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Frank Lloyd Wright and the Destruction of the Box

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FRANK LLOYD WRIGHT wrote eloquently and often about the destruction of the box,[1] and writers ever since have indiscriminately used such phrases as "open space" and "flowing space," whether they are discussing interiors by Wright, Le Corbusier, or any number of 20th-century architects. In so doing they reveal basic misconceptions concerning Wright's achievement: Wright's spaces are more open and flowing than those that existed previously, but they are also profoundly different both in their design and in their psychological impact from the interiors with which they are often associated.

When Wright entered the profession late in the 1880s the Shingle Style had largely spent its force. From this style he inherited the idea of using generous openings between principal rooms and of occasionally basing his layout upon an axial or cruciform plan. Until about 1900 this exerted a considerable influence on his work.

But Shingle Style planning did not call into question the basic concept of the room. The four walls, joined at the corners, and the uniform floor and ceiling remained; the room continued to be a box. What had changed was the degree of openness between the rooms and this was achieved by increasing the size of the door (the hinged door gave way to a sliding door, or might be eliminated altogether) until it approached the size of the wall itself. The specific organization and use of the room was not affected. What one gained was a sense of spaciousness while looking from room to room. What one lost was a sense of privacy.

Wright realized this. He also saw that room specialization exceeded realistic limits with each social or family function requiring a separate room. In effect, one box, neatly labeled, was placed beside another and a series of these boxes made up the home. This was nothing new; the room as a box had been a western tradition since earliest times. It was a situation that Wright inherited, yet he soon redefined the concept of interior space, and he began this process by dismembering the traditional box.

The Ross house (1902) at Delavan Lake will ideally serve to demonstrate how he approached the problem. Being among the earliest of Wright's prairie houses, changes in it can be noted at a rudimentary stage in their development, and being a small house, it is not so difficult to analyse as the more complex Willits or Martin houses of about the same date. And because the plan derives directly from a Shingle Style house, it is easy to compare and contrast differences.

From Bruce Price's Kent house (1885) at Tuxedo Park Wright accepted, in designing the Ross house, the basic layout of the plan. Both are cruciform in shape, both have the same disposition of similar rooms, and both have a characteristic U-shaped veranda around the front (Figs. 1 and 2). Different but essential is the subtle spatial relation in Wright's design between the dining and the living rooms.

Wright attacked the traditional room at its point of greatest strength—at the corner. He dissolved the corner between the dining and living rooms at the Ross house by permitting one room to penetrate into the other. If the living room walls are extended to their point of contact, the corner is at the dining room table. A similar extension of the dining room walls makes a corner located well within the living room. At a primary level, therefore, both rooms are making use of an area within the other room's space; this is totally different from Shingle Style space (Fig. 3). In addition, the area of overlap serves as a connecting space (the corridor or doorway) between the rooms. Thus Wright obtains several uses out of this single space and he can reduce the size and cost of the house by that amount—without making the house seem any smaller.

This, when demonstrated, is a simple idea (most great ideas are simple ones) yet in its ultimate implications it is one of the most important "discoveries" ever made in architecture.

In Wright's work, space loses its fixed value and acquires a relative one. In the sense that it depends upon experience and observation, this is empirical space, contingent upon the viewer rather than possessing an independent reality of

1. Wright's most concise discussion of the box will be found in *An Autobiography*, New York, Duell, Sloan & Pearce, 1943, 141-142 in the section "Building the New House."

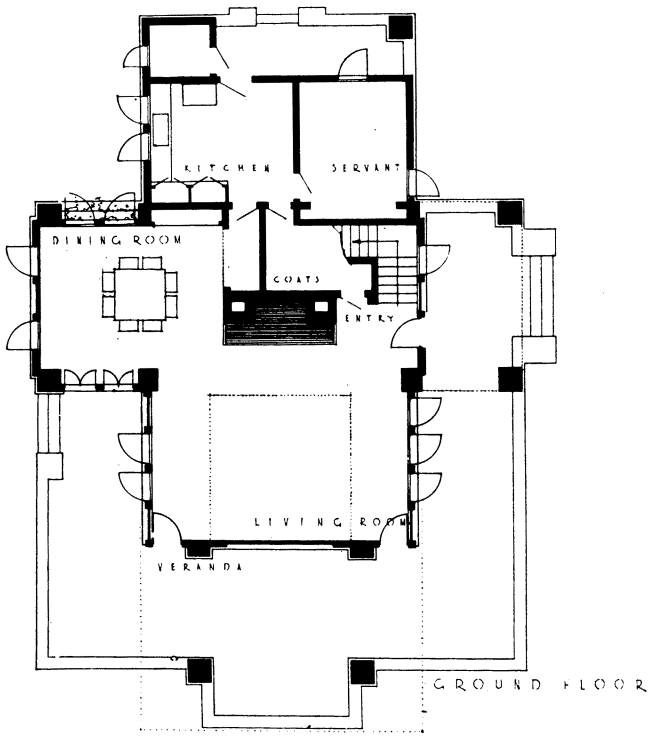

Fig. 1. Frank Lloyd Wright, Charles S. Ross house, Delavan Lake, WI, 1902, plan (Hitchcock, *In the Nature of Materials*).

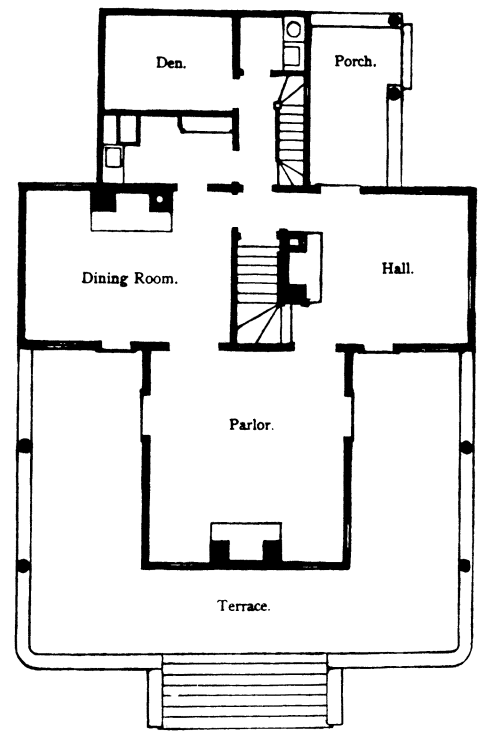

Fig. 2. Bruce Price, William Kent house, Tuxedo Park, NY, 1885, plan (Sheldon, *Artistic Country-Seats*, 1886-1887).

its own. It relates to individuals and their changing position within that space.

The visual space in the Ross house extends well beyond the point of overlap between two rooms. Unlike the vista in the Shingle Style house, it is diagonal, not face-to-face. As a result, Wright gains more privacy and variety. The view into the neighboring room is restricted, and changes markedly as one moves from place to place.

Outside corners were more difficult for Wright to eliminate, yet once he got rid of them his "invisible corners" (of mitered glass) became one of the hallmarks of the modern movement. In the Ross house he took a major first step in this direction. The glazed doors leading to the veranda are set flush against the corner, visually eliminating the right angle at this point. As one looks down the length of the lateral walls one's sight is not stopped at the corner but passes outside through the doors. At the other end, the left hand wall has no visible inside corner where it dissolves into the dining room. It is beginning to assume the character of a freestanding slab. When Wright completely freed the wall from its corners, it did become a slab, and once it became a slab he was free to move it around or divide it up at will. When this happened, the room as a box was destroyed.

Yet boxes have tops and bottoms as well as sides, and already at the Ross house Wright began manipulating the height of the ceiling in order to enhance the activities taking place underneath. The dotted line on the plan indicates a higher ceiling in the front-center of the living room—the area where one normally stands. Near the fireplace, along the windows of the outside walls, and in the dining room—all places where one normally sits—the ceiling height is lower.

The axonometric sketch, Figure 4, clarifies what has been said. To the left is what Wright set out to destroy, a house made up of a series of boxes, each placed beside or above the other, and each with its single specialized use. Enlarging the openings between contiguous boxes (as in the Shingle Style) created a sense of greater openness, but if carried too far, the smaller rooms would merge and become a single larger room with one relinquishing its identity to the other (a process that again produces a series of boxes).

The axonometric at the right indicates Wright's first step in destroying the box. He interlocks two rooms so that part of each space is given over to the other. The corners (the least useful part of the room) are destroyed and a controlled view into the adjacent area is opened up. This view, which is diagonal and pinched at the point of interlock, is limited and leaves much of the adjoining area obscure, introducing a sense of mystery into the spatial se-

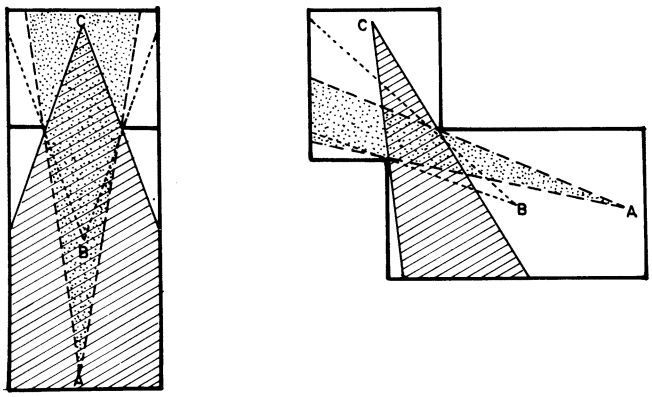

Fig. 3. Shingle Style *vs.* Frank Lloyd Wright. Left: typical Shingle Style plan with large openings between the principal rooms. Right: in a Wright house, one room penetrates into the other, at the corners.

A, B, and C show the angle of vision, taken from identical positions, into the neighboring room. Wright achieves more privacy and variety.

Room dimensions in these two plans are identical (author).

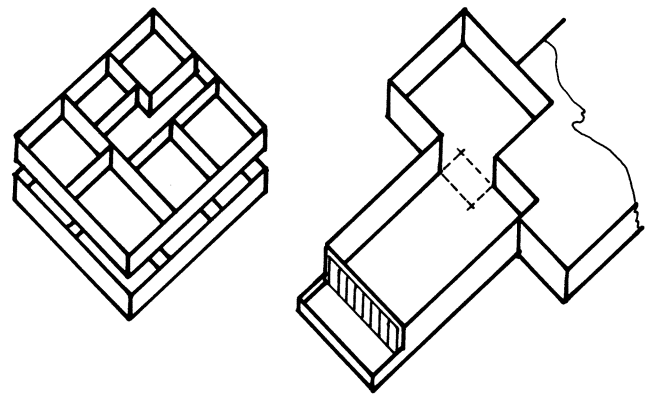

Fig. 4. Left: typical house composed of box-like rooms. Right: Wright's first step is destroying the box. Rooms are interlocked, usually at the corners, with each relinquishing part of its space to the other. Sometimes this occurs at different levels creating balconies, split-levels, and varying floor and ceiling heights. The corner has been dissolved (author).

quence. Mystery is an essential element in Wrightian space; he never resolves all visual questions at once; rather he holds in reserve something to be examined later. To assist in this process of limiting and controlling the view and guarding the privacy of the adjoining spaces, Wright screens openings by various means—for example, vertical wooden slats combined with low bookshelves (Willits house), walls that do not reach the ceiling (Roberts and Hanna houses), fireplaces or chimneys that open into the neighboring space (Martin and Robie houses).

A comparison of the Willits plan with a house project of similar date by Robert Spencer makes abundantly clear the difference between Wrightian and "open" space (Figs. 5 and 6).

The axonometric also indicates how two spaces of different height can interpenetrate, the one imparting to the other its ceiling and/or floor height. In its simplest form, this creates a balcony (Roberts, Baker, Millard at Pasadena) or "split-level" type of house (Davidson, Pope, Grant). But in the sophisticated arrangement preferred by Wright it produced two or more ceiling heights that overlapped and interpenetrated throughout the house (and on the exterior as well) with the height carefully related to the human activity underneath. Although Wright perfected this for his Usonian houses, he mastered the idea prior to 1910.[2]

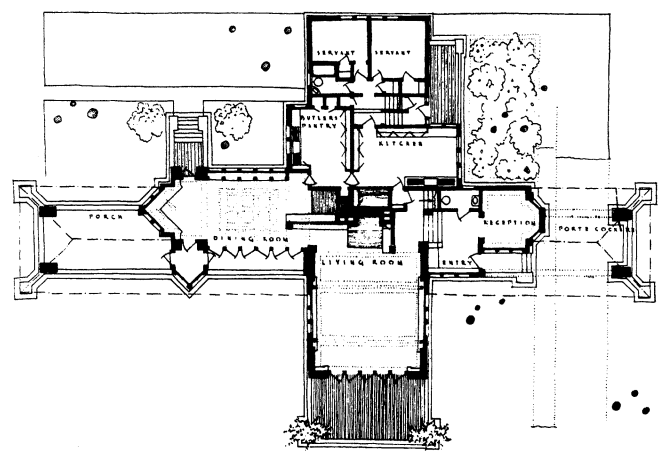

Fig. 5. Frank Lloyd Wright, Ward Willits house, Highland Park, IL, 1902, plan (Hitchcock, *In the Nature of Materials*).

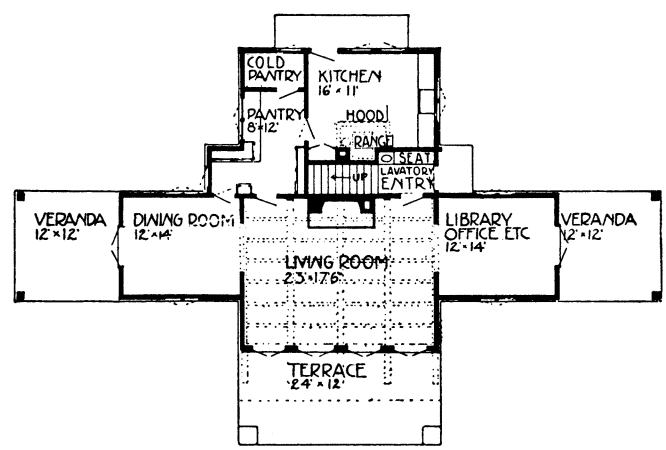

Fig. 6. Robert C. Spencer, Jr., "A Shingled Farmhouse," project, 1901, plan (*Ladies' Home Journal,* April 1901).

2. A brilliant early example of this is seen in the dining room of the Boynton house (1908) at Rochester where three ceiling heights relate directly to Wright's furnishings which, after 70 years, are happily still in place. A small family-size table for

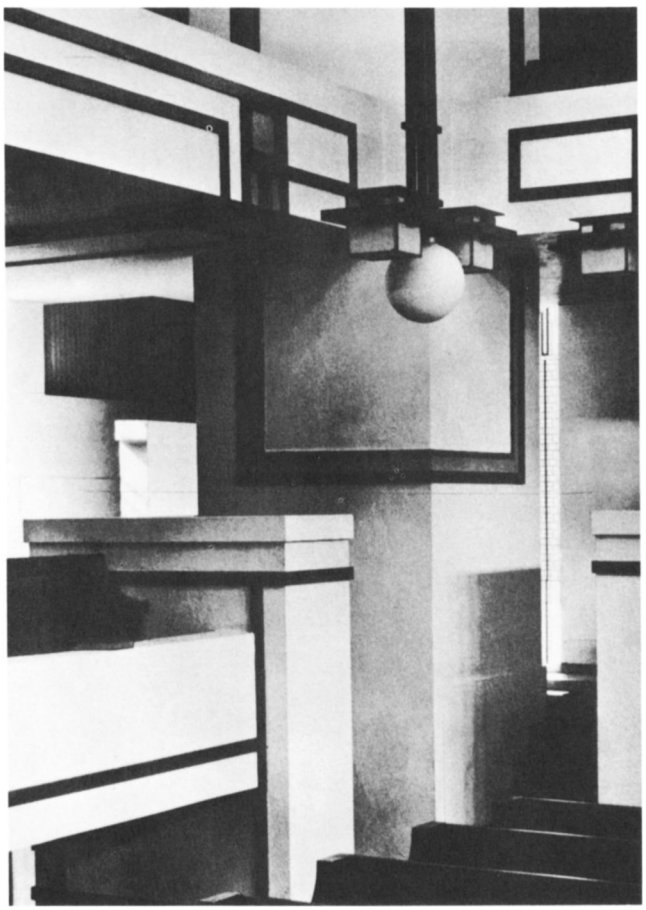

Fig. 7. Frank Lloyd Wright, Unity Temple, Oak Park, IL, 1906, interior pier (John Szarkowski).

Before continuing with other implications of Wright's research, two points will be developed further in order to clarify and amplify what already has been said. First, a consistency of design permeates every aspect of Wright's work, imparting to it a unity that is total and complete. Consequently, the concept behind the destruction of the box found expression in a wide variety of things designed by Wright. Note, for example, the interior pier at Unity Temple (Fig. 7). The wood stripping (Wright's word for trim) is not used in the traditional manner in order to define a two-dimensional rectangle on the surface, with a separate rectangle for each face of the pier, but instead the stripping passes around the corner to unite the two surfaces into a single *three-dimensional* form. This destroys the age-old concept of the corner just as effectively as Wright destroyed it in the region between the living and dining rooms at the Ross house. This three-dimensional manner of thinking, which is characteristic of Wright's work, can also be seen in the way he often unites ceilings and walls by this simple device, as in the Robie house. Spatially Wright dissolves the corner and makes it transparent; the next logical step was to use mitered glass instead of opaque materials, a system Wright perfected early in the 20s.

The second point concerns the center of the wall. Unlike the architects of the Shingle Style or their 20th-century counterparts, Wright did not create large openings in the wall[3] since this would lead to a loss of interior privacy. Instead, if he wished to relate two rooms face-to-face, he substituted for the wall a screen that could be walked around or looked over. The Robie house is a perfect example of this. The dining room and living room have their outer walls in common, but the "wall" that separates the two rooms is a freestanding fireplace (Fig. 8). The flues go up the sides making possible a large opening in the chimney mass at the level of the ceiling. From either room one can look back to the adjoining ceiling, and this adds a sense of spaciousness without diminishing privacy. Similarly—and this is of great importance—one has an unbroken view along the lateral walls of these two connected rooms. Due to the absence of corners (no visual "stop" signs) it is impossible to tell where these outer walls terminate, or when they are no longer part of the space in which you are standing. This is especially effective on the street side of the Robie house: the uninterrupted range of French doors is simultaneously part of both rooms. No visual break, outside or inside, denotes the limits of either space. This is so, as already explained, because Wrightian space depends on the position of the viewer and not on a predetermined boundary.

By visually extending space, Wright achieved a sense of expansiveness that the actual dimensions of the building would seem to deny. This was immensely important for Wright's later work; it holds great potential for the future

breakfast or lunch is placed near the outside windows; over it the ceiling is only head-height and creates a wonderful sense of intimacy for family meals. Further into the room is a large, imposing table flanked by high-backed chairs. This is obviously for formal family gatherings and for entertaining guests, and in scale with it is a higher ceiling. Between these two tables with their related ceilings is a single-sided clearstory that lights the main table and brightens the deepest parts of the room. This story-and-a-half high ceiling covers the area where one walks within the room.

3. Except when uniting interior and exterior space. Then he would often create a screen of glazed doors between the interior and the terrace, as at the Willits house or any number of Usonian houses.

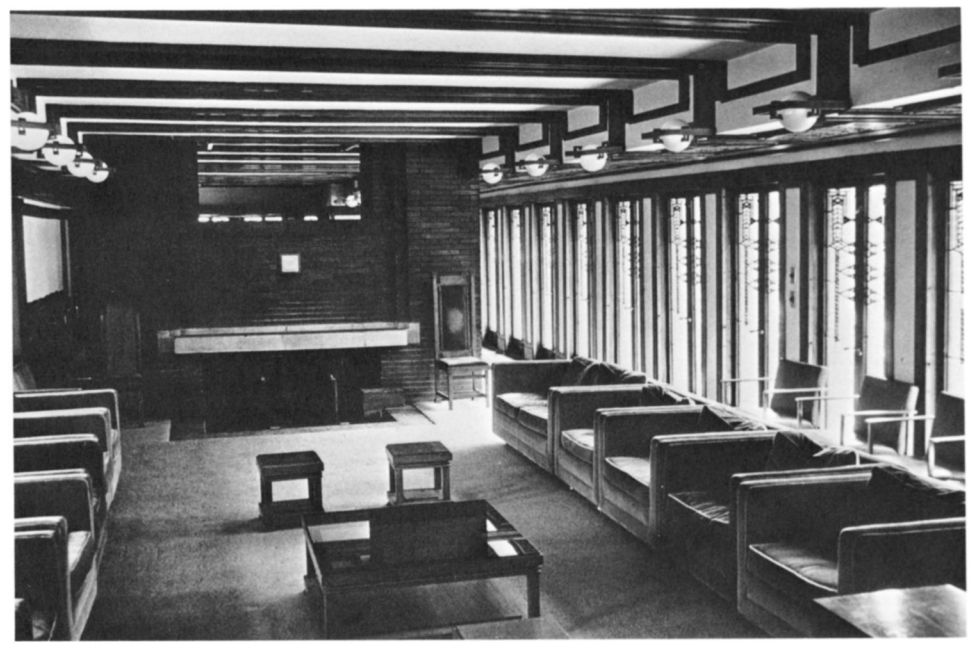

Fig. 8. Frank Lloyd Wright, Frederick C. Robie house, Chicago, 1908, living room with dining room beyond the fireplace (author).

of architecture, yet even in his smallest prairie houses Wright utilized this means with stunning effect.[4]

Thus far we have emphasized the destruction of the box, and Wright's attack on such traditional elements as corners, walls, and ceilings. But he did not stop there.

The implications of freeing the wall from its terminals were immense, and further consequences of this fact were soon realized by Wright. Once the wall was freed from its corners it became a slab, and once it became a slab, it was no longer locked into a fixed position in space; it could be rotated on its axis, it could be divided into smaller slabs, it could (as later occurred in Cubist painting) be reassembled and reintegrated to define something new. The evolution of this process is illustrated in Figure 10 where the first sketch-plan, A, represents a typical rectangular room with its four walls locked together at the corners. In the second diagram, B, the corners are eliminated and the corner posts removed.[5] The walls have become independent planes or slabs, each clearly separate from one another. Taken together they define (rather than precisely enclose) an area that is similar to the first diagram, except for the region

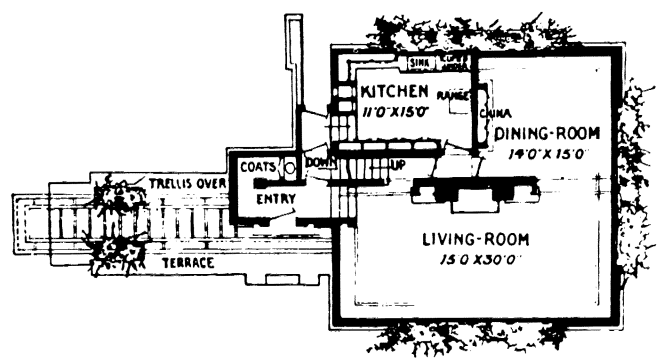

Fig. 9. Frank Lloyd Wright, "Fireproof House for $5,000," project, 1906, plan (*Ladies' Home Journal*, April 1907).

near the corners. This sketch is analogous to the Ross house plan already discussed.[6]

An intermediary stage between B and C is exemplified in the plan of the Martin house (1904, Fig. 12), which was published in the 1910 Wasmuth portfolio and therefore widely available in Europe (cf. Mies van der Rohe's 1923 project for a brick country house, and the work of the

4. For example, the *Ladies' Home Journal* project (1906) for a "Fireproof House for $5,000" (Fig. 9) and its prodigy such as the Hunt house at La Grange, Illinois. These share a continuous window-wall between the living and dining rooms similar to that at the Robie house. A fireplace also screens the opening between the two rooms. And again, it is one's position within the house that determines whether this window-wall is considered part of the living or dining room.

5. A structural advantage is also inherent in this scheme. When the main supports are moved back from the corners a cantilever is created. As a result, under certain conditions, the number of supporting posts, or the size of the stringers, can be reduced.

6. It is also analogous to certain non-architectural elements designed by Wright such as the electric light fixtures at Browne's Bookstore (1908) in Chicago (Fig. 11). These consist of four squares of translucent glass hung from a larger square such that the pendant pieces, which form a cube, do not touch at the corners. In plan this fixture is similar to diagram B, except for being square.

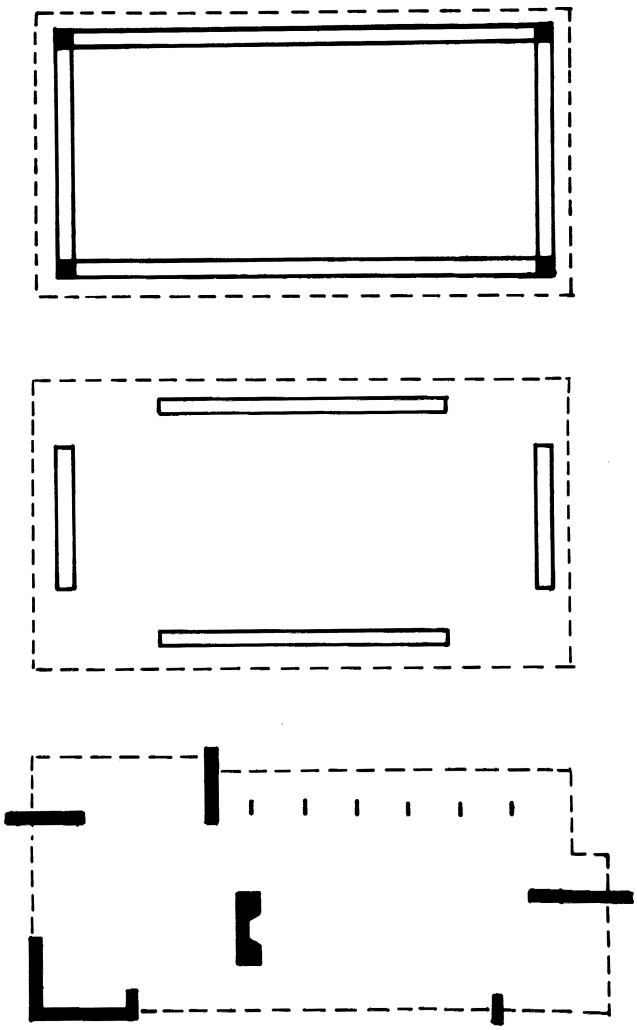

Fig. 10. A: typical room with walls joined at four corners. B: Wright's first step: eliminate the corners, thus turning the walls into freestanding, movable slabs. C: Wright's second step: define, by reassembling segments of these slabs, a new spatial context that integrates the former functions of the demolished rooms; this is the schematic plan of a Usonian house (author after Wright).

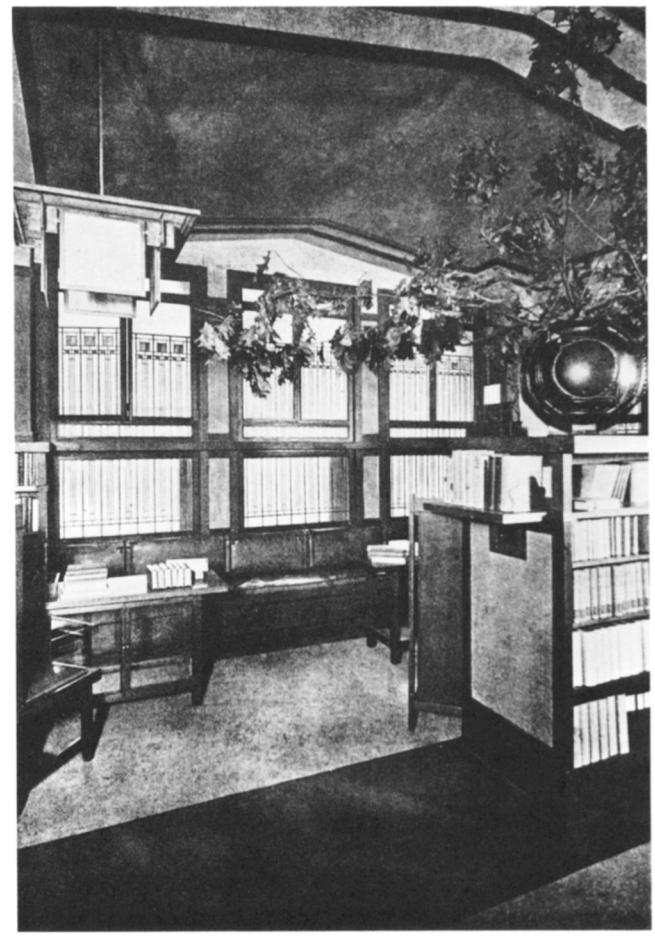

Fig. 11. Frank Lloyd Wright, Browne's Bookstore, Chicago, 1908, demolished, hanging light fixture consisting of four squares of pendant glass that do not touch at the corners; compare with Figure 10-B (*Ausgeführte Bauten*, 1911).

de Stijl group, for instance). The striking fact about this plan is the absence of walls in the traditional sense. Only piers and slabs are used, set in a charged, yet dynamically balanced, paired relation one with the other. A screen of windows, as protection against the weather, connects these points of support, which define the limits of the house and the various spaces therein.[7]

The third diagram, C, illustrates what Wright achieved once the wall was free of its terminals. Here even the formality and axial symmetry of the Martin plan (which owed much to Beaux-Arts planning) are gone and instead there is an abstract pattern of reassembled parts. This pattern represents the schematic plan of one of Wright's Usonian houses in which the living space contains many "rooms." Integrated into this new spatial environment can be a living room, a dining room, a hallway, a den, and perhaps other rooms as well. They are defined within the context of the larger space. Thus one or two spur walls, a lower ceiling, a different fenestration create the setting for a dining room, other combinations are used to establish a den, and so on.

7. This effect is more dramatic in plan than in the actual building where low walls under the windows impart a solidity to the design. Later Wright would use floor-to-ceiling French doors to achieve the intended result.

Originally, the freestanding fireplace was open on both sides, and the stripping of the ceiling united living room, fireplace, and entrance hall in a single spatial entity. Unfortunately the fireplace has been closed on one side by subsequent owners and the stripping removed from the ceiling.

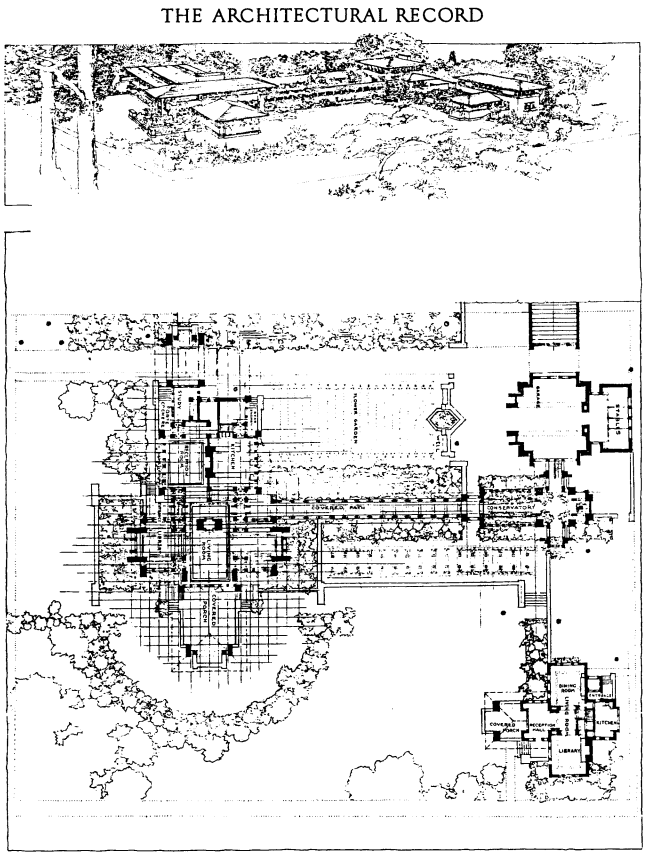

Fig. 12. Frank Lloyd Wright, Darwin D. Martin house, Buffalo, NY, 1904, plan (*Architectural Record,* January 1928).

These are sometimes difficult to identify in plan, but when experiencing the three-dimensional space the function of each area is absolutely clear—and this is independent of any furniture grouping. Each use-space utilizes and participates in part of the adjoining spaces (and they in it) just as we saw in a more rudimentary form at the Ross house. Only bedrooms and baths retain their integrity as private rooms.

Our attention thus far has focused upon the walls of rooms rather than on floors and ceilings. Yet these were also essential to Wright's manipulation of space and they gained in importance as the actual size of the house decreased and more and more "rooms" were integrated into the basic living space. Either two or three ceiling heights were used in his smallest houses and, if the character of the landscape permitted, he would raise or lower the floor as well.

With a change in ceiling height Wright could psychologically define the boundaries of a use-area in a region where the walls had been removed. Thus the outer limits of a low ceiling might "stake out" a dining room, the ceiling height harmonizing with the seated activity of dining. All areas primarily designed for sitting and for intimate thoughts and conversation had lower ceilings than those designated for standing or walking or working. The miracle is that Wright did not end up with an overhead mess of conflicting ceiling heights but instead succeeded in creating something that was as unobtrusive and restful as it was effective.

Floors present a special problem but occasionally Wright introduced a single change in level, as in the Willits and Davidson houses dating from the prairie period. Later, for instance at the Palmer house, he might employ an upward step to dissuade the visitor from approaching the bedroom wing, or, as at the Pope house, to increase the sense of nobility and spaciousness as one descends from the entrance into the more public regions of the house (Fig. 13).

The dimensions and placement of these various space-defining elements (such as screens, slabs, piers, ceilings, fireplaces) was never haphazard or arbitrary but was always controlled and governed by what Wright called a "unit system." Uppermost in his mind was the need to create buildings with a sense of repose and calm and to achieve this it was essential that every aspect of the design—scale, proportions, materials, furnishings, colors—be in perfect harmony. Nothing must strike a discordant note. Architects through the ages have turned to mathematics and geometry to aid their search for harmony; the most enduring crutch has been the golden section ($\frac{a}{b} \times \frac{b}{a+b}$), yet in our time Le Corbusier's Modulor has claimed much attention.

Wright never made a secret of his system which developed, he said, from his Froebel kindergarten training. Occasionally he even published the units under illustrations of his buildings (Fig. 12).[8] Yet he never explained how the system worked. We had to await Robert MacCormac's published research[9] before having a plausible explanation. I do not intend to recapitulate MacCormac here, but his analytic drawing of the Ross house indicates the tartan-like grid of units that controlled the size and placement of each element in the plan (Fig. 14). Later Wright applied this system to elevations as well.

8. See his 1920s series "In the Cause of Architecture" published in the *Architectural Record* and especially the article subtitled "The Logic of the Plan," LXIII, January 1928, 49-57.

9. "The Anatomy of Wright's Aesthetic," *Architectural Review,* CXLIII, no. 852, February 1968, 143-146, and "Froebel's Kindergarten Gifts and the Early Work of Frank Lloyd Wright," *Environment and Planning B,* I, 1974, 29-50. See also John Sergeant, "Woof and Warp: A Spatial Analysis of Frank Lloyd Wright's Usonian Houses," *Environment and Planning B,* III, 1976, 211-224.

Fig. 13. Frank Lloyd Wright, Loren Pope house, Mt. Vernon, VA, 1939, interior. Two floor levels and three ceiling heights are visible in this photo. From the entrance (center, rear) several steps lead down, and the height of the ceiling is raised in scale with standing activities of the living area. For seating areas, around the dining table to the right and between the fireplace and the windows at the left, the ceiling is much lower (HABS/Boucher).

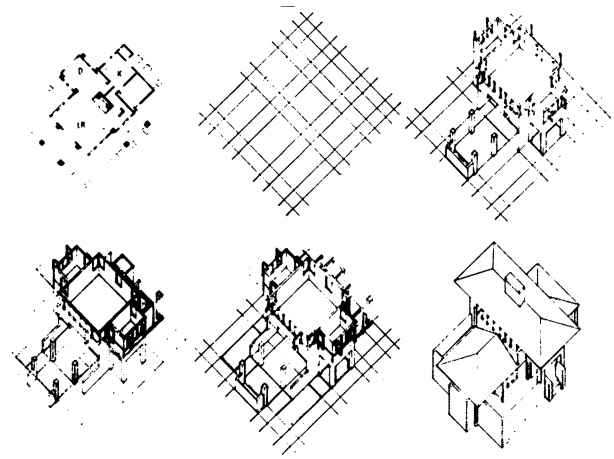

Fig. 14. Charles S. Ross house. R. C. MacCormac's analysis of the plan from which he determined the unit system used by Wright in its design. The units form a tartan-like pattern rather than a regular grid, yet it should be noted that MacCormac has suppressed certain (less significant) intermediary lines which would, had he chosen to draw them, reconstitute the regular grid of the Froebel system (MacCormac, *Architectural Review*, 1968).

An essential aspect of Wright's organic architecture is the idea that interior space must find exterior expression. That this occurred is revealed by even the most cursory review of his buildings. In the closed, stately forms of the Winslow façade (1893) space is imprisoned and there is no sense of outward release. With the prairie houses the wall quickly loses its role as container of space as increasingly it is shattered into piers and screens; horizontal elements are left visually unsupported at their terminals and become cantilevered roofs and balconies that in no way impede the outward-inward interaction of space. A comparison of the Willits (1902) and the Robie (1908) houses makes this development absolutely clear. In the years that followed, the change was one of degree, not of kind. The buildings became more informal, open, and immediate in their association with the natural surroundings. The modest-sized Usonian house was the perfect expression of this. Yet outwardly, the spatial facts of the interior could always be read. A closed, U-shaped masonry wall, lit internally only by a clearstory window under a low slab roof, was a den, a place of retreat; a higher roof and banks of glazed French doors signaled a more public living space; modest windows facing a protected court were those of a bedroom. The manifestations of the space were always apparent; they were defined, and the definition was there for all to read.

In sum, we have seen how Wright dealt with the age-old question of interior space. For him the process of its reorganization was no fanciful or playful matter, but an arduous intellectual feat. The traditional concept of the room, formed by walls joined at the corners, had existed—unchallenged—since the earliest habitations, and by the 19th century its proliferation (nowhere carried to a more ridiculous extreme than in the English country house) had reached, both socially and economically, illogical bounds. He recognized this and was determined to correct it. He analyzed the components of a room, which basically was a box. He realized that the corners were the most expressive element, so he demolished them first. He then dismembered intermediary walls, ceilings, and even floors. Finally, as in synthetic Cubism, he reassembled the shattered pieces (images) in a different spatial context. He defined, rather than enclosed, the functions that rooms had served. And in accordance with his profound understanding of the human psyche, he created a physically smaller, yet psychologically more healthy, environment in which to live. This is the measure of his genius, and toward this end the destruction of the box was the first essential step.