos's "limewash" Vienna was something he imagined or idealized—even remythologized. There is thus a tension between his recognition of anonymous collective forms (of dressing or cladding) and self-conscious presentation of individual forms (dandyism). These concerns are paralleled by the ideas of the poet Georg Trakl, who during the years of this controversy abandoned the age-old dedication to the question "Who am I?" by replying "I am not!"—a reply similar to Rimbaud's comment, the "I is someone else."³⁴ Each of these quotations questions the individuality of the person or building, perhaps even destroys the expression of individuality, as a result of the "rational derangement of the senses."

The use of ornament as an end in itself had become pervasive in Hapsburg culture. The Viennese were not "well dressed"; they were "beautifully dressed." Karl Kraus wrote: "The streets of Vienna are paved with culture, the streets of other cities with asphalt."³⁵ In a similar vein, Egon Friedell wrote: "every material used tries to look like more than it is. Whitewashed tin masquerades as marble, papier mache as rosewood, plaster as gleaming alabaster, glass as costly onyx. . . . The butter knife is a Turkish dagger, the ash tray a Prussian helmet, the umbrella stand a knight in armor, and the thermometer a pistol."³⁶ In response to this excess, Loos stressed the material substance of ornament, the fact that ornament has a "material cause." This is evident in his rhetorical complaint: "If the leadership in clothing were left to the Viennese, sheep's wool would be woven to look like velvet and satin. Even though it is only made of wool, English clothing material, and thus our clothing material, never manifests the Viennese 'I'd really like it but can't afford it.' . . . Which brings us to the principle of cladding."³⁷ Material value is not in the material itself, but in the labor necessary for its formation. For Loos, all materials were of equal value. His "law of cladding" prohibited the confusion of a material clad with its cladding, and also

prohibited the use of paper, paint, cloth, and other surfacing materials to represent materials other than themselves. Paper should not be made to look like brick or stone, and woven underclothes should not be dyed skin color. If a material looks like anything, it looks like itself: no material should claim for itself the form of another.

This understanding of materials explains another aspect of the Looshaus facade. The use of whitewash for the upper part of the building is as much a reference to the buildings of Vienna as it is a representation of the logic of construction inherent in the material's language. Forms in architecture arise out of the production methods and applications of materials, having come into being "with and through materials."³⁸ With typical irony, Loos observed that the best way to invent a saddle is to remain ignorant of leather and the way it is cut and sewn.³⁹ This fact of material formation is also true for a wide range of architectural materials: not only thick and palpable materials, such as stone, timber, and metals, but also thin and liquid coverings, such as stains and paints. All of the materials of the Looshaus facade—the stucco, marble, steel, glass, and copper—should be interpreted in this way, for each has its own language and method. The application of paint to the surface of another material is also conditioned by this same rule of propriety disallowing the imitation of another material. Accordingly, metal can be painted any color but a metallic color. The use of cladding in the Looshaus, then, should be understood as a result of three sorts of criteria: the requirements of the interior settings, those of the street or urban situation, and the practices of the craftsmen who built the building by shaping its materials.

But to accent materials and methods of construction would be to distort the interplay of issues at work in the making of this facade. The windows of the building, particularly those at the mezzanine level, can also be understood to represent Viennese culture insofar as they accommodate the practices that typify that culture. For this reason, equal emphasis should be placed on what we have called the situational performance of architectural elements, not only on the appearance of their tectonic performance or their similarity or dissimilarity to antecedents.

Several historians have discussed similarities between these apertures and examples in Chicago commercial architecture. For example, in their study of the Looshaus Czech and Mistelbauer pointed to Burnham and Root's Rookery (1886).⁴⁰ By this time the bay window had become commonplace, not only in Chicago but also in New York and London, although its application in England was frequently associated with residential uses. Yet, apart from associations with

its precedents, this window type was specific to Loos's building insofar as it was sized, proportioned, and detailed to accommodate practical situations on either side of the facade, particularly on the inside. The Looshaus was built as a specialized department store for the firm of Goldman and Salatsch, whose advertisements appeared in Loos's publication *Das Andere*. While the entry level of the building is given over to the display and sale of a range of merchandise, the mezzanine level, behind the bay windows, houses a number of settings for the storage, cutting and sewing, display, and sale of cloth and men's suits. In most of these situations abundant light is necessary. In others, such as the fitting rooms, privacy is required as well. In still other places, light is required, along with a view, whereas in other areas ventilation is needed. The use of different glazing types allowed Loos to acknowledge these several requirements and to modulate ambient conditions. But the consistent use of one type of glazing also allowed him to give the entire level compositional uniformity. Within the thickness of the facade he had the depth of the bay window to work with, and thus was able to variously dispose display tables, seating, work surfaces, and storage shelves. The great quantity of glazing also favored the illumination of the edges of the central volume, which otherwise would have been too dark because of the building's considerable plan depth. The use of mirrors and the *Raumplan* section also helped increase light levels in the depth of the interior. When seen from the outside, these facade openings are expressive not only of modern precedents but of specific patterns of commercial practice, endowing their representational function with performative substance. The same can be said for the openings above and below the mezzanine level, making the facade as a whole a set of figures determined as much by functionality as association.

WINDOWS AND/AS WALLS

When Pierre Chareau accounted for the history of the window wall facade of the Maison de Verre (1931), he explained: "[When] I had to build between two party walls . . . there was only one way to get the maximum amount of light. . . . The principle of doing away with windows was adopted. . . . [When the] elements that [were to be] assembled [were chosen] . . . the Nevada type of glass lens seemed to correspond best to the conditions of the problem."⁴¹ With the comprehensive use of glass brick, light was indeed maximized, but so too was privacy, which was not only desired but necessary. As is well known, the house was

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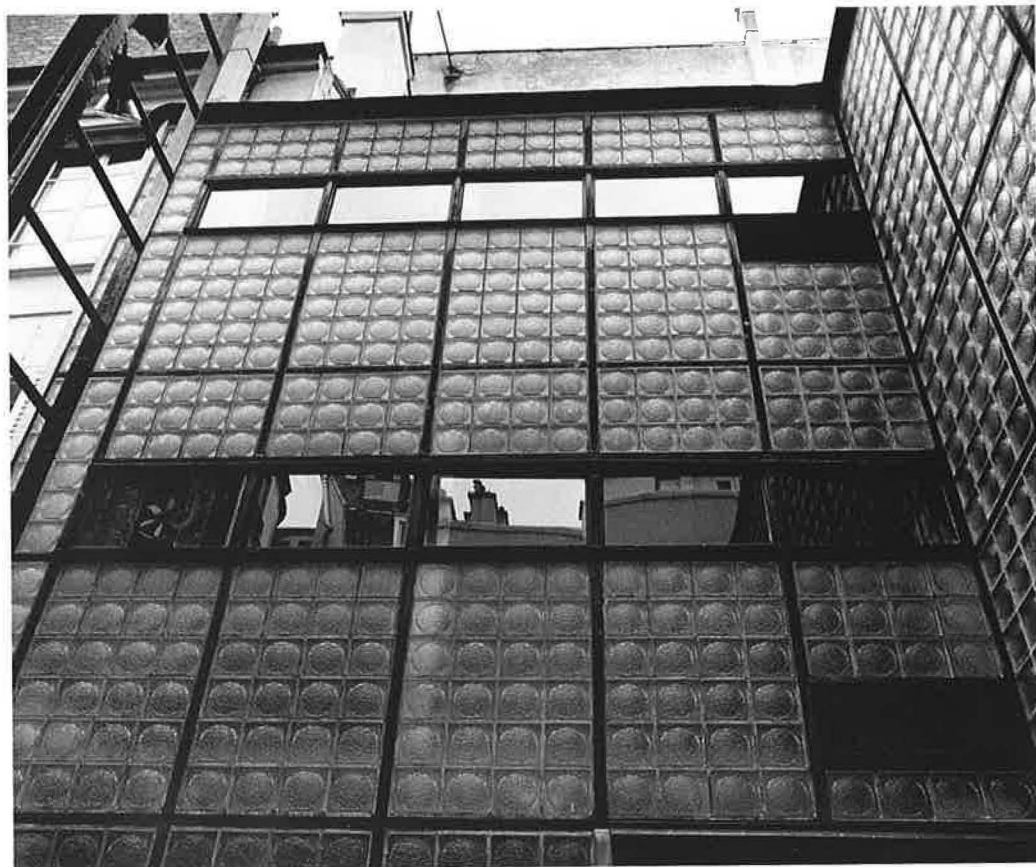
3.15

Adolf Loos,

Goldman & Salatsch store (Looshaus),
detail, Vienna, 1911.

3.14

Cover of *Das Andere* with advertise-
ment for Goldman & Salatsch, 1903.



3.16
Pierre Chareau, Maison de Verre,
exterior, Paris, 1931.
Photo: Charles H. Tashima, 1991.



3.17
Pierre Chareau, Maison de Verre,
interior, Paris, 1931.

built to enclose not only domestic settings on the upper two floors but Dr. D'Alsace's medical practice on the ground level, which required not only bright and uniform light but privacy. The glass brick, previously unused in such an application, met both needs. Upstairs, as an enclosing element for the house's main living spaces, the glass also suited the family's needs. Yet, while it was used comprehensively, glass brick was not used everywhere on the exterior walls, for other settings required connections to the exterior that the glass brick could not afford. An example is the doctor's ground-floor study, which is the only setting that gives onto the rear garden. The room required uniform lighting, as did other settings in the house, and the glass brick worked fine for that purpose; but it also benefited from apertures that permitted views into the garden and the introduction of fresh air into the space. Windows in the top half of the doors serve the second of these purposes, the doors themselves the first. Through much of the house, ventilation is mechanical, but in some spaces—along the second-floor hallway, for example—windows that rotate on a pivot can be opened one at a time or all together. Like the rest of the “equipment” in the house, they are operable or performative. A number of critics have described these devices as both functional and poetic, indicating with this second term an aesthetic or figurative content that resulted from imaginative attention to thematics of light and hygiene. The “workings” of the building and its facades show how windows and window walls can serve both constructional and representational purposes—as long as the subject matter of the representation includes the typical practices that occur behind the facade, with the facade as one of their furnishings.

This accent on the operations of the window or wall was not Chareau's alone; it had been seen in modern buildings before his, in those of Loos, Perret, and Le Corbusier. It can be seen in projects of later decades too. Perhaps the best summary to this argument is a text published in 1962 entitled “Windows and Walls,” in which José Luis Sert observed that “for thousands of years, from the doors of the caves until recently, all windows . . . served the triple function of providing light, ventilation and view.”⁴² Here Sert restated the topics of concern that were apparent in the *Maison de Verre* and the *Looshaus*, as well as other examples: apertures illuminate interiors, allow those settings to breathe, and frame exterior landscapes. Sert developed his theme by writing a brief history of aperture types (as if he accepted Le Corbusier's assertion that the history of architecture is nothing more than the story of how architects have opened windows in walls). Like Le Corbusier, Sert described the epochal change that resulted from



3.18

Sert, Jackson and Gourley, married student housing, Harvard University, Cambridge, 1965.

the substitution of masonry construction with steel frame structures, for this building technique transformed walls—both inside and out—into screens: “with the introduction of steel and concrete skeletons . . . the nature of walls [was transformed] from bearing walls to nonbearing partitions, curtain or screen walls.”⁴³ This change did not lead to the neglect of the three functions outlined above, but to their reconsideration as the basic components of facade design. An important step forward in the redefinition of the wall of windows was the invention and use of the sun-breaker or *brise-soleil*. But not all architects operating in the postwar years followed Le Corbusier’s lead; others took a step backward by encasing their office buildings with uninterrupted plates of glass: “modules that repeat [themselves] from bottom to skyline.” These are the facades of “anonymity” that came to be criticized with such vehemence a decade and a half later. The alternative for Sert involved reconsideration of scale as a way of preserving (or reinventing) the link between people and buildings. His alternative also involved attention to both the range of materials available to the architect and the range of “performances” the wall was meant to achieve. Sert’s approach to the problem of civic representation and monumentality led him to recommend the collaboration of artists, sculptors, and architects in the development of facades that would restore figurative substance to city centers. In this paper, too, he turned to aesthetic problems, concluding that “the growth and rebuilding of cities demands a more complete and varied vocabulary.” The “play” of elements, whether transparent, translucent, or opaque, was important to Sert, whether they were deployed in a wall with windows or a wall of windows. He preferred neither operable nor sealed elements, but recommended both. Just as significant as the play of elements was that of dwelling practices—the cultural play that prompted the selection and configuration of specific elements, practices such as viewing, breathing, lighting, shading, or sheltering—because the performance of a window wall has as its most basic task the orchestration of human events, those it encloses and reveals.