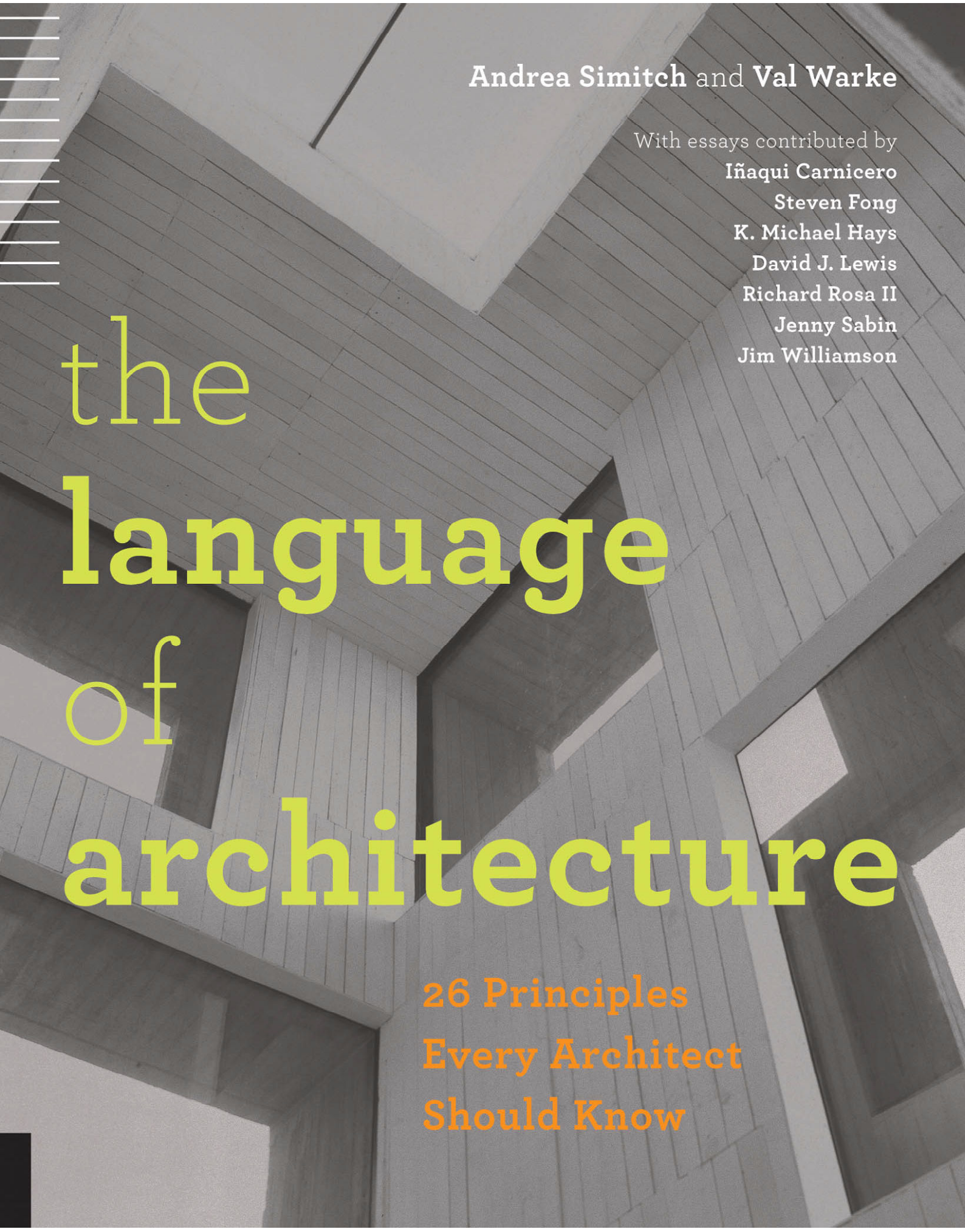


Andrea Simitch and **Val Warke**

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the language of architecture

26 Principles Every Architect Should Know

the **language** of **architecture**





Dedication
To all of our students, from whom we have learned so much. And to Eva and Dax, who have not only tolerated but infinitely enriched our endless excursions in the interest of architecture.

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introduction

It is our hope to stimulate old and new interests in architecture, to share an enthusiasm for some venerable sheds and evocative cathedrals, and to introduce the limitless poetics that can be composed in architecture's language.

Tireless debate has always focused on the qualities that could cause a building to be described as "architecture." Nikolaus Pevsner, who famously declared that "A bicycle shed is a building; Lincoln Cathedral is a piece of architecture," assumes that human habitation is a characteristic of all buildings, while architecture transcends building because of its aesthetic aspirations. Other arguments have been based on issues as indeterminate as emotional resonance (in other words, architecture, unlike building, stirs our emotions), as reductive as professionalism (architecture is by architects), as evaluative as historical appraisal (architecture is what a culture has deemed as significant, or what has proven to be significant through time), and as limitless as inclusivism (all constructions are architecture, perhaps even those by other species, such as the hives of bees or the dams of beavers).

Parallel to these discussions, analogies to language have been frequent, varied, and inevitable throughout the history of architecture. The fact is that every building, from a bicycle shed to a bus stop, is capable of meaning something to someone: "Here, I can protect my bike from the rain," or "This is the stop near my home." But it is clear that those constructions we describe as "works of architecture" tend to convey countless levels of meaning to numerous unique observers over an indefinite number of years. Perhaps, then, architecture might be understood to be comparable to a "thick," poetic language.

One of the traits of any language is that it provides a system that can convey meaning. When being introduced to a new language—when one first learns to speak as an infant or when one attempts to learn a second language—meaning is generally direct and singular. To the infant, a "dog" is the furry four-legged beast in the room. To the first-time speaker of Italian, "cane" is directly associated with one among that general group of animals we know as "dogs." However, after becoming familiar with more complex levels of language—with poetry, slang, mythology, and allegory, for example—a more sophisticated notion of meaning is required. For example, when Shakespeare has Hamlet say:

"Let Hercules himself do what he may,
The cat will mew and dog will have his day."
Shakespeare, Hamlet*, Act V, Scene 1*

our elementary concept of the meaning of "dog" becomes complicated by the various affects of context, by our knowledge of dramatic genres, of precedent, of poetic language, and, if heard during a performance, by the actor's verbal and physical inflections. Clearly, Shakespeare's "dog" is much more than that furry four-legged beast once in the room.

Meaning in architecture is similarly complex, both profound and open ended. Such meaning is inevitably compounded by architecture's lengthy processes of production, by the vast array of individuals responsible for every stage of that production, by the final construction's relationships with its various contexts, by its interrelationships with other known elements of architectural expression, and by the unique pasts and presents of each individual who observes the final construction. Architecture is further complicated by the fact that each design is a testing ground for a number of associated concepts drawn from history, theory, technology, and even representation. For this reason, many attempts at defining a language of architecture have necessarily been reductive. Like textbook translations of elementary Italian, they

become simple exercises in decoding, with no regard for syntax, idioms, voice, genre, and so on.

For these reasons, this book is not intended to be an exhaustive or definitive lexicon of architectural ideas. Such an effort would be futile. It is instead an introduction to what we believe—after over sixty years of combined experience in architectural education—to be some of the more vital fundamentals of architectural design. Just as the English alphabet is arbitrarily limited to twenty-six letters, we have limited ourselves to just twenty-six elements, each described in its own chapter.

We have organized the text so that we begin with three chapters that introduce the essential elements one needs to develop a visual language and the skills for critical thinking: analysis, concept, and representation. We follow with three of the elements that are generally considered to be among the givens of any design process: program, context, and environment. Then, we turn to what might be considered the substances of architecture. After introducing the physical substances—mass, structure, surface, and material—we consider the equally palpable, but more ephemeral substances—space, scale, light, and movement—that serve to make the physical substances legible. Four chapters on the conceptual devices that frequently contribute to what might be understood as the poetics of architecture—dialogue, tropes, defamiliarization, and transformation—are followed by five chapters that discuss the operations of architecture's diverse organizational devices: infrastructure, datum, order, grid, and geometry. Finally, two chapters concerning some of the considerations an architect might have for the implicit possibility of construction—fabrication and prefabrication—are followed by a final chapter on what is usually the culmination of the design process for most architects and students of architecture: presentation.

And we illustrate these chapters throughout with some of the more distinctive and expressive examples of architecture's language. From the grandiloquent to the slang, from the epic to the everyday, projects are culled from the great masters of architecture, from notable contemporary practitioners and from students around the world who have confronted these issues in their studies.

We address this book to several different audiences. For those just commencing studies in architecture, we hope to introduce the potential breadth and depth of the field while showing some of the works—by both students and well-known practitioners—that might inspire or even provoke. Those who have already embarked on one of the various aspects of architectural practice might find in the text a series of subtle reminders, a mine of possibilities. Each chapter includes a short essay that brings greater depth to the chapter's theme and may suggest further inquiry for those interested in architectural history, theory, or criticism. And finally, for those of our colleagues interested in developing a curriculum in beginning design, we intend each chapter to germinate an idea that might foster its own design exercise or that could suggest more elaborate problems when combined with other themes.

In short, it is our hope to stimulate old and new interests in architecture, to share an enthusiasm for some venerable sheds and evocative cathedrals, and to introduce the limitless poetics that can be composed in architecture's language.



Giorgio de Chirico: *Mystery and Melancholy of a Street*, 1914. Private collection.



Aldo Rossi: Gallaratese II Housing, Milan, Italy 1974

Aldo Rossi's Gallaratese II Housing block in Milan takes not only certain formal cues from Giorgio de Chirico's trancelike metaphysical painting, *Mystery and Melancholy of a Street*, with a giant loggia surmounted by a cadence of square windows, but there is also a similar sensibility of urbanism, of buildings as monumental backdrops that impassively modulate individual activity while suggesting the mysteries that might be hidden in their shadowy depths.

and appropriation of something that already exists. It is not that *something* that is the subject of this chapter, but it is, instead, the processes by which one understands, abstracts, and interprets the known or the given so that it can meaningfully inform the design process. In architecture, these processes of abstraction are usually called *analysis*.

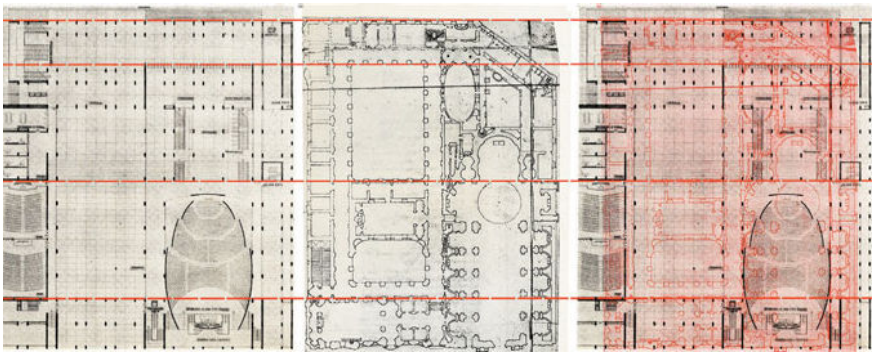
Project Givens

The design process is initiated by the intersection of two circumstances. One is the givens of a project, which include program (the functions that the project needs to accommodate; these may include specific material requirements, such as the use of aluminum), site and context (where the project is to be located), and conventions (the cultural contexts of the project). The other circumstance is *what* the architect brings to the givens: how the architect interprets or defines these givens. Analysis is the process of exploration and discovery with which an architect not only develops a familiarity with the assumptions, expectations, and conditions that are given, but subsequently establishes the critical framework of the problem, the conceptual lens through which all design decisions are subsequently made.

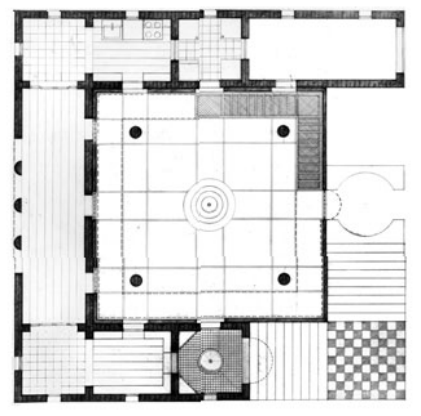
Precedent

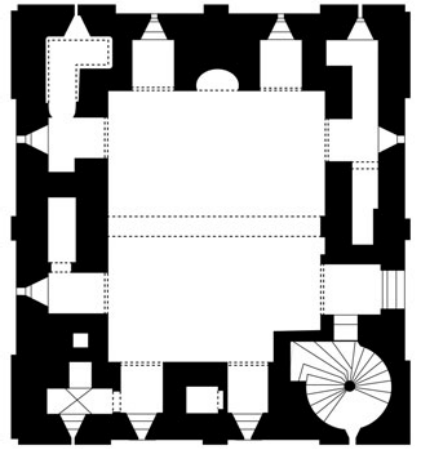
Fundamental to the education—and continued development—of an architect is an awareness of what has come before. It is the raw material that provides the basis for an infinite inventory of architectural ideas: it is the architect's library, allowing the architect

(continued on page 13)



These plans show Giuseppe Terragni's design for the Congress Hall for the Rome International Exposition (E42) of 1937 (left) in relation to the Oratory Complex of Saint Phillip Neri (1620–50), also in Rome, by Francesco Borromini and others (center). While the structures are extraordinarily different in their three-dimensional development, it is clear that the modern building derived significant inspiration from the plans of the Oratory, borrowing the older complex's geometries as well as its basic distribution of programmatic spaces.





Left: Machado and Silvetti: *House in Djerba*, Tunisia, 1976, plan

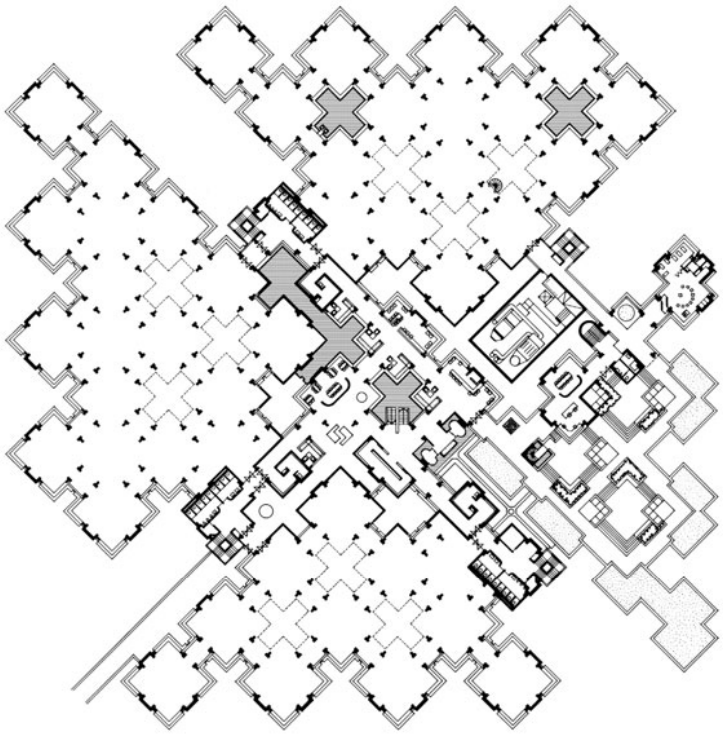
Right: Castle Hedingham, Essex, England, c. 1133, plan

It is possible to derive basic organizational strategies from one's understanding of precedents. The occupiable wall that wrapped the primary rooms of the medieval English castle is combined with the typical Tunisian troglodyte house in which an excavated courtyard is surrounded by its primary living spaces, to provide inspiration for a project designed by Machado and Silvetti in Djerba, Tunisia. Here, the exterior wall of rooms that enclose the house's central volumes is transformed into an exterior staircase, and as it begins to peel away, the central volumes of the house are revealed.

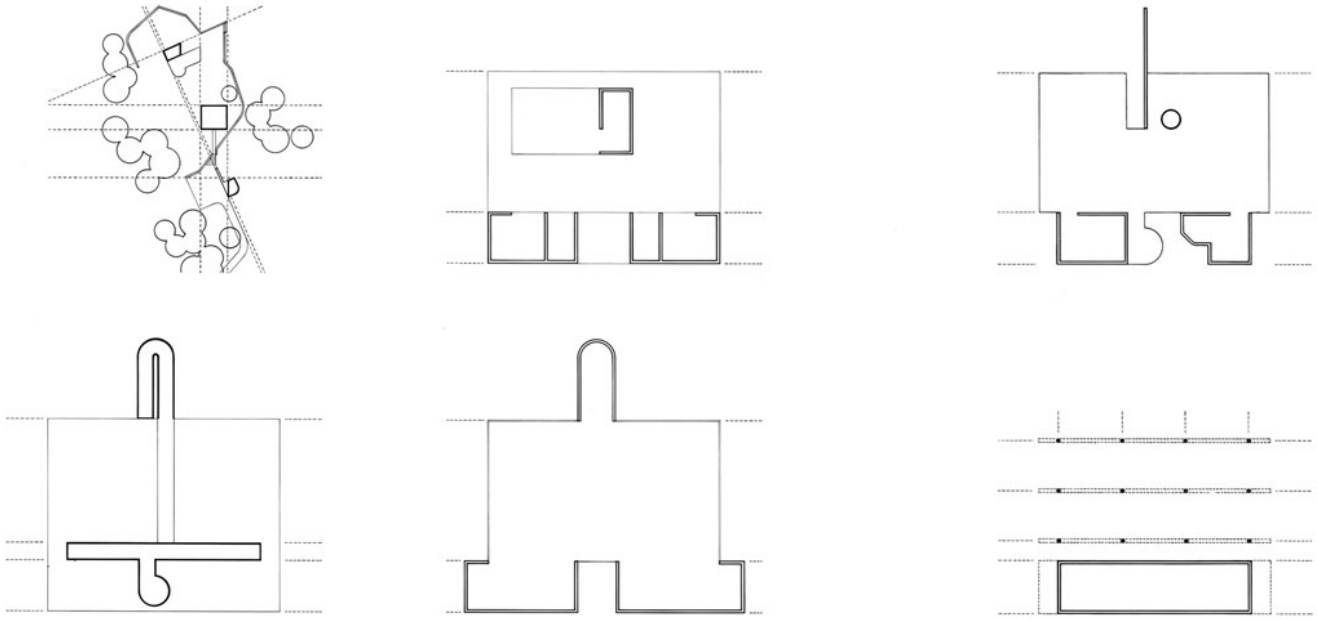
to quickly identify works that have evolved in response to similar programmatic, contextual, or cultural circumstances, or that may offer a repertoire of formal solutions that can inspire solutions to problems that may at first seem unrelated. As Álvaro Siza Vieira has said, "Architects don't invent anything; they transform reality. They work continuously with models that they transform in response to the problems that they encounter."

This knowledge can be made useful only if it undergoes a series of thoughtful transformations that increasingly abstract and distill those fundamental characteristics of a source that are relevant to the problem at hand. It is only then that a simple imitation can be replaced by the genuine *generative* potential of the precedent.

Precedents can originate from within or outside of architecture. They can inform a project's form or its organization, its structure or its circulation, its internal operations or its outer membranes. They can be buildings or cities, films, or paintings. They can be animals or machines, biological behaviors or fictional narratives. Designs often have more than one precedent.



In his design for a building in Apeldoorn, the Netherlands, completed in 1972, architect Hermann Hertzberger cast in concrete and masonry his theories that a building should be a communal structure, in effect, a small village, containing streets, plazas, and gathering spaces both formal and informal. Hertzberger is able to recast his analytic understanding of traditional, canalized Dutch towns into the scale of a modern building where the village's density that serves to create its cultural vitality is interpreted as a series of densely packed miniature office towers peering out over interior streets.



Richard Meier: House in Pound Ridge, NY, 1969

In these iconic diagrams by the architect Richard Meier, site, program, structure, entrance, circulation, and enclosure are independently represented in order to present the project's basic organizational strategies. While describable as a series of autonomous systems, each following an "internal" logic, together they form a constellation of systems that intersect, engage, and often deform one another in producing the final work.

ABSTRACTION

Just as an artist sees a painting through the eyes of someone intending to produce another painting, and a musician might hear music with the ears of someone intending to produce more music, an architect sees a building—ultimately, analyzes it—with the goal of designing another work of architecture. For the architect, the role of analysis is not to uncover the fundamental intentions that may have been behind a design's origin, but to uncover the values a design may have in inspiring more designs.

Analysis is a process whereby one draws from a precedent or from a programmatic given its distinguishable characteristics, what makes one work different from any other work. "Analysis," as Cornell University Professor Jerry Wells would say, "is designing backwards." It is breaking down a work into parts in order to examine a subject from multiple perspectives, to investigate a project in order to uncover what may have been the strategies for its design. While these parts are often form*less*, they are the precursors of the concepts and forms that have produced the final work.

Components, or breaking down into parts

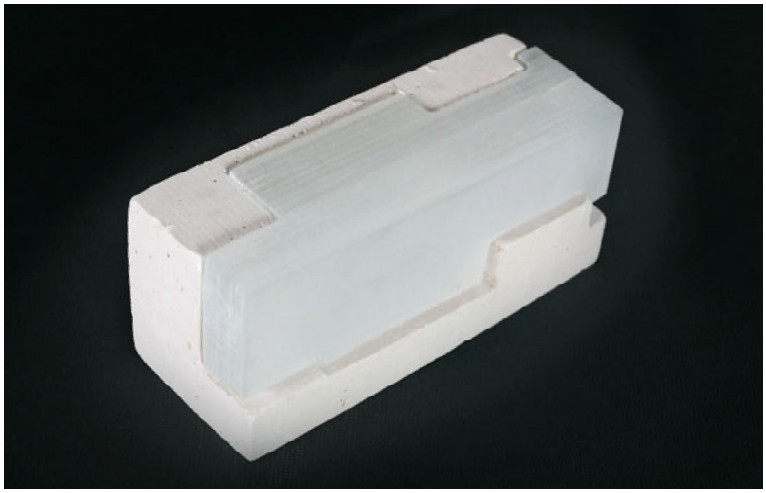
Most works of architecture are composed of a series of overlapping and bypassing systems that, together, form the complete work. It is the "unpacking" of these systems into a series of discrete diagrams that can offer insights into a precedent's unique characteristics, and it is the distillation of these systems into idealized components that can provide an inventory of systems that can subsequently be redeployed in other projects.

The most common systems separated during an analysis are structure, circulation, exterior envelope or membrane, major versus minor spaces, public versus private spaces, solids versus voids, repetitive versus unique, supportive spaces, and the geometric and proportional orders that often hold these systems together.

While each system on its own is important in understanding a work, the ways in which they are transformed, merged, or overlaid is what ultimately leads to an understanding of the unique qualities of the greater whole.







A series of analytical models demonstrates alternate formal and material strategies for a Danish Design Center that students were asked to design in a 2006 freshman design studio at Cornell University.

Diagramming

Diagramming is the process of abstracting and simplifying an idea so that it can be easily understood. It is the recording of the physical and spatial characteristics that identify the unique and recognizable characteristics of a building, site, or program. It is the process by which familiarity with a specific set of programmatic and contextual circumstances can be achieved. Much like a child's sketch, a diagram is not concerned with developing nuance but, instead, with clarity: it is a reduction—a boiling down—of an idea. The diagram cannot only analyze the physical, it can also reveal the ephemeral, the historical, the infrastructural. Diagrams allow one to gain an understanding of a particular project by revisiting it again and again through a series of distinct lenses. They also facilitate an understanding of how several seemingly unrelated works might in fact be brought together as an inventory of thematically related conditions. And, finally, diagramming can also facilitate the quick exploration of alternate solutions to a problem in its initial stages of development. The diagram not only maps the identity of a given project, but points the way to the conception of a new project. And it is in these reductive, abstract states that diagrams often resemble more universal conditions.

INTERPRETATION

It is the simplicity of the analytical diagram that allows for its subsequent interpretation and transformation when introduced to a new set of parameters.

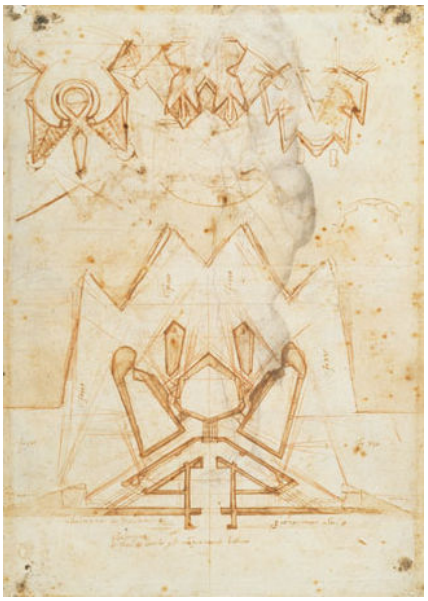
Intermediary Device

The synthesis of an analysis often leads to the production of an intermediary device, an artifact that is subsequently open to multiple interpretations. This device is, in effect, a 'prearchitectural' moment. It can take the form of a drawing or model, and it is a suggestive and interpretable representation that has the ability to shift in both scale and

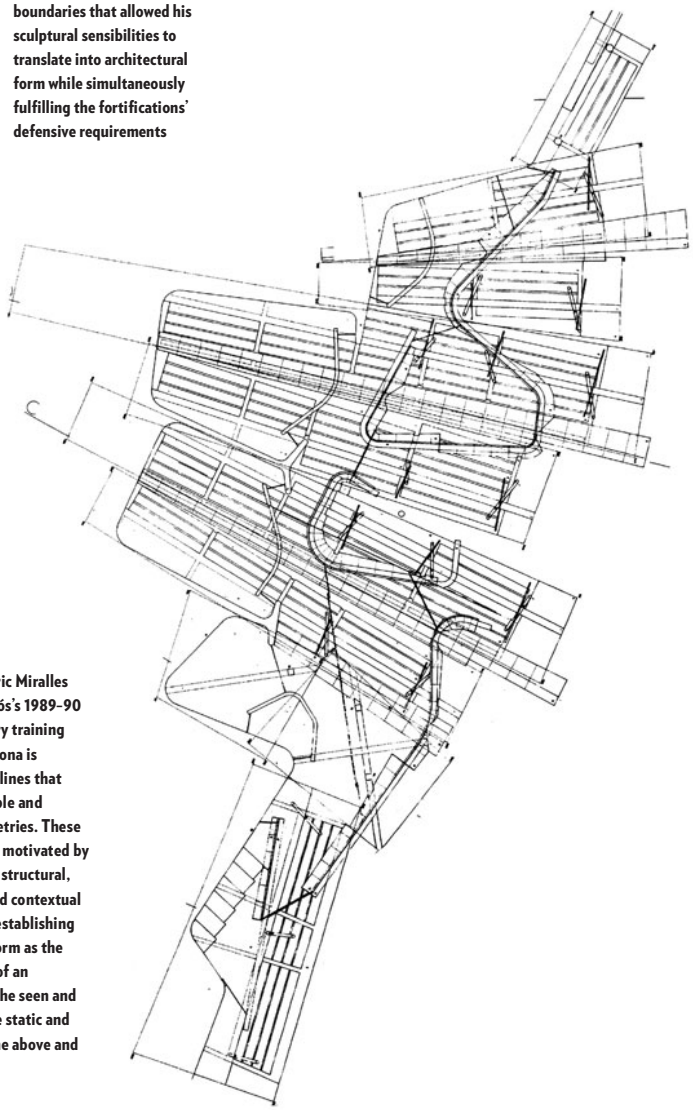
3 representation

The final architectural work inevitably bears the traces of its representational origins.

Architects do not build buildings, they make the drawings and models from which buildings are made. Take for instance a Scottish *waller* and a Native American basket weaver—what do they share? The medium in which each works is intimately tied to the thing that is produced—they are inseparable.



Michelangelo's *Study of Fortifications Number 27* model the walls as sculpted surfaces. Regulating lines that suggest cones of vision (and angles of gunfire) provide the geometric underpinning for the overlay of thickened lines whose bistre infill registers the massiveness of the walls. For Michelangelo it was this blurring of representational boundaries that allowed his sculptural sensibilities to translate into architectural form while simultaneously fulfilling the fortifications' defensive requirements



The plan of Enric Miralles and Carme Pinós's 1989-90 Olympic archery training range in Barcelona is saturated with lines that mark both visible and invisible geometries. These geometries are motivated by programmatic, structural, experiential and contextual relationships, establishing architectural form as the tangible trace of an archeology of the seen and the unseen, the static and the animate, the above and the below.

Here, too, then is the argument that for the architect, the representational tools (a drawing, a model—be they analog or digital), and the typologies (be they, say, a plan or a section, a drawing or a model) that are used in the *development of a concept* are to be understood as accomplices to that concept—and that the final work will inevitably bear traces of their influence.

Tools

Let us begin with a discussion of the tools of the trade—the media with which architects work. Paper was the 'ground' of the Renaissance architect where pen and ink drawing for, perhaps, the first time served to represent *ideas* for buildings. Drawings at multiple scales and views were often superimposed one upon the other to serve as traces of a creative stream of consciousness. These permanent ink marks operated much like handwriting and often served as a binding contract between architect and client. And while the tools have evolved and expanded considerably since the Renaissance, drawings and models remain the primary media of the architect in both developing, representing, and executing architectural concepts.

Analog

Just as a building is composed of a series of independent systems that together construct the structure, the analog drawing can be understood as an archaeology of lines—a registration of multiple layers and ideas within a surface—that together register and imply the third dimension. Unique to the pencil drawing is the use of line weight that allows the line to take on hierarchical significance in relation to the various systems that construct architectural space. If one were to imagine a conversation, one might argue a correspondence exists between the volume of speech and the significance of its content. Now, a scream is not always more effective than a whisper, and so too with the line. In an architectural drawing, the weight of the line establishes a link to its role in constructing architectural space. A very light line might reference an underlying geometry or set of dimensional relationships. A darker, heavier

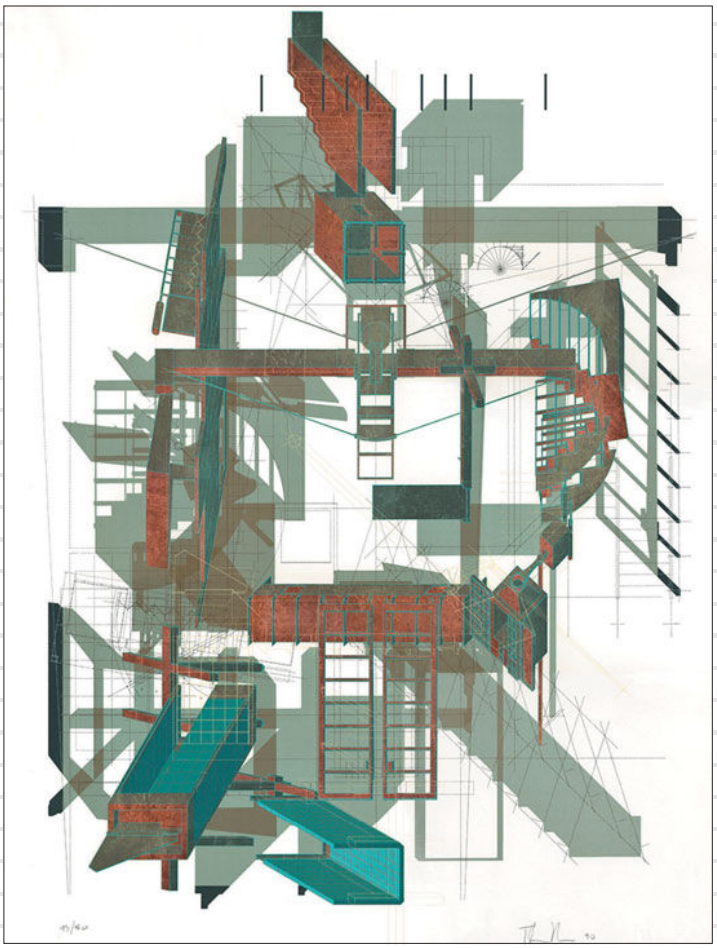
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Morphosis and the Representation of the Indescribable

Despite their ultimate and obvious solidity and despite their concrete presence, works of architecture begin and then persist as ephemeral constructions. Architecture is born from our remembrance of the architectures we have known and resonate with our expertise in using the tools we are given to produce further architectures. Even after construction, our perceptions of a building are influenced by weather, light, sound, other occupants, the events of our day, our thoughts and memories—dodging and feinting through our minds—all affect how and what we comprehend.

Recognizing this, the work of Thom Mayne and Morphosis proceeds from a commitment to the ubiquitous complexities of our world. It is instigated by the complexities they observe *beyond* the work—in the site, in the program, in history, in human behavior—as well as forming a parallel to the complexities that are always to be found in every type of discourse.

Layers of complexity influence each project from its inception, as Mayne and Morphosis seek to infuse the projects with compound forms, forms that collide, shear, bend, warp, rotate, and that are as often subtracted from each other as added, generally articulated by numerous materials and textures. Just as in the early twentieth century the cubists, futurists, and constructivists attempted works that, despite their essentially static states, represented the increased dynamism of their societies—present in speed, movement, mechanical and industrial devices—the

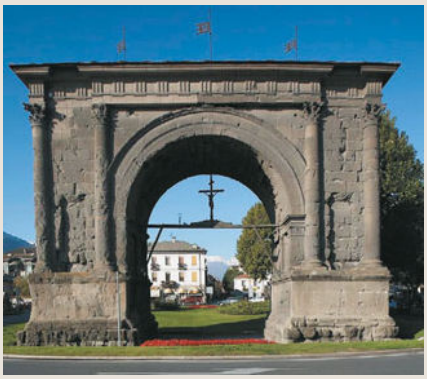


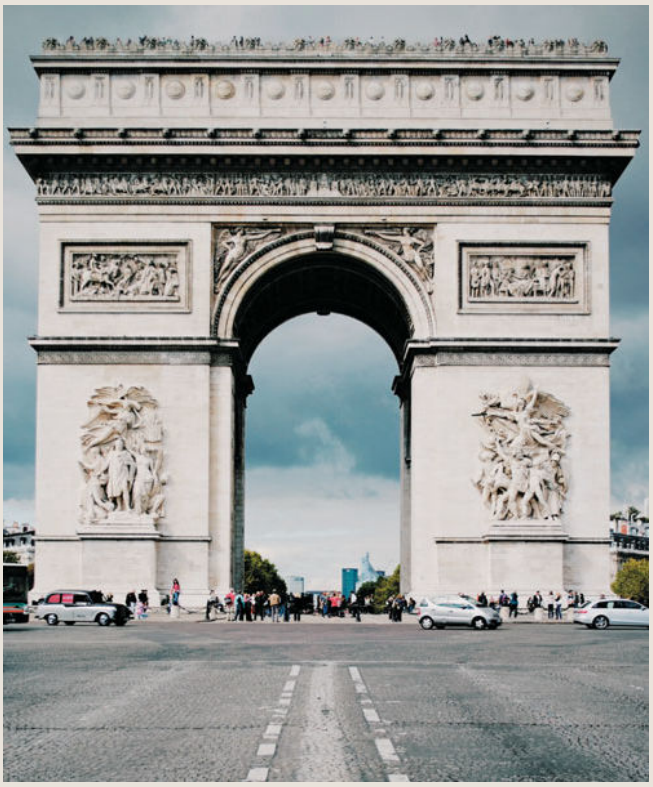
***Sixth Street*: Serigraph, 1988**
Thom Mayne with Selwyn Ting and John Nichols Printmakers

4 program

Programs begin with measurements and expectations but mature with thoughtfulness and understanding, anticipation, and empathy.

An architectural program is, in its most basic form, the list of requirements that initiates a project. Outlined by the client, often with the assistance of either an architect or a special consultant, this type of program generally represents a compromise between desire and budget. And although determined by the client, the client is not





Beginning with the Roman Empire, the freestanding arch conveyed a message of memorialized triumph. The Arch of Augustus outside Aosta, for example, connotes a first-century BCE victory over a Gaulish tribe. The nineteenth-century Arc de Triomphe in Paris, although originally programmed to commemorate Napoleon's victory at Austerlitz, has continued to evolve in meaning and interpretation—as a monument of wartime victory (alternately by the French, the Germans, and the Allied troops), and as a monument to achieved peace. Its attic stories have been programmed to include associated museums, most recently one dedicated to the iconography of the arch itself.

necessarily the user. Even in the case of a house, it is unlikely that a client would forever be the only occupant.

In schools of architecture, the program may resemble a client-generated program, but it inevitably encompasses specific pedagogic objectives. The studio instructor usually generates such programs, with stated requirements serving as vehicles for achieving these objectives.

But despite the apparent clarity a program suggests, accommodating a program is more than solving a puzzle: It requires three-dimensional strategizing, an understanding of space, the addition of missing elements, and a *concept*. Further, many programs tend to include contradictory requirements that need to be resolved through some form of negotiation or innovation.

The Empirical Program

The empirical aspect of a program can be derived from charts, tables, and direct measurements: in general, observations of the way things are. The data that contributes to the empirical program are basically dimensional, functional, relational, and measurements determined by building and safety codes.

Dimensional

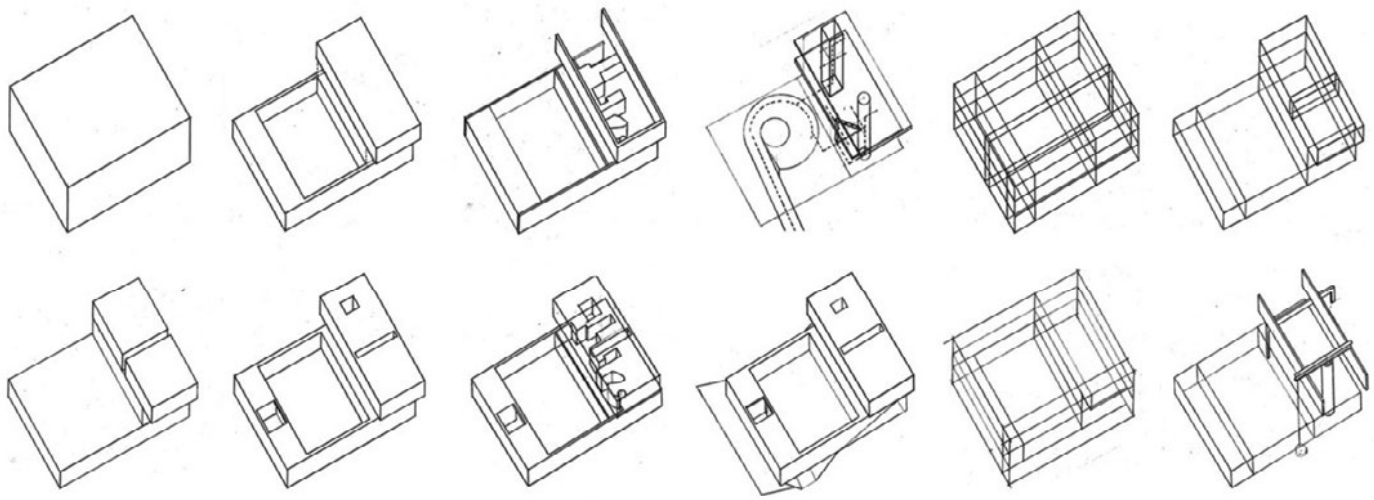
There are certain dimensions that can be taken for granted and that must be recognized when compiling a program. The most fundamental of these dimensional imperatives is the accommodation of the human *body*.

The architect should be aware of the kinds of bodies that will occupy a building. The average adult tends to conform to a range of dimensions concerning height, grasp, eye level, and the variable dimensions related to the body while sitting, leaning, or reclining. These dimensions differ considerably in the case of children from infancy toward adulthood. Additional dimensions should be taken into account for the accommodation of those in wheelchairs, those with special physical requirements, and the innumerable nonaverage adults.

Foremost in all of these cases are those dimensions that permit someone to move comfortably through space: hall and aisle widths, ceiling heights, the angles and lengths of stairs and ramps, as well as the suitable arcs and angles that permit the unimpeded operation of doors, windows, and other moving elements.

(continued on page 41)

Program as Tactical Device: Rem Koolhaas and the Office for Metropolitan Architecture



Bordeaux House, exploded axiometric sketch

It can be argued that the fundamental motivations guiding the work of OMA include a relentless reconceptualization of the modernist project, an opportunistic attentiveness to the intricacies and forces of formal and cultural-political contexts, and persistent exploration of the grammar-syntax-language intersection. However, the most essential act of invention and intellectual rigor is asserted through OMA's description, organization, distribution, and theorization of what we call *program*. With *program*, Rem Koolhaas—and earlier, Elia Zenghelis—construct a conceptual framework for making function and use *architectural*, and against which all context-based and culture-specific experimentation is understood.

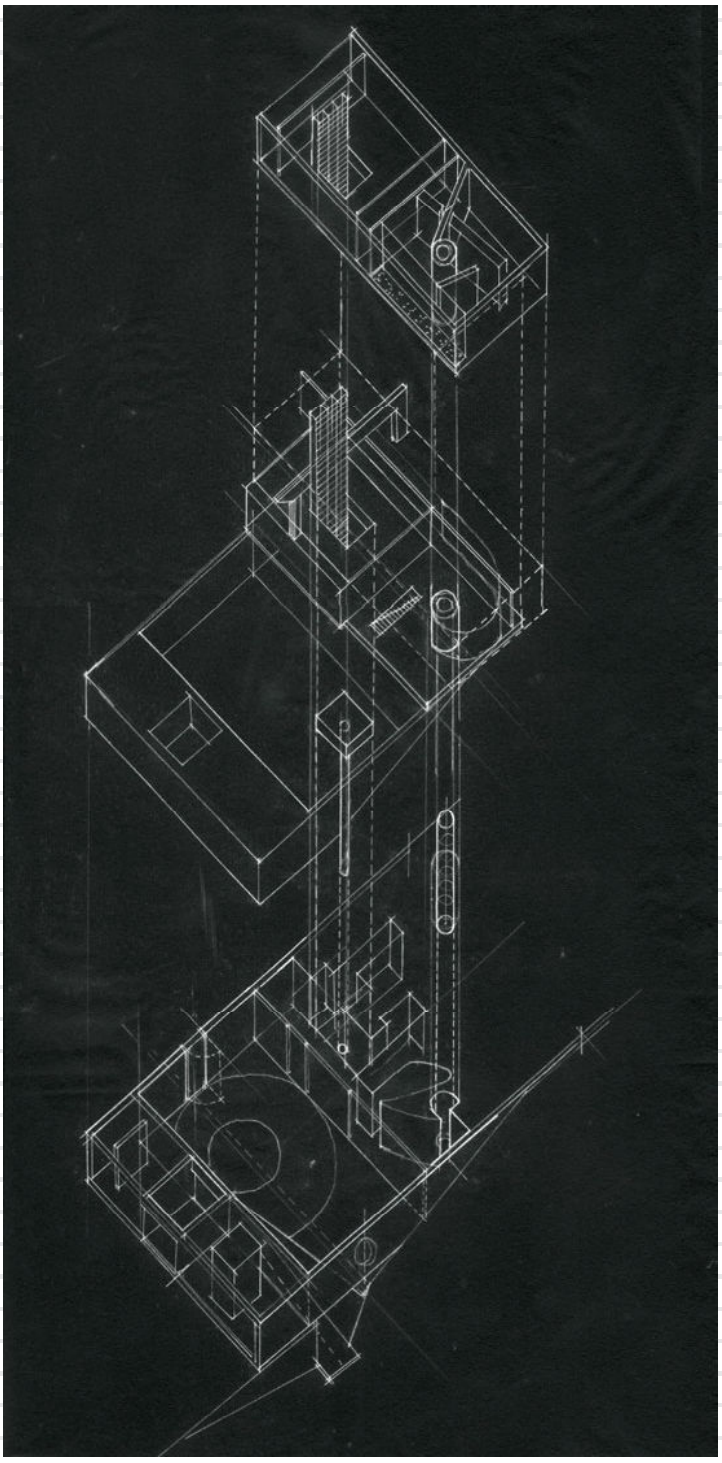
The Bordeaux House addresses a unique domestic program assignment by producing a courtyard house on a sloping site, organized into three horizontal slabs of associated functions. The result is a layered sandwich of program elements manifesting as a heavy floating house for sleeping in the sky, a *light* house carved in the ground for cooking and access, and an *invisible* glass house for living and leisure compressed between the two—each element self-sufficient and composed according to its own programmatic logic. Within this structured subdivision of program are rituals and sequences that penetrate and actuate the horizontal separations. The first is the domestic realm of the father—a wheelchair user—with specific practical and customary needs: His program centers on a piston-driven elevator that serves a vertical house comprising an office, library, living, dining, sleeping, and wine cellar. This elevator is a moving room, providing access while fusing with the functional conditions it engages on each floor, producing a temporal alteration of activity that conflates functions with users. The three daughters occupy a private sanctum within the compound's levitated red box, achieved by slicing the entire composition along the longitudinal axis, bifurcating the house into two halves: parents and daughters. The father's elevator is countered by a spiraling stair in a mirrored cylinder that serves only

the girls' bedrooms, linking them from the entry "cave" in the ground to pinwheeling bedrooms in the sky.

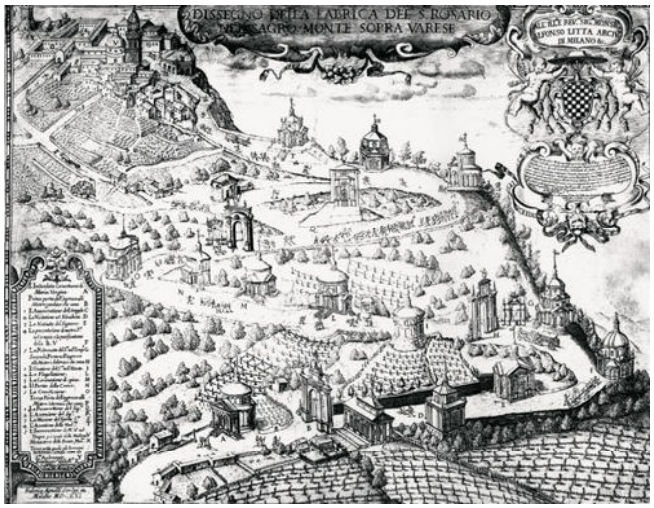
In their project for the Kunsthal in Rotterdam (1992), OMA was challenged to satisfy a complex set of functional requirements including three independently accessible galleries, an auditorium, external café, administration, storage, smaller galleries, and service components. The scheme assumes the form of a square penetrated by a continuous exterior ramp facilitating the connection between the boulevard and Museum Park. A second passage, positioned below and perpendicular to the public passage, allows for vehicular service access. These crossing paths produce a square cut into four distinct, disconnected volumes. The resulting circulatory experience is conceived as a circuit of sloping floors and ramps crafted into episodic twists, turns, and counterintuitive movements that ultimately connect each part of the complicated sequence, suturing parts fragmented by their initial functional assignments, producing access and orientation along the way.

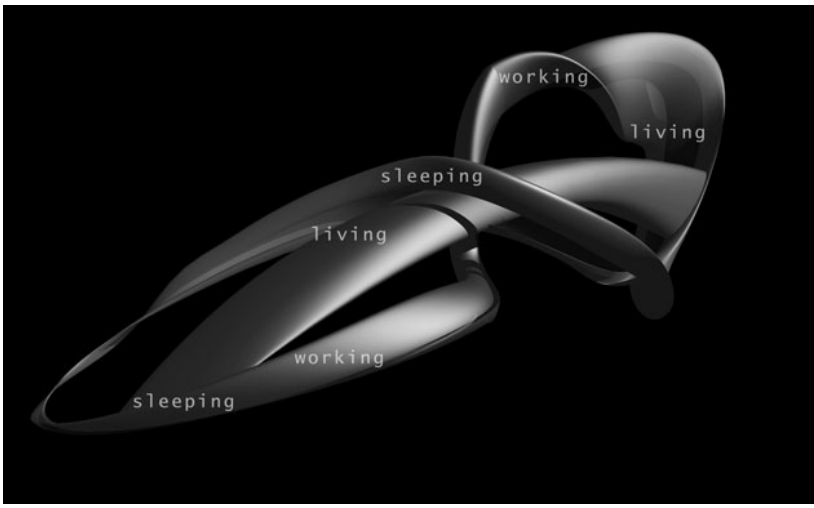
OMA understands the inherent value of addressing architectural program, of embracing functional requirements to help advance the intellectual and performative basis for their work. They consistently perform complex acts of functional elasticity whereby the edges, names, and restrictions associated with typical functional limits are tested and teased, allowing for the intermingling and co-occupation of otherwise disparate programmatic elements.

—Richard Rosa II (Syracuse University)



Kunsthal, north-south and east-west sections
Rotterdam, 1992









The fourteen chapels of the Sacro Monte located near Varese, Italy, and completed in 1623 contain scenes of the life of Christ, the Virgin Mary, and the saints. The chapel pavilions construct a pilgrimage path up the now sacred mountain that terminates in the church of Madonna del Monte. Each pavilion establishes the spatial context for one of the important events of the life of Christ, and like the chapters in a narrative, each pavilion is situated in relation to its adjacent pavilions to produce a seamless spatial journey through the landscape.

Tradition

Rituals and traditions specific to a culture can be inscribed within a context. They can produce specific buildings or landmarks that mark an extended route along which the ritual occurs, or they can produce spaces within which cultural practices can be performed.

Narrative

Architecture has the ability to illustrate a story, one of legends and of wars or one of loves and of obsessions. A translation inevitably has to occur and it is in perceiving that translation that the work is able to address a user, and then it tells a story.

It is through the geometry of Ben van Berkel's 1993 Möbius House in Het Gooi, Netherlands, designed for a couple with two children, that the two independent and yet intersecting domestic rituals of sleep, work and domestic life of the couple that inhabit it are spatially mapped within the volume of the house.



The red, pyramid-topped cones of Souto Moura's 2008 Casa das Historias Paula Rego in Cascais, Portugal, reference both religious and secular contexts. By evoking both the kitchen chimney of the monastery at Alcobaca and the pointed turrets that dot the cityscape of nearby Sintra's National Palace, it situates and interprets the museum within multiple histories and contexts.

Historical

The reading of a historical context reveals what might have happened before on a particular site. It can connect a series of events that might have occurred in vastly different time periods. And even though it may not be physically present, a historical context continues to be alive in the memories of the citizens.

Environmental Context

One of the most important and pressing aspects of the design of a structure is its environmental context, a context that can either affect the building positively (as provide warmth or shade) or extremely negatively (as in erosion or collapse). Most characteristic of this context is that it is continuously transforming, either in predictable or unanticipated ways. And the building in turn has a responsibility toward that context: perhaps at worst it will coexist, but at best it will enhance it.

Extreme Variability

Architecture has a responsibility to anticipate that the environment in which it is situated will change, and often in quite unpredictable ways. Extreme weather—floods, earthquakes, hurricanes, and avalanches—introduce design parameters that situate a work in a specific environmental context. A building erected in a flood plain might be raised on stilts while one in a frequent avalanche zone might be wedge shaped and embedded into the mountainside.

Weather

Rates of environmental change can be more predictable, from a twenty-four-hour cycle to seasonal variations. A building's anticipation of the behaviors of basic yet constantly changing environmental elements of sun, rain, and wind cannot only be traced in the placement and dimension of apertures, the slopes of roofs, and the materials used, but in the more fundamental placement of a building within its actual physical site.



Constructed over 4,000 years ago, sunken courtyards dot the landscape of Henan province. These ingenious dwellings not only take advantage of the relative constant temperature of the earth to keep them cool in the summer and warm in the winter but free up the ground plane for agricultural fields.



Atelier Bow Wow's 2008 Double Chimney House in Nagano, Japan, reflects the firm's belief that architecture should express the behaviors of its occupants and the inherent elements of the environment in which it is constructed. Here the house is split open into two halves, permanently registering both its program (one side for guests, the other for the owner) and its environment, as the house carefully situates itself amongst the trees, opening itself up to the southern light.



The Global Seed Vault in the Svalbard Mountains of Norway (2008), designed by Peter W. Søderman of Barlindhaug Consult, is a highly secure facility containing up to 4.5 million seeds from around the world, partially carved into a mountain for protection from variable temperatures, earthquakes, climate change, and other potentially devastating environmental impacts. Its entrance is designed in both shape and material to avoid the risks of avalanches and major storms. The roof and front of this concrete and steel entry is a beacon signaling the presence of the structure while suggesting its function as a potential source of life rediscovered. This sculpture, entitled *Perpetual Repercussion* by its artist, Dyveke Sanne, consists of prisms, mirrors, and steel shards that combine with turquoise fiber optics to alternately reflect the subtle arctic light and to glow with its own luminosity.

7
mass

Paradoxically, a sense of massiveness can be most evident in conditions of apparent weightlessness.

Most consider the making of buildings to be an additive process—and indeed it usually is. It is the layering of multiple materials and systems that, together, construct the completed edifice. However, when a work is conceptually conceived as a monolithic volume, the resulting mass transcends the thinness of these layers.

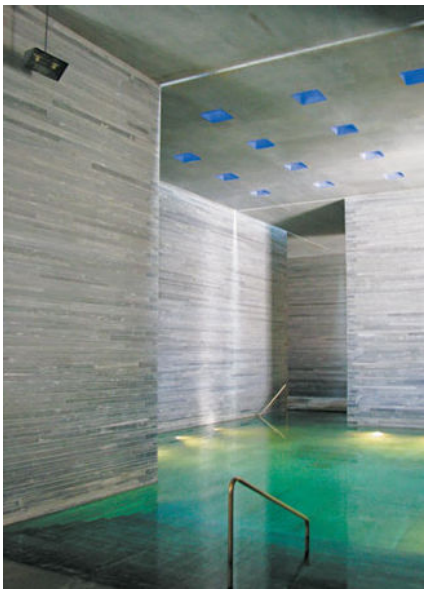


The walls of Wang Shu and Lu Wenyu's 2008 Ningbo Historic Museum in Ningbo China are constructed of bricks and tiles recycled from local buildings. A delicate imbalance is achieved between the massive form with its tilting surfaces and the seeming fragility of each material component. It stands as a monumental testament of the absence of those structures devastated by disaster and of the presence of (vanishing) construction traditions.

And though buildings tend to be thought of as massive if they are very large, a sense of mass in and of itself does not necessarily suggest scale. Mass is the distinct presence of *volumetric* density.

The pyramids of Egypt are masses that convey solidity and impenetrability. Embedded within their cores are the inner sanctums of the pharaohs for whom they were built. Here, mass is both a literal volume of stacked blocks of stone and a symbolic one of impenetrability and longevity. The secret passage through which the mummy was transported is conceptually understood as an *excavation* within this mass—a negative space that is conceived through the removal of mass.





In Peter Zumthor's Thermal Baths in Vals, Switzerland, mass is achieved at two distinct scales. A series of (often occupiable) piers in spatial dialogue with one another together construct mass at the building scale. The spaces that are defined between these piers are read as the primary spatial voids. At another scale, bands of compressed gneiss produce a monolithic mass of material density.

Processes

A sense of mass is achieved by the relentless repetition or aggregation of material or volume that subsequently transcend their individual incrementalism in favor of a monolithic surface or volume. Yet, *conceptually,* mass is conceived as a solid form, from which spaces have been subsequently "carved."

Additive

A sense of mass is exaggerated by the repetition and accumulation of elements that are known to possess considerable mass—as in a pile of stones or bricks or a stacking of logs.

(continued on page 69)





Alberto Burri's Cretto—a land art installation in Gibellina, Sicily—is conceived as a memorial to the victims of the 1968 earthquake that destroyed the town. Here, the wreckage was amassed back into the blocks by which the town had originally been organized and a blanket of concrete poured atop the rubble. The abstracted urban monolith references the town's physical past and embedded within the masses that construct the ghosted streets is the physical detritus of imagined narratives.

Mendes da Rocha and the Levitation of Mass

The Brazilian architect Paulo Mendes da Rocha asks a group of students if they know why the pyramids were built. After all of the traditional answers have been hesitantly proffered and rejected, with Mendes da Rocha all the while shaking his head, he goes on to say, "The pyramids were built because someone pointed at a giant rock lying on the ground and asked, 'How can we get *this* up *there*?'" and then he points up into the sky.

The exhibition of getting *this* up *there* is a recurrent theme in his work, which inevitably involves masses that are not simply floating but, at times, appear to be caught between ascent and descent, hovering over plazas, pools, and even other buildings.

Because concrete, his material of choice, is intrinsically very heavy, to see it float is to witness an almost supernatural event, with viewers' responses being more of a subjective, emotional order than an objective, rational one. Still, the levitation of mass demands a resolution in physics, and Mendes da Rocha supplies these resolutions ... sparingly.

One encounters the importance of mass at the Brazilian Museum of Sculpture in São Paulo. If the neoclassic museum required a grand portico to signify its entrance as well as its importance, Mendes da Rocha uses a giant beam spanning the site to mark the presence of this important museum. This hollow beam, delicately supported on its two end walls with seven steel joints, houses lighting and storage for outdoor events, while protecting from sun and weather the plaza that is in turn the actual roof of the museum as well as its principal exterior public space. Investigating this hulking yet buoyant block, one discovers the primary interior spaces of the museum





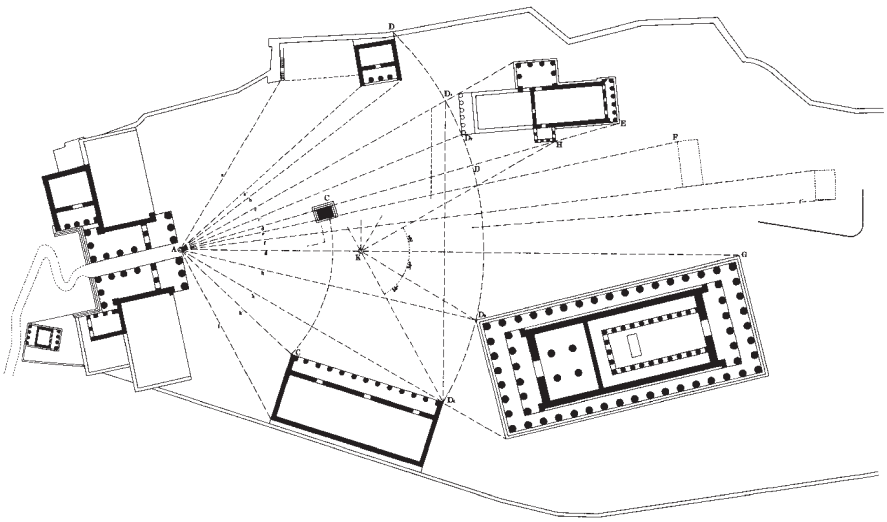
Mendes da Rocha: Brazilian Museum of Sculpture, São Paulo, Brazil, 1988

11

space

Space may be the principal defining characteristic of architecture and what distinguishes it from the other arts.

Wallace Stevens's poem, *The Snow Man*, concludes with what might be a good definition of the distinction between a *void* and what might be considered architectural *space*: the "... Nothing that is not there and the nothing that is." If a void is the nothingness that is absent, space might be understood as the nothingness that is present.



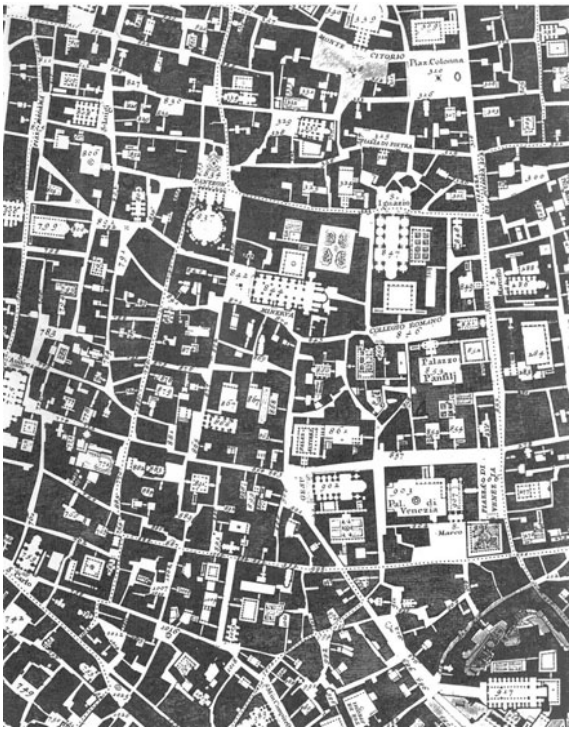
As Constantinos Doxiadis has famously diagrammed in his Architectural Space in Ancient Greece, one can understand the organization of the structures of the Acropolis as being based on a series of uninterrupted visual scans, radiating from a position at the portico of the Propylaea at the entry to the complex. This conception of space might be described as a "site of perceiving," in that the objects arrayed about the Acropolis are perceived in their relative positions—horizontally and vertically—as distributed across the site.

Architectural space provides the range across which our gazes pass before resting on objects, surfaces, and other people. Space encompasses the stage for human activity, the cadence of our movements, the duration of our experiences. Space contains that which is within our physical grasp and that which may be "graspable" only through perception, comprehension, and memory.

It was probably August Schmarzow who, in 1898, first argued that the manipulation of space is the principal defining characteristic of architecture and what distinguishes it from the other arts, such as sculpture. This is not to say that architectural space did not exist before 1898—certainly the Pantheon exists as an emphatic spatial volume—only that its identity had not been adequately described.

There is also that conception of space as a "site of perceiving." In this sense, space is the range within which a person, located at a point, apprehends his or her environment, actually *constructing* this environment based upon prior knowledge, experiences, and techniques of observing.

(continued on page 104)



Giambattista Nolli's 1748 map of Rome is remarkable not only for its accuracy, but it endures as an example of the spatial equilibrium that occurs during the experience of a city. The contrast between the darkened fabric of the city and the white, figural spatial elements elegantly demonstrates the way that public exterior spaces—such as piazzas and courtyards—and public and semipublic interior spaces—such as the Pantheon and various churches—become equal participants in establishing a pedestrian's perception of a city.

“Phenomenal Transparency” in the Spaces of Le Corbusier

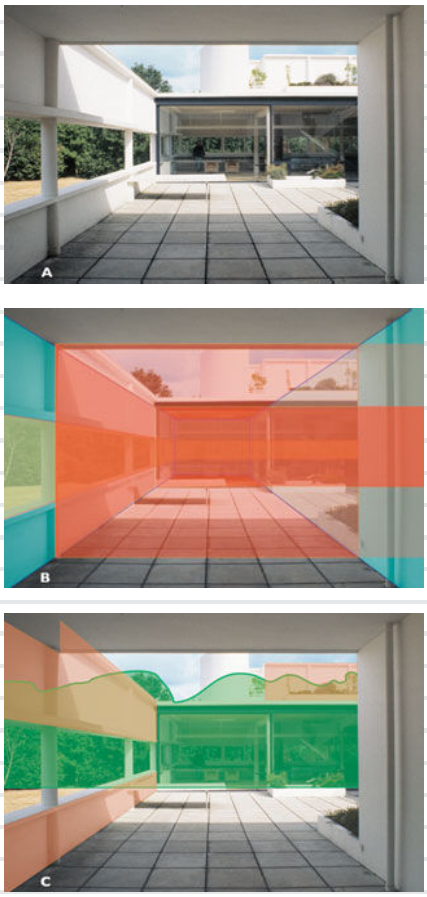
In the twentieth century—the century roughened by unimaginable wars, yet emboldened by velocity, stream of consciousness writing, nuclear fusion, motion pictures, jazz, Futurism, and Cubism—there was an impulse to construct a concept of space that was as unique to architecture as the century was to its predecessors.

Sigfried Giedion’s *Space, Time, and Architecture*, based on a series of lectures given at Harvard from 1938–39, proposed a formulation of Einsteinian space–time as an intrinsic aspect of the new architecture. Although ultimately more of a metaphor than a scientific validation, Giedion’s theory introduced Cubism as a form of spatial research, with important architectural implications.

Bruno Zevi’s *Saper Vedere L’Architettura* (1948, translated as *Architecture as Space: How to Look at Architecture*) came later, arguing that the history of architecture was largely a history of architectural space, by which he meant especially enclosed space. Like Giedion, Zevi also argued that time was an important component of the newer concepts of spatial definition, incorporating the experiments of the Italian futurists, for whom speed was a Muse. He promoted a version of “organic architecture,” a compilation of theories founded on gothic architecture and the work of Frank Lloyd Wright, stressing spatial ambiguity, with an indefinite flow of spaces often crossing functional boundaries.

Then, combining their expertise in architecture and the fine arts, Colin Rowe and Robert Slutzky’s *Transparency* (1955), proposed a more articulate argument regarding the spatial implications of modern art and of Cubism, in particular. Based on Gyorgy Kepes’s notion—presented in his *Language of Vision* (1948)—of the Cubist-based phenomenon whereby two or more overlapping figures claim the overlapped zones with equal priority (as opposed to the foreground figure occluding the background), “transparency” connotes “a simultaneous perception of different spatial locations,” imparting a continuous oscillation of spatial definitions. Rowe and Slutzky introduce the distinction between literal transparency—which simply involves a clear layer, as vision through a film—and phenomenal transparency, in which multiple and simultaneous spatial interpretations are evoked, and “the transparent ceases to be that which is perfectly clear and becomes instead that which is clearly ambiguous.” (page 23) And Rowe and Slutzky find that such “clearly ambiguous” transparencies are especially evident in the work of Le Corbusier.

The view from the terrace of his Villa Savoye in Poissy (1928-31), for example, affords numerous such spatial transparencies (fig. A). Beneath the roof of the outdoor pavilion, one already participates in several spaces: that of the pavilion itself, of the exterior spaces, and of the shaft of space that moves directly into the house (see the blue zones, fig. B). A band at the horizon line (yellow/orange) extends from the terrace through the interior, circumscribing the peripheral “frame” of the house; and a large exterior space (reddish) open to the sky moves from the center off toward the right. Figural, in a more painterly way, is the band of greenery (green, fig. C), which begins beyond the house on the left, visible through the horizontal slot and then above the roof, to emerge both upon the terrace and on the roof above; both outside and within the volume of the house, the greenery’s ambiguous presence is emphasized by the setlike walls (orange) that alternately act as frame and backdrop.



Le Corbusier and Pierre Jeanneret: Villa Savoye, Poissy, France, 1928–31

Here, one finds the spatial depiction of the twentieth century fully realized.

15 dialogue

A work is constantly renewed by its encounters with new perceptions, new works.

Most works of art—including, of course, architecture—are evaluated by their capacity to "live" beyond their boundaries. That is, a work is seen to have an enduring artistic value when it repeatedly transcends its superficial subject matter, and to engage others in an ongoing exchange of observations, understandings, and even



The Vietnam Veterans Memorial wall in Washington, DC (designed by Maya Lin, completed in 1982) is a complexly dialogical construction that has evoked countless, occasionally contradictory interpretations: a wound in the ground, a ditch, a bulwark, a "V" (Vietnam or victory?), a transitory bolt of lightning, a timeline, an arrow, a mute tombstonelike symbol of death, a vibrant mirrorlike reflection of life. Here, the construction of memory—and meaning—is wholly the task of the individual visitor. However, concern over the unpredictability of interpretation led politicians to supplement the wall with a realistic sculpture representing three male soldiers and, later, another depicting three female nurses and an injured soldier, explicit representations intended to delimit the range of possible commemoration.



Rafael Moneo's El Greco Congress Center (2012) establishes a clever dialogue with the fortified walls of historic Toledo, Spain, but incorporates the traditional rubble construction within bands of concrete, and the irregular system of "buttresses" that resonates with other externally-supported ramparts that were reinforced by necessity over time, are in reality, hollow ventilation shafts serving the subterranean parking garage.



Ragnar Östberg's Stockholm Town Hall (1923) is a festival of dialogues, from the historic to the internal. Its Riddarfjärden façade is composed of bands of windows that seem to follow their own rhythms, reminiscent of the Doge's Palace in Venice, an allusion to Stockholm's maritime affinities. Additionally, details such as the occasionally aberrant column—only one in the loggia being octagonal for instance—signal their varying roles within the circulatory paths of the building. With its blind "windows," apparently erratic apertures, subtle brick hieroglyphs (like the crescent moon to the right of the large window), and intentional misalignments, Stockholm's Town Hall keeps the viewer's eyes dancing and mind speculating on its countless layers of meaning and elusive systems of order.

behaviors that can persist long after the work is complete, even after the author and the original audience are no longer present. Such works initiate an open-ended, *dialogical* engagement with their world. Indeed, much of a work's meaning and identity is developed by an audience's past and present experiences as elicited by the work, and of their perceptions of the work's relationship to other works. A work is constantly renewed by its encounters with new perceptions, new works.

A *monological* work, on the other hand, has no intention of engaging its audience in a new or transformed understanding of their worlds. This work insists on the unambiguous singularity of its meaning and resists—occasionally fears—multiple interpretations. It is the unequivocal voice of authority. Monuments will often adopt a monological tone, lest the subject of their commemoration be subject to unanticipated interpretations. Also, buildings considered to be primarily utilitarian might operate monologically (factories, water towers, electrical substations, and grain silos), but this does not preclude them from being overlaid with imposed interpretations, or for these functions to be accommodated in a design that has more expansive aspirations.

Architecture also approaches the status of a monologue when it is designed with a singularity of intention (perhaps a work intended as a manifesto) or one in which the designer is determined to make an autobiographical or otherwise private statement, with the identity of the author being the predominant message. Works of limited capacity for dialogue include those that simply mimic another work—like someone who annoyingly repeats another's words—or those that merely negate without rebuttal, a "no" without any positive assertion.





Left: In converting the ruined Santa Maria do Bouro Convent in Amares, Portugal, into a hotel (1987–97), Eduardo Souto de Moura uses contemporary materials to articulate the modern occupation of the structure while scrutinizing its former status both as a once grand convent and—perhaps more compellingly—as a ruin. Highly reflective, frameless windows simulate the empty apertures of a ruin, pretending to reveal sky within. A weathering steel panel traces the window's proportions while displacing it in space, underscoring the massiveness of the wall with the thinness of the steel. Fragments of now irrelevant masonry protrude along the clean, scarred wall, joined by rust stains leaching from the newly inserted balcony.

Above: The minimally punctured wall of a wing of the former convent's cells serves as both a background and a primary rhythm for the syncopated rhythms of the new, highly fenestrated wing of hotel rooms in this part of Fernando Távora's Pousada Santa Marinha in Guimarães, Portugal (1984). Viewed from above, this new wing appears to be a simple terrace; it is both literally and figuratively a new ground for the convent.

The architectural designer has numerous resources for the production of a work that engenders dialogue: program, site, various forms of representation, other buildings (adjacent as well as unseen or even unbuilt), materials, forms (basic and compound), personal experiences, memories, and the participation of a cadre of others. The role of these others—instructors, critics, collaborators, clients, users, historians, and casual observers—is essential to the continuation of a work's capacity for dialogue, not just through active critique, but also by placing a work in the context of other works and experiences, and by seeing architecture's capacity for shading the memories of past experiences and establishing a framework for future observations.

Inevitably, architectural forms invite a certain amount of discourse. No architect can be fully aware of the meanings that have accumulated in even the simplest of forms, forms saturated by centuries of history and the countless recollections, world views, and experiences of individual observers. For this reason, most forms—from spheres and cubes to petal-shaped roofs and insectlike substructures—are dialogically open ended; they have no determinate past and can have no fixed future. The role of the architect is to facilitate the discursive aspect of forms, and by engaging various types of dialogue, to allow the continuous redefinition of a work's meanings by all of its observers and all of its contexts.

In the more dialogical works of architecture, everyone has an opportunity to "construct" the work, to assign it values and meanings, both internally and in relation to its environment. It is through dialogue that everyone becomes an architect.



The façade of Francesco Borromini's Oratory of the Filippini on the left (completed 1650) both translates and analyzes its neighbor, the Chiesa Nuova (façade by Fausto Rughesi, c. 1605); to gaze at one is to interpret the other. The Oratory's segmented gable refers to the subtle layering of that on the church; the small arch of the church's upper window becomes a flattened half dome in the Oratory; the shallow arch framing the church's central doorway sponsors a shallow bulge at the Oratory; the belt across the Oratory's middle aligns with the church's lower cornice and frieze; the capitals of Borromini's pilasters are reductive versions of those at the church; and while the church steps forward at its center, the Oratory's façade presents an emphatic concavity. The main entry to the new complex is through the small door in the gap between the façades, duplicating the dimensions of the church's side doors.



Giuseppe Jappelli's Caffé Pedrocchi (1831–42) in the historic center of Padua, Italy, is triangular in plan and uses the same motif to establish multiple dialogues in varying contexts. The porch motif with its largely blank background story with a single door and embedded frieze sits alone in one piazza, establishing a center to the space while appearing to be a pavilion embedded in the fabric (although the "gothic" structure to its left is actually a later addition by the same architect, engaging his own building in a complex, time-bending dialogue). A street façade in which two of these motifs are used as bookends terminates in another piazza in which two of these porch/pavilion motifs are subordinated to framing a large central bay, sheltering an outdoor café.





Within a former cloister near the entry of the Santa Marinha Convent in Guimarães, Portugal, now a ***pousada***, Távora reveals the building's promiscuous history of repeated reconstructions by excavating a carefully delineated "window" into the wall, making the viewer aware of the building's complex past while establishing the case for its current transformation into a hotel (completed 1984).

Forms of Dialogue

One of the most effective techniques of interpreting forms is to measure them against other forms, not just through similarities but also through differences.

Contrast

The dialogue between two contrasting forms is especially powerful, in that contrast provides a relational means of defining a form. To perceive something as being small, it is necessary to perceive it in relationship to something else that is big. Heaviness is understood in its relation to lightness, roughness to smoothness, oldness to newness. Without a sense of one of these terms, the value of the other remains undefined. Moreover, each term carries within it a remnant of its opposite: The concept of "natural" always retains traces of "artificial." In each case, further dialogue can lead to a reorganization of these terms, with something heavy, for example, suddenly understood as being weightless.

A work can also develop through a series of internal dialogues: unique versus repetitive elements, curvilinear as opposed to orthogonal forms, figural components within background field conditions. It is also possible for an element to develop evolving understandings when understood in dialogue with an environmental or temporal phenomenon. For example, a form can be understood alternately as opaque, translucent, or transparent, based on the time of day, changes in location of the Sun, the engagement of screens, or the transitions between external daylight and internal artificial light.

Enrichment

The *enrichment* of meanings can also arise from a dialogic engagement. For example, a design can *elaborate* on the meanings of an existing building or site by highlighting—by framing, isolating, or uncovering—previously underemphasized or hidden aspects of the previous forms.

Dialogue can arise from the *reiteration* of forms, supplementing meaning by resituating or reframing other forms in differing contexts. A form—just as a phrase—transplanted into a different context absorbs new inferences, new potential meanings, that reflect back onto the original.

Redirection

Redirection can also be a means of engaging a work or form in a dialogue. This can occur by means of reprogramming, as in the case of a doorway becoming a window, a factory becoming a museum, or a garden becoming a roof. It is possible to directly *supplement* the meanings of a form by adding or subtracting details or characteristics. Examples of *subtraction* include cutting into buildings in order to reveal aspects that might have been previously unconsidered, to open views previously inaccessible, or to introduce new sequences that retell a building's narrative.

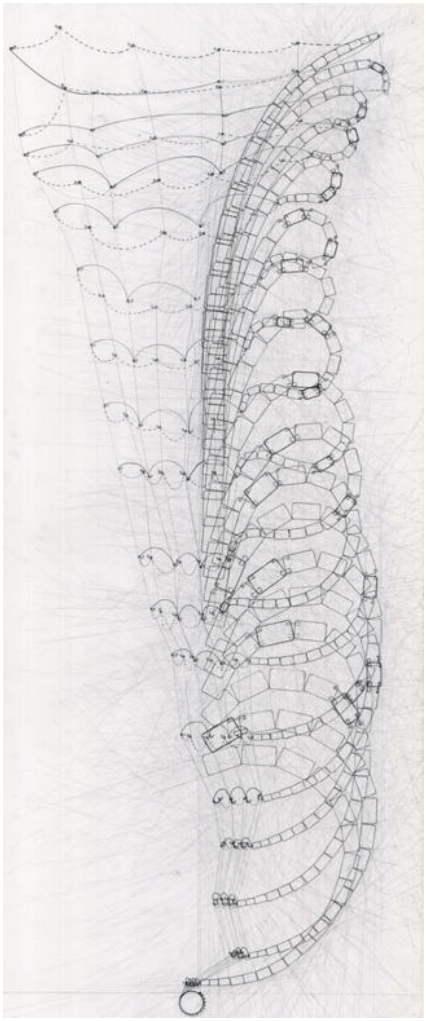
Addition

Addition may produce an expanded or unexpected interior within the implied volumes of an exterior, bring new emphasis to one component in a series, or suggest further meanings by presenting a form or motif in an alternative material (what was brick becomes stone) or shape (one in a row of round columns is hexagonal instead).

17 defamiliarization

By introducing unfamiliar sources of conjecture as well as unfamiliar techniques of observing, of conceptualizing what is observed, and of describing what has been conceptualized, the architect is able to cultivate a set of enhanced sensibilities.

Just as a building is expected to provide shelter, facilitate our day-to-day activities, and give us a sense of comfort and familiarity, architecture may also on occasion lead us to question what we believe about the world, to contemplate what has become customary or habitual, to reevaluate what makes us comfortable, to



This pencil drawing by a first-year student illustrates an interpretation of the defensive movements of a vampire squid. While not an anatomical representation, the record of these movements is already anticipating the construction of an animated model that may later be used to propose a structure capable of turning itself inside out.

Student: Allison Wills (faculty: Val Warke & Jim Williamson, teaching associate: Larisa Ovalles)



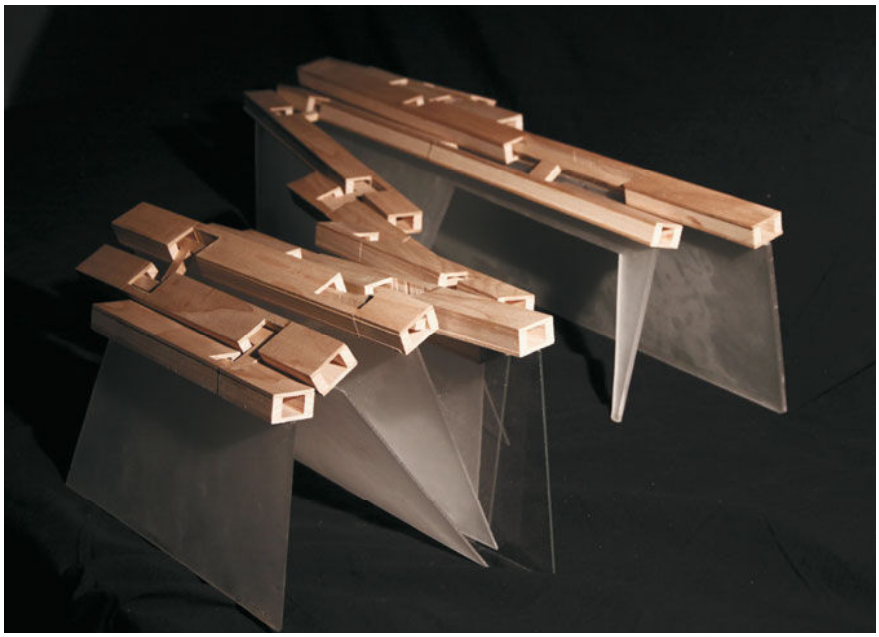


From its exterior, the Mãe D'Água Amoreiras Reservoir in Lisbon (constructed 1834 from designs by Carlos Mardel), seems to be an elegant urban monument, perhaps even a temple. The roof is a public plaza, providing vistas of the city. Inside, however, the structure is full of water, being the termination of an eighteenth-century aqueduct, once the city's primary source of fresh water. Occupation of the interior had been limited to the perimeter, with a grotto-like cascade announcing the water's grand entrance into the city. The Mãe D'Água Reservoir diverts notions of building and landscape, inside and outside, rustic and urbane, even floor and wall from the realm of the expected.

challenge what we think we know. Similarly, in the education of an architect, evoking the unfamiliar is an essential technique for motivating the creative process and going beyond mere reiteration. By introducing unfamiliar sources of conjecture as well as unfamiliar techniques of observing, of conceptualizing what is observed, and of describing what has been conceptualized, the architect is able to cultivate a set of enhanced sensibilities. An architecture that results from this process can provide the observer with an exceptional way of comprehending the world, and consequently an expansive, intensified way of living in the world.

"Defamiliarization" was first evoked by the literary theorist Viktor Shklovsky in "Art as Device," published in 1917. He saw defamiliarization (his term was *ostranenie*) as a technique, central to many of the arts, whereby the reader or observer is given a more indirect perceptual route than in everyday presentations. The goal is to prolong the act of perception in a poetic work, to make it less automatic and more thoughtful.

While we may feel close to the familiar, such closeness may obscure the genuine object. Defamiliarization distances the object from its observer, opening a space of cognition that requires thoughtful navigation. But there is more than poetry in this gap. If there is a comfortable stability to what is familiar, defamiliarization ultimately discloses the instability lurking within—the variability of observations across times and cultures and from individual to individual—as well as exposing the opaque veil that "familiarity" often constructs around a subject, preventing one from seeing its deeper significance.



This acrylic, glass, steel, and wood model illustrates concepts derived from a drawn analysis of the expansion of a cheetah's spine and the lowering of its body as it accelerates. This model represents an intermediate stage in the development of a design for a structure capable of physical expansion as it adapts to variable site configurations and circulation routes.

Student: Lisa Zhu (faculty: Val Warke and Jim Williamson, teaching associate: Larisa Ovalles)



Le Corbusier's de Beistegui Penthouse (completed 1930) was located atop a nineteenth-century apartment building on the Champs-Elysées in Paris. It is an essay on surrealist defamiliarization in architecture, whereby one term partially displaces another. In this view, a rooftop "room" has the sky as its ceiling, the hills of Paris as its cornice, a croquet lawn as "carpet," and the "fireplace"—which appears to "smoke" when steam is exhausted from a flue behind the wall—as an Arc de Triomphe, suggesting simultaneously that the Arc de Triomphe is a fireplace (that does not function) and that every fireplace might aspire to being an Arc de Triomphe.

There are consequences to defamiliarization: when practiced by the producer of a work, an understanding of the unfamiliar is inevitably and eventually practiced by its perceiver.

Operations

Defamiliarization can play many roles in the design of a project and especially in the education of an architect. An architect may sketch a mountain silhouette that later becomes a roof, dissect a fruit cart in a local market that later becomes a preschool, translate the translucent tessellations of a Paul Klee painting into an urban design, or apply a pig's penchant for wallowing to a design for desert structures. Mining the unfamiliar often results in an expanded inventory of forms, contextual and environmental responses, and analytic and representational techniques.

Appropriation

Architectural concepts can be derived—through analysis and conceptualization—from virtually any artifact, even those that are not explicitly architectural (such as a tree, a beetle, a crinoline, a periscope). The *appropriation* of forms, operations, or representational methods from the investigation of such sources is one of the most common techniques a designer can employ in defamiliarizing a design process during its early stages.

Even the tools of design can be redefined: one can challenge the implications of representational conventions (a photograph might be interpreted as a plan, a silhouette as a basis for a model), or unlikely objects can be incorporated in a representation (children's toys in a model, anatomical illustrations in a section).

It is the discovery of a fluid relationship between things—forms, contexts, functions, and scales—that consistently renews our understandings of the world around us, suggests new questions, answers previously unresolved problems, and initiates one of architecture's most powerful discursive capabilities.

Subversion

Another technique involves the "overthrow" of a form or formal complex's traditional values or relationships, perhaps by upsetting its hierarchical status (a kitchen might supplant a living room's predominance, an electrical substation might be a civic monument), by making it nonfunctioning or dysfunctional (a gabled roof is filled with holes, a staircase goes nowhere), or by distorting its customary social value (a shunned subject is framed as if an object of reverence, a private space is made very public).

18 transformation

Transformations occur at multiple scales, from the smallest particle to an entire building, and at any interval, from a one-time event to a cyclical transformation.

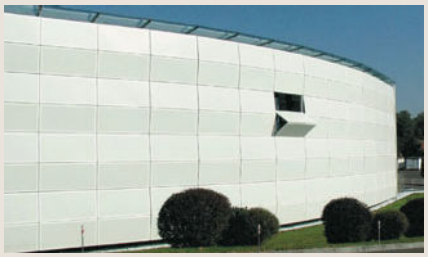
While the material of architecture might be predominantly static—concrete, steel, stone, glass, wood—the *experience* of architecture can be a highly dynamic one. Architecture has the capacity to transform from minute to minute, day to day, year to year.

Ernst Giselbrecht in 2005–07 created the "Dynamic Façade" for the Kiefer Technic Showroom in Bad Gleichenberg, Austria. Here an independent surface of perforated light metal bifold panels can be positioned in an infinite variety of ways, allowing for both personalized orientations and environmental responsiveness. The origamilike surface continually transforms the experience of the building and the landscape from within and from without.









By inserting a series of full-height steel doors into the vast, seemingly limitless space of the former slaughterhouse structure, Iñaqui Carnicero's 2012 Hangar 16 in Madrid, Spain, creates multiple spatial readings that also facilitate a range of programmatic scales—from intimate art openings to full-blown rock concerts.





These transformations can be literal, implied, or often both. In other words, a panel can slide from one position to another, or as light moves across its surface, it can transform from reflective solid to transparent. But in all cases, this transformative capacity can sponsor alternative programs, inhabitations, appearances, and performances—in other words, architecture really is never very static at all.

Literal

A kinetic architecture not only registers and adapts to the effects of external stimuli but it also provokes behaviors as a function of its transformation. External stimuli can be environmental (shutters adapting to the movement of the Sun), programmatic (a train compartment transforms from living room by day to bedroom by night with the lowering of the bunks), or spatial (a volume enlarges as its occupancy increases). Transformations occur at multiple scales, from the smallest particle to an entire building, and at any interval, from a one-time event to a cyclical transformation.

For example, it is very common in modern theaters for the audience/performance relationship to be physically altered by rotating stages, lifts, and movable loge seating; while projection technologies can perceptually alter the sense of enclosure, weather, and time.

Temporal (Animation)

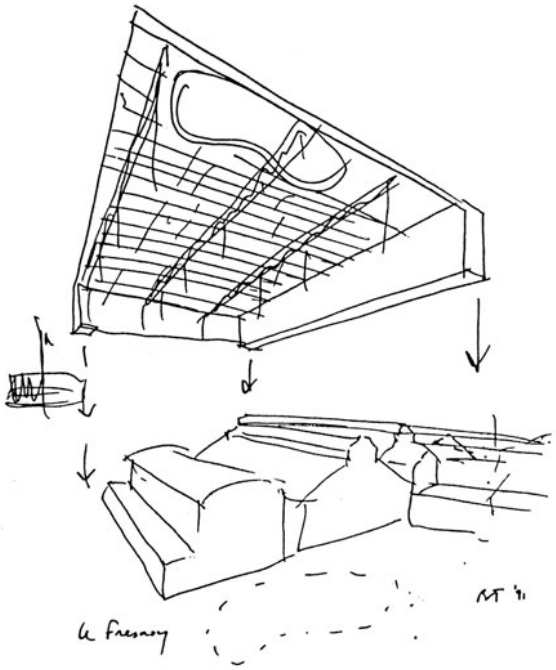
Architecture registers the passage of time. Embedded within its transformations are the traces of human rituals and environmental stimuli. The sliding, rotating, opening, and closing of surfaces have the ability to transform spatial scales and relationships, determine conditions of public and private, and transform functions and operations.

Topological

Architectural space, form, and surface can also transform through the deformation of underlying structural patterns, based on mathematical models that subsequently inform the qualitative aspects of such patterns. As an alternative to literal



At Bernard Tschumi's 1991–97 Le Fresnoy Art Center in Tourcoing, France, a new roof blankets the existing 1920s structures, collecting them beneath one continuous surface, producing a liminal space between the roofs of the old and the underbelly of the technologically sophisticated new structure. And while the old buildings house the spaces traditionally associated with an art and education center—exhibition spaces, a library, a cinema, a restaurant, and apartments for faculty and students—the addition of this new roof not only collects the existing and randomly organized buildings into a cohesive whole, but it produces a discovered space of walkways and suspended seating areas: an extension of the urban landscape beyond.





José María Sánchez García's 2011 project in Mérida, Spain, mediates between the archeological ruin of the Temple of Diana and the existing encroaching urban fabric, producing a perimeter wall on one side that makes a continuous backdrop for the temple and a cleared space in which the temple is once again objectified, while also producing a continuous pattern of volumes on the other side that allows it to stich itself into the dense urban fabric surrounding the temple. Here, the datum has two faces, operating as a mediator between two distinct conditions.

that might otherwise not have any spatial relationship to one another. It can also serve as an interface that simultaneously separates yet collects opposite conditions on either side of it. A horizontal surface, as in a large roof, for example, can act as an umbrella, one that collects smaller elements beneath it. Likewise, it can be a common base on which a variety of structures might stand.

Space

Spaces are recognizable references that exist in *both* buildings and cities. Spaces with recognizable shapes—such as squares, rectangles, or ovals—act as orienting devices to which one often returns. These become especially recognizable references if they exist in contrast to a series of smaller spaces, as with a significantly larger space or exterior courtyard surrounded by smaller rooms or, within the density of an urban fabric, as in a public square or a larger avenue flanked by a continuous surface of similarly scaled buildings.

This is true even of curved armatures. The Grand Canal in Venice, for example, is not only an armature collecting the palaces that line its edges, but it is also a datum that provides spatial orientation within the city's dense urban fabric.

João Álvaro Rocha's 1991–98 National Veterinary Investigation Laboratory in the parish of Vairão in Vila do Conde, Portugal, is an example of a datum that physically constructs the circulation zone as a wall that links the head administrative block, the blocks of laboratories of varying sizes, the employee cafeteria, and the oval animal corral at its end. This space of circulation steps down the sloping terrain as it provides the skeletal armature for the various building blocks that are plugged into it from either side.



Axis and Grid

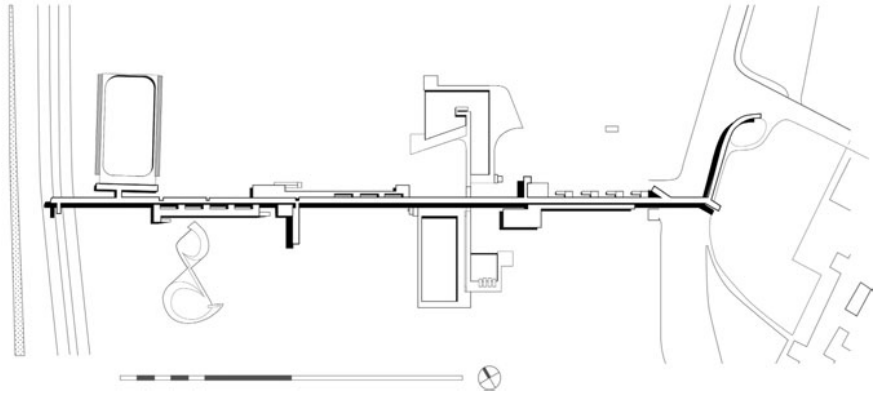
An axis is a line that connects two or more things (this line might be folded or bent). It determines the relationship between a series of spaces or things. This line can be a visual and/or physical one, such as a line of sight or a procession along which one walks (as in a series of rooms *enfilade*). A grid, on the other hand, provides a reference *field*, a continuous framework of repeated and recognizable dimensions by which multiple objects can be measured.

Horizon

The horizon is the line that literally separates earth and sky and, as in a perspective drawing, it is the line of human sight. In architectural space, the horizon line is a constant visual datum that locates and relates elements that are both below and above it. It is also the datum shared by both infinite space and foregrounded elements. Spatial depth is shaped by the continuous dialogue and fluctuation between this background and foreground.

Mass

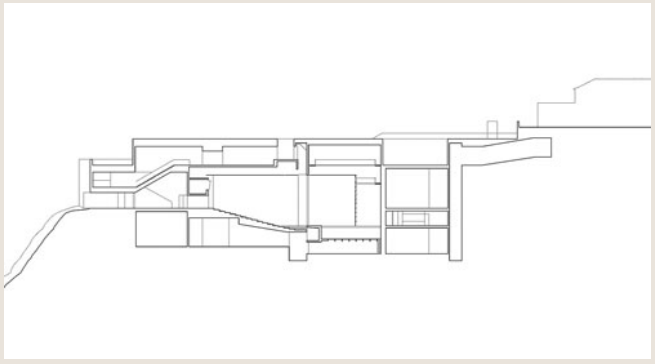
A dense volume can serve as a powerful physical datum—it can be a constructed object or a metaphoric ground. It is the mass from which occupiable space can be extracted or objects can be extruded.



Aurelio Galfetti and Flora Ruchat's 1967–70 public pool in Bellinzona, Switzerland, is an elevated open-air circulation path that begins in the city and extends to the river, a linear datum that collects a series of pools and sports facilities along its way. Nestled beneath the walkway are the entry stalls, changing rooms and facilities through which the pedestrians access the variety of pools below. The concrete path not only physically connects the various programs at multiple scales but also provides a continuous line through which the sky, the horizon, and the landscape can be measured.

In Frank Lloyd Wright's 1908 Frederick C. Robie House in Chicago, Illinois, the unbroken rhythm of continuous fenestration reestablishes the horizon line of what was once an open prairie—a space captured between the planes of the cantilevered roof and continuous terraces and parapets. The domestic rituals of living and dining play out against this horizontal datum interrupted only by the vertical chimney mass.





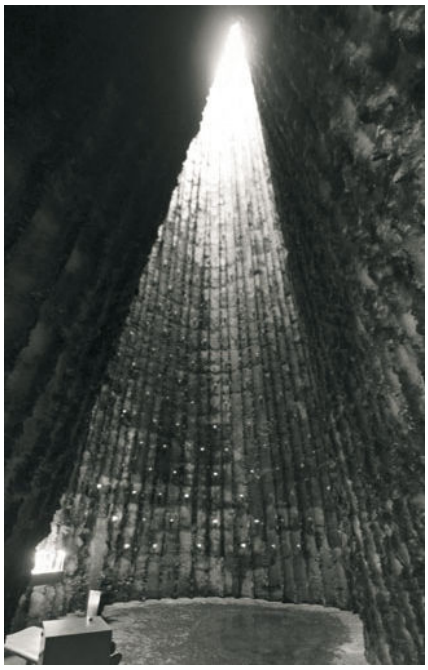
Paolo David's 2004 Arts Center—Casa Das Mudas in Vale dos Amores, Madiera, Portugal, is conceived not as an object but as an extension of its surrounding landscape. This topographic datum produces a surrogate ground from which the occupiable spaces appear to be excavated.



Georges-Henri Pingusson's 1953–62 Memorial to the Martyrs of the Deportation in Paris, France, is located on the southeastern tip of Île de la Cité. The sequence into the memorial is initiated by symmetrical staircases inscribed into the horizontal ground plane of the island, bringing the visitor down into the space of the river below. Its interior spaces are subsequently excavated into the mass of the island, terminating with an infinitely projected hall of illuminated glass beads.



The enclosing wall of Hanil Visitors Center & Guest House in South Korea, completed in 2009 by BCHO Architects with Mark West of CAST, registers the trace of the fabric-lined formwork that was used to construct it. The concrete takes on a surprising fragility, as if, like a curtain, it is about to sway in the wind.





The inner space of the Bruder Klaus Field Chapel by Peter Zumthor in Wachendorf, Germany (2007), was created by burning away the locally forested spruce trees that had been arranged in a teepee formation upon which the concrete was layered. Their textured residue bears witness to the farmers' use of local materials to construct this modest chapel.

inform the characteristics of the architecture. For example, the dimensions of plywood panels that compose the formwork of a poured-in-place concrete wall are permanently inscribed, as measure and as texture, onto the surfaces of the wall that they have formed. The plug holes that served to distance the plywood surfaces into which the concrete is poured, and that are either left open or subsequently plugged, provide yet another clue as to its process of coming into being, adding another scale of measure and texture to its surfaces. Similarly, a wall might be constructed of a series of individual metal components where the potential for incremental geometric mutation and variation is inherent to the wall's fabrication. The computational and fabrication systems necessary to both conceive of and manufacture each component are traced within the wall's scalelike surfaces as well as its responsive geometries.

CRAFT

The act of building can be understood as the result of a process, one that through a series of steps produces the finished work. While drawings typically serve as the instruction manual for the construction process and operate as intermediaries between the designer and the finished work, the equipment, tools, and methods that form and assemble the materials are essential to the characteristics of the finished work. The characteristics—physical, cultural, and economic—of the site in which the work is constructed and the methodologies of local building practices can provide a unique specificity that clearly situates a work within a particular context.



The walls of the 2011–13 Kantana Film and Animation Institute, designed by Boonserm Premthada of Bangkok Project Studio in Nakorn Prathom Province in Thailand are built of bricks handmade from the surrounding paddy fields. The stepping of each brick transforms the massive wall into an undulating curtain full of light and shadow, punctuated by openings that reveal its thickness and mass.



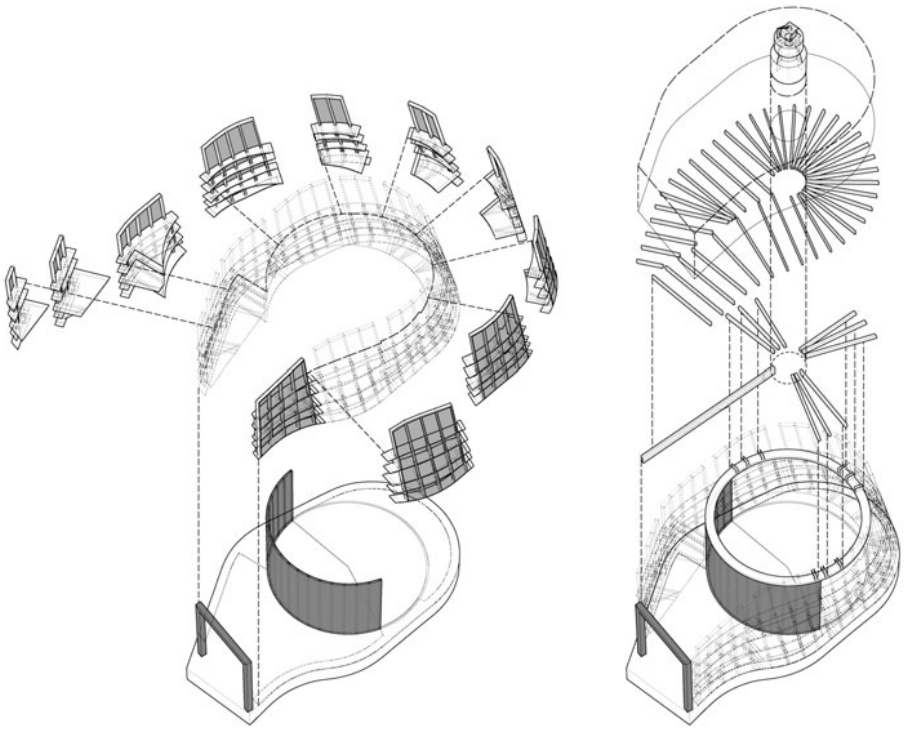
Beginning with an abstracted doric column, Michael Hansmeyer's *Sixth Order* installation at the 2011 Gwangju (South Korea) Design Biennale explores a subdivision process where inherent formal characteristics are individually tagged and then assigned specific behavioral parameters. The result generates an ornamental system of endless variation and complexity, yet one that retains a sense of overall order.

DIGITAL FABRICATION

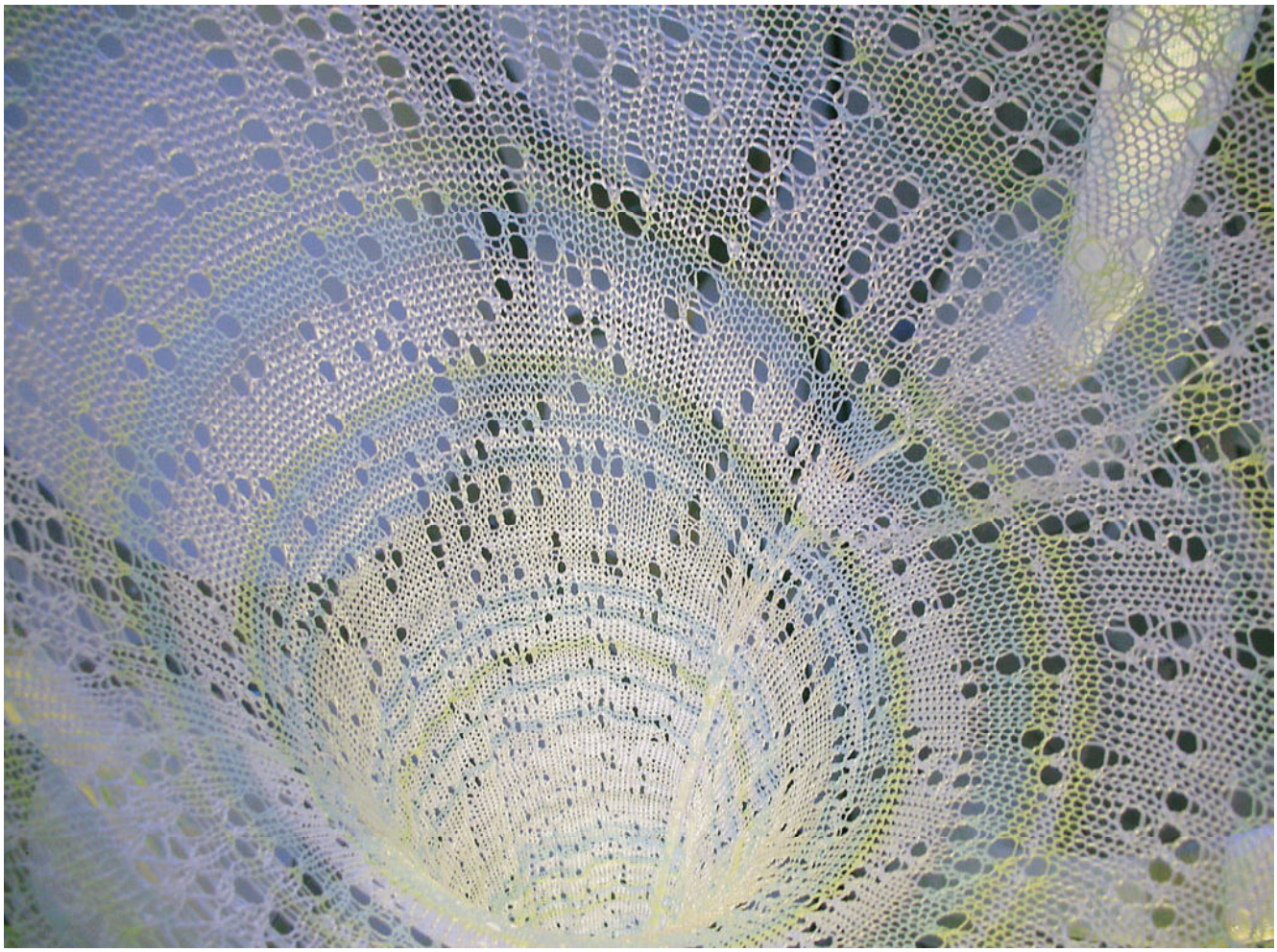
Digital fabrication generates form directly from computer drawings, enabling increasingly complex forms to be constructed. Designs and details are developed using specific computer software that is compatible with various types of fabrication machinery. These drawings are then transmitted to machines that subsequently fabricate the forms. This fabrication can occur at multiple scales and with extremely precise detail and dimensional tolerances.

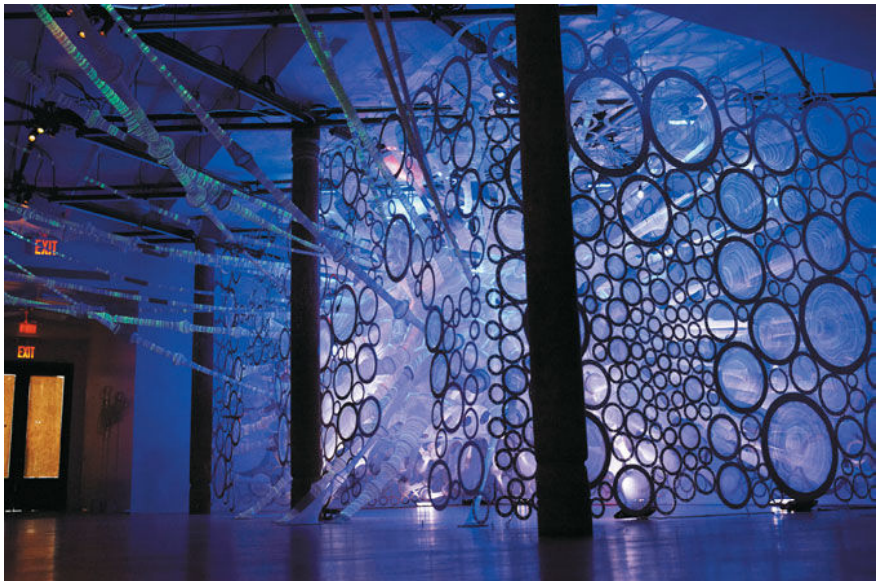
Furthermore, while industrialization introduced an efficiency that depended on the repetition of both assembly and fabrication, the development of computational design and fabrication processes brings an equal efficiency to the mass production of differentiated elements, where standardization is no longer necessary for either material or economic optimization.

And not all fabrication processes are initiated within architecture. Techniques of fabrication often expand the characteristics of an existing technology that might have initially been intended or limited to a particular (and perhaps nonarchitectural) application, making material and structural discoveries that were previously untapped. While the technology remains embedded within the work, these technological "misuses" can often produce surprising results that expand an existing technology's potential.



SHoP Architects' Camera Obscura, completed in Greenport, NY, in 2005, is an early example of a project constructed entirely from digitally fabricated components. Each material system—whether it be the wood cladding or the metal panels or the steel connector plates—necessitated a unique fabrication technology, which was then subsequently assembled on site.





Jenny Sabin's myThread pavilion, exhibited in 2012 at the Nike Stadium in New York City, deploys textile-based technologies to weave reactive and photoluminescent threads into a gauzelike fabric. A skeleton of aluminum rings stretches the fabric into spatial tubes that weave the pavilion into the surrounding space. The scale at which the textile is deployed, along with its reactive capabilities, introduces new and surprising characteristics to a familiar technology—this is no longer a sweater.

Bibliography

Sources in **bold** are recommended as general introductions to architecture. Numbers in brackets [ ] indicate chapters to which the texts refer.

Addington, Michelle, and Daniel L. Schodek. *Smart Materials and New Technologies for the Architecture and Design Professions.* Oxford: Architectural, 2005. [10]

Cook, Peter. *Drawing: The Motive Force of Architecture (Architectural Design Primer).* Chichester, England: John Wiley & Sons, 2008. [3]

Doxiadēs, Kōnstantinos Apostolou. *Architectural Space in Ancient Greece.* Cambridge, MA: MIT Press, 1972. [11]

Evans, Robin. *The Projective Cast: Architecture and Its Three Geometries.* Cambridge, MA: MIT, 1995. [23]

Forster, Kurt W. "Schinkel's Panoramic Planning of Central Berlin." *Modulus 16,* Charlottesville: University of Virginia, 1983, 62–77. [11]

Giedion, S. *Space, Time, and Architecture; the Growth of a New Tradition.* Cambridge: Harvard UP, 1954. [11]

Goethe, Johann Wolfgang von. *Goethe's Theory of Colours: Translated from the German.* Trans. Charles Lock. Eastlake. London: Murray, 1840. [13]

Hejduk, John, with Kim Shkapich (editor). *Mask of Medusa: Works, 1947–1983.* New York: Rizzoli, 1985. [20]

Herzog, Jacques. "Conversation Between Jacques Herzog and Theodora Vischer." Gerhard Mack. *Herzog & De Meuron 1978-1988.* Basel: Birkhauser, 1997. [10]

Holl, Steven. *The Chapel of St. Ignatius,* introduction by Gerald T. Cobb. New York: Princeton Architectural Press, 1999. [13]

Kahn, Louis I. *Louis Kahn: Essential Texts.* Ed. Robert C. Twombly. New York: W.W. Norton, 2003. [21]

Kepes, Gyorgy. *Language of Vision: With Introductory Essays by S. Giedon and S.I. Hayakawa.* Chicago: P. Theobald, 1944. [11]

Le Corbusier, Jean-Louis Cohen (introduction), and John Goodman (translation). *Toward an Architecture.* Los Angeles, CA: Getty Research Institute, 2007. [3]

Lobell, John. *Between Silence and Light: Spirit in the Architecture of Louis I. Kahn.* Boulder: Shambhala, 1979. [13]

Mohsen Mostafavi and David Leatherbarrow. *On Weathering.* Cambridge: MIT Press, 1993. [9]

Moos, Stanislaus von. *Le Corbusier, Elements of a Synthesis.* Cambridge, MA: MIT Press, 1979. [13]

Norberg-Schulz, Christian. *Existence, Space, & Architecture.* New York: Praeger, 1971. [11]

Otto, Frei. *Occupying and Connecting: Thoughts on Territories and Spheres of Influence with Particular Reference to Human Settlement.* Ed. Berthold Burkhardt. Stuttgart: Edition Axel Menges, 2009. [23]

Pérez-Gómez, Alberto. "The Space of Architecture: Meaning As Presence and Representation." *Questions of Perception: Phenomenology of Architecture.* San Francisco, CA: William Stout, 2006. [11]

Pevsner, Nikolaus. *An Outline of European Architecture.* Baltimore: Penguin Books, 1960. [Introduction]

Ramsey, Charles G., and Harold R. Sleeper. *Architectural Graphic Standards.* Hoboken, NJ: John Wiley & Sons, 2007. [4]

Rasmussen, Steen Eiler. *Experiencing Architecture.* Cambridge, MA: MIT Press, 1962.

Rowe, Colin, and Robert Slutzky, commentary by Bernhard Hoesli. *Transparency*. Basel: Birkhäuser Verlag, 1997. [11]

Rüegg, Arthur. *Le Corbusier—Polychromie architecturale.* Basel: Birkhäuser Architecture, 2002. [13]

Samuel, Flora. *Le Corbusier and the Architectural Promenade.* Basel: Birkhäuser, 2010. [14]

Sandaker, Bjorn N., Arne P. Eggen, and Mark R. Cruvellier. *The Structural Basis of Architecture.* 2nd ed. Hoboken: Taylor and Francis, 2013. [8]

Sherwood, Roger. *Principles of Visual Organization.* Philadelphia: M.C. De Shong, 1972. A later version is also occasionally available: *Principles and Elements of Architecture,* Los Angeles: School of Architecture, University of Southern California, 1981.

Shklovsky, Viktor. *Theory of Prose.* Trans. Benjamin Sher. Elmwood Park, IL, USA: Dalkey Archive, 1990. [17]

Soltan, Jerzy. "Architecture 1967-1974." *Studio Works 5*. New York: Princeton Architectural Press, 1998. [4]

Straaten, Evert van, and Theo van Doesburg. *Theo van Doesburg: Painter and Architect.* The Hague: SDU, 1988. [13]

Summerson, John. *The Classical Language of Architecture.* Cambridge: M.I.T. Press, 1963. [Introduction]

Thompson, D'Arcy Wentworth. *On Growth and Form.* Ed. John Tyler Bonner. Cambridge: Cambridge UP, 1961. [23]

Todorov, Tzvetan. *Mikhail Bakhtin: The Dialogical Principle.* Minneapolis: University of Minnesota, 1984. [15, 17]

Zevi, Bruno. *Architecture as Space: How to Look at Architecture.* Trans. Milton Gendel. New York: Horizon, 1974. [11]

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Chicago History Museum
chicagohistory.org 183 (top)

CODA
co-da.eu 63 (bottom, left)

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The Frank Lloyd Wright Foundation Archives, Avery Architectural & Fine Arts Library, Columbia University
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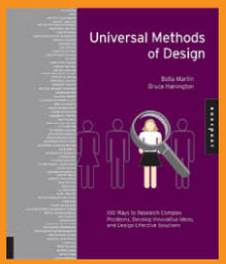
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