



Ultraviolet: Alvar Aalto's Embodied Rationalism

by SARAH WILLIAMS GOLDHAGEN

In the story of Modernism, told and retold, interpreted and reinterpreted, Alvar Aalto is often treated as the most important early Modernist who doesn't fit. The mainstream, nearly filmic narrative begins with the work of Frank Lloyd Wright, and then, in a series of cuts, presents a central cast of characters in which Le Corbusier, Ludwig Mies van der Rohe, J. J. P. Oud (sometimes), and Walter Gropius play leading roles. Afterwards, separately, comes the short on Aalto. The story of a northern outlier, lauded throughout his career and to this day by a small if devoted coterie of architects, scholars, and theorists, remains an interlude played in some ancillary off-Modernist theater.

Puzzling out Aalto's uneasy exclusion from mainstream Modernist practice is not difficult. Many of his design methods contravene the precepts by which Modernism is typically conceived. If Modernism was concerned with standardization, Aalto often complained that the *Neue Sachlichkeit's* approach to standardization bulldozed through and leveled human particularity, and he advocated and practiced instead what he called a flexible standardization of a building's parts but never of the architectural whole, which he insisted should be planned and constructed with attention to a site's climate, topography, and the needs of users.

If Modernism was concerned with mass production, Aalto almost defiantly celebrated the irregularities and idiosyncracies of handicraft. If Modernism aspired to universalism, Aalto — putatively, at least — practiced particularism. If Modernists

embraced structural rationalism, or at least the pretense of it, Aalto exhibited an only occasional interest in exhibiting the structure of his buildings. Aalto refused to bend over backwards to integrate structure with form and masked hybrid structural solutions freely: load-bearing masonry here, steel beams, or poured concrete there.¹ If Modernism insisted upon the symbolic importance and pragmatic superiority of new materials, Aalto liberally mixed old with new — wood; stucco; reinforced, poured, and prefabricated concrete; steel; brick. If Modernism suffered a deep ambivalence toward typology and historic precedent, Aalto freely drew from Eric Gunnar Asplund's *Stockholm Public Library*, Le Corbusier's *Villa Savoye*, the Vesnin Brothers' project for *Pravda*, Italian Renaissance palazzi, Finnish country churches, Karelian courtyard farmhouses, Roman amphitheaters, and more. If Modernism mandated a functional approach to planning and consequently a formal abstraction, Aalto's buildings pulsate with figuration and symbols.² If Modernism redefined architecture as space, Aalto celebrated objectness. If Modernism whispered or shouted transparency, Aalto's buildings revel in their long passages of opacity.

At times Aalto opportunistically encouraged his partial heretical status within the field and, to be sure, seeing his architecture in this way has borne fruit.³ The canonical view of his relationship to Modernism has nurtured architectural practices, critical questions, and scholarly interpretations about the chronological

Alvar Aalto, *Palmio Sanatorium, driveway and main entry, Palmio, Finland, 1932*. Photo: Gustav Wehn/
Copyright: Alvar Aalto Foundation/Courtesy, The Alvar Aalto Museum

development of Modernism and the complexity of Modernist attitudes to regionalism, standardization, and functionalism that continue to influence contemporary architectural practice and historical understanding. Still, the basic paradox remains. Aalto's canonically un-Modernist work is indisputably Modernist. How is that possible?

To answer this question—a question, after all, about the work of a single architect, dead for three decades—is not the apparently straightforward undertaking it might seem. Doing so requires unpacking a number of tightly boxed assumptions about how we as users and makers of buildings look at and comprehend our built world. These precepts include how we understand human cognition, the philosophical concept of rationalism, and rationalism's role in the construction of Modernism in architecture.

Central to understanding Aalto's Modernism, and how that Modernism *is* Modernism, are two of his central notions, rationalism and humanism. Here I conceptualize these notions not only from within the internal discourse of Modernism in architecture but also from two other overlapping vantage points: a contemporaneous discourse on human culture in which Aalto participated and recent scientific findings, especially in neuroscience and linguistics, that dramatically reconfigure our understanding of human cognition.

For Aalto, rationalism and humanism intermeshed so much that the concepts were practically coterminous. Even if this makes for a somewhat counterintuitive notion of rationalism, Aalto's rationalism better describes the cognitive realities of human experience than did the multifarious rationalisms advanced by his contemporaneous Modernist colleagues. Aalto's conflation of rationalism with humanism makes historical and intellectual sense if we reflect each term through the prism of phenomenology, which has taken various disciplinary forms, from early 20th-century scientific (*wissenschaftliche*) psychology to mid-20th-century phenomenological philosophy to contemporary cognitive linguistics and neuroscience. Aalto developed his singular and lasting approach to Modernism in architecture partly by learning and partly by intuiting a model of human cognition and reason grounded in phenomenology.⁴

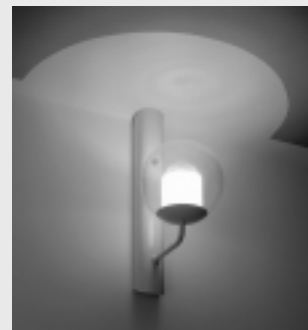
Understanding Aalto's rationalism, then, requires traveling through a dense forest on what may at times seem a crooked path. First, his commitment to rationalism must be explored. Then these several intertwined philosophical and architectural traditions of rationalism must be untangled to properly articulate

Aalto's conception of rationalism and place it within these long-standing intellectual traditions. Only then can the alternative notion of rationalism, which I call embodied rationalism, be both explicated and shown to be the cognitive and historical datum from which Aalto in fact developed his architecture. This in turn clears the ground for revisiting Aalto's two great, early buildings, the *Sanatorium* in Paimio (1929–1932) and the *Municipal Library* in Viipuri (1927–1935). Both have been commonly understood to exemplify Aalto's putative discovery of continental Modernism in the late 1920s, thus predating his supposed maturation toward the more particularistic, regionalist practice embodied in the *Villa Mairea* (1938–1939). Yet Aalto repeatedly insisted that both these earlier buildings were foundational to his later work.

When Aalto's notions of rationalism and humanism, and the architecture that he built out of those ideas, is seen from these multiple, overlapping vantage points, the importance of these buildings for contemporary architectural theory and practice emerges. Aalto's extravasation from the central discourse of Modernism also disappears, and a more theoretically adequate and historically accurate conception of Modernism and Aalto's critical architectural project within it emerges.

Throughout his career, Aalto broadcast and rebroadcast his commitments to Modernism and rationalism. He contended that Modernists (by which he largely meant his colleagues in the Congrès internationaux d'architectes modernes, CIAM) had “no reason” to dispense with the pursuit of rationalism because rationalism itself was “not wrong.”⁵ But he gently suggested that the way in which Modernists conceptualized reason and rationalism was shallow, even wrong-headed. Equating rationalism with the rationalization of the building process or with structural or mathematical logic, these architects violated basic human needs. Rationalism, Aalto declared, “has not gone deep enough.” In a barely veiled reference to Le Corbusier, who declared his pavilions for the Weissenhofsiedlung “as efficient as a railway car,” Aalto wrote, “by the word ‘economical’ I do not mean the economy that prevailed in the early days in the railway cars of the Pullman Company.”⁶ Pullman cars, he averred, were “said to be practical and economical, but the wise traveler was quick to point out that their practicality and economy provided significant advantages only to the Pullman company, not to the passengers.” Similarly, his colleagues' attempt (surely he referred to the lighting designs emerging from the Bauhaus work-

Left to right: Alvar Aalto, Paimio Sanatorium, sun deck, 1932. Photo, Gustav Welin/Copyright, Alvar Aalto Foundation/Courtesy, The Alvar Aalto Museum; open plan foyer and reading room in the upper part of the dining hall. Copyright, Alvar Aalto Foundation/Courtesy, The Alvar Aalto Museum; lighting example from a patient's room. Photo, Maija Holma/Copyright, Alvar Aalto Foundation/Courtesy, The Alvar Aalto Museum



shops) to “rationalize” lighting “has introduced little else but blindingly white porcelain spheres or opal cubes” — again, reaping profits for the manufacturer but visiting upon the consumer little more than headaches and hotspots.⁷

Modernist architects needed to expand their definition of rationalism. They needed to analyze, he wrote, “more of the qualities” intrinsic to the architecture they designed. Comparing the array of human needs architecture accommodates to hues on a color spectrum, Aalto contended that architects needed to consider not only architecture’s “visible” colors — program, economy, technology, hygiene, site — but also its invisible “ultraviolet band.” There only the “purely human questions” lurk. Buildings should serve everyday needs. Early in his career, he effusively imagined a new house in which the visitor, standing in the entrance foyer, would catch glimpses of its less formal upper story “with its bedrooms, children’s rooms, and a line with drying

AALTO CONTENDED THAT ARCHITECTS NEEDED TO CONSIDER NOT ONLY ARCHITECTURE’S “VISIBLE” COLORS — PROGRAM, ECONOMY, TECHNOLOGY, HYGIENE, SITE — BUT ALSO ITS INVISIBLE “ULTRAVIOLET BAND.” THERE ONLY THE “PURELY HUMAN QUESTIONS” LURK. BUILDINGS SHOULD SERVE EVERYDAY NEEDS.

articles of clothing on it, hanging there as a somewhat careless piece of evidence of the chores of everyday life.”⁸ Architectural environments must at once accommodate users and slow them down, forcing them to appreciate “the value of the fleeting moment.”⁹ He acknowledged that architectural methods do “sometimes resemble scientific ones.” An analytical, rational approach to the multiplicity of human needs and a “process of research, such as science employs, can be adopted also in architecture.” Nevertheless, “Always there will be more of instinct and art” in this process — intuition, he asserted elsewhere, “can be astonishingly rational.”¹⁰

Whatever Aalto meant by rationalism, his notion of it certainly differed in both degree and kind from that of his many colleagues. These worlds of difference become comprehensible only if we take ten steps backwards to examine the term *rationalism* in Modern architecture and modern philosophy, because it is on philosophical notions of rationalism that the best-known strains of early Modernist rationalism largely rest.

When invoked in discussions of Modern architecture, the word *rationalism* elicits a fairly standard set of meanings.¹¹ Twentieth-century rationalism, often riddled with contradiction in individual practices, is the intertwined theoretical legacy of two 19th-century pedagogical traditions: the structural rationalism of Eugène-Emmanuel Viollet-le-Duc and his successor, Auguste Choisy, and the typological functionalism of Jean-Nicholas Durand.¹²

The best known Modernists of the 1920s in the techno-rational strain, such as Le Corbusier, Gropius, and Mies, conjoined structural rationalism and typological functionalism into a set of guiding principles that they applied in such sundry combinations that rationalism became nearly topological, a single lump of theoretical clay ever-transforming into a multiplicity of forms. Mies, for example, became the supposedly unschooled successor to 19th-century structural rationalism while rejecting typological functionalism as unsuited to the psychic and locational needs of

ever-transitory modern man.¹³ Le Corbusier and Gropius insisted on pressing new technologies into what they claimed were architecture’s logical structural, functional, and aesthetic ends. A sometimes-adjunct to this latter strain of rationalism mandated that architectural design should be developed according to the dictates of the anticipated construction process, a conviction that developed under the influence of Frederick Winslow Taylor’s theory of scientific management and intensified after the publication in Europe of an autobiography by Henry Ford.¹⁴

The formal incarnation of techno-rationalism is most famously represented by projects such as Mies’s for a *Concrete Office Block* (1922), Le Corbusier’s *Maison Dom-Ino* (1914–1915), and Gropius’ *Bauhaus* at Dessau (1926). Each is shaped by a species of Euclidean geometry that formally became the symbolic language of rationalist design. A cube, a cone, a sphere, a cylinder, and a pyramid appear above a bird’s eye view of ancient

Rome in Le Corbusier’s *Vers une architecture*; in *Urbanisme*, he amusingly and famously incarnates modernity itself in the straight line. For Gropius, Durand’s geometrically neutral grid figuratively supplied the graph paper on which one could design buildings with an eye toward their eventual mass production. Many of the best known Modernist buildings discursively engage the grid in plan and elevation, even if they occasionally violate its unfor-givingly orthogonal dictates, sneaking, as Le Corbusier did in the Villa Savoye, non-geometrically-derived curves on top or within.

For some of the techno-rationalists’ contemporaries such as Hugo Häring and Hans Scharoun, rationalism in design did not begin from a building’s formal disposition but from how the architect handles the human social functions that nearly any edifice accommodates. Often called organic functionalists, these architects owed to Durand their insistence that a building’s shape and plan suit its projected use. They rejected typology, however, because they believed it so saturated in historical precedent that it prohibited individuated solutions to architectural design, thereby violating the Modernist dictum that a new architecture need serve *modern* life. For the organic functionalists, a building’s design emerged from the specifics of program and site.

Most architects and critics of the 1920s (along with many today) considered these two best-known theoretical strains of Modernist practice, techno-rationalism and organic functionalism, diametrically opposed.¹⁵ And not without reason. Techno-rationalists began from the object, organic functionalists from its users. Techno-rationalists employed (or purported to employ) mathematical systems of geometry or physics; organic functionalists shunned such abstractions (even as they occasionally used them) in favor of the contingencies of site and the patterns of human social interaction. Techno-rationalism revered systematic, parsed-out logic while organic functionalism preferred pragmatic analysis of the empirical world. Techno-rationalism chose straight lines, organic functionalism curves.

Early Modernist theory’s binary opposition of these two

approaches indicates the loose affiliation of each with an epistemological tradition that itself has been historically opposed to the other: the intellectualism of Descartes on the one hand and the empiricism of Burke and Locke on the other.¹⁶ This philosophical debate on rationalism vs. empiricism is longstanding, and all its complexity need not be examined here. Suffice it to say that the debate revolves around the extent to which people gain knowledge by way of information acquired through the senses. Descartes' "I think, therefore I am" famously epitomizes the intellectualist position: the mind at all times knows its own ideas; human thought is wholly conscious; the structure of the mind is directly accessible to itself; certain forms of human knowledge are constructed without input from sensory experience.¹⁷ The empiricist tradition rests on most of these same premises, but differs in its contention that *only* from data acquired through sensory experience can human knowledge emerge.

In early 20th-century architectural discourse, the parallels between these two dominant strains of Modernism and their philosophical analogues — intellectualism and techno-rationalism on the one hand, empiricism and organic functionalism on the other — are not exact. Still, they are suggestive. The techno-rationalists propounded formal, rule-bound, abstract systems of logic and analysis that bore the stamp of Cartesian intellectualism. The organic functionalists asserted that design should begin with the architect's study of the empirical world, with *data*, data gathered from the projected users' sensory experiences, patterns of social interaction, and experience of the site.

Predictably, the tendency of early Modernist architects and critics to oppose techno-rationalism to organic functionalism

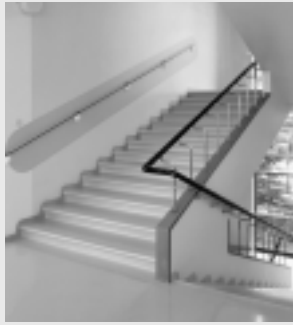
blinded them to effective continuities between the two, as is also true in the case of their philosophical cousins. The design methods of both techno-rationalists and organic functionalists indicate their assumption that the mind can know or excavate its own ideas, that human thought is largely conscious, and that the mind's structure is accessible to itself. Both employ a logic-driven approach, differing mainly in their beliefs on *what kind* of data is offered up to human cognition. Both insist that architecture reflect and serve the conditions of modern life. In such convictions, techno-rationalists and organic functionalists shared the view that the makers and users of buildings are thinking subjects capable of cognitions dispassionately constructed from rational analysis. Both approaches presume that this thinking human subject is categorically distinct from the object-world of other people and of buildings, cities, and nature.

Techno-rationalists and organic functionalists also joined in their dislike of Surrealism, an artistic movement that celebrated personal self-expression and the irrational. Surrealism, led by Hans Arp, André Breton, Giorgio de Chirico, Max Ernst, and others, established rapid currency among avant-garde intellectuals in the same years that techno-rationalism and organic functionalism earned widespread recognition.¹⁸ Surrealist artists, and their occasional architect-friends — Berthold Lubetkin, Frederick Kiesler, Paul Nelson, and Le Corbusier come to mind — impudently assembled a here-and-there aesthetic that they believed expressed, and even provoked, primal human drives. Analysis, logic, and empirical data were shunned. Surrealist work celebrated the poetic, the associative, and the uncanny.

Surrealism was the godchild of Freud's Id, that shadowy

Alvar Aalto, *Paimio Sanatorium*, rear of patient wing. Copyright, Alvar Aalto Foundation/Courtesy, The Alvar Aalto Museum





Alvar Aalto, Paimio Sanatorium, foyer. Photo, M. Kapanen/Copyright, Alvar Aalto Foundation/Courtesy, The Alvar Aalto Museum; **stairwell.** Photo, M. Kapanen/Copyright, Alvar Aalto Foundation/Courtesy, The Alvar Aalto Museum; **hallway in the patient wing naturally lit by pivot windows.** Copyright, Alvar Aalto Foundation/Courtesy, The Alvar Aalto Museum

subconscious force that the Viennese psychoanalyst contended is twinned to and navigated by necessary judgments and restraints of the prudential Ego. Like his philosophical confederates, Freud presumed the thinking subject and the objective world split, with the Id militating against grounded interpretations of empirically verifiable realities. Reason's "other," the Id lurks, a ghost ever threatening the smooth operation of the human machine, perverting one's cognitions of and interactions with the objective world. The cognitive style of the Id is everything that its putative opposite is not: organic, primal, ecstatic, symbolic.

Throughout the 20th century and even today, this three-point philosophical description of human cognition — intellection, empiricism, and irrationalism — governs much scientific as well as humanistic thought, art and architecture included. Popularly, it is taken as commonsensical. Yet in truth it is a triangle of unstable dimensions: ever tottering, but yet to meet its inevitable collapse.

The foundation of this triangulated model of human cognition is the assumption that cognition and reason are the collaborative product of successively executed faculties. George Lakoff, a cognitive linguist, and Mark Johnson, a philosopher, dub this model of cognition the Society of Mind.¹⁹ Input is processed bottom up. Both rationalism and empiricism posit that each of five human senses — sight, touch, taste, smell, hearing — receives

understanding, the brain's higher-level function, Reason, remains dissatisfied with interpretations that rely solely on putatively lower-level processes such as Sensation, Perception, Imagination, and Feeling. Searching for a more solid foundation on which to rest its conclusions, the brain hands its preliminary interpretation up to its preexisting databank of received wisdom — Memory. Yet Memory too distorts. So this already highly processed cognition is once more handed upward, this time to the mind's most sophisticated arbiter, Reason. Reason is unlike in kind to the mind's lower-caste members: it is unflinchingly guided by discipline, logic, and analysis. Bound by rules and clear-sighted, Reason plays the man of cool systematization.

Recent research (including that by Lakoff and Johnson) in a number of overlapping but professionally distinct disciplines such as language acquisition, cognitive linguistics, gesture analyses, historical linguistics, and cognitive neuroscience, falsifies both the triangulated description of human (intellection, empiricism, unreason) and the Society of Mind paradigm of cognition on which it rests. Facilitated in part by developments in biotechnology such as computerized data analysis, PET scans and functional Magnetic Resonance Imaging, this research determines that the machinations of the human mind do not concord with any part of the "common sense" three-point model of cognition. Cartesian intellectualism does not exist. The presumption it shares with empiricism — that a divide separates thinking sub-

A 21ST CENTURY MODEL OF HUMAN COGNITION IS EARNING EVER-WIDER ACCEPTANCE IN THE SCIENCES AND SOCIAL SCIENCES, AND IT DETERMINES THAT COGNITION IS APPROXIMATELY 90% UNCONSCIOUS. IT DEMONSTRATES THAT COGNITION — AND THEREFORE, HUMAN REASON AND KNOWLEDGE — IS INTRICATELY STRUCTURED IN DETERMINATIVE PATTERNS BY THE REALITY OF A PERSON'S BODILY INHABITATION OF THE WORLD.

bits of information that they hand up to Perception, the brain's preliminary synthetic faculty. Perception registers the information and then transmits it to its "higher" (and more sophisticated) processor, Imagination, at which point the mind forms a preliminary interpretation of the data received.

Imagination, however, is inevitably colored by Feeling — undisciplined, irrational, and out of control: an unruly child or a threateningly emotive woman. In cognitive pursuit of "true"

jects from their perceived world, is misconceived. Consequently, accepted notions of the irrational as the "other" of rationalism need to be toppled as well.

A 21st century model of human cognition is earning ever-wider acceptance in the sciences and social sciences, and it determines that cognition is approximately 90% unconscious. It demonstrates that cognition — and therefore, human reason and knowledge — is intricately structured in determinative patterns

by the reality of a person's bodily inhabitation of the world.²⁰ *Contra* the Society of Mind, cognition is not the progressive analytic synthesis of information received from the external world via the senses. Everyday and "higher" cognitions typically emerge unconsciously and intersensorily; they are unavoidably imaginative and emotion-driven. How I interpret what I see is intermeshed with what I have seen and what I anticipate seeing, with what I hear, have heard, and anticipate hearing, and with what I touch, have touched, and anticipate touching.

A simple but powerful falsifier of the triangulated description of human cognition lies in the global, cross-cultural universality of body-based metaphors used to describe everyday human experience.²¹ In every known language, spoken and non-spoken, humans employ, and as far as scholars know, always have employed, the same or an extremely similar set of metaphors to characterize emotional and intellectual states and to describe how they attain knowledge about the world. Exemplifying this phenomenon is the so-called primary metaphor that equates human affection with physical warmth.²² This metaphor is probably forged during infancy, in what linguists and neurologists call a "cross-domain association": Newborns conflate the psychological experience of affection with the physical warmth they experience in the close embrace of their caretaker's body. "Affection equals warmth" becomes "neurally instantiated" in the brain, a cognitive schema. From then on, "We are not free to think just anything."²³

Some cognitive scientists point out that infants in all cultures begin to employ primary metaphors in the same developmental sequence, which indicates their neurological basis. A host of other such metaphors reveal additional cognitive schemas, all hung upon the scaffolding of human embodiment. An expression commonly used to describe one's emotional and/or intellectual state is something like "I'm in a bad place" — a disequibrated emotional or intellectual state is equated with a disequibrated physical one. By contrast, "I feel at home there" conflates the psychological feeling of secure well-being with the physical experience of inhabiting a familiar building. Such familiar phrases constitute only a few of a vast and fluid body of primary metaphors common in aggregate to every culture, framing intellectual and emotional cognitive states around the blunt fact of human embodiment. Users and listeners comprehend these metaphors — despite their patent illogic — precisely because the cognitions each describes are born of our irreducible physiological constitution as human beings.

The cognitive framing of emotional states often refers to bodily movement through space and time. In day-to-day perceptual experience, moments abound in which people routinely orient themselves emotionally with respect to other people, other objects, and other containers. Cognitive orientation schemas are instantiated in such primary metaphors as "change is motion," which are exemplified in familiar phrases such as "I'm getting to a better place," whereby a change in an emotional or intellectual state becomes the metaphorical equivalent of a change in physical location. In everyday discourse, many primary metaphors are so clichéd that their tropic qualities are nearly indiscernible. When people say "I'm getting there" or "I'm making progress," they equate psychic or intellectual advancement with forward, and sometimes upward, movement toward a psy-

chologically preestablished if literally amorphous destination. Acquiring knowledge is walking from the unseeing state of darkness into vision and light. In this instance, too, the brain's neurological architecture likely underlies the consistency and the universality of these metaphors: Neuroscientists now believe that the brain's locus of reason also manages perception and motor control.

The diachronic and synchronic persistence of primary metaphors confirms that our minds develop in total integration with our bodily experience. A theory of bodily cognition and reason — embodied rationalism — does not belie that human consciousness is profoundly inflected by the political, economic, scientific, social, and cultural phenomena of its time. Nor does embodied rationalism fail to recognize the wide variability across cultures and over time in how people interpret the primary metaphors and cognitive schemas they employ. Yet the facts on the ground remain: The space of the world is not, and could never be, exterior to the space of the bodily self. In terms of how we inhabit the world as thinking subjects, the self is, as Maurice Merleau-Ponty wrote, "the zero degree of spatiality."²⁴ The simple antonymic relationship of "here" (within or of our body) to "there" (outside it) says so. No throne elevates reason above sensory experience, as the Society of Mind model of cognition suggests. Rationality is "imbued with a sensibility, and vice versa."²⁵ Reason is unconscious and intuitive; it is simultaneously "rational" and "irrational," analytical and poetic, systematic and associative, logical and metaphoric.²⁶ It is embodied.

Among early and mid-20th-century intellectuals who accepted the existence of a rational human faculty, only phenomenological philosophers, phenomenologically oriented experimental psychologists, and those in other fields who drew on these bodies of thought, rejected in all or part the substantive premises of the three-point model of human cognition. In certain instances, the insights of these thinkers foreshadow contemporary findings on the embodied mind — or, conversely, this recent research attests to the validity of phenomenology's fundamental principles. Aalto's early intellectual biography and projects strongly indicate that he might be counted among this group. As Eeva-Liisa Pelkonen has shown, from his student days he knew the basic precepts if not the specifics of proto-phenomenological experimental psychology. Certainly by the late 1920s he was extremely familiar with its central ideas, as both his lectures and designs for buildings attest.²⁷

Founded in mid-19th-century Germany by the physicist Gustav Fechner and greatly elaborated upon and popularized by his pupil Wilhelm Wundt, scientific or experimental psychology was broadly defined to include adjacent fields such as phonetics, linguistics, aesthetics, philosophy, and the study of culture.²⁸ By the 1910s, Wundt had established a laboratory of experimental psychology at the University of Leipzig that had become the leading center and model for psychological research in the world, replicated throughout Europe and in India, Japan and the United States. In Leipzig, Wundt and his students conducted systematic, controlled scientific investigations of a vast constellation of human cognitive processes such as reaction times in muscular sensations and reflexes, the experience of binocular vision, and the visual perception of color.²⁹ Through these experiments,

they established many of scientific psychology's paradigmatic precepts: that human perception is an act of creative synthesis, that emotion is a determining factor in any and all mental processes, and that no split divides human consciousness (the subject) from the physical world (the object).

These ideas coursed through many domains of German intellectual life: Wundt himself taught for over forty-five years and was enormously popular among students.³⁰ During his tenure at Leipzig, he hired like-minded and widely influential scholars, including the art historian August Schmarsow (1853–1936), Chair of the Department of Art History from 1893 to 1919.

After 1900 experimental psychology developed two estuaries, equally wide, one more philosophical and phenomenologically

other senses, Schmarsow believed that experimental psychology, in taking a strictly scientific approach, was on “the wrong track”: it unrealistically abstracted human consciousness, he wrote, “from all the contingencies of the earthly scene.”³²

Schmarsow contended that cognition encompassed the whole body in its worldly environment, including an awareness of that body. Any notion of reason must encompass the imagination and the “play of associative factors.”³³ Foreshadowing the phenomenology of Merleau-Ponty, Schmarsow posited the human body as degree zero in the human perception of space and time, writing that our cognitive understanding of verticality drew from our phenomenological experience of standing, and that our cognitive understanding of measure from “the reach of

our arms” and from a person's projected or actual position in and movement through space.

By the early 20th century, then, many prominent psychologists and aestheticians held that human cognition and reason is fundamentally embodied, fundamentally intersensory, and fundamentally creative; that emotion, memory, and imagination are integral to human reason, and that the commonly accepted gulf dividing subject from object does not exist. This German scholarship in psychology, philosophy, and aesthetics was premised on positions that contemporary science, with its vastly more refined research tools, has confirmed and built upon to create its revolutionary findings on the nature of human cognition. Contemporary research has established that most human thought is unconscious (a position with which at least some early experimental psychologists, such as Lipps, would have taken issue) and has identified a more or less stable set of cognitive schemas and primary metaphors that underlie the operations of human cognition and reason.

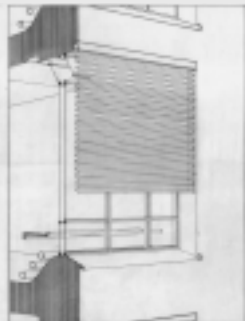
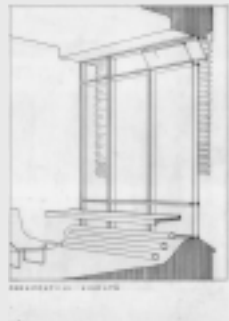
How might this knowledge of early 20th-century experimental psychology or mid-century phenomenology or contemporary cognitive neuroscience and linguistics change or develop our understanding of Aalto's Modernism? If we revisit Aalto's intellectual development in this light, many of his statements and design practices that at first blush appear to violate the basic

IF WE REVISIT AALTO'S INTELLECTUAL DEVELOPMENT IN THIS LIGHT, MANY OF HIS STATEMENTS AND DESIGN PRACTICES THAT AT FIRST BLUSH APPEAR TO VIOLATE THE BASIC PREMISES OF CANONICAL MODERNISM BECOME PART OF A TRANSPARENT ATTEMPT TO ARTICULATE A MORE ADEQUATE MODERNISM, A NEW ARCHITECTURE THAT TAKES ADVANTAGE OF THE OPPORTUNITIES MODERNITY PRESENTS, AMELIORATES THE PSYCHIC CASUALTIES IT LEAVES IN ITS WAKE, AND SPRINGS FROM THE ESSENTIALLY EMBODIED NATURE OF COGNITION AND REASON.

oriented, represented in the work of Wundt and Schmarsow, and one more scientifically-oriented, propounded most prominently by Theodor Lipps (1851–1914), whose Psychological Institute in Munich was founded in 1894 and quickly became the main institutional enclave in competition with Wundt's in Leipzig. Despite significant differences in their orientations and research agendas, both insisted on the centrality of human embodiment to an understanding of cognition and reason.

Schmarsow, in numerous art-historical and psychological articles, criticized a psychology overly driven by the scientific study of physiology, calling instead for what he specifically described, in reference to Kant, as a more phenomenological approach to the interpretation of artistic intention and experience.³¹ Criticizing Alois Riegl's *Spätromische Kunstindustrie* as too narrowly focused on the optical to the exclusion of the

Left to right: Alvar Aalto, Paimio Sanatorium, patient room. Courtesy of the author; Diagram showing use of sun blinds and ceiling-mounted radiant heating system. Copyright, Alvar Aalto Foundation/Courtesy, The Alvar Aalto Museum; Lecture hall. Photo, Gustav Welin/Copyright, Alvar Aalto Foundation/Courtesy, The Alvar Aalto Museum





Left to right: Alvar Aalto, *Viipuri Library*, lower left, aerial model, *Viipuri*, Finland, 1935. Copyright, Alvar Aalto Foundation/Courtesy, The Alvar Aalto Museum; *Viipuri Library*. Photo, Gustaf Welin/Copyright, Alvar Aalto Foundation/Courtesy, The Alvar Aalto Museum; *Viipuri Library*. Photo, Sergei Kravchenko

premises of canonical Modernism become part of a transparent attempt to articulate a more adequate Modernism, a new architecture that takes advantage of the opportunities modernity presents, ameliorates the psychic casualties it leaves in its wake, and springs from the essentially embodied nature of cognition and reason. Aalto drew upon primary metaphors and cognitive schemas even in his earliest published writings on architecture, which he conceptualized with the somewhat blunt instruments that he had at hand: the contemporaneous language of experimental psychology.

From 1900 to 1921, the years of Aalto's childhood, basic education at the *lyceum* in Jyväskylä, and architectural training in Helsinki, European intellectuals in the sciences, the arts, philosophy, and culture were schooled in the basic insights and findings of proto-phenomenological experimental psychology. Although the field was centered in Germany, interest in its findings extended into Germanophile countries, including Finland.³⁴ By 1902 a major psychology laboratory was established in Sweden at Uppsala University, and by 1917 a member of the Department of Pedagogy at the University in Jyväskylä, where Aalto grew up, was publicly lobbying for the founding of a laboratory of experimental psychology.³⁵

Aalto read German fluently and closely followed intellectual currents in Europe, and he subscribed to over thirty architectural publications from various countries. He was exposed to empathy theory, and probably also to the basic precepts of experimental psychology, during his basic training in Jyväskylä.³⁶ As a young man he sketched mainly in perspective, an embodied (if still artificially constructed) point of view, and throughout his career rarely drew in axonometric—the language of disembodied, mathematically abstracted spatial depiction. His writing from very early on is saturated with the precepts of embodied rationalism: At twenty-six he wrote that the beauty of a hilltop town in Tuscany (which he saw on his honeymoon in 1924) was most apparent “when seen from the level of the human eye, that is, from the ground level,” because only from this perspective was “a vision the senses receive whole and undisrupted, adapted to human size and limitations.”³⁷

Proposing a sauna for a hilltop ridge in Jyväskylä that would serve as a national monument to Finnish culture, Aalto described his “Roman bath—a Finnish sauna” as a building “caress[ing] the senses,” sparking deep memories and profound emotions. Swimming in the language of the sensorium, he evokes

his imagined sauna's smells, textures, and sights: the aroma of burning spruce and juniper twigs, the warmth of “a stove with a crackling fire of choice logs,” the soft, warm light emitting from a colored lamp, the textures of “changing rooms covered with beautiful Nordic woven fabrics.”³⁸ Such early writings and projects suggest that as a young architect Aalto partly intuited, partly conceptualized philosophical and psychological concepts that today's scholarship lays bare: the intersensory and often unconscious nature of cognition and the deep enmeshment of reason with emotion and bodily experience.

When earning his architectural degree at the Polytechnic Institute in Helsinki in the years 1916 to 1921, Aalto worked closely with Selim Lindqvist, one of his professors, who was far more attentive to architectural trends in Europe than to the National Romantic movement that predominated in Finland at the time, and who was especially interested in the *Jugendstil* movement that had been so deeply influenced by the ideas of Lippis.³⁹ In 1927, when Aalto moved to Turku, he had chosen a coastal city where intellectual, economic, and social exchange with Stockholm and the rest of Europe dominated local culture. He became still more deeply involved in European architectural discourse and was further exposed to proto-phenomenological experimental psychology during his trips to Germany and other parts of Europe in 1928, 1929, and 1930, during which he became familiar with the work of early Modernist artists such as Hans Arp, Paul Klee, Oskar Schlemmer, and most importantly, László Moholy-Nagy, the last of whom became Aalto's lifelong friend.⁴⁰ Moholy-Nagy's interest in experimental psychology is well documented; he described his artistic project as the “psycho-biological” experience of man, by which he meant the sentient person's intersubjective relationship with space, time, and light.⁴¹

From the mid-1920s on, Aalto felt his way toward a formal idiom equal to and shaped by his sense of the embodied nature of human cognition. His writings are steeped in the language of experimental psychology: He argued that “the rationalist working method” must encompass “psychological

Alvar Aalto, sketch for the design concept of the *Viipuri Library*, a mountain of plateaus. Copyright, Alvar Aalto Foundation/Courtesy, The Alvar Aalto Museum



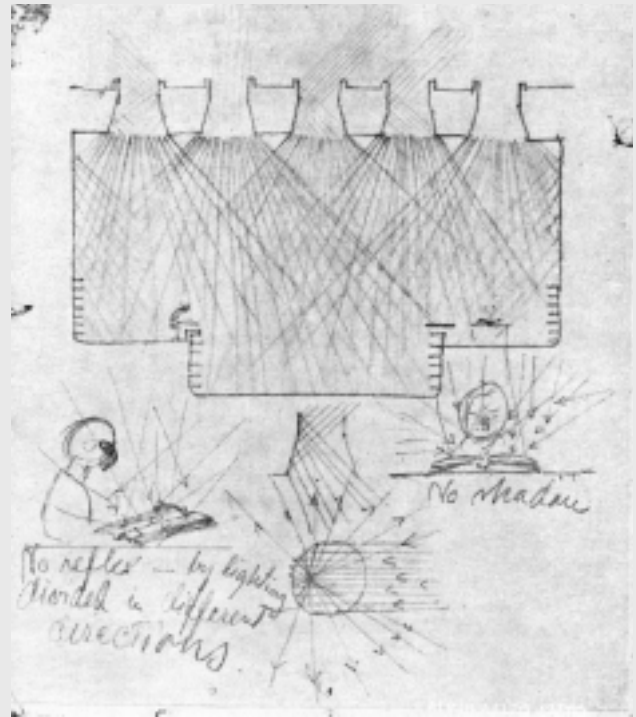
requirements” such as neurophysiology and the “general physiological properties” of human beings.⁴² “My aim,” he averred, “was to show that real rationalism means dealing with all questions related to the object. . . . [The architect must] take a rational attitude also to demands that are often dismissed as vague issues of individual taste, but are shown by more detailed analysis to be derived partly from neurophysiology, and partly from psychology.” Once architects adopt such an approach, he continued, “we will have extended the rationalist working method enough to make it easier to prevent inhuman results.” Rationalism “should be extended to the psychological domain,” he insisted. “Only one book has not yet been published anywhere in the world, *The Physiological Home*.”⁴³

Repeatedly, Aalto spoke of how humans appropriate architecture through the entanglement of its forms with sensory perception and intellectual cognition. His blackened theater interior proposed in his essay a “Rational Cinema” was premised on his observations about modernity and vision: “Modern man’s retina is beleaguered with images (photographs, printed matter, street advertisements, cinema) from morning ’til night.”⁴⁴ He explained that the designer of a successful cinema must peel this particularly new, quintessentially modern program away from the apparently similar typology of the auditorium or theater. When a person watches a film, he observed, lighting is “crucial. . . . The clarity of the picture depends on absolute darkness.”⁴⁵ He explained that when shown in current cinemas, films typically project a great deal of light back into the viewers’ eyes, greatly compromising their perception of image quality. His proposed solution was to blacken the cinema’s interior completely and to install a washboard-like arrangement of raised vertical slats in which the sides facing the screen were painted with a matte, light-absorbing black.

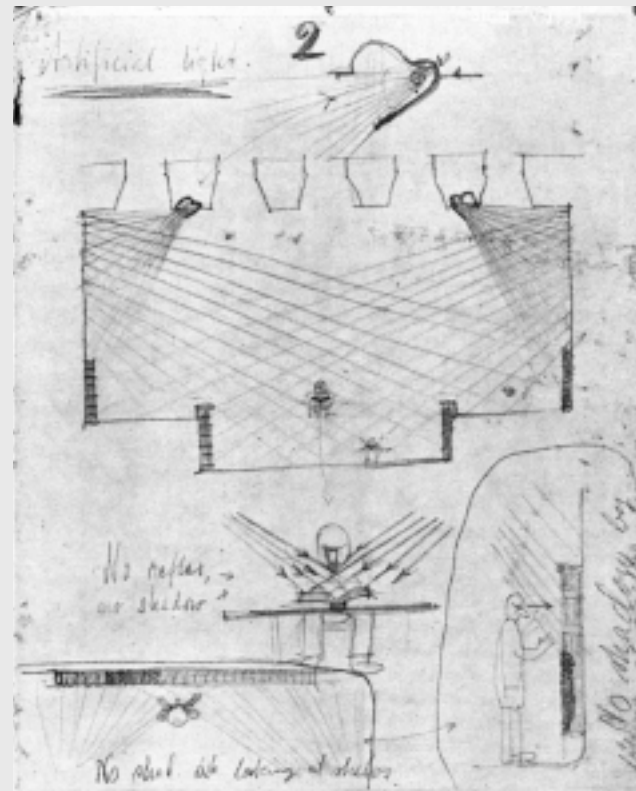
Throughout his career, Aalto repeatedly invoked the word “human,” asserting that architecture should “serve human life” or that it must “humanize” a world overwrought by the conditions of modernity. These vague, repeated incantations to humanism — the word appears no less than thirty-two times in a single article — can be and sometimes have been misleading.⁴⁶ They allude not, as some writers have assumed, to a kinder, gentler Modernism or to the European classical tradition or to a cozily familiar woody regionalism. Aalto’s “humanism” was an expertly articulated call for Modernists to create a rationalist architecture of the *human being*: a physiological, perceiving, thinking creature.

In the 1920s, medical research had not yet identified bacterial infection as the cause of tuberculosis. Treatment for patients suffering from this deadly disease prescribed removing them from the enervations of modern life and the unhealthy effects of urban waste and pollution. Only rest, plentiful sunlight, and fresh air offered hope for rehabilitation. This treatment regimen pointed to an architectural program specifically attuned to physical and psychic health. Aalto won the commission for a sanatorium complex in Paimio, Finland, in a state-sponsored competition in 1929 and completed the project in 1932. It proved a challenge perfectly suited to the humanly rational, phenomenologically oriented, architecturally Modernist young architect.

In his description of the *Paimio Sanatorium*, published in



Alvar Aalto, *Vipuri Library*, sketches illustrating use of natural light. Copyright, Alvar Aalto Foundation/Courtesy, The Alvar Aalto Museum



1940 as “The Humanizing of Architecture,” Aalto rejects extra-phenomenological compositional systems such as the grid, then popular among his Modernist colleagues. Such undifferentiated, mathematically regularized notions of space were and are wholly antithetical to the premises of embodied rationalism. Aalto designed *Paimio* (as well as the *Viiipuri Library*, which he discussed in the same article) around the rhythms and patterns of daily life. Spaces emanated from the body, degree zero of human cognitive experience. In conception and final form, these buildings are shaped around the human mind’s fundamentally intersensory and metaphoric apprehension of the world. By describing the principles that underlie these projects’ designs, he hoped that they might inspire his colleagues to partly reconceptualize and thereby redirect Modernism, which he believed was a right-thinking movement gone astray.

Aalto explains that the *Paimio* design emerged only after he conducted “experiments” examining his projected users’ daily rituals and routines, their psychological reactions to room forms, to shades and degrees of colors, and to types and intensities of light. Echoing experimental psychology’s research experiments conducted in Leipzig and Munich, he recounts analyzing the impact on patients of variations in temperature, types or degrees of ventilation, and levels of noise. From these “experiments,” he concluded that the sanatorium’s design needed to address an intertwined array of physiognomic, phenomenological, and cognitive phenomena particular to its afflicted users’ needs.

The organizing spatial principle for patients’ rooms therefore differed from that of ordinary rooms. In a perhaps direct, perhaps unconscious, and perhaps completely unrelated allusion to one of Schmarsow’s best-known premises — that spatial experience depends on a vertically aligned, ambulatory, embodied subject — Aalto wrote that although most interior architectural spaces accommodate an ambulatory person whose body is oriented along a vertical axis, *Paimio*’s patients would be lying down. Hence this project’s spatial organization needed to dissimilate the ordinary room in that it should be designed not around a vertical axis in motion but around a stationary, low-slung, horizontal one.⁴⁷

One consequence, he discovered, would be that ceilings, which architects typically overlook, took on an unusually prominent role in the design. Aalto thought through how his infirm users would respond, visually and perceptually, to different ceiling colors and illumination schemes. He oriented their bedrooms

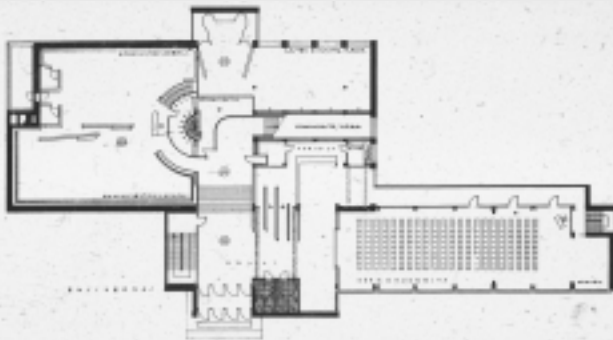
south-southeast, an orientation that, he explained, offered the most variable natural light, basking resting invalids in the morning’s softer rays while shading their eyes from the sharp glare of the afternoon sun. He painted some walls to reflect light and others to absorb it, depending upon how much sun each would receive in different seasons and at different times of day. In the interest of visual variety, he exaggerated tonal variation in the ceilings with a dark hued, highly saturated (and therefore perceptually variable) bluish-green, close to the “hospital green” that environmental psychologists now confirm is most restful to the human eye. No overhead fixtures cast light into the resting patient’s eyes: Aalto explains that his scheme for artificial lighting, combined with the room’s dark tonal values, would greatly reduce eye-stressing glare.

Aalto recounts the many ways his analysis of his prospective users’ auditory, sensorimotor, tactile, and psychological experiences guided the project’s design. Quiet reigned. He placed access panels to plumbing fixtures in the hallways outside invalids’ bedrooms so that pipes could be serviced without disturbing their rest. He packed one wall in each room with sound-absorbing materials. Most famously, he specially designed “noiseless sinks,” reconfiguring the conventional sink basin to reduce the auditory disruption of tap water splashing at right angles onto an impermeable porcelain surface.

Attention to ambulatory spatial experience and its potential to elicit metaphorical associations, such as the primary metaphor “I’m getting to a better place,” also shaped *Paimio*’s design. Entrants exit their automobiles at the turnabout and first come upon a low, somewhat dark space only to be diagonally deflected toward a large, light-flooded staircase backed wall-to-wall, floor-to-ceiling, by a multistoried window. Aalto exaggerated this carefully constructed darkness-into-light sequence with the staircase floors of highly saturated bright yellow. Although the staircase’s banister is metal — a signifier for modernity, efficiency, and hygiene — its handrail is wood, which he preferred because it is so much warmer to the touch. In a critique of Marcel Breuer’s chair designs written at about the same time, Aalto wrote that any object which comes “into close touch with the skin must not be made of a material that is an effective heat [and cold] conductor.”⁴⁸

The patients’ experience of entering the space of the sanatorium metaphorically reenacts the experience of redemptive healing: They leave the automobile, icon of modernity, and walk

Left to right: Alvar Aalto, *Viiipuri Library*, plan. Courtesy of the author; entrance foyer, from left: Aarne Ervi, Alvar Aalto, Aino Aalto. Photo, Gustaf Welin/Copy-right, Alvar Aalto Foundation/Courtesy, The Alvar Aalto Museum



toward the sun, looking out onto the vast lucid stillness of wooded nature. The floor plans in the patients' bedrooms reinforce these associations of warmth, brightness, and tranquility. The rooms are arranged so that patients can move easily from bed to wall-length desk. Once seated, they again look out wall-to-wall windows into the surrounding forest, an omnipresent reminder of their needed escape from urban life. In between the double-glazed windows, Aalto threaded a heating element, warming the glass, a material as highly sensitive to variations in temperature as the metal of Breuer's chairs. Ensclosed at their desks, patients could read, write, or just look, resting their feet on the curving footrest protruding from that typically extruded moment in a room where floor meets wall.

Aalto contended that the design principles he established in *Paimio* offered Modernists a "deeper" rationalism, configured neither around abstract, mathematically bound systems (as did the techno-rationalists), nor around an analysis of a specific individual's or family's particular needs and the idiosyncrasies of that building's site (as might the organic functionalists), nor around the protean Id seething beneath the socially adept ego (as might a surrealist-inspired architecture). The rationalism of *Paimio* accommodates the full experiential spectrum of embodied cognitions, the common property of human life.

Aalto's plan for the sanatorium complex, its relationship to its site, its spatial sequences, the patients' rooms, the built-in

ALTHOUGH THE STAIRCASE'S BANISTER IS METAL — A SIGNIFIER FOR MODERNITY, EFFICIENCY, AND HYGIENE — ITS HANDRAIL IS WOOD, WHICH HE PREFERRED BECAUSE IT IS SO MUCH WARMER TO THE TOUCH. IN A CRITIQUE OF MARCEL BREUER'S CHAIR DESIGNS WRITTEN AT ABOUT THE SAME TIME, AALTO WROTE THAT ANY OBJECT WHICH COMES "INTO CLOSE TOUCH WITH THE SKIN MUST NOT BE MADE OF A MATERIAL THAT IS AN EFFECTIVE HEAT [AND COLD] CONDUCTOR."

and freestanding furniture, the heating and plumbing systems, the materials, the colors all sprang from Aalto's imagined projection of an embodied user hearing, seeing, and prospecting; touching windows, doors, hand rails, and sink handles; resting, walking, or being wheeled on a stretcher; consciously or unconsciously remembering past visual, tactile, and auditory cognitions. His explicitly detailed imaginings of how patients would experience the building physiologically and perceptually demonstrates his profound assimilation of the principles of German experimental psychology, and his intuitive — "astonishingly rational" — sense that the conventional models of rationalism in architecture made no sense. The sanatorium at *Paimio* interweaves the cognitive experience of the human sensorium with mnemonic associations, cognitive schemes, and primary metaphors to create a lived experience of peaceful comfort and calm.

In a competition in 1927, Aalto won the commission for a library in Viipuri, Finland, yet the project underwent many design iterations and a site change before the building's completion in 1935. Meant to be, as Aalto described it, "the soul of the town's cultural

life," the library sits adjacent to a major 19th-century church in a formal park. One of the program's stipulations specified that the new building should provide the park a better sense of enclosure. In its final iteration, the library faces both this park and an informal woodland beyond.⁴⁹

Interpretations of the *Viipuri Library* typically begin with the project's stylistic evolution from the initial competition drawings of 1927 to the final design of 1933–1934. The competition-winning scheme depicts an Asplundian Neoclassicism consistent with Aalto's design for the *Muurame Church* of 1927–1929, complete with an overscaled doorway that alludes directly to Asplund's *Stockholm Public Library*. The monumental opacity of a single white prism was to be relieved by a sculpted frieze of figures in apparently classical garb. After the four-year delay, when he took up designing the final, executed scheme, Aalto instead composed two rectangles joined on their long dimension, with the smaller slid off the larger's line of symmetry. A foyer, near the corner of the smaller, single-story block, contained a dogleg staircase backed floor-to-ceiling with plate glass. All figurative ornament was gone. Undoubtedly, the built project's style echoes the formal language he saw in the work of his European colleagues in CIAM, which he joined in 1928.

Aalto's idiom had changed, yet he insisted that from the first to the final schemes the library's central concept held: "When I designed the city library at Viipuri," he wrote, "I pursued the solution with the help of primitive sketches from some kind of fantastic mountain landscapes with cliffs lit up by suns in different positions." Aalto never really explained the meaning of this image, which he implied had come upon him spontaneously. But from this vision, he "gradually arrived at the [architectural] concept for the library building."⁵⁰ The compositional transformation of the *Library* project's idiom, he insisted, owed

more to the particularities of its resiting: Because the final site was less formal than the first, he sought a less symmetrical, less historicizing composition.⁵¹

Taking Aalto at his word and delving instead into the meaning of those initial, "primitive" sketches — not into the project's stylistic transformations — clarifies his guiding concept for the building and its continuity throughout its conception and execution. His sketchy imaginings elicit a raft of primary metaphors steering the central compositional features of the design. To adduce only examples discussed above, the idea of ascending a fantastic mountainscape alludes to the primary metaphors, "knowledge is light," "the acquisition of knowledge is ascent up a path toward a pregiven destination," and "thinking is seeing." Contemplating mountaintop views as light and shadows change with the day's passing, anticipating the monumental isolation and psychic clarity of the summit: These metaphors constitute the *Viipuri Library's* central organizational trope.

Giving architectural form to this vision of ascent inspired Aalto to employ a sectional approach. For the primary spatial sequence he exaggerated, with even greater success than he had



Left to right: Alvar Aalto, *Viipuri Library*, internal stairwell. Copyright, Alvar Aalto Foundation/Courtesy, The Alvar Aalto Museum; internal stairwell from foyer. Photo, Gustaf Welin/Copyright, Alvar Aalto Foundation/Courtesy, The Alvar Aalto Museum

at *Paimio*, the user's procession from the distracting cacophony and visual "bombardment" of everyday life to an internalized, silent world. From one secondary entrance, that closest to the street, the user enters a periodical reading room below the main reading room and filled with rows of shoulder-height reading stands. The room evokes the transitory hustle and bustle of modern life: One imagines a user pulling onto the curb, running inside to scan the day's headlines, and running back out without even sitting down.

By contrast, from the main entrance foyer (which also leads to the auditorium), users on their way to the main reading room walk on axis toward a monumental staircase and slowly ascend into a large, double-height, single-span, multilevel room that falls away from the access desk at its apex-like cliffs from a mountain summit. *I'm making progress. I'm getting there. Knowledge is light.* The reading room, Aalto wrote, needed "a conserving and externally closed character." No views opened up to the distractions of the world. Aalto packed the brick walls with sound-absorbing materials and made them "exceptionally strong." An otherworldly realm of silence, the reading room's visual, auditory, tactile, and spatial features focus users on the central purpose of their destination. Here, as Aalto put it, is the place where books and people meet. Vertically, bookshelves line the room; horizontally, large communal reading tables offer surfaces on which to lay out work. Another part of the room is filled with rows of individual carrels furnished with bentwood storage units to facilitate readers' use of space without inhibiting views of the roomscape, of other cliffs, and of other people.

In designing the reading room, Aalto wrote, he was principally concerned with the interrelationship of the reader, the book, and light. He determined that physiologically, a reader needs even, indirect light for two reasons: so that distracting shadows would not fall upon one's open book and so that bright light would not reflect from the white page back into the reader's eyes. The architectural solution is provided by the library's fifty-seven conical concrete skylights, each nearly four feet wide and six feet deep. The shape of the cones was determined by the angle the summer sun reaches at its highest possible point. Each skylight also contains retractable spotlights that can be switched on and off to compensate for glare or shadows as the sun moves. This system, Aalto explained, made it possible, as at the top of a mountain, for light to come at every moment of the day from "millions of directions."⁵²

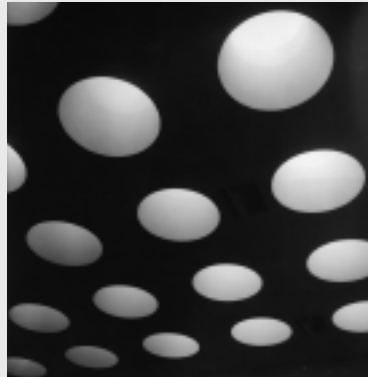
These skylights fulfill the physiologically determined program Aalto set for himself in the library project: reader, book, light.

Together with the room's multileveled, horizontally and vertically expansive form, they also comprise the room's central compositional trope: a fantastic mountain landscape lit by many suns. This is a reading room replete with accommodations to the bodily basis of human cognitive experience, to its reliance on cognitive schemas and primary metaphors; a room where light both literally and figuratively allows the reader to see; a room to which its user has literally and figuratively processed to attain a goal; a room designed around the users' bodily being when they are engaged in different pursuits: researchers standing and moving about or readers quietly sitting in imaginative thought.

By settling on a kit-of-parts organization for the plan that explicitly differentiated — programmatically, architecturally, and experientially — between what Aalto called the "social" block and the block in which the reading room is housed, he draws upon the specific primary metaphor: emotional states are physical containers. The larger block contains mainly the multileveled reading room; the smaller, single-story block houses offices, the periodical and children's reading rooms, and most famously, the auditorium with a wavy ceiling. The principal entrance to this social block, adjacent to the woodland park, begins in a foyer bathed in the filtered light of layered transparency, a space of transition from nature and urbanity to the sheltered world of social interchange and private scholarly pursuit. Aalto, symbolically emphasizing the liminality of the foyer, trained vines to grow inside the floor-to-ceiling windows.

Aalto continues this theme of filtered layers of transparency in other parts of the social block, containing the activities within while offering his users the chance to imaginatively project their escape into a quieter world. Such a compositional strategy is especially evident in his design of the auditorium, where he reinforces users' peripheral awareness of the informal woodland park beyond by butting the wavy ceiling against the rectangular plate-glass windows. The windows look out into the forest canopy, as uneven and fluid as the ceiling inside. Aalto echoes this intermeshing of his projected users' fluid and multidirectional experience of the space of the world and their axial and directional experience of space of the *Library* in the corridor walls leading to the auditorium: At one moment, an apparently load-bearing wall breaks into a trunk-like pair of columns; at another, these walls break into curves that arc this way then that, gently shepherding people inside.

Aalto explained how he had decided upon the famously wavy ceiling of the long, narrow auditorium by considering the acoustical experience of both listeners and lecturers. Although



Left to right: **Alvar Aalto, Viipuri Library, main room.** Photo, Gustaf Welin/Copyright, Alvar Aalto Foundation/Courtesy, The Alvar Aalto Museum; **skylights in reading room.** Photo, Gustaf Welin/Copyright, Alvar Aalto Foundation/Courtesy, The Alvar Aalto Museum; **periodical reading room with shoulder-height stands.** Photo, Gustaf Welin/Copyright, Alvar Aalto Foundation/Courtesy, The Alvar Aalto Museum

he spoke of the social block as the “block for the ear,” his theoretical declarations and compositional gestures indicate that he referred to the ear not only in its biological sense: “I conceive acoustic questions mainly as physiological and psychological questions,” he wrote. “Purely mechanical solutions are not justifiable.” He imagined a lecture hall without a lecture; rather, the room is filled with participants in a discussion, sound waves traveling forwards and backwards. Revealing his socially democratic ideals, Aalto wrote that even in the design of a lecture hall, “general discussions should be just as important as individual performances.”

As in the *Viipuri* reading room, Aalto’s physiognomically derived solution becomes the compositional datum for the auditorium space, which formally instantiates the back-and-forth movement of conversation that it technically facilitates. (At the same time, it breaks up the linearity of what would otherwise perhaps be an excessively long and narrow room.) Finally, the dropped ceiling (which hides both the room’s mechanical equipment and its structural armature) brings the room’s vertical scale more into line with that of the human body.

Throughout the building, architectural details offer rich and highly variable tactile, visual, auditory, and experiential moments. It contains stucco walls, rubber flooring, plate glass, steel, and a wide variety of woods — sycamore, oak, birch, red beech, and teak — each of which is placed according to its color, grain, and tactile qualities, and the level of wear Aalto anticipated that it would receive. The midsections of many interior columns are wrapped with wooden slats, offering extra stimulus and proprioceptive markers to passing hands. Woven wastebaskets are furnished with a rectangular shelf placed above their circular apertures, offering users a surface so that they might shuffle through collected papers, separating wanted from unwanted. Here, as in the *Paimio Sanatorium*, Aalto detailed and furnished the building by thinking through the often overlooked, sometimes invisible everyday needs of ordinary users.

Aalto’s use of organic curves, careful attention to natural light, embodiment of allusions to the forms of nature (and in other instances also to local vernacular traditions), frequent use of wood, and more, are often gathered under the rubric of his putative regionalism. Very often his work exhibits an extraordinary sensitivity to the inflections, nuances, and character of a particular site or locale. Yet Aalto’s regionalism, if we must

employ that term, constitutes part of his larger agenda: to create an architecture of embodied rationalism. The *Viipuri Library* and a number of his subsequent works are “regionalist” in that a sensitivity to site, season, place, and memory inevitably, naturally, figures into a phenomenologically grounded Modernist architecture. After all, perceiving, thinking subjects situate themselves in real places and times.

In both the *Viipuri Library* and the *Paimio Sanatorium*, Aalto offers a model of rationalism based on the phenomenological principles of embodied cognition: To paraphrase his own words, he had extended the rationalist working method to prevent inhuman (and therefore instead to effectuate “humanist”) results. Aalto’s embodied rationalism, developed early in his career, guided his approach to design throughout his life, imbuing his architecture with a distinctive Modernist idiom that resulted in a host of iconic projects, many of which justly hold their place as some of the 20th century’s greatest buildings. Such projects include the *Town Hall and Library* at Säynätsalo, the *Cultural Center* in Wolfsburg, the *Baker Dormitory* in Cambridge, and the *House of Culture* and the *National Pensions Institute* in Helsinki. In each, Aalto developed a quiet, nuanced, phenomenologically dense architecture that remains unsurpassed in the history of Modernism.

Alvar Aalto, Viipuri Library, auditorium. Photo, Gustaf Welin/Copyright, Alvar Aalto Foundation/Courtesy, The Alvar Aalto Museum



Aalto identified with and embraced the conditions of modern life and believed that Western culture was in the midst of an all-encompassing break with the past. With childlike enthusiasm, he consumed products that became the emblems of 20th-century modernity: the automobile, the cinema, the phonograph. As an artist he moved in the society of Modernism and befriended many of its most vigorous proponents. As an architect, he insisted on and incorporated the central tenets of the new architectural credo that he believed would advance a new architecture. This included incorporating new technologies when appropriate to the task at hand — *Paimio's* elevator was one of the earliest glass elevators in Finland, and his flexible standardization of building parts for low-cost housing along with his furniture designs relied heavily upon the techniques of mass production that simply were not possible before the technological innovations of the 20th century.

Aalto practiced what are indisputably the core tenets of Modernism: Architecture must be radically reevaluated in light of the conditions of modernity; a new architecture must be devised that is appropriate to the conditions of modern life; this new architecture must express the conundrums and ameliorate the ills visited upon humanity by modernity; it must accommodate not just the powerful but also the less powerful or even the disempowered; it must create more than monuments; it must create architectural spaces in the service of an ordinary life richly and fully, symbolically, intellectually and intuitively well lived.

Although Aalto arguably gave embodied rationalism its fullest, first architectural manifestation, other well-known avant-garde architects of his generation — including J. J. P. Oud, Bruno Taut, Hans Scharoun, El Lissitzky, and the Vesnin brothers — also explored embodied rationalism's compositional and intellectual principles, albeit in what may initially appear to be a misleadingly dizzying multiplicity of forms. But when one sees form not as the foundation of Modernism but rather as the final expression of Modernists' positioning within a multi-streamed and multi-dimensional Modernist discourse, then the coherence of this phenomenologically oriented strain of embodied rationalism becomes manifest.⁵³ Why this strain of embodied rationalism remains so inadequately explored is a topic for another essay. What is clear is that an unrecognized form of rationalism coursed, and perhaps continues to course, through the history of Modernism, which the work of Alvar Aalto can help us to see, not only with our eyes and through our bodies but also with our minds. □

I am greatly indebted to and would like to thank the following people for their gracious and helpful comments, many of which improved this essay: Daniel Abramson, Stanford Anderson, Gail Fenske, Daniel Goldhagen, William Saunders, and Dell Upton. This essay is drawn from one chapter of my book in progress, "Rethinking Modernism in Architecture"; a version will be published in *Aalto and America*, edited by Stanford Anderson, Gail Fenske, and David Fischer.

NOTES

1. In *The Details of Modern Architecture, Vol. 2: 1928–1988* (Cambridge, MA: MIT Press, 1996), Edward R. Ford writes that each of the *Paimio Sanatorium's* four wings has a different structural system, a variation that not evident from its external appearance (121). He adds that in the *Viipuri Library*, structure is "seldom exposed" (122).
2. See, for example, Richard Weston's "Between Nature and Culture:

Reflections on the Villa Mairea," in *Alvar Aalto: Toward a Human Modernism*, Winfried Nerdinger, ed. (New York: Prestel, 1999), 61–76.

3. Eeva-Liisa Pelkonen discusses Aalto's opportunistic reconfiguring of his persona in her "Empathetic Affinities: Alvar Aalto and his Architectural Milieus," Ph.D. dissertation, Columbia University, 2003. Her *Alvar Aalto: The Geopolitics of Architecture* is forthcoming.

4. In the architectural history and theory of 20th-century Modernism, phenomenology is often associated with the mystical, antimodern phenomenology of Martin Heidegger. For examples, see many of the essays in *Body and Building: Essays on the Changing Relation of Body and Architecture*, George Dodds and Robert Tavernor, eds. (Cambridge: MIT Press, 2002); Karsten Harries, *The Ethical Function of Architecture* (Cambridge: MIT Press, 1998); Steven Holl, Juhani Pallasmaa, and Alberto Pérez-Gómez, *Questions of Perception: Phenomenology of Architecture* (San Francisco: William K. Stout Publisher, 2007); Alberto Pérez-Gómez, *Architecture and the Crisis of Modern Science* (Cambridge: MIT Press, 1983); and Christian Norberg-Schulz, *Genius Loci: Toward a Phenomenology of Architecture* (New York: Rizzoli, 1983).

Phenomenology's close association with Heideggerian philosophy — with all its mystical, anti-modern and even quasi-fascistic implications — has, in the discourse of the history and theory of Modernism in architecture, either provoked hostility or simply been ignored by the two other dominant strains in the field: Marxist and post-Marxist studies influenced by the Frankfurt School and psychoanalytically oriented studies influenced by Sigmund Freud and his followers. For examples of how a phenomenological approach to architecture is approached with a mixture of fascination and hostility, see Jorge Otero-Pailos, "Theorizing the Anti-Avant Garde: Invocations of Phenomenology in Architectural Discourse, 1945–1989" (Ph.D. dissertation, MIT, 2002); Mark Jarzombek, *The Psychologizing of Modernity: Art, Architecture, and History* (New York: Cambridge University Press, 2000), and his "Joseph August Lux: Werkbund Promoter, Historian of a Lost Modernity," *Journal of Society of Architectural Historians*, June 2004, 202–219; and Mitchell W. Schwarzer, "The Emergence of Architectural Space: August Schmarsow's Theory of *Raumgestaltung*," *Assemblage*, August 1991, 48–61.

Examples of scholarship in the field that touches upon the strain of phenomenology discussed here, in addition to Jarzombek's *Psychologizing* (mentioned above, which does so despite itself) is Sandy Isenstadt, "Richard Neutra and the Psychology of Architectural Consumption," in *Anxious Modernisms: Experimentation in Postwar Architectural Culture*, Sarah Williams Goldhagen and Réjean Legault, eds. (Cambridge: MIT Press, 2001), 97–117, and Dell Upton, "Architecture in Everyday Life," *New Literary History*, Autumn 2002, 707. Juhani Pallasmaa's *The Eyes of the Skin: The Architecture of the Senses* (New York: Wiley, 1996) falls in a category somewhat its own. On the differences between Heideggerian phenomenology and the sort of phenomenology discussed here, most famously propounded by Maurice Merleau-Ponty, see Dermont Moran, *Introduction to Phenomenology* (London: Routledge, 2000), 412 and *passim*.

5. Aalto, "The Humanizing of Architecture" (1940), in Göran Schildt, *Alvar Aalto in His Own Words* (Helsinki: Otava Publishing, 1997), 102. The two subsequent quotations by Aalto are from the same essay.

6. Aalto, "The Housing Problem" (1930), in Schildt, 80. The subsequent quotation by Aalto is from the same essay. Le Corbusier wrote, of the bedrooms in the double house at the Weissenhofseidlung, "by day, the sleeper becomes a parlor car," referring to the transformability of the overnight cubicles on Pullman trains, quoted in Karen Kirsch, *The Weissenhofseidlung: Experimental Housing Built for the Deutscher Werkbund, Stuttgart, 1927* (New York: Rizzoli, 1989).

7. Aalto, "Rationalism and Man" (1935), in Schildt, 91. The subsequent four quotations by Aalto are from the same essay.

8. Aalto, "From Doorstep to Living Room" (1926), in Schildt, 55.

9. Aalto, "The Stockholm Exhibition" (1930), in Schildt, 76.

10. First two quotations are Aalto, "The Humanizing of Architecture," in Schildt.

11. For discussions of rationalism in Modern architecture, see Adrian Forty, *Words and Buildings: A Vocabulary of Modern Architecture* (New York: Thames & Hudson, 2000), 174–195, 276–291; Vittorio Lampugnani, *Encyclopedia of 20th-Century Architecture* (New York: Abrams, 1986), 275–278; Antoine Picon, introduction to Jean-Nicholas-Louis Durand, *Précis of the Lectures on Architecture* (Santa Monica: Getty Publications, 2000), 1–68.

12. Reyner Banham, *Theory and Design in the First Machine Age* (New York: Praeger, 1960), 9–34; Kenneth Frampton, *Modern Architecture: A Critical History*, third ed. (New York: Thames & Hudson, 1992), 12–19 and *passim*; Robin Middleton and David Watkin, *Neoclassical and Nineteenth-Century Architec-*

ture (New York: Rizzoli, 1987), *passim*.

13. See Vittorio Magnago Lampugnani, "Berlin Modernism and the Architecture of the Metropolis," 35–65, and Detlef Mertins, "Architectures of Becoming: Mies van der Rohe and the Avant Garde," 106–133, in *Mies in America*, Terence Riley and Barry Bergdoll, eds. (New York: Museum of Modern Art, 2001).

14. Mary McLeod, "'Architecture or Revolution': Taylorism, Technology, and Social Change," *Art Journal* 43, Summer 1983, 132–147; Fritz Neumeyer, *The Artless Word: Mies van der Rohe on the Building Art* (Cambridge: MIT Press, 1991), 250.

15. For selected examples of this diametric opposition of techno-rationalism and organic functionalism (widely ranging in time), see Adolf Behne, *The Modern Functional Building* (1926; Santa Monica: Getty Publications, 1996); Sigfried Giedion, *Space, Time, and Architecture: The Growth of a New Tradition* (Cambridge: Harvard University Press, 1941); Peter Blundell-Jones, *Hugo Häring: The Organic versus the Geometric* (Stuttgart: Axel Menges, 1999); Colin St. John Wilson, *The Other Tradition of Modern Architecture: The Uncompleted Project* (London: Academy Editions, 1995). Such oppositions do not begin to capture the actual complexity of Modernism in architecture: See Goldhagen, "Something to Talk About: Modernism, Discourse, Style," *Journal of the Society of Architectural Historians*, Summer 2006, 144–167.

16. Peter Markie, "Rationalism vs. Empiricism," *Stanford Encyclopedia of Philosophy*, <<http://plato.stanford.edu/entries/rationalism-empiricism>>.

17. For a discussion of these tenets of Cartesian rationalism, see George Lakoff and Mark Johnson, *Philosophy in the Flesh: The Embodied Mind and Its Challenge to Western Thought* (New York: Basic Books, 1999), 391ff.

18. On the impact of surrealism on architecture, see, for example, John Allen, *Berthold Lubetkin: Architecture and the Tradition of Progress* (London: RIBA Publications, 1992); Romy Golan, *Modernity and Nostalgia: Art and Politics between the Wars* (New Haven: Yale University Press, 1995); Caroline Maniaque, *Le Corbusier et les maisons Jaoul* (Paris: Picard, 2005); *Surrealism and Architecture*, Thomas Michal, ed. (London: Routledge, 2005); Don Quaintance, "Modern Art in a Modern Setting: Frederick Kiesler's Design of Art of This Century," in *Peggy Guggenheim and Frederick Kiesler: The Story of the Art of This Century*, Susan Davidson and Philip Rylands, eds. (New York: Guggenheim Museum Publications, 2004), 207–273; Terence Riley and Joseph Abram, *The Filter of Reason: The World of Paul Nelson* (New York: Rizzoli Publications, 1990); Anthony Vidler, *The Architectural Uncanny: Essays in the Modern Unhomely* (Cambridge: MIT Press, 1992).

19. Lakoff and Johnson, 410–414.

20. Francisco Varela, Evan T. Thompson, and Eleanor Rosch, *The Embodied Mind: Cognitive Science and the Human Experience* (Cambridge: MIT Press, 1991); many of the essays in José Luis Bermúdez, Anthony Marcel, and Naomi Dissanay, *The Body and the Self* (Cambridge: MIT Press, 1995); Anthony Dimasio, *Descartes' Error: Emotion, Reason, and the Human Brain* (New York: Avon Books, 1994); George Lakoff and Mark Johnson, *Metaphors We Live By* (Chicago: University of Chicago, 1980), and their *In the Flesh* as well as Mark L. Johnson, "Embodied Reason," in *Perspectives on Embodiment: The Intersections of Nature and Culture*, Gail Weiss & Honi Fern Haber, eds. (New York: Routledge, 1999), 81–102.

21. Andrew N. Meltzoff and M. Keith Moore, "Infants' Understanding of People and Things: From Body Imitation to Folk Psychology," in *The Body and the Self*, 43–69.

22. Shaun Gallagher, "Body Schema and Intentionality," 225–244 in *The Body and Self*; Maurice Merleau-Ponty, *The Phenomenology of Perception* (London: Routledge, 1962), 118–119; Merleau-Ponty, "Eye and Mind," in *The Primacy of Perception: And Other Essays on Phenomenological Psychology, The Philosophy of Art, History and Politics* (Evanston, IL: Northwestern University Press, 1964), 159–192; on Merleau-Ponty, see also Moran, 391–434; Hubert L. Dreyfus, "Merleau-Ponty and Recent Cognitive Science," 129–150, and Richard Shusterman, "The Silent, Limping Body of Philosophy," 151–180, in *The Cambridge Companion to Merleau-Ponty*, Taylor Carman and Mark B.N. Hansen, eds. (New York: Cambridge University Press, 2005).

23. Lakoff and Johnson. The discussion of primary metaphors and complex primary metaphors in the two subsequent paragraphs is based on Lakoff and Johnson, 30–38 and 45–94.

24. Merleau-Ponty writes in *Phenomenology*, 100: "The word 'here' applied to my body does not refer to a determinate position in relation to other positions or to external co-ordinates, but the laying down of first co-ordinates." 25. Moran, 423.

26. Mark Johnson's "Embodied Reason," in *Perspectives on Embodiment*,

passim, and Lakoff and Johnson, 122–137.

27. Pelkonen first brought to light Aalto's exposure to empathy theory in his student days, and later to scientific psychology, in her "Emphathetic Affinities," although she takes her analysis of Aalto's work and ideas in a very different (and extremely fruitful) direction from mine.

28. Duane P. Schultz and Sydney Ellen Schultz, *A History of Modern Psychology*, 8th ed. (Belmont, CA: Wadsworth Publishers, 2004), offers an excellent introduction to the early history of experimental psychology, as do Harry Francis Mallgrave and Eleftherios Ikononou in the introduction to their edited collection, *Empathy, Form, and Space: Problems in German Aesthetics 1873–1893* (Santa Monica, CA: Getty Publications, 1994), 1–85.

29. Wilhelm Wundt, *Principles of Physiological Psychology*, 1874; see also section on Wundt in Schultz and Schultz, 87–100, and R. I. Watson, Sr., *The Great Psychologists*, 4th ed. (New York: J.B. Lippincott Co, 1978), chapter 12.

30. Enrollment in his lecture classes sometimes exceeded 600, and in his lifetime he granted more doctorates in psychology than any other scientist in Germany.

31. The use of the term phenomenology in the sense discussed here was introduced by Immanuel Kant in the *Critique of Pure Reason*, in which Kant writes that the space and forms of the world are "less an image corresponding to an external reality and more a mode" by which we actively "arrange the objects of our perception." Quoted in Mallgrave and Ikononou, 5–6. On Schmarsow, see Mallgrave and Ikononou, 60–66.

32. On Schmarsow, see his "The Essence of Architectural Creation" (1893), in Mallgrave and Ikononou, 281–297 (the "earthly scene" phrase appears on page 291); see also Michael Podro, *The Critical Historians of Art* (New Haven: Yale University Press, 1982), 143–149; and Schwarzer.

33. Schmarsow, 283.

34. Ritva Wäre, "National Romanticism in Finnish Architecture," <www.broehan-museum.de>.

35. Jyväskylä Department of Psychology website, <www.jyu.fi/indexeng>. Experimental psychology within the academy became institutionalized as a separate discipline only in the 1940s; Schultz and Schulze, 100. For background information, see also Jarzombek.

36. Pelkonen.

37. Aalto, "The Hilltop Town," 49.

38. Aalto, "Temple Baths on Jyväskylä Ridge," 18–19.

39. "Alvar Aalto," *Grove Art Online*, <www.groveart.com>.

40. Paul Klee's interest in phenomenology is discussed in Victoria Salley, "The Master Years," in *Paul Klee: Selected by Genius, 1917–1933*, Roland Doschka, ed. (New York: Prestel, 2001), 12–14; Schildt discusses Aalto's friendship with Moholy-Nagy in *Alvar Aalto: The Decisive Years* (New York: Rizzoli, 1986), 70–78.

41. See, for example, László Moholy-Nagy, *Vom Material zu Architektur* (Munich: Lagen, 1929).

42. Aalto, "Rationalism and Man," *In His Own Words*, 92. The subsequent two quotations by Aalto are from the same essay.

43. Aalto, "The Housing Problem," *In His Own Words*, 83.

44. Aalto, "An Independence Monument in Helsinki—The Olympic Stadium," *In His Own Words*, Schildt, ed., 64–66.

45. Aalto, "The Rational Cinema," *In His Own Words*, 66–71.

46. Aalto, "The Humanizing of Architecture," *In His Own Words*.

47. Schmarsow, 289; also, in Mallgrave and Ikononou, *Empathy*, 15. Note that Pelkonen's appendix to her doctoral dissertation, listing the contents of Aalto's library, does not include any works by Schmarsow.

48. Aalto, "Rationalism and Man," *In His Own Words*, 90.

49. Aalto, "Municipal Library in Viipuri: Description of the Building's Construction," *Municipal Library, Viipuri* (Jyväskylä: Alvar Aalto Museum, 1997), unpaginated. On the design process of the library, see also Michael Spens's *Vipuri Library: Alvar Aalto 1927–1935* (London: Academy of Editions, 1994).

50. Aalto, quoted in Spens, *Viipuri*, 36.

51. Aalto, "Municipal Library." The information on Aalto's design intentions for the Viipuri Library in the subsequent two paragraphs is based on this source.

52. Aalto, "The Humanizing of Architecture," *In His Own Words*, 105–107.

53. On the complexity of Modernism and its many under- or unexplored strains, see Goldhagen, "Coda: Reconceptualizing the Modern," in Goldhagen and Legault, 301–323; and Goldhagen, "Something to Talk About."