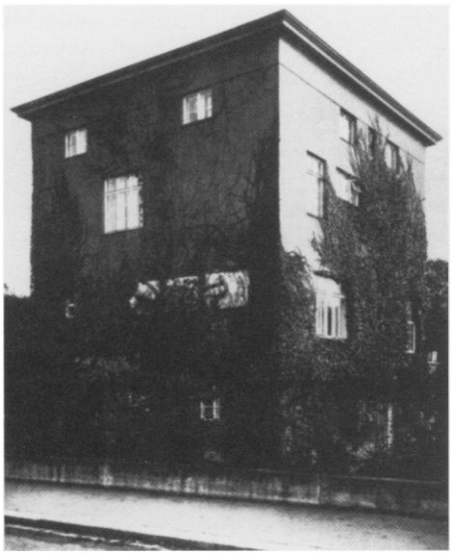
Adolf Loos's *Raumplan* Theory

CYNTHIA JARA, *University of Minnesota*

This article presents an argument demonstrating the complexity and generative capacity of Adolf Loos's *raumplan* theory. In pursuing this goal, I have used the first raumplan scheme to be realized—the Rufer House, built in Vienna in 1922—as a medium through which to review the definition of raumplan developed by Loos's modernist disciples. As an alternative to traditional interpretations, I propose an analysis of the theory based on four characteristics of *raum*—site, presence, gathering, and staying among things—posited by Martin Heidegger in his 1954 essay, "Building Dwelling Thinking."

TOWARD THE END OF HIS CAREER, THE Viennese architect[1] Adolf Loos (b. 1870) formulated a theory of design that became known as *raumplan*. The Rufer House (Vienna, 1922) has been identified as Loos's first project to realize the principles of this theory. Presumably, the houses that Loos designed between 1922 and his death in 1933 continued to represent the raumplan.[2] Because he neglected to elaborate on the theory of raumplan, little can be certain about Loos's intentions beyond what can be inferred from the work he produced.

The only written explanation of raumplan that Loos is known to have made was prompted by disappointment over his exclusion from the *Weissenhofsiedlung* exhibition.[3] He communicated his bitterness parenthetically—in a footnote to the obituary he wrote in 1929 for the furniture maker Josef Veillich: "I would have had something to exhibit: the solution of how to arrange the living rooms in three dimensions, not in the flat plane. . . . That is the great revolution in architecture: the three-dimensional rendering of a ground-plan!"[4]

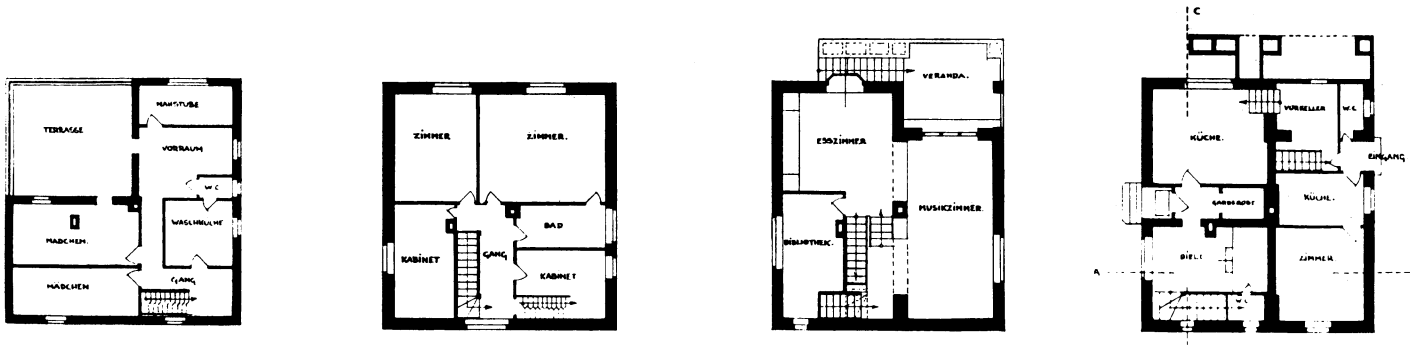


1. Rufer House, street view, Vienna, 1922. © Artists Rights Society (ARS), New York / VBK, Vienna.

In 1931, two years before his death, the first monograph of Loos's work was published by one of his protégés, Heinrich Kulka.[5] The book included a section on raumplan that announced the new theory by stating, "Adolf Loos introduced to the world a new and essentially higher conception of space: free-thinking in space."[6] This assertion was followed by a definition of raumplan, whose authorship was later claimed by another of Loos's followers, Ludwig Münz.[7] Since the word *raum* means "room" or "space" in German, Münz's characterization of raumplan as a design technique governed by principles of spatial manipulation was a logical extrapolation, consistent with the claim that Loos himself had made in the Veillich essay. Loos's tacit approval at the time of publication gave further credence to the explanation of raumplan proposed in the monograph.

Münz's role in the definition of raumplan was reinforced in 1964, when Gustav Künstler produced a comprehensive monograph on Adolf Loos.[8] The work was based on archives bequeathed to Münz; authorship was attributed to both men even though Münz had died in 1957, several years prior to publication.[9] Künstler's monograph has remained influential partly because it reflects the extensive knowledge implicit in Münz's personal relationship with Loos and partly because of Künstler's thoroughness in organizing the archival material. A notable feature of the monograph

Journal of Architectural Education, pp. 185–201,



2. Rufer house, plans of ground floor, main floor, bedroom floor, and servants' floor. © Artists Rights Society (ARS), New York / VBK, Vienna.

is the chapter entitled "Houses on a 'plan of volumes,'" which develops Münz's original interpretation of the raumplan. It is difficult to know whether Künstler or Münz himself was primarily responsible for this amplification.

Although the exposition of Kulka, Münz, and Künstler was consistent with both the substance and the ambition of modernist architectural discourse, an examination of Loos's personal history suggests a more complex background for the theory. Although he encouraged disciples, Loos did not cultivate relationships with other architects; throughout most of his life, he was involved instead with a Viennese avant-garde whose membership was cross-disciplinary. In particular, his friendship with the journalist Karl Kraus helped Loos define an ideology that supported his architectural thinking.[10]

In this regard, a lesser-known reference to raumplan is revealing. In 1933, the year of Loos's death, Karel Lhota published his account of an interview with Loos in a Czech journal.[11] Speaking of the raumplan, Loos was quoted as saying, "My work does not really have a ground floor, first floor or basement. It only has connected rooms, annexes, terraces. Each room requires a particular height. . . . The rooms must then be connected in such a way as to make the transition imperceptible, and to effect it in a natural and efficient fashion."[12] These remarks suggest that Loos's understanding of his own theory was more subtle than the material in Kulka's book had indicated. Loos's characterization of rooms as spaces that are both bounded and joined ("rooms . . . connected in such a way as to make the transition imperceptible") recalls an observation in the Veillich essay which has been overlooked. Considering the nature of *raum*, Loos had reflected, "Before Immanuel Kant mankind was unable to think in terms of space."[13]

Based on Loos's state of mind at the end of his career, a conflict between two interpretations of the raumplan—one geared to an architectural posterity; the other corresponding to the abstract, discursive environment in which Loos was immersed socially—is not inconceivable. By implying that the raumplan was actually a more advanced version of the "free plan," Kulka's monograph had articulated a standing for Loos relative to other modern masters. That contention was important to Loos, and personal egotism may have motivated him to endorse the monograph without careful scrutiny. Another factor must be considered: by the time the monograph was published, Loos was already quite ill and may not have been capable of full approval.

My doubts concerning traditional descriptions of raumplan accumulated as I studied the houses themselves. While working on an analysis of the Rufer House, it occurred to me that it would be possible to propose a revisionist interpretation of raumplan theory based on four characteristics of *raum*—site, presence, gathering, and staying among things—predicated by Martin Heidegger in his essay "Building Dwelling Thinking."[14] Before proceeding with the main arguments of the paper, I would like to be clear that I do not intend to link Heidegger directly to Loos. Heidegger's constructs appealed to me originally because I suspected they could reveal the potential for a new rendering of raumplan. As a philosopher, Heidegger was untainted by the bias hindering modernist architects and thus—like Kant before him—able to pursue the idea of *raum* for its own sake.

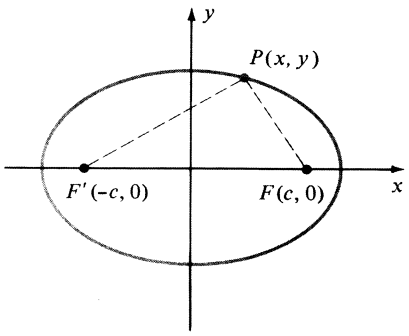
Raum 1: Site

According to Heidegger, site is not simply the vicinity of a built object; rather, it is an autonomous agent in the building process. Heidegger claims that location precedes site. He explains this dynamic with an analogy to the banks of a river when crossed by a bridge: "The banks emerge as banks only as the bridge crosses the stream. The bridge designedly causes them to lie across from each other."[15] In other words, the banks on either side of the bridge are undifferentiated until the location of the bridge makes them a site: "Only something *that is itself a location* can make space for a site."[16] Heidegger elaborates, explaining further about location: "The bridge does not first come to a location to stand in it; rather a location comes into existence only by virtue of the bridge."[17]

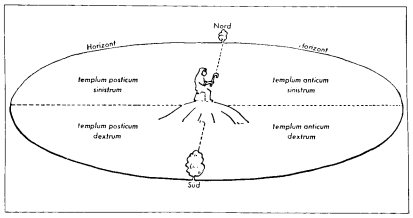
Location, thus defined, can be identified as a factor in raumplan theory via a striking feature of all Loos's raumplan projects: the pair of orthogonally disposed axes that characterize the underlying order of the houses.[18] These serve the same function as the bridge vis-à-vis banks: the crossing axes identify the location that gathers the four quadrants of the plan, making space for its site.

Loos must have considered his options and carefully chosen the axial intersection as his first step in engaging the raumplan. Münz and Künstler, however, speak only vaguely about the possibility of order in raumplan: "Most astonishing . . . is the circumstance that the creative work, the maturing of the idea of the 'plan of volumes' seems to have developed according to the laws of strict logic."[19] By stressing a pragmatic interpretation, the modernist position actually obscures the potential significance of this initial gesture.

A cardinal intersection is more than a means of generating orthogonal relationships. Its axial system lacks the neutrality of a modulated grid: one line, and one line only, carries the force of each dimension. The dimensions oppose one another at right angles; they meet in only one location.



3. Mathematical description of an ellipse. From Earl W. Swokowski, *Precalculus: Functions and Graphs* (7th ed.), p. 696, Figure 15. Reprinted by permission of PWS Publishing Company, Boston.



4. Roman augur consecrating a building site. From Christian Norberg-Schulz, *Meaning in Western Architecture* (New York: Rizzoli, 1980).

Christian Norberg-Schulz has demonstrated that in architectural situations, the crossing of perpendicular lines of force is more than a geometric device; it is a powerful abstraction signifying order. For thousands of years, crossed axes have served to symbolize the understanding that men and women have of their relationship to nature and the universe. In ancient Egypt, for example, where the Nile River, coinciding with the north-south direction, was daily crossed by the east-to-west path of the sun, axial planning permeated building design. But it was the Romans who institutionalized the cosmic significance of crossed axes by assigning them roles that were explicitly sacred. The Romans considered the north-south axis, which they called the *cardo*, to be the primary axis. The *cardo* was designated the axis of the world. The east-west axis naturally represented the passage of the sun; it was called the *decumanus*. Roman building sites were always consecrated by a priest who identified the *cardo* and *decumanus* as crossing at the center, or focal point, of the site.[20]

Roman custom emphasizes an important characteristic of cardinal relationships: intersecting lines determine a location (as in the common cliché, "*X* marks the spot"). Münz and Künstler acknowledge this aspect in their attempt to identify the essential characteristics of raumplan: "Firstly, there must be a meaningful center of the house, around which individual rooms may be grouped."[21] But the idea of a focal point within the house is accepted here only as a useful given; the modernist interpretation does not question the origin of centering in raumplan.

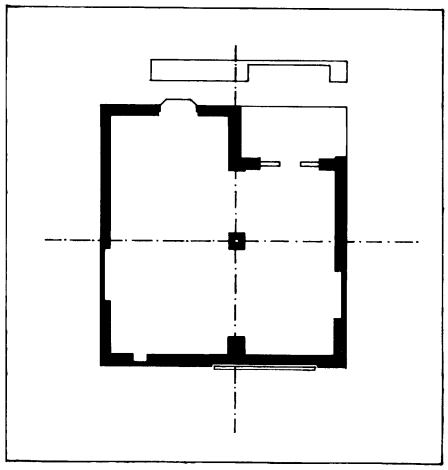
Based on Heidegger's insights, the operation of raumplan can be seen in a new light. First, the axial system imposes a directional mandate on an otherwise expressionless field; next, the intersection of the cardinal lines reveals a center. These early operations enable Loos to accomplish the conditions that Heidegger requires to locate a site. Insofar as men and women can center their existence through rational means, above and against the random neutrality of the outside world, Loos's characteristic optimism is also evident in this gesture.

In Loos's first raumplan project, the Rufer House, the center of the house is marked by a square column. Although this column has structural pretensions—Münz praised the raumplan for its "spatially economical structure"[22]—as a paradigm, it lacks the technical force of, for example, Le Corbusier's *Dom-ino* scheme. In fact, structuring the house around a central column is not a particularly impressive innovation considering its similarity to the wood-frame system commonly used to construct single-family houses in twentieth-century America. The American system requires bearing down to a column support in the basement if the span exceeds fifteen feet anywhere in the house.

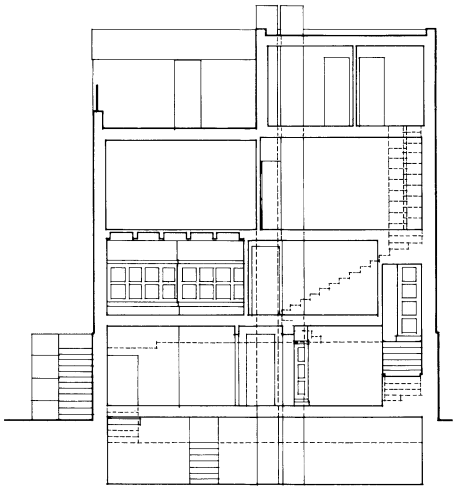
Neither does Rufer's column have the experiential impact of centering which, by contrast, Frank Lloyd Wright achieves when he focuses on the hearth as the center of the house. As an isolated symbol, Loos's column also fails to evoke the kind of imagery that Le Corbusier is able to generate—via the unfolding ramp and the spiral stair of Villa Savoye, for example—of the house as machine.

What the Rufer column does do, however, is serve as a particularly effective grounding mechanism. In this role, it calls to mind Christian Norberg-Schulz's analysis of the vertical axis in the Pantheon. Speaking about the oculus in the dome of this ancient Roman temple, Norberg-Schulz argues convincingly that the vertical axis bears spiritual connotations because the imagery it generates connects the idea of human standing on the earth with the idea of heavenly aspiration.[23]

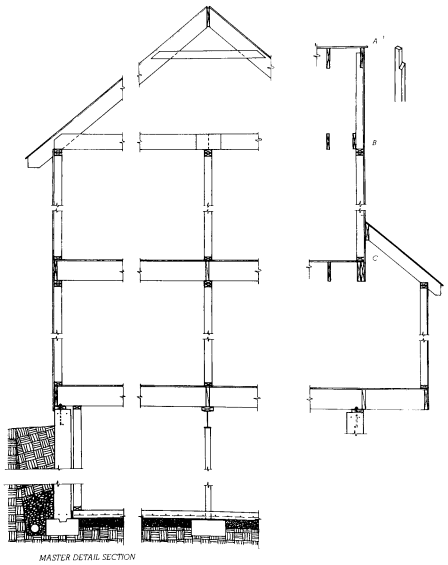
This function of both grounding and aspiring is particularly suited to Loos's col-



5. Rufer House, diagram of the main floor, axial field, and center. Drawing by Laurel Ulland.



6. Rufer House, section. Drawing by Tom Jenkinson.

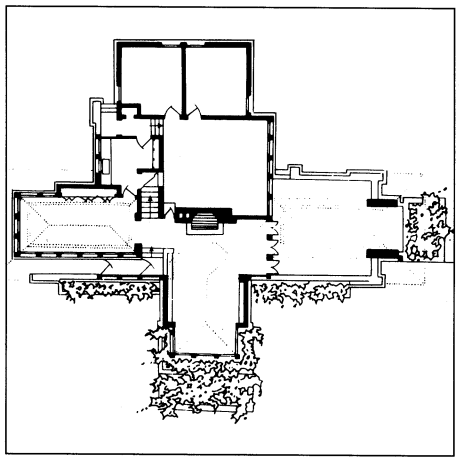


7. Section, wood frame construction. From Edward Allen, *Fundamentals of Building Construction*, drawings by Joseph Iano. © 1985, John Wiley & Sons. Reprinted by permission of John Wiley & Sons, Inc.

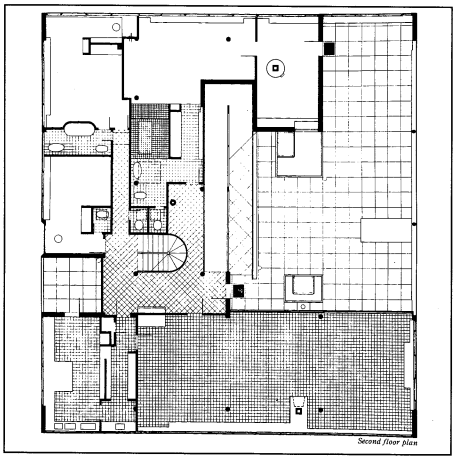
umn. Although the abstract framework of the axial system is capable of independently determining a center—and thus a location—the multistoried column, by giving the third dimension a concrete form, becomes a convincing manifestation of Loos's intention, further strengthening the plausibility of location in the Heideggerian sense.

According to Münz and Künstler, the second of two necessary factors for raumplan is the design of the house from the inside out: "The outside of the house must be completely subordinated to the requirements of the inside."[24] Implicit in this stipulation is the modernist bias further revealed in the dictum, "To fulfill the requirements of function one must build from the inside out."[25] Relative to the internal generation of raumplan, Münz and Künstler stress the significance of the main living room: "The principle of building on a 'plan of volumes' . . . was gradually prepared and clarified—starting with the space that seemed to [Loos] the most important for living purposes."[26]

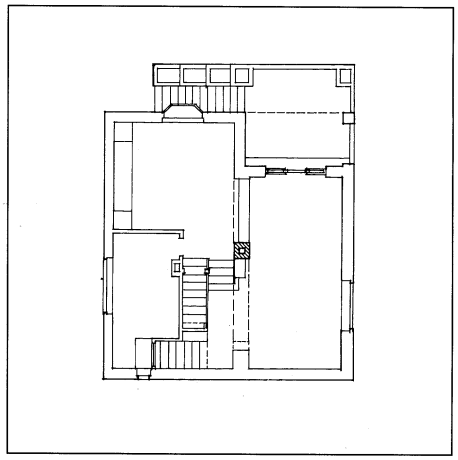
Although the raumplan schemes do have a main room on which the house is focused, nothing in the modernist analysis explains the characteristic 2:1 proportions of the main living space. Functional logic would suggest variation in the configuration of this room based on differing programmatic requirements. But, whereas the size of the main room varies among the houses, the main living room is always generated, as in Rufer, from a double-square module. Such a module could not exist except for the quadripartite division established between the directional system and the house's enclosure. As though to



8. Isabel Roberts House, plan of the ground floor, Chicago, 1908, Frank Lloyd Wright. From Christian Norberg-Schulz, *Meaning in Western Architecture* (New York: Rizzoli, 1980).



9. Villa Savoye, plan of the main floor, Poissy, France, 1928–31, Le Corbusier. From Le Corbusier, *Villa Savoye*, edited and photographed by Yukio Futagawa (Tokyo: A.D.A. EDITA [*Global Architecture*], 1972).



10. Rufer House, plan of the main floor. Drawing by Tom Jenkinson.

emphasize how deliberate this delineation is, the raumplan perimeter—contrary to the functionalist assertion of exterior subordination—always takes the form, or is derived from, a perfect square.

In Heidegger's terms, perimeter is essential to the definition of *raum:* "A space is something that has been made room for, something that is cleared and free, namely within a boundary, Greek *peras.*"[27]

In his book, *The Earth, the Temple, and the Gods*, Vincent Scully explores the Greek attitude toward site from a different, but not unrelated, point of view. Scully focused on the Greek conception of site, in particular sacred sites, as "found" landscapes that were claimed for human purposes.[28] In ancient Greek culture, the recognition of a natural site was not a passive gesture, but a highly charged act that involved the ability both to identify and to clarify the site.

Greek sites were typically surrounded by a wall; the resultant enclosure was called a *temenos.*[29] The *temenos* wall typically lacks the intention to exclude, which is evident, by contrast, in the walled sites of ancient Egypt. With the Greek wall, the characteristics of defense seen later in medieval situations are also lacking. Rather, the boundary walls of a Greek site serve to verify both its existence and its extent. The space of the *temenos* belongs to the site enclosed by the wall; the space within is claimed as free and clear.

Heidegger's definition of location is particularly useful because its abstract construction incorporates variations in scale. Insofar as the raumplan functions in the same manner as a Greek site, the house's exterior walls, and not its lot lines, are the true boundaries of the theory's operation.

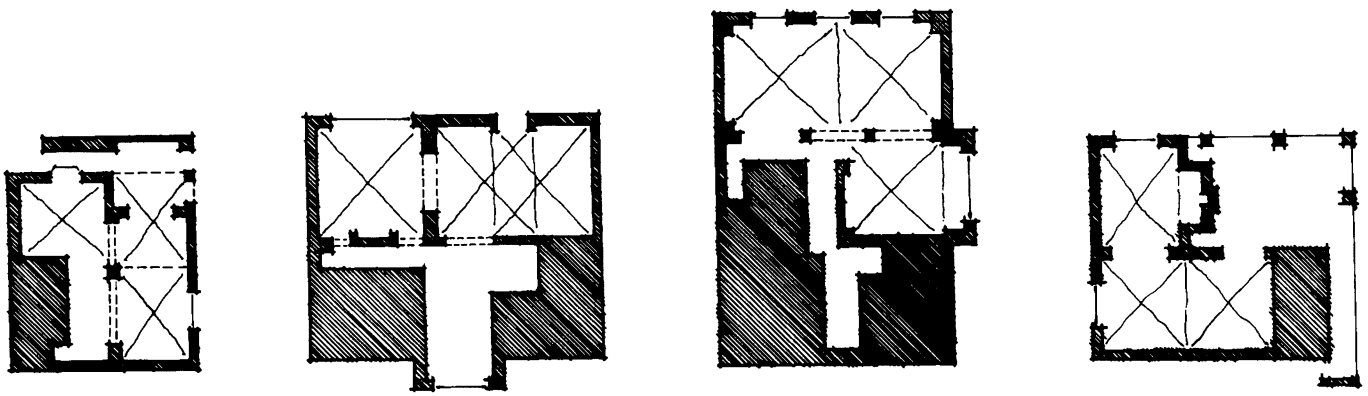
Heidegger's philosophical inquiry suggests a foundation for raumplan theory; this foundation is established through a sequence of abstract propositions. To begin the sequence, the axiality implicit in a linear intersection designates a system of order that embodies a world view. Next, the crossing of lines identifies a center. This location is acknowledged and marked, in a physical sense, by a solitary column. While the column serves to ground the order inherent in the axial gesture, it also introduces a tangible, three-dimensional reality that condenses the force of the abstract system. Finally, with the inscription of the perimeter, there is correspondence between the preparatory stages of the raumplan and Heidegger's concept of site. These three elements—the abstract directional order, the column as a physical marker at the center, and the platonic, square-shaped perimeter—act together to sustain a site for the location of the raumplan.

Raum 2: Presencing

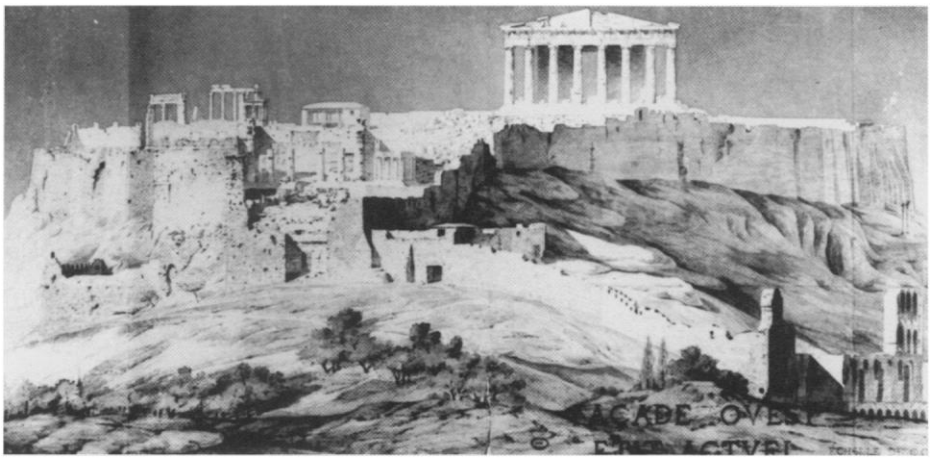
Once the site is established, Loos is free to engage strategies that further characterize the raumplan. Münz and Künstler describe this phase of design as an almost biological orchestration in which the rooms of the house agglomerate around the main living area: "If such a room were thought of as the building's germ cell, to which everything adheres, an arrangement is implied."[30]

Whereas conventional architectural drawings represent the raumplan with difficulty, Münz and Künstler's emphasis on the main room does suggest a useful strategy for understanding the layout of a raumplan house. The raumplan "arrangement" can be most readily grasped by following the logic of "adherence": working backward from the "germ cell" living room toward the entry and, conversely, forward from this main room toward the bedrooms and other upstairs rooms. But even though the germ-cell description makes the scheme of the house comprehensible, from a theoretical standpoint it proves nongenerative.

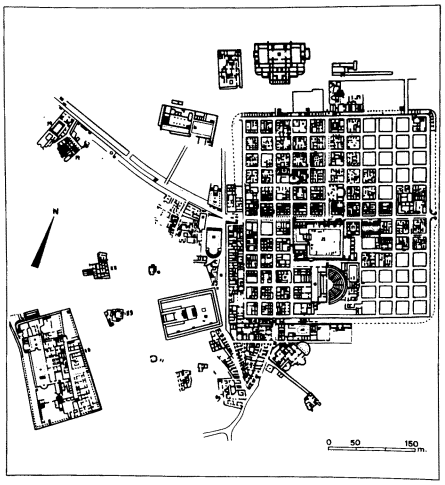
If, for example, the raumplan is based on an agglomeration of rooms around the germ cell, how can one explain the coincidence of this accretion with a platonic shape—the overall perfect square of the house's perimeter? By contrast, Heidegger's



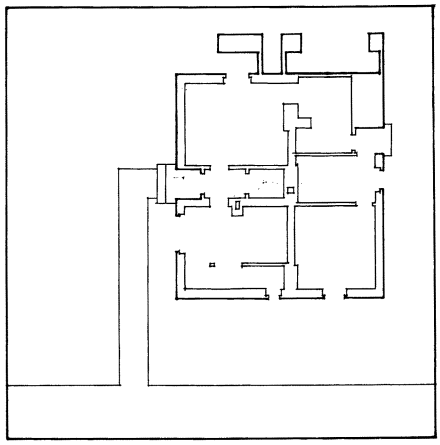
11. Diagrammatic plans of main floors: Rufer House, Möller House, Müller House, Villa Moissi. Drawings by Laurel Ulland.



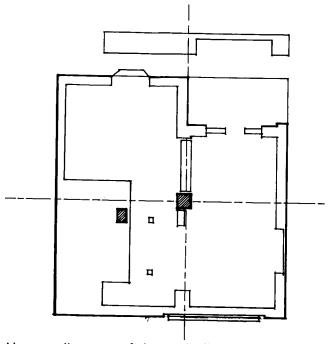
12. The Acropolis, Athens, c. 400 B.C. Drawing by Marcel Lambert. From *Paris, Rome, Athens: Travels in Greece by French Architects in the Nineteenth and Twentieth Centuries* (Houston: Museum of Fine Arts, 1990).



13. Timgad, plan, c. A.D. 100. From Christian Norberg-Schulz, *Meaning in Western Architecture* (New York: Rizzoli, 1980).



14. Rufer House, site plan. Drawing by Laurel Ulland.



15. Rufer House, diagram of the main floor, unfolding within a boundary. Drawing by Laurel Ulland.

work again suggests a new possibility for interpretation of the raumplan. According to Heidegger, "A boundary is not that at which something stops but, as the Greeks recognized, the boundary is that from which something *begins its presencing.*"[31]

Within the framework of Heidegger's existential ontology, the term *presencing* describes the process through which reality is both recognized and understood. From an abstract point of view, *presence* suggests *embodiment;* according to ordinary usage, a *presentation* implies an acknowledgment that can be shared by all. *To present* literally means "to send ahead." In an architectural context, *presence* connotes a concrete yet subtly charged reality—a reality that is meaningful because it emerges: it has been put forward.

Consistent with Heidegger's observation, many sites that the Greeks developed, particularly sacred sites, demonstrate appreciation for the significance of defining a boundary and the potential for presencing within it. The application of the terms *presencing* and *boundary* can be illustrated through one such example, the Sanctuary of Apollo at Delphi.[32]

The site at Delphi is extremely steep; the enclosed *temenos* was entered at its lower end, and a switchback wound up to the sanctuary's main feature, a temple dedicated to Apollo.

Along the path, the visitor encountered a variety of architectural attractions. These ranged from the scattered treasuries of the independent city-states, which Vincent Scully describes as representing, through both symbolic allusion and their physical scale, the human element of Greek culture[33]—to the sophisticated abstraction of the smooth, yet irregularly jointed stone of the polygonal wall and the attenuated columns of the portico of the Athenians fronting it.

After a sharp turn in the path, the temple suddenly appears. Although travelers could see this edifice as they approached the site, subsequent to the sanctuary's entrance the temple is hidden by projecting objects and the foreshortened angle of the slope. When it is seen again, especially in contrast to its previously distant view, the temple seems abruptly large and close.

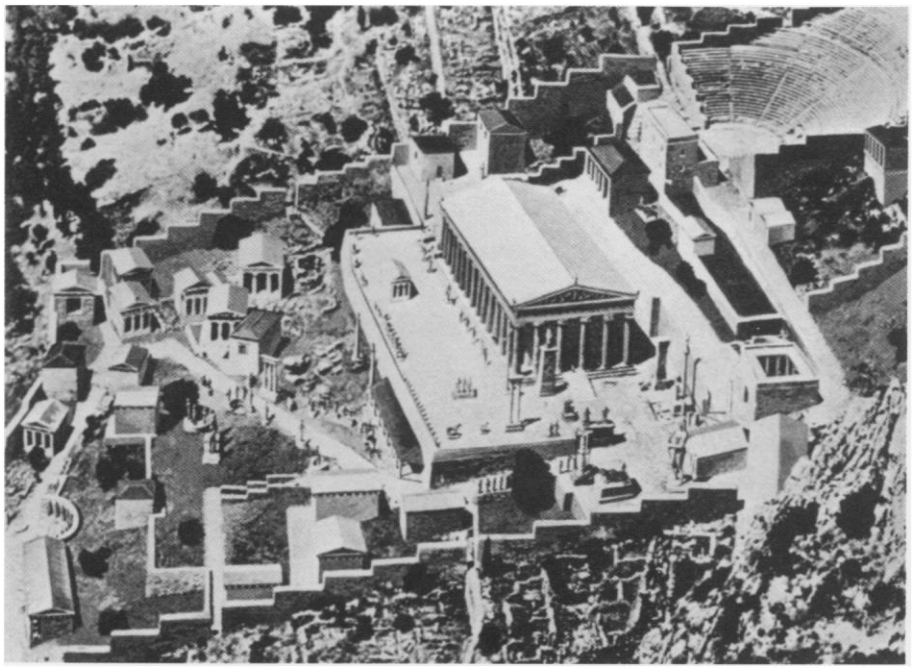
Despite its importance, the temple does not command the *temenos* in terms of its placement on the rising ground. The uppermost area within the site's enclosure

is reserved for a theater, which acts as an epilogue to the climactic religious experience of the temple, located immediately below. From the theater, visitors could look back, apprehending the consecutive episodes of their pilgrimage up the mountain as a now-understood totality.

At Delphi, the mysteries of the sacred world are re-*presented*.[34] Representation in this sense transcends imitation or mimicry. In Greek terms it is *methectic* as opposed to *mimetic*. *Methectic* situations form the basis of ritual; they can be understood as "a helping out of the action."[35]

The sacred world unfolds within the boundaries of the site. The meaning of the site is not, however, isolated by its boundaries. Rather, from inside the sanctuary one senses that the site is sheltered by the wall surrounding it. The very use of the term *sanctuary* supports this notion of protection. Thus, Heidegger says, "To save really means to set something free within its own presencing."[36] In other words, presencing is possible because there is safety inside the boundary. This security guarantees a place of refuge that allows for clearing, reflection, and rebuilding.

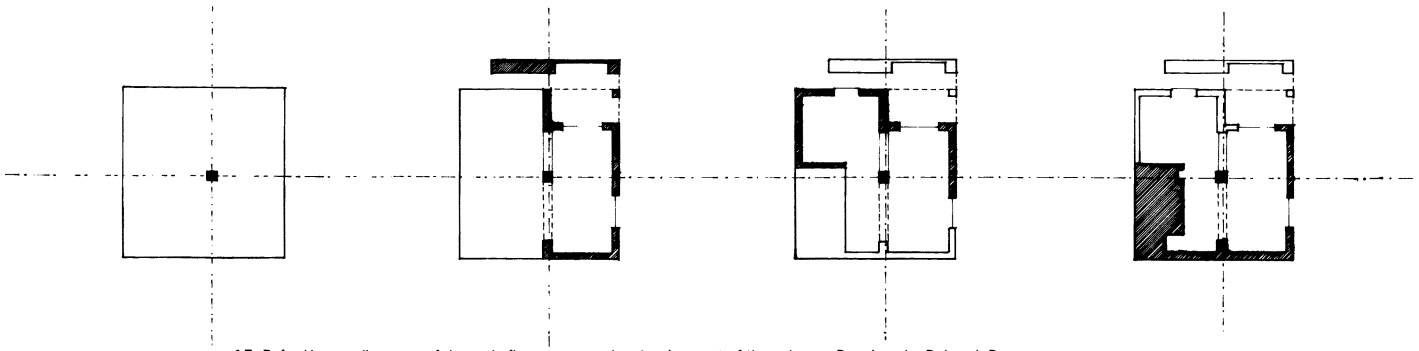
In Loos' design for the Rufer House, the transformations that occur in the evolution of the raumplan support the idea of presencing, or setting free, within a boundary. The perimeter of the house takes the form of a perfect (or platonic) shape—the square. A quadripartite division of this square is implied through the placement of the central column, but an emphasis on one axis over another causes a sort of bilateral override, splitting the house in half.



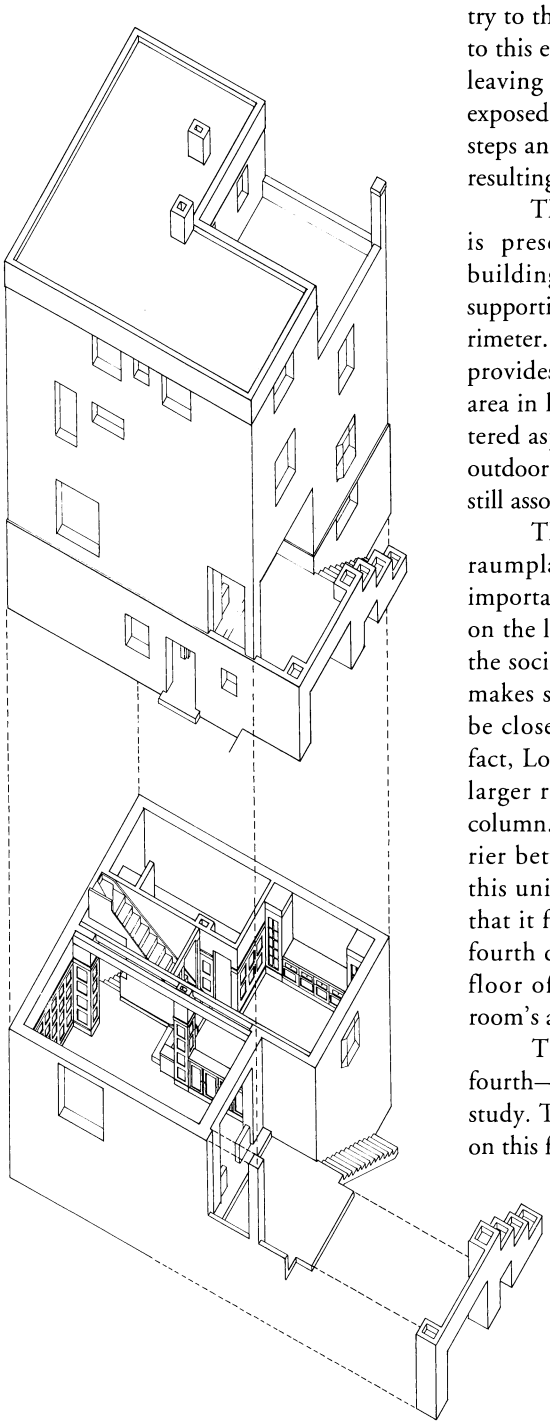
16. Sanctuary of Apollo at Delphi, reconstruction, c. 350 B.C. From Christian Norberg-Schulz, *Meaning in Western Architecture* (New York: Rizzoli, 1980).

Once Loos has located the living room—what Münz and Künstler call the germ cell and the most important room of the house, one floor above the main entry on the house's second story—the plan begins to configure rapidly. Encompassing two of the quadripartite modules and coinciding with the bilateral division of the square, the living room occupies one half of the floor area.

Meanwhile, a stair at the rear of the house offers the potential for a garden en-



17. Rufer House, diagrams of the main floor, progressive development of the scheme. Drawings by Deborah Duncan.



18. Rufer House, axonometric, garden view. Drawing by Laurel Ulland.

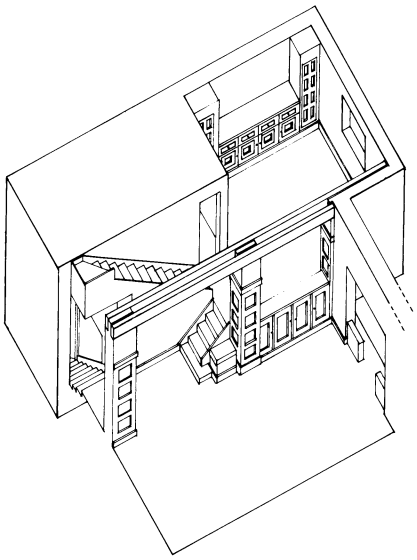
try to the living room. The room responds to this encroachment by retreating slightly, leaving a fragment of the double module exposed but now available to join with the steps and landing of the garden entry. The resulting terrace overlooks the backyard.

The integrity of the original module is preserved by the overhang of the building's upper stories and the column supporting the corner of the volumetric perimeter. The covered portion of the terrace provides a transition to the more exposed area in line with the stairs, while the sheltered aspect suggests that the terrace is an outdoor manifestation of the living room—still associated with the interior space.

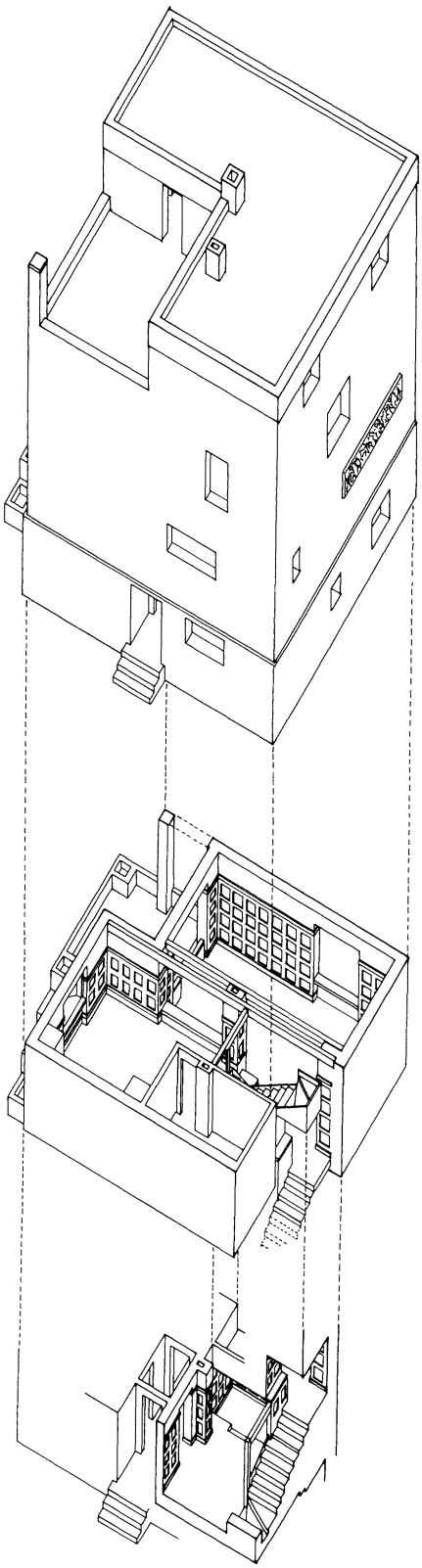
The next room to emerge out of the raumplan is the dining room, second in importance only to the living room. Based on the link between communal living and the social rituals associated with eating, it makes sense that the dining room would be closely related to the living room. In fact, Loos literally draws space out of the larger room, pulling it back around the column. Having breached the implied barrier between the two halves of the plan, this unifying flow of space is so powerful that it fills a complete module, the entire fourth quadrant, and Loos must raise the floor of the dining area to preserve the room's autonomy.

The remaining quadrant—the fourth—is reserved for the owner's private study. The only completely enclosed room on this floor, it is accessible through a single door located near the dining room. The placement of the study effectively shuts down the quadrant—it becomes a "black box" anchored within the house's perimeter. Due to the relatively modest square-footage requirements of this private room, however, the quadrant is amenable to retraction and erosion when, for example, the stairs from below require access to the public rooms on the main floor or when a foyerlike space, negotiating transit to the dining room and ultimately the bedrooms above, is needed adjacent to the living room.

Despite the modernist belief that raumplan is volume-generated, the way in which the scheme of the Rufer House evolves—primarily through the plan of this second-story floor—suggests a strategy compatible with the typology of the traditional *piano nobile* house. At first, this observation appears to undermine the validity of raumplan theory. Actually, however, this is not the case insofar as it is presencing—setting free, or unfolding, within a boundary—not the manipulation



19. Rufer House, axonometric view of the stairway and dining room. Drawing by Laurel Ulland.



20. Rufer House, axonometric, the "sliding sleeve." Drawing by Laurel Ulland.

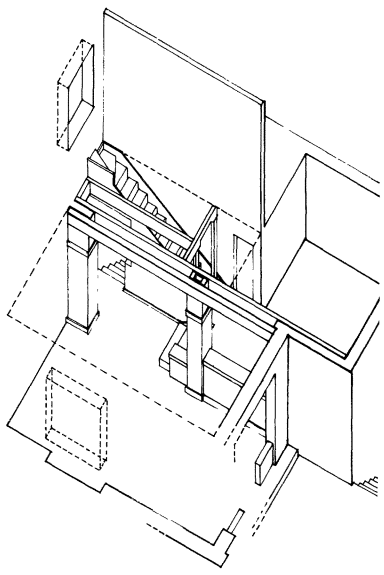
of volumes per se, that accounts for the spatial interplay in raumplan. Conversely, although the sectional manipulations that are characteristic to these houses seem at first to support the volumetric mandate for raumplan, an analysis of these three-dimensional interactions again serves to demonstrate the idea of presencing.

A significant instance in the Rufer project is the house's main entry. This occurs below the level of the *piano nobile*. A "cloak room" is entered via a door at the side of the house, and from the corner of this room winding steps tunnel upward to the public floor. If this vertical maneuver is conceptualized, not as an upward movement, but rather as a tail that extends from the public floor, dropping down and expanding into the cloak room when it encounters free space below, then the three-dimensional situation can be seen as rooted in the *piano nobile*—in other words, originating from it. This interpretation does not contradict the germ cell intuition so much as it goes beyond its simpler formulation.

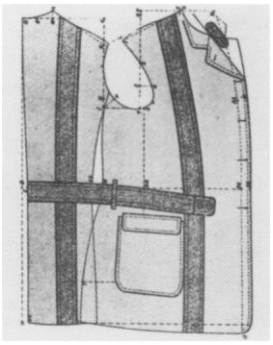
Another way of visualizing the cloak room entry conjures the image of a mechanism in which a sliding sleeve has dropped out of the "black box" above.[37] If the sleeve were pushed back into the box, the entry would literally occupy the fourth quadrant of the *piano nobile*, and one could proceed directly across the quadrant to enter the living room. But since the sleeve has fallen out of the box, circulation must climb back upward and, in the process of doing so, gravitates toward the slippage at the edge of the sleeve.

A similar strategy transforms the stair landing into a modest but honorific entry at the level of the *piano nobile*. The space needed for a small, open foyer at this location is cleared by pushing a series of vertical planes into the "black box" quadrant. The erosion of the quadrant is halted by a two-story plane that coincides with the wall of the owner's private study and supports the stairs leading to the bedrooms above. This rising wall, which serves to lock the upper floor to the main floor, is also rooted in the *piano nobile* and can be understood as an extension of it.

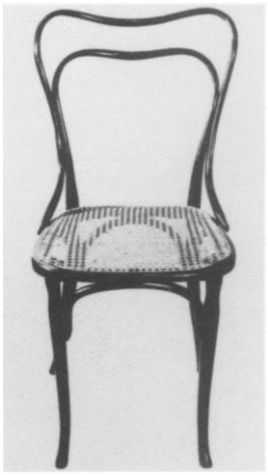
The function of this locking mechanism is made explicit by a manipulation of daylighting. The *piano nobile* is lit directly from a window located at right angles to the ascending stair, but the stairwell is also illuminated, as though from a skylight above. In fact, a window at the top of the stairs floods the stairway and foyer space below while also lighting the stair landing and hall above, thus enhancing the integrating tendencies of the vertical plane through an intersecting play of light. This locking mechanism does not simply connect two parallel layers. Rather, it acts as a conduit, opening up the possibility of expansion—or escape—from the public realm to a backwater of unseen, private rooms.



21. Rufer House, axonometric view showing the placement of windows relative to the stairway and living room. Drawing by Laurel Ulland.

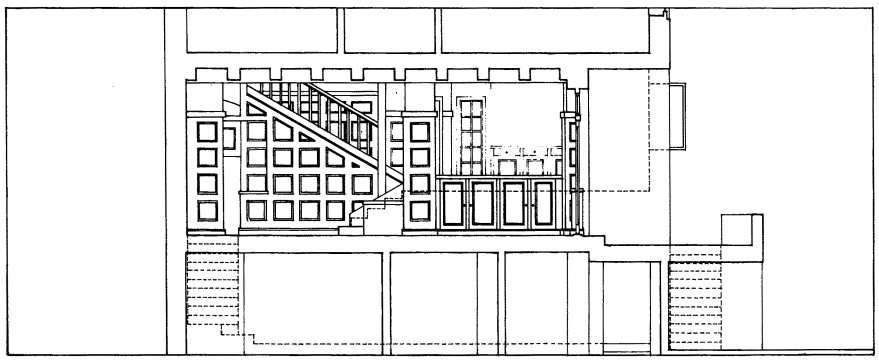


22. Tailor's pattern for a Norfolk jacket. J.P. Thornton, *The Sectional System of Gentlemen's Garment Cutting, Comprising Coats, Vests, Breeches, and Trousers* (London: Minister & Co., 1887). From Adolf Loos, *Spoken into the Void* (Cambridge: MIT Press, 1982).



23. Chair designed by Adolf Loos for the Museum Cafe, Vienna, 1899. Manufactured by Thonet. From Adolf Loos, *Spoken into the Void* (Cambridge: MIT Press, 1982).

In making his argument, Münz ignored the formal structure of the spaces, again focusing on their strictly volumetric properties: "The rooms, according to their purpose and use, not only have different sizes but also different heights."[38] Aside from the fact that the sizes of rooms are normally dependent on their use, the validity of Münz's observation is challenged in the Rufer House, where only the living room has a different height. By itself, this situation seems hardly more innovative than the introduction a few decades later of the sunken living room—a popular feature of American suburban homes. As for the Rufer House, rooms below the main floor are pursued by this height alteration to the practical disadvantage of the layout of the lower floors. Heights of rooms on the upper stories do not vary within a given level. Münz's additional contention that due to the volumetric strategy in raumplan, "Loos can therefore create more living space within the same confines, since the same cubic capacity on the same foundations and under the same roof can now contain more rooms within the same external walls,"[39] is consistent with modernist rhetoric but seems less useful as a contemporary proposition.



24. Rufer House, section showing the wall dividing the main floor. Drawing by Laurel Ulland.

By contrast, presencing suggests that the three-dimensionality in Loos's work is in reality a continuation of setting free. Positioning the raumplan, not within Münz's volumetric ideology, but relative to Heidegger's existential dissertation proves a more fertile basis for interpreting Loos's theory. Ironically, this Heideggerian vantage also brings Loos closer to Le Corbusier since the unfolding of spatial entities within a perimeter is not incompatible with Le Corbusier's belief that "the Plan is the generator."[40]

Raum 3: Gathering

Architecture can occur, finally, only through a concrete manifestation—that is, through building. For this reason, the design process cannot be fully described by the concept of presencing. In order to discuss the necessary transition from idea to reality, Christian Norberg-Schulz coined the term *concretization.*[41] Heidegger had earlier recognized the dilemma of abstract versus material reality when he chose, in his own philosophical inquiry, to emphasize the investigation of a world made up of "things."[42]

Evidence of Loos's interest in "things" dates from 1898 when he wrote a series of essays for the progressive Viennese *Neue Freie Presse.* Titles such as "The Luxury Vehicle," "Men's Hats," and "Underclothes" characterize the series. The newspaper's editorial logic in choosing an architect to expound on these topics accorded with the concept of total design popularized by the Secessionist movement.[43] Ironically, Loos was opposed to the flamboyant and highly decorative art nouveau style that this group promoted. In "Architecture," an essay written in 1910, he later stated, "There are many things which show the style of the twentieth century by pure form alone. They are made by craftsmen,

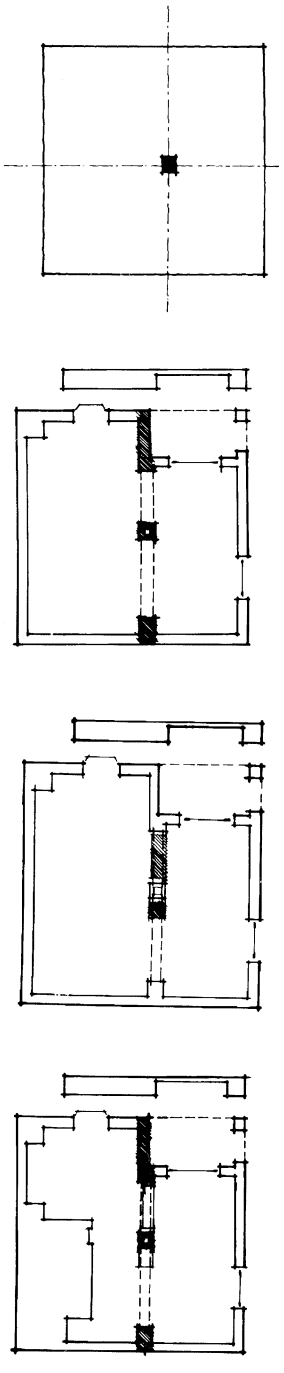
with whom the warped architects were not acquainted."[44] While the essay's ostensible purpose was to champion the ultilitarianism of the craftsperson, Loos's fascination with the process of fabrication is evident as he further elaborates his effort to learn joinery and detailing in wood construction: "I approached the workshop gingerly, like an apprentice, and I reverently gazed up at the man in the blue apron. And asked, 'Let me into your secret!'"[45]

Loos's concern with the crafting of materials is relevant to the definition of raumplan insofar as detailed construction is essential to the realization of his theory. An explanation of how Loos did, in fact, utilize tectonic devices in raumplan can best be demonstrated through an analysis of the houses themselves.

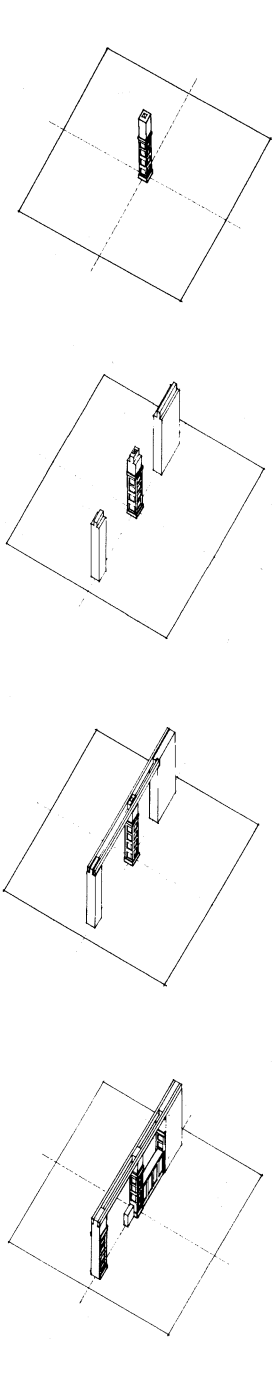
According to the initial strategy that establishes a scheme for the Rufer House, the crossing of two perpendicular lines identifies a quadripartite division, and an orthogonal perimeter surrounds four equal modules. Then, the emphasis of one axis over another causes a secondary, bilateral shift in the plan's organization. In the actual development of the plan, this bilateral emphasis is possible due to the formation of a wall along the line of the favored axis. The wall in question does not, however, come into being as the result of a single gesture, but through the accumulation of numerous, fragmented pieces.

Among the individual pieces, the main column stands out as a dominant component. It was previously seen to mark the point of crossing of the two lines that generate the four-part module. In its original schematic role, the column was both a locator and an anchor. In its more palpable manifestation as a squat, densely vertical *thing*, it now stands in the center of an open site, enclosed by a broad perimeter.

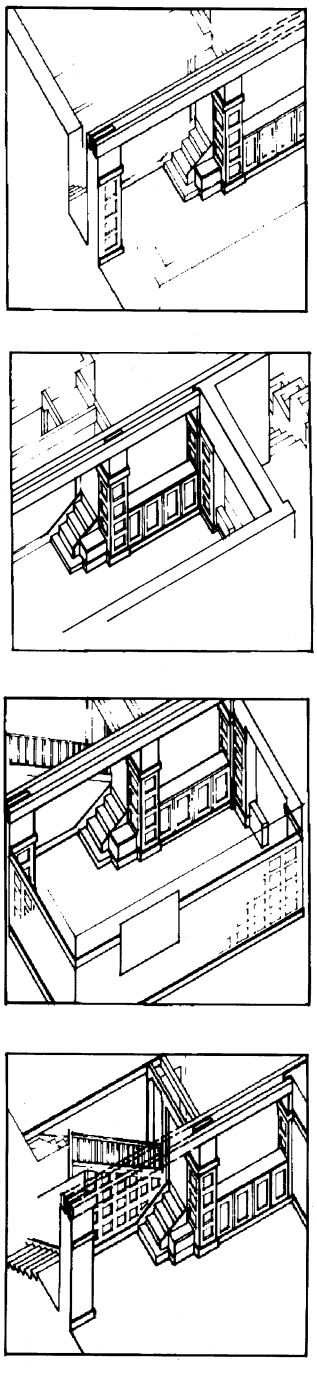
Accruing to the column is a linear string of elements. These are drawn from



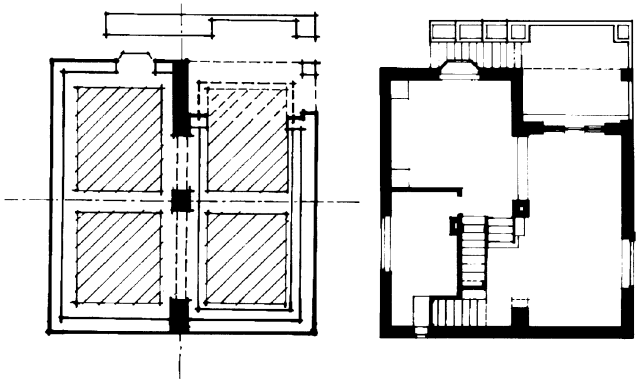
25. Rufer House, diagrams of the main floor, progressive assembly of the wall. Drawings by Laurel Ulland.



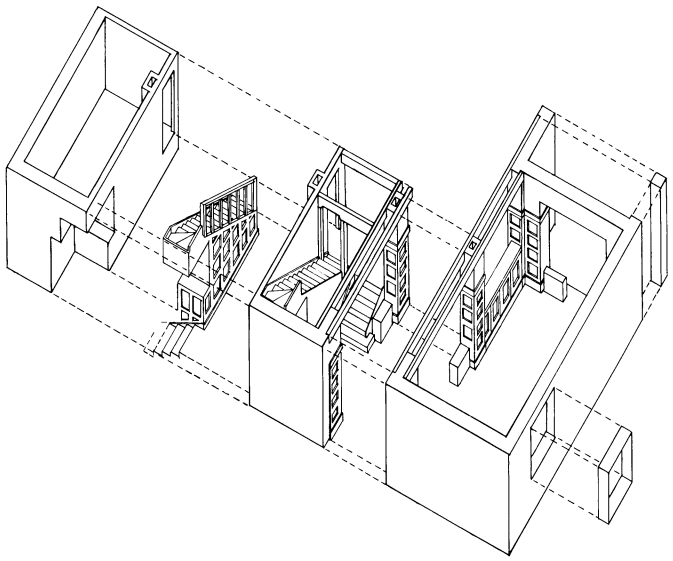
26. Rufer House, axonometric diagrams of the wall assembly. Drawings by Julie Oseid.



27. Rufer House, axonometric vignettes demonstrating the potential for simultaneity within the wall assembly. Drawings by Julie Oseid.



28. Rufer House: diagram of the original four quadrants, plan of the main floor. Drawings by Julie Oseid.



29. Rufer House, extended axonometric of the stair landing on the main floor. Drawing by Laurel Ulland.

the unfolding scheme insofar as the scheme is disposed to develop as a bilateral configuration. Such a disposition could emerge for any number of reasons—to bring a more sophisticated level of abstraction to the order of the plan, to impose hierarchy among the four previously equal quadrants, to programmatically sequester a large area backed by two smaller ancillary spaces, and so on. But whereas the origins of the scheme occur through earlier abstract propositions, these concrete manifestations are new. They are elements "called into play" like athletes taking up positions on a playing field.[46] These elements are further assembled—or gathered—relative to the original column.

In the case of the lower two quadrants, a pilaster at the bottom of the plan, paired at its full height with the center column, completes a trabeated frame that serves as a final, formal element of entry into the living room. Added components, such as the boxlike ledge placed against a short run of stairs to the dining room, modify the simplicity of this opening.

Similar events describe the activity in the plan's upper two quadrants. The wall originates as a straightforward, elongated segment. Significantly, this length of wall ends with a pilaster that mimics the form and decoration of the center column, so that the two elements appear naturally paired. Set between them is a cabinet opening onto the main living space; the back of the cabinet edges the dining room's higher floor.

Ceiling beams that run, counter to exposed joists, the entire length of the wall, verify Loos's intention to arrange all these pieces as a coordinated assembly. The process of forming the wall is consistent with Heidegger's observation: "Gathering or assembly by an ancient word is called 'thing.'"[47] With this assembly, or gathering, of elements to make a "thing"—in this case, a wall—the idea of *raum* achieves a tangible expression.

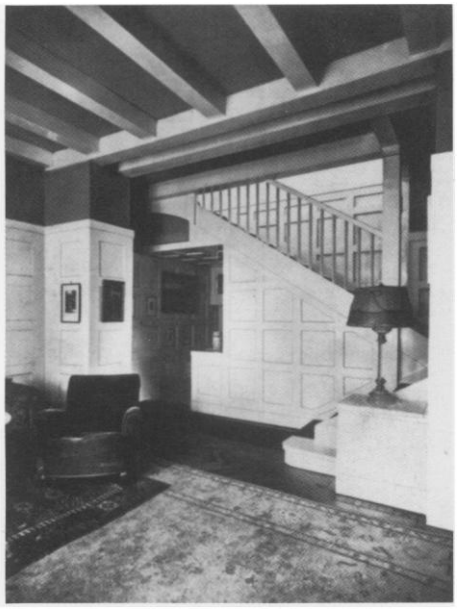
As the raumplan develops from this point, the relationship among elements takes on a syntactic quality. The level of complexity now available to the assemblies can best be understood by studying their potential for simultaneity. For example, consider the number of distinct assemblies in which the center column participates.

From the front half of the living room, the column acts as one jamb of the entry portal, whereas from the back half of the living room it completes a frame that brackets the flow of space into the dining room. Within the living room, the column anchors an enclosing perimeter that serves a unifying function. From the area immediately outside the living room, at the head of the stairs coming up from the floor below, the column engages with a short run of steps and the adjacent ledge to form an entry into the dining room.

Simultaneity can occur because elements, when they are gathered or assembled into a "thing," do not necessarily forfeit their autonomy. The degree to which the identity of any given element is subsumed within the assembly is relative and can be controlled by the designer. In the instance of the Rufer House, the column becomes part of a wall but can still be recognized as a column. It therefore remains available if called on to act in other subassemblies. Because the average person rarely consciously makes these distinctions, what he or she experiences is the simultaneity of the column in its role of gathering.

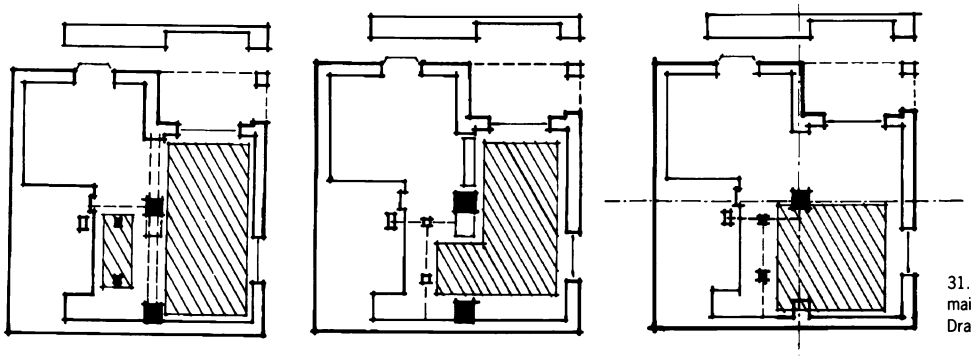
Raum 4: Staying among Things

The complexity associated with the maturing stages of the design process is often described as a transparent series of meanings whose layering must enrich the experience of a building without causing cacophony or confusion.[48] Because simultaneity can



30. Rufer House, view of the foyer from the living room. © Artists Rights Society (ARS), New York / VBK, Vienna.

32. Rufer House, view from the foyer looking into the living room. © Artists Rights Society (ARS), New York / VBK, Vienna.



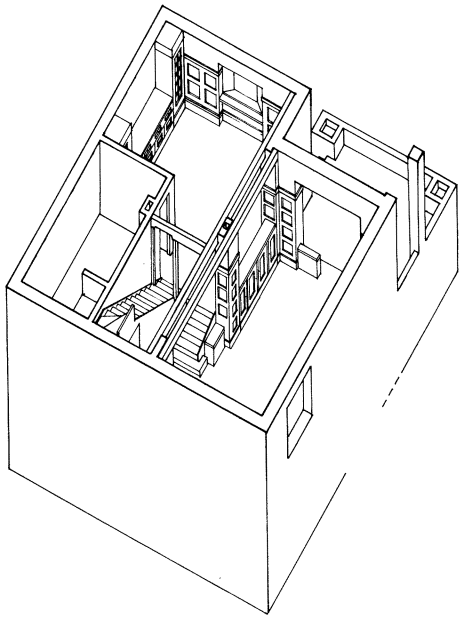
31. Rufer House, diagrams of the main floor, multiple readings (1). Drawings by Julie Oseid.

be closely linked with this idea of multiple reading in the scheme—in fact, simultaneous reassembly makes multiple reading possible—the raumplan houses are an especially fertile source for studying the formal consequences of multiple reading.

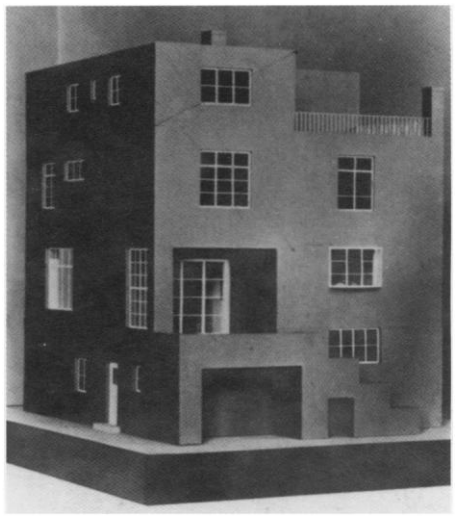
Of particular importance in the raumplan is not the incidence of either multiple reading or simultaneity per se, but—insofar as each embodies the concepts of presencing and gathering—the opportunity for evaluating the mutual dependence of these two phenomena. Although it may seem logical to assume that schematic planning precedes the concrete realization of a design, analysis of the raumplan demonstrates that the execution of a complex building is not a simple, two-stage process in which abstract thinking gives way to the manipulation of mate-

33. Rufer House, view of the stair to the bedroom floor. © Artists Rights Society (ARS), New York / VBK, Vienna.

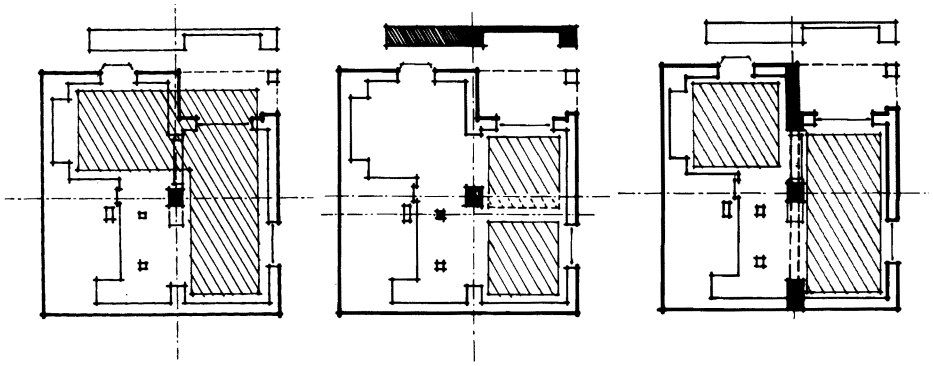
34. Rufer House, view from the living room into the dining room. © Artists Rights Society (ARS), New York / VBK, Vienna.



35. Rufer House, axonometric view of the main floor and terrace. Drawing by Laurel Ulland.



37. Rufer house, model, rear view. © Artists Rights Society (ARS), New York / VBK, Vienna.



36. Rufer House, diagrams of the main floor, multiple readings (2). Drawings by Julie Oseid.

rial elements. In the raumplan, once the concept of *presencing* engages the concept of *gathering,* there is an escalating interaction between the two modalities.

This is clear in the Rufer House. Although the scheme initially posits a two-module living room, which is then realized through the assembly of the long wall, the potential identity of the original quadrants is retained, notably on the side of the wall opposite the large room. Taking advantage of this arrangement, a series of vertical planes is forced back through the portal of the main space and into the adjacent quadrant. The area cleared becomes an enlarged stair landing and intermediate foyer that negotiates entry primarily to the living room and secondarily to the dining room, ultimately providing access to the study and stairway rising to the private rooms above. Since this small, honorific space does not require the entire area of the usurped quadrant, erosion can be halted by the placement of a run of stairs to the upper floors, leaving enough square footage to insert the enclosed study behind the stairway.

At least two readings, however, have already come into existence. The most obvious portrays the invaded quadrant as a separate entry foyer, an associative but intrinsically autonomous space adjacent to the main living room. The assembly of elements that support this interpretation includes the original entry portal (consisting of pilaster, beam, and column), the planes of the stair and its railing, and the boxed arrangement of exposed beams above the foyer itself. The syntactic disposition of minor elements is effective in developing this reading: the pilaster, dining room steps, and low side ledge anchoring the base of the central column both enclose the space and give it a formal exit.

A second reading of these two quadrants is visual rather than functional; it negates the autonomy of the foyer, co-opting that space as an extension of the living room's lower quadrant. According to this reading, dragging or pushing the lower end of the boundary at a perpendicular angle to the orientation of the original two-module room now suggests an ambiguous L-shaped configuration for the main living space. Through its interaction with the pilaster, abetted by the compressive vertical angle of the rising stairway, the cutaway ledge of the stair coming up from below forces a diagonal projectile of entry into the living room. The diagonal imprint of the dining room steps further assists the illusion that the perimeter of the room re

cedes in successive eroding planes within the shape of the L.

The ambiguity of these two readings is resolved through the perception of a third arrangement, which is dependent on the window in the wall facing the stairs. The window is centered on the portal to the living room. While this opening lights the plane supporting the stair run, an unseen window at the landing above floods the back wall of the stairway. The resulting luminous effect tends to sequester the lower half of the living room as particularly open and expansive. Significant details that enhance this quality include the uniformity of surface paneling, which is kept at one height and seems to undulate across receding and approaching planes. The luminous expansion of these vertical planes is further bracketed, and thus accentuated, by the consistent height, color, and texture of the floor and dark beams in the ceiling. A tall newel post on the stair, acting together with the center column, completes this reading, which ultimately divides the long room, reorients its lower half at a cross angle, and forms a new square within the original configuration.

Similar strategies characterize the remaining development of this *piano nobile* scheme. The quadrant adjacent to the living room's upper module is selected for the second most important room on this floor, the dining room. An opening between the living and dining rooms, framed by the assembly of column, cabinet, and pilaster, suggests that a "free plan" is intended and reinstates the problematic L-shape at this new location. But syntactic elements are again deployed to coordinate a more sophisticated double reading. The dining room floor is raised so that the cabinet literally represents its height differential. The need for steps to reach the higher floor and the addition of the low ledge bordering them create, with the original cabinet, a string of horizontal elements, pinned by the vertical column. Taken together, with the beams lining the ceiling above, this assembled barrier protects the original, self-contained reading of the living room and makes the open-plan reading subordinate without negating it.

Meanwhile, the introduction of the terrace as an outdoor counterpart to the interior living room proves a critical schematic insertion. The placement of the terrace is partially within the perimeter of the building so that it is sheltered by the overhang of the upper stories before extending into the open air. The slipping square of the upper quadrant thus expresses a phased transition from inside to outside. The compression of the two-module living room, which this placement causes, is critical. Although the original clarity of the double module is deformed, the compression—which also shortens the length between the column and pilaster in the upper quadrant and activates minor elements, such as the step ledge, in their role as agents of dimensional ambiguity—recoups the force of the original bilateral division.

Also significant is the way in which the disposition of the terrace translates to the dining room. As the compressed space bears down on the arrangement of column, cabinet, and pilaster, Loos mimics this assembly in the opposite wall of the dining room, replacing the open frame with a mirror. The diagonal resonance of the two assemblies has an expansive effect similar to the one that occurs in the composition of the landing foyer, only here it is more broadly scaled. As indicated by the adjusted proportions of the space and the protruding bay window, the dining room expands not only through illusion, but also in reality. Finally, the heavy railing of the outside stair and the wall of the terrace seem necessary to cap both this diagonally generated expansion and the energy of the terrace's earlier sliding square.

In the design of buildings, multiple readings serve as a kind of concretized riddle. These riddles are significant precisely because they are necessary. They allow a building to evolve a complexity that corresponds with reality. When the potential for more than one interpretation exists in any environment, resolution occurs through experience or habitation. This phenomenon corresponds with Heidegger's concept of "staying among things." Ultimately, Heidegger makes the connection between thinking and building through the concept of dwelling. He claims, "Dwelling itself is always a staying with things."[49] The necessity of introducing the new term *staying* indicates that "things" are not ends in themselves. This idea readily translates into the architectural realm: Even though a design scheme can become tangible only through the gathering of things, the mere assembly of elements is meaningless unless directed by the scheme.

In Heidegger's terms, within the space set clear and free by a boundary, the presence of a building can unfold, complicit with the gathering that characterizes the making of things. Women and men are then able to find locations in which they can stay—that is, they can dwell: "To say that mortals *are* is to say that *in dwelling* they persist through spaces by virtue of their stay among things and locations."[50]

Acknowledgments

I wish to particularly thank Laurel Ulland, who worked as my research assistant during both the formative and developmental stages of this article. Others who contributed include Tom Jenkinson, Julie Oseid, and Deborah Duncan. I am grateful to Dean Harrison Fraker of the College of Architecture and Landscape Architec-

ture at the University of Minnesota for his support; the completion of this article was made possible by a Grant-in-Aid from the Graduate School at the University of Minnesota.

Notes

1. Prior to the dissolution of the Hapsburg monarchy, the town in which Loos grew up—Brno, Czechoslovakia—was the capital of Moravia, a province of the Austro-Hungarian empire. Loos eventually settled in Vienna, the imperial capital, where he remained until after World War I. Among the sources of biographical information on Loos, a detailed chronology is included in Ludwig Münz and Gustav Künstler, *Adolf Loos: A Pioneer of Modern Architecture* (New York: Praeger, 1966), pp. 25–27. A succinct biographical essay is contained in Bennedetto Gravagnuolo, *Adolf Loos, Theory and Works* (New York: Rizzoli, 1982), pp. 28–31.

2. Heinrich Kulka assigns the term *raumplan* to the Strasser House of 1918–1919; he also labels as raumplan many of Loos's subsequent projects, including the Tzara House in Paris and several unbuilt villas. See Heinrich Kulka, *Adolf Loos: Das Werk des Architeckten* (Vienna: Schroll, 1931), pp. 33–43. According to Münz and Künstler, the Rufer House was the first of "three houses on the 'plan of volumes' principle which were actually built," the later constructions being the Möller House in Vienna and the Müller House in Prague. Münz and Künstler, *Adolf Loos: A Pioneer of Modern Architecture*, p. 143. Gravagnuolo speaks of the Rufer House as "the first complete construction generated entirely by the principle of the Raumplan." Gravagnuolo, *Adolf Loos: Theory and Works*, p. 172. Max Risselada has identified ten houses as relevant to the discussion of raumplan; his documentation begins with the Strasser House, but he cites the Rufer House as "the basic type on which the majority of subsequent Raumplan houses are modelled." Max Risselada, in Max Risselada, ed., "Documentation of 16 Houses by Adolf Loos and LeCorbusier," *Raumplan versus Plan Libre* (New York: Rizzoli, 1988), p. 84.

3. The *Weissenhofsiedlung*, sponsored by the German *Werkbund* in 1927, was an exhibition of model houses built at a site in the town of Stuttgart. Participating architects were selected by the director of the project, Mies van der Rohe. See Christian Norberg-Schulz, *Meaning in Western Architecture* (New York: Rizzoli, 1980), pp. 198–99.

4. Adolf Loos, "Josef Veillich" (1929), in *Trozdem, Sämtliche Schriften* (Vienna: Herold, 1962), p. 438.

5. Kulka's monograph has never been translated into English.

6. Kulka, *Adolf Loos: Das Werk des Architeckten,* p. 14. The English translation is by Harold Meek; Münz and Künstler, *Adolf Loos: A Pioneer of Modern Architecture*, p. 139.

7. Actually, Künstler makes the claim posthumously on Münz's behalf. *Adolf Loos: A Pioneer of Modern Architecture*, p. 10.

8. The original publisher was Anton Schroll of Vienna. The English translation, available in 1966, was published by Frederick A. Praeger in New York. Praeger's new edition included an introduction by the art historian Nikolaus Pevsner and the added subtitle, *Pioneer of Modern Architecture.* Perhaps ironically, Künstler finished the book just as the attack on modernist theory began. Compare, for example, Christian Norberg-Schulz, *Intentions in Architecture* (Oslo: Universitetsforlaget, 1963); Aldo Rossi, *L'architettura della città* (Padova: Marsilio, 1966); and Robert Venturi, *Complexity and Contradiction in Architecture* (New York: Museum of Modern Art, 1966).

9. Künstler credits Münz's widow Maria, with the assistance necessary to complete the joint work. Münz and Künstler, *Adolf Loos: A Pioneer of Modern Architecture*, pp. 9–10.

10. The significance of the friendship has been documented by Edward Timms in *Karl Kraus: Apocalyptic Satirist* (New Haven, CT: Yale University Press, 1986), pp. 115–28 and *passim.*

11. Karel Lhota, "Architekt A. Loos," *Architekt SIA* 32/9 (1933): 137–43. Yet another disciple of Loos, Lhota is credited as *Mitarbeiter*—"assistant," or literally "co-worker"—for the Müller House in Prague (Kulka, p. 43); dated 1930, this was the last project Loos completed. Although their relationship developed subsequent to the breakup of the Austro-Hungarian empire, the two men must have shared a common bond through Loos's birth and childhood in Czechoslovakia.

12. The English translation is taken from Risselada, *Raumplan versus Plan Libre*, p. 78; Risselada summarizes all three of the known references, including the Veillich footnote, Kulka's monograph, and the Lhota interview, pp. 78–79.

13. Loos, "Josef Veillich," p. 438.

14. Originally a lecture given in 1951, "Building Dwelling Thinking" was first published in written form in 1952; a final version of the German text was published in Martin Heidegger, *Vorträge und Aufsätze* (Pfullingen: Günter Neske Verlag, 1954) pp. 145–162. The quotations cited in this article are from the English translation by Albert Hofstadter in Martin Heidegger, *Poetry Language Thought* (New York: Harper, 1971), pp. 145–61.

15. Heidegger, "Building Dwelling Thinking," p. 152.

16. Ibid., p. 154; the italics are Heidegger's.

17. Ibid.

18. This axial disposition is clearly demonstrated in the Rufer House. In later raumplan designs, the initial orientation is superseded by either a shift along one axis, as in the Möller House, or the slippage of an entire square, demonstrated by the Müller House.

19. Münz and Künstler, *Adolf Loos: A Pioneer of Modern Architecture*, p.140.

20. Norberg-Schulz originally discussed the concept of axiality relative to the question of form in *Intentions in Architecture* (pp. 54–55 and 100–101 are relevant; see also pp. 142–45 and 149–50). He expanded the topic at greater length in *Existence, Space and Architecture* (New York: Praeger, 1971), pp. 12–13 and the section "The Elements of Existential Space," particularly pp. 20–24. His interest in these ideas continued to develop in subsequent publications. Differences between Egyptian and Roman uses of coordination are clearly expounded in *Meaning in Western Architecture*, pp. 6–7 ff., 42–43 ff. *Genius Loci* (London: Academy Editions, 1980) elaborates on the significance of axiality in terms of natural and human-made environments (pp. 28, 32, 71–73); see also the chapters "Khartoum" and "Rome."

21. Münz and Künstler, *Adolf Loos: A Pioneer of Modern Architecture*, p. 140.

22. Kulka, *Adolf Loos: Das Werk des Architeckten,* p. 14; and Münz and Künstler, *Adolf Loos: A Pioneer of Modern Architecture*, p. 139.

23. Norberg-Schulz cites Heidegger, "'on earth' already means 'under heaven,'" as a source for this interpretation. Norberg-Schulz, *Meaning in Western Architecture*, pp. 51–52.

24. Münz and Künstler, *Adolf Loos: A Pioneer of Modern Architecture*, p. 140.

25. Ibid., p. 139.

26. Ibid.

27. Heidegger, "Building Dwelling Thinking," p. 154.

28. In a section entitled "Addenda," appendixed to the second edition, Scully states: "In *The Earth, the Temple, and the Gods* I tried to show that all important Greek sanctuaries grew up around open altars which were normally sited where they are because the place itself first suggested the presence of a divine being. Indeed, its natural forms were regarded as embodying that presence. The temple,

when finally built, embodied it also, now in terms of the human conception of the divinity" (New York: Praeger, 1969), p. 214.

29. According to Norberg-Schulz, "The *temenos* is the archetypal form of meaningful space, and constitutes the point of departure for meaningful settlement." Norberg-Schulz, *Genius Loci*, p. 58.

30. Münz and Künstler, *Adolf Loos: A Pioneer of Modern Architecture*, p. 139.

31. Heidegger, "Building Dwelling Thinking," p. 154; the italics are Heidegger's.

32. My exposition is based on Scully's analysis in *The Earth, the Temple, and the Gods*, pp. 108–15.

33. Ibid, p. 112.

34. Johan Huizinga, *Homo Ludens* (Boston: Beacon, 1955), states that "'representation' is really *identification*, the mystic repetition or *re-presentation* of the event," p. 15 (the italics are Huizinga's). Aldo Rossi's assertion in *The Architecture of the City* that the singularity of an urban artifact "begins *in the event and in the sign that has marked the event*," p. 106 (the italics are Rossi's), is also a factor in this context. The more recent usage, "re-*presentation*," was introduced by Karsten Harries, "Representation and Re-Presentation in Architecture," in Charles Hay, Peter Wong, Bryan Fleenor, and Alex Goffhelf, eds., *Via* 9 (New York: Rizzoli, 1988), pp. 12–25.

35. Huizinga, *Homo Ludens*, p. 15. In this portion of the text, Huizinga is quoting two sources: Jane Harrison, *Themis: A Study of the Social Origins of Greek Religion* (Cambridge: Cambridge University Press, 1912), p. 125; and R.R. Marett, *The Threshold of Religion* (1912), p. 48.

36. Heidegger, "Building Dwelling Thinking," p. 150.

37. The image of the "sliding sleeve" was first brought to my attention by my research assistant, Laurel Ulland.

38. Kulka, *Adolf Loos: Das Werk des Architeckten,* p. 14; and Münz and Künstler, *Adolf Loos: A Pioneer of Modern Architecture*, p. 139.

39. Münz and Künstler, *Adolf Loos: A Pioneer of Modern Architecture*, p. 139.

40. Le Corbusier, *Towards a New Architecture* (New York: Dover, 1986), p. 2.

41. Unlike other existential concepts that he adapted from Heidegger, Norberg-Schulz introduced the term *concretization* independently in *Intentions in Architecture*, pp. 61–64 ff. and *passim*. See also "The Purpose of Architecture," pp. 187–89. Norberg-Schulz's usage of this term was popularized through later writings, notably *Meaning in Western Architecture.*

42. The question of "being," which attracted Heidegger to the study of philosophy was originally posed as an Aristotelian inquiry, but Heidegger modified his approach after encountering the phenomenological work of Edmund Husserl. Heidegger eventually became a protégé of Husserl, to whom he dedicated his first major publication, *Being and Time.* The phenomenological method, with its focus on "things," was axiomatic to the premise of this seminal work, first published in 1927. See David Farrell Krell, "The Question of Being," in *Martin Heidegger: Basic Writings* (New York: Harper, 1977) pp. 1–35.

43. Loos was commissioned by the *Neue Freie Presse* to cover the six-month-long Vienna Jubilee Exhibition of 1898, held to honor the fiftieth anniversary of Emperor Franz Josef's rule; however unconventional Loos's response to his assignment, the essays were successful and later formed the basis for the first volume of his written work, *Ins Leere gesprochen*, published in 1921. Opposition Books sponsored the recent English edition: S*poken into the Void,* trans. Jane O. Newman and John H. Smith (Cambridge: MIT Press, 1982). Relative to the original essays and their subsequent history, see editor's note, p. vi.

44. Adolf Loos, "Architecture" (1910) in Tim Benton and Charlotte Benton with Dennis Sharp (eds.), *Architecture and Design, 1890–1939: An International Anthology of Original Articles* (New York: Whitney Library of Design, 1975), p. 44.

45. Ibid., p. 44.

46. Huizinga discusses the attitude of players and the rules that govern their actions as well as the importance of spatial limitation and separation in creating a playing field. See *Huizinga,* "Nature and Significance of Play as a Cultural Phenomenon," *Homo Ludens,* especially pp. 10–12 and 19–20.

47. "Building Dwelling Thinking," Heidegger, p. 153.

48. Concepts of layering, transparency, and multiple reading are currently so well established in architectural theory that it is difficult to locate their origins. Going as far back as the turn of the century, Norberg-Schulz cites scholars such as Paul Frankl and, later, Hans Sedimayr and Rudolf Arnheim, who identified issues of interrelation, figure-character, and interpenetration. See Norberg-Schulz, *Intentions in Architecture*, especially the chapter "Form." Familiar among architects is Colin Rowe and Robert Slutsky, "Transparency: Literal and Phenomenal," in *The Mathematics of the Ideal Villa and Other Essays* (Cambridge: MIT Press, 1984). The article, originally written in 1955–56, refers to a tradition of visual analysis among aesthetic critics. Gyorgy Kepes, *Language of Vision* (Chicago: Theobald, 1944) and Laszlo Moholy-Nagy, *Vision in Motion* (Chicago: Theobald, 1947) are specifically mentioned.

49. Heidegger, "Building Dwelling Thinking," p. 151.

50. Ibid., p. 157; the italics are Heidegger's.