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To Jane

Contents

Preface

> No construction, no architecture.
>
> —Julien Gaudet

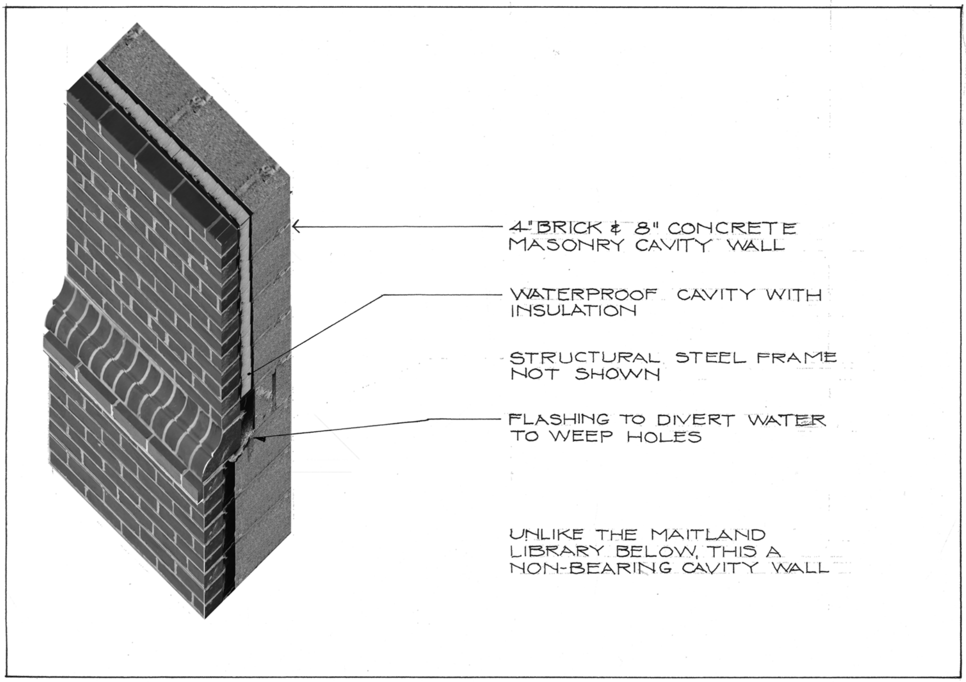
When I wrote the following pages, or rather when I began them, I lived in a third-floor flat overlooking the green at Cambridge University's Downing College. It was a familiar landscape, much like the Lawn of the University of Virginia, my own school. The Lawn was begun nineteen years after the founding of Downing in 1800, and there are remarkable similarities between the two landscapes: both have central greens; both greens are flanked by ranges with pavilions, and both have a large central building closing one end. There are also significant differences. William Wilkins' Downing is Greek Revival in form and built of Ketton stone, whereasThomas Jefferson's Virginia is more Palladian-influenced and built of brick and wood. Virginia's central building was its library; its chapel, a post-Jeffersonian afterthought built in 1890, sits uncomfortably to one side. In perfect asymmetry with Virginia, Downing's chapel lies on the central axis, while its library occupies the periphery. It is an afterthought as well, having been built in 1993. Like Downing, Virginia continues to expand its historic core, having just completed a library for special collections at the periphery of its lawn, and thus both institutions faced the question of how to build adjacent to the context of an architectural unity that is separated from the present not only by 180 years but also by a significant technological, and to many ideological, gap. Both institutions have answered this question in the same way: their overriding objective is to imitate their stylistic context, whether Federal Style or Greek Revival architecture.

Shortly after my return to Virginia, with a number of other faculty, I coauthored an open letter to the university's administration and community at large, deploring the historicist prison in which the university had placed itself, arguing that Jefferson's architectural legacy was not one of literal symbols, but rather of a set of larger principles. In the letter we asked, rhetorically, that this policy of glib, shallow revivalism be at the very least reexamined.[1] The process of writing the letter revealed some odd truths about its authors. We were united in our criticism of the status quo, but our individual reasoning was diverse and, at times, contradictory. Some were troubled by the lack of authenticity of the campus's new buildings, by the pseudohistorical implications of revivalism. Some were troubled by the issue of diversity, by the Eurocentric and historical associations of universal classicism. Some sought a more sensitive response to the landscape. Some were troubled by attitudes toward preservation, by the university's policy of destruction of real histories and construction of fictitious ones. Many said it was not about style at all, arguing that better site planning, greater variety, and simply better buildings would solve the problem.

Given that the bulk of my teaching career has been spent in the subject of construction, it might be assumed that my own objection to the new buildings at the University of Virginia was that they have failed to bridge the gap between their late-eighteenth-century imagery and the modern technology that it conceals. The solid brick wall has become a veneer; the arches, once a structural necessity, are now supported by steel; the small pane of glass has become large. Yet the imagery remains, full of false headers, quoins, muntins, steel-supported lintels, and precast classical columns. Few things are more visually painful than these buildings in their incomplete state: steel-framed structures with concrete block infill awaiting their 4-inch veneer of Colonial architecture. Virginia's new library is built this way, and so are the great majority of its historicist counterparts.

But this paradoxical construction is not the inevitable choice for this kind of revivalist architecture. There are few such tensions between real construction and preconceived imagery in the new Downing library. The walls are solid—a layer of four-inch Ketton stone bonded to eight-inch brick, with insulation provided by an inner layer of three-inch insulating block. *fig.* 1 They are structural and, except for the roof, there is no concealed steel frame.

Does this solve the problem posed by the new Virginia library? In a way, yes, but constructional solidity was, to me, not enough. The Downing library, however well made, has no ambitions beyond vague historical allusions. This is architecture by association, and an architecture based solely on historical



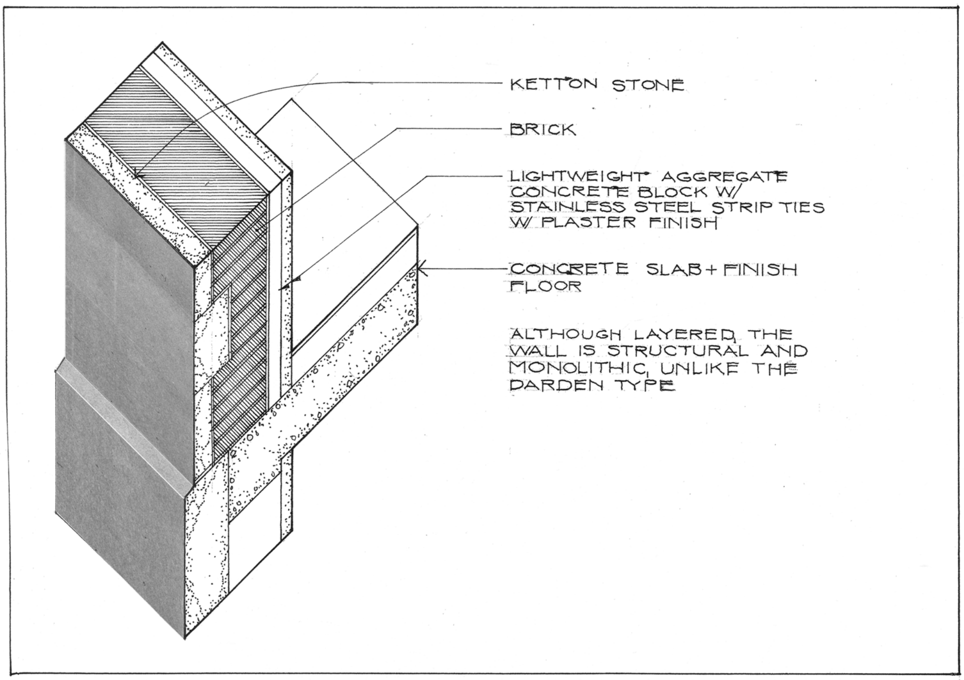


fig. 1

Top
Wall Detail, Darden School of Business, University of Virginia, Robert A.M. Stern, Charlottesville, Virginia, 1996
Bottom
Wall Detail, Maitland Robinson Library, Downing College, Quinlan Terry, Cambridge, United Kingdom, 1993

association can only be a glib, disingenuous, and transient one, however ancient its references or solid its construction. Good architecture has a deeper structure, in the largest sense of the word.

Ultimately my problem with the new libraries at Downing and Virginia was not that either is a building in which the technology of one historical period is clad in the language of another, not that either building used literal symbols, not that they were oblivious to the technology of the modern world, not that they were classical per se, not that they recalled repressive societies from the past, not that they were Eurocentric, not that their forms originated in a belief in absolute standards of beauty to which few if any of their admirers subscribe, although all these things were problematic. The problem was their details. It was not that their details delivered a message with which I disagreed. It was not that they were ornaments; it was that in great buildings, the details, in the sense of a demonstration of constructional resolution, are the means of delivering whatever message architecture communicates.

This has no better illustration than the Lawn itself. There was a consensus among the authors of the letter that the meaning of the Lawn lay not in its superficial appearance, but in a body of principles of which it is the manifestation, that is, that there is a deeper structure below the surface that gives the Lawn its significance. Understandably, many readers of the letter objected to the implications of this, arguing that if all articulation   capitals, bases, moldings and trim   of the various parts that make up the Lawn's architecture disappeared, the result would be a very un-Jeffersonian, unified monolith. To strip the Lawn of its ornaments, they argued, would deprive it of all character and significantly alter its meaning. Proportion, composition, and geometry were insufficient, the argument went, and if the ornaments were removed, one would need to replace them with something else, not necessarily historical, not necessarily even recognizable as a symbol, but something that would perform the tasks of the older ornaments that transcends their historical associations. I agree; some type of detail was necessary. But to find a true detail meant that one had to get beyond the familiar and find what Louis Kahn calls its point of beginning. I am not so naive as to argue that classical ornaments have constructional origins, although many believe this, and some ornaments probably do. But as details, and not as ornament, they perform a variety of tasks beyond historical recollection, and this recollection is an impediment, not an aid, to understanding the larger order of the architecture and its meaning.

Details are the basis for, not an accessory to, understanding a building. This is not to say that the detail contains within it the idea of the totality of the building; this book is, in fact, an argument to the contrary, only that an understanding of the building cannot be separated from an understanding of the detail, and that the role of the detail is not simply to create pleasant allusions or comfortable associations. Significant details are about a good deal more than construction, but they begin with construction. Architecture, as I have come to know it, is the art of building, and if it communicates any message of significance, it does so through construction. Construction not just in the sense of building, not just as a practical necessity, but in the way that we see it, the way we understand it as a manifestation of science, as an object to which we intuitively respond, as a part in a history that we know. I believe that architecture communicates many things, but it does not do so, or does not do so well, by mere association.

Insofar as it communicates an idea about place, it does so through an understanding of scale. Insofar as architecture communicates spirituality, it does so through weight. Insofar as it communicates an idea about society, it does so through joints. Insofar as it suggests something beyond, something different from, even something contradictory to its own reality, it does so using its own construction as a point of departure.

The following institutions allowed me to study their collections as well as provided reproductions and advice: Drawings Archive, Alvar Aalto Foundation; Special Collections Research Center at Syracuse University; the Faculty Library of the Department of Architecture of the University of Cambridge; Drawings Collection, Cheltenham Art Gallery & Museum; Fondation Le Corbusier; the Greene and Greene Library at the Gamble House, Pasadena, California; Fay Jones Papers, Special Collections, University of Arkansas; Louis I. Kahn Collection, Architectural Archives, University of Pennsylvania and the Pennsylvania Historical and Museum Commission; the Kimbell Art Museum; Archives, Maitland Robinson Library, Downing College, University of Cambridge; Bernard Maybeck Collection, Environmental Design Archives University of California, Berkeley; Library, Netherlands Architecture

Institute; The Psychiatrisches Krankenhaus der Stadt Wien Baumgartner Höhe, Vienna; the Postsparkasse Archives, Vienna; the Library of the Royal Institute of British Architects; and the Swedish Museum of Architecture, Stockholm.

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Epigraph. Peter Collins, *Concrete* (New York: Horizon, 1959), 162.

1 *Cavalier Daily* 116, no. 12 (September 7, 2005): B6, http://www.arch.virginia.edu/lunch/print/trespass/open.html.

opposite left

Capitals (top to bottom):
Oxford Museum, Oxford, United Kingdom, Deane and Woodward, 1860
Merchants National Bank, Winona, Minnesota, Purcell, Feick, and Elmslie, 1913
Musée des Travaux Publics, Paris, France, Auguste Perret, 1939
Eggers Hall, Syracuse University, Syracuse, New York, Bohlin Cywinski Jackson, 1993

opposite right

Ionic Capitals (top to bottom):
Dining hall, Downing College, Cambridge, United Kingdom, William Wilkins, 1821
Pavilion II, University of Virginia, Charlottesville, Virginia, Thomas Jefferson, 1822






1

Chapter 1

What Is a Detail?

The production of a book necessitates compromise, mostly with oneself, and this was the case with the two volumes of *The Details of Modern Architecture* that I wrote between 1985 and 1996.[1] The first compromise was the name, a working title that I never found the time to improve. If straightforward, it was both dull and inaccurate, as both books were about a great deal more than detailing. I compensated for this problem by creating a second one, by never really saying what detailing was, by never distinguishing between detailing and design development or just plain design. Nowhere, in all 798 pages of both volumes, will you find the word *detail* defined. In the classes in construction that I taught in the 1980s, I used to say that detailing was about consistency, about carrying the larger concepts of the design of the building into the smaller elements. Not long ago, a colleague, in the course of a lecture introduction, quoted me as saying this. My reaction was, frankly, "What was I thinking?" It was a statement that was imprecise, ill-formed at the time I made it, and, in light of my current thinking on the subject, dead wrong.

What, precisely, is an architectural detail? Is detailing nothing more than small-scale architectural design, requiring a bit more technical knowledge simply because it occurs at the end of the process? Is there an activity of "detailing" that is distinct from architectural design? Is it a concept of traditional architecture, simply a code word for ornament? Is a detail something that can be isolated from the totality of a building? Is a detail, as Peter Cook, Zaha Hadid, and Greg Lynn have argued, a fetish?[2]

These questions the definition of detail and the appropriate detail are part of some larger questions. What is the correct relationship of the architectural part to the architectural whole? Is consistency of part and whole desirable aesthetically or economically? How does scale matter? That is, if the considerations that determine the form of two architectural elements—structure, performance, program—are the same, how are the solutions changed by differences in size, if at all? And most critically, is an understanding of the functional aspects of building essential to an architectural understanding of a building, or is that understanding irrelevant or meaningless in architecture as an art?

Except for the last, these are not questions that are addressed very often in the history of architectural theory. *Detailing* is not a word one often finds in premodernist writings on architecture. Words like *trim*, *molding*, and *ornament* were more precise and more useful. No doubt detailing, in its technical sense, is of greater consequence in the modern era simply because of the complexity of the modern building, but the recent deluge of architectural theory has seen only occasional forays into the question of detailing. There are a variety of types of detail in modernism, more often found in buildings than described in text, but even within these limits there are recognizable schools of thought about what a detail is and what constitutes good detailing.

But if contemporary architectural theory has not yet answered these questions, neither have I, so here, by way of penance, are several answers. I will begin with a short introduction to five definitions, or types, of detail, along with the questions that each definition raises: the detail as abstraction, the detail as motif, the detail as structural representation, the detail as joint, and the detail as an autonomous or subversive element.

Definition Number 1

There Are No Details in Modernism.

The Detail as Abstraction

The Media Center (1999) designed by Future Systems for Lord's Cricket Ground is a seamless aluminum egg. *fig.* 1 A product of shipbuilding technology, it has no visible joints. The divisions in the glass are marked only by glass mullions. There is no visible frame connecting the glass to the aluminum shell. The only break in the surface is a miniscule rain gutter around its horizontal centerline. Jan Kaplicky, its designer, said of it:

fig. 1

Media Center, Lord's Cricket Ground, Future Systems, London, United Kingdom, 1999

> So there's virtually no obvious detailing.... The major detail is so invisible, and that's the only detail I want to publish much because it's so simple that nobody believes it's there, because it's not painted over, and it will never show.... The smooth effect of the object in that rather busy environment was important from day one.[3]

To many modernists, this is an irrelevant book; details are impossible, unnecessary, or undesirable. Lynn, Hadid, and Rem Koolhaas have expressed similar thoughts. Ben van Berkel and Caroline Bos wrote in 2000: "The concept of a detail as part of a larger whole, as an articulating element of architecture, is dated.... The first aspect [of details] concerns their omission. What is involved in this case is not the stressing, accentuation of paraphrasing of details, but their exclusion."[4]

This is not a recent development. Writing in 1964, Marcel Breuer was not sure the subject of "detailing" had any contemporary relevance:

> The architecture of past periods tended to lend melodies to the details; a column capital was a piece of sculpture in itself—a bit of art or decoration independent of the building. Today, our details tend to exist solely for the service of the whole structure, and become inherent particles of the whole... So much so that details often fuse completely with the greater architectural form to the point where it's difficult to separate them.[5]

A typical Breuer building of that time is composed of simple masses of concrete and stone and uses constructional systems that have few intermediate-scale elements other than window mullions and hardware. Details in this system, in theory, can only be ornament, and thus could be eliminated.

One might draw two conclusions from these thoughts: first, that details are the vestiges of traditional architecture—unnecessary trim or ornament—that can be eliminated as they were for Breuer; or second, that detailing requires the elimination—or at least the suppression—of technically necessary elements for the purpose of achieving a certain simplicity of imagery, as it is for Kaplicky. Details do not exist for these architects, but detailing certainly does.

For these architects, detailing is the activity of eliminating not only "unnecessary" trim, but also those small-scale elements that are the evidence that a technical problem has been solved: how water is shed from the top of a wall or a windowsill, how a plane of glass is supported, or how two materials are joined. In traditional architecture, there were visible elements to accomplish these tasks: copings, sills, mullions, and applied trim. In the practice of nondetail, these elements are, for the most part, present, but not as discernable parts.

A school of thought closely related to that of the non-detail—that details do not exist—holds that detailing is simply a question of consistency, that detailing is the extension of the ideas of the larger design into the small. The lever handle of Walter Gropius's Bauhaus building in Dessau, Germany (1926) was designed for a project fifteen years earlier, the Fagus Factory in Alfeld, Germany (1911), and it lacks a one-to-one formal correspondence with the building itself, which contains few cylinders, yet it unquestionably belongs there. *fig.* 2 For Gropius, at least in the 1920s, good industrial design was exemplified by simple geometric solids, thought to be the easiest to mass-produce. The Bauhaus Building—the school as factory—is very much conceptually aligned with the geometry of the handle. It does not replicate the geometry of

fig. 2

Door Handle, Bauhaus Building, Walter Gropius, Dessau, Germany, 1926 the building, but it is ideologically sympathetic. It is an example of consistent detailing, of a conceptual, if not formal, unity of part and whole.

The school of thought that is consistent detailing is in some ways no different than that of nondetailing. There may be small-scale elements in consistent detailing, but they will be designed in the same way as the building at-large, considering the same issues, solving the same problems, and articulated in the same way. There is no independent activity that is detailing, but only variations in the scale of design. Peter Salter writes:

> The understanding that building details may be found within the architectural strategy, and that strategy may be found in the details, is a recognition that a building may carry certain resonances of a wider context. The relationship between strategy and detail necessitates the making of rules for the design of the building and its construction. These rules act as data against which to measure the appropriateness of the detail and also sustain the strategy.[6]

This train of thought would seem to dispose of the entire question of what a detail is, but consistency is not without its problems. Santiago Calatrava's addition to the Milwaukee Art Museum (2001) opened to great fanfare, so much so that the daily opening of its winglike sunshades became a performance event. *fig.* 3 Programmatically, the building is more of a museum lobby than an art museum, and because of this, an important part of the design was the furnishings—information desks, benches, gift shop display cases. If consistency is a virtue, they are virtuous furniture, for each is a miniature version of the building. The triangular strut that supports the entry canopy appears in much reduced size in all of these furniture pieces. *fig.* 4 These are small-scale models, perhaps paradigms, of the larger system, and that is precisely what is wrong with them; they are not very good furniture as a result. They have the effect of reducing the rational design of the larger building into superficial styling. The use of these elements at the small scale, while not irrational, is certainly unnecessary, and not a response to their own individual structural or functional needs.

There is nothing new about this kind of rigid formal consistency of architecture and furniture. Perhaps it is because the miniaturized building

fig. 3

Addition to the Milwaukee Art Museum, Santiago Calatrava,
Milwaukee, Wisconsin, 2001

fig. 4

Casework in Gift Shop, Addition to the
Milwaukee Art Museum, Santiago Calatrava,
Milwaukee, Wisconsin, 2001

is such a staple of Gothic Architecture that it is so commonplace in Gothic Revival furniture. Augustus Welby Northmore Pugin was one of the foremost practitioners of this methodology, but in later years also one of its critics. He wrote in 1841:

> Hence your modern man designs a sofa or occasional table from details culled out of Britton's Cathedrals, and all the ordinary articles of furniture, which require to be simple and convenient, are made not only very expensive but very uneasy. We find diminutive flying buttresses about an armchair; every thing is crocketed with angular projections, innumerable mitres, sharp ornaments, and turreted extremities. A man who remains any length of time in a modern Gothic room, and escapes without being wounded by some of its minutiae, may consider himself extremely fortunate.[7]

At the time when detail was synonymous with ornament, many felt that formal consistency was necessary simply for stylistic consistency, but despite the logic of the idea of consistent design, it is not the rule in practice, at least as far as it concerns furniture. Robert Adam, Karl Friedrich Schinkel, Ludwig Mies van der Rohe, Le Corbusier, and Marcel Breuer approached architecture and furniture in highly different ways. For the majority of furniture designers—traditional or modern—formal consistency was a shortcoming. It can be argued that there is a precise line between architecture and furniture, and that the architectural detail has nothing to do with furniture, but the evidence of history tells a different story: the distinction between furniture and architecture is part of the larger issue concerning the relation of part to whole.

There are of course advocates of the detail, or rather the visible detail, in modernism. Peter Zumthor wrote in 1998:

> Details express what the basic idea of the design requires at the relevant point in the object: belonging or separation, tension or lightness, friction, solidity, fragility.... Details, when they are successful, are not mere decoration.... They lead to an understanding of the whole of which they are an inherent part.[8]

The argument in favor of details is that they are, in Kenneth Frampton's words, a "tectonic condensation" of a building. How this is accomplished varies considerably. The consistent detail can be a motif, paradigm, symbol, or ornament.[9]

The Questions

Is good detailing nothing more than a question of simplifying the basic shapes and minimizing the apparent parts of a building? Does detailing have no task other than the suppression of constructional information in order to enable the expression of other information?

Is all good detailing negative, in the sense that it involves the elimination of something visible, or are there small-scale elements that are positive details—visible elements that are technically necessary and act to demonstrate on a small scale the properties of the whole?

Is consistent detailing possible without what seems the inevitable result—styling—and if it is not, is this bad? How can consistency be maintained without absurdity as scale is changed?

Definition Number 2

A Detail Is a Fragment in Which the Whole Building Is Represented.

The Detail as Motif

Modern architecture is not particularly popular in Cambridge, England. An exception, at least for some, is Edward Cullinan's addition to St. John's College Library (1994), located in one of the oldest parts of one of the oldest colleges. *figs.* 5–6 *The Blue Guide*, no friend of modernism, called its entrance "artfully contrived," and the professional press found much to admire in the building, with the exception of its details. The authors of *Cambridge: An Architectural Guide* wrote: "Attempts at mannerism . . . make the building feel overworked." Peter Davey, writing in the *Architectural Review,* said, "For all the Mannerist moves and the perhaps excessive Puginian intensity of the detailing, the building has integrity, ingenuity, and gentleness."[10] If the theoretical

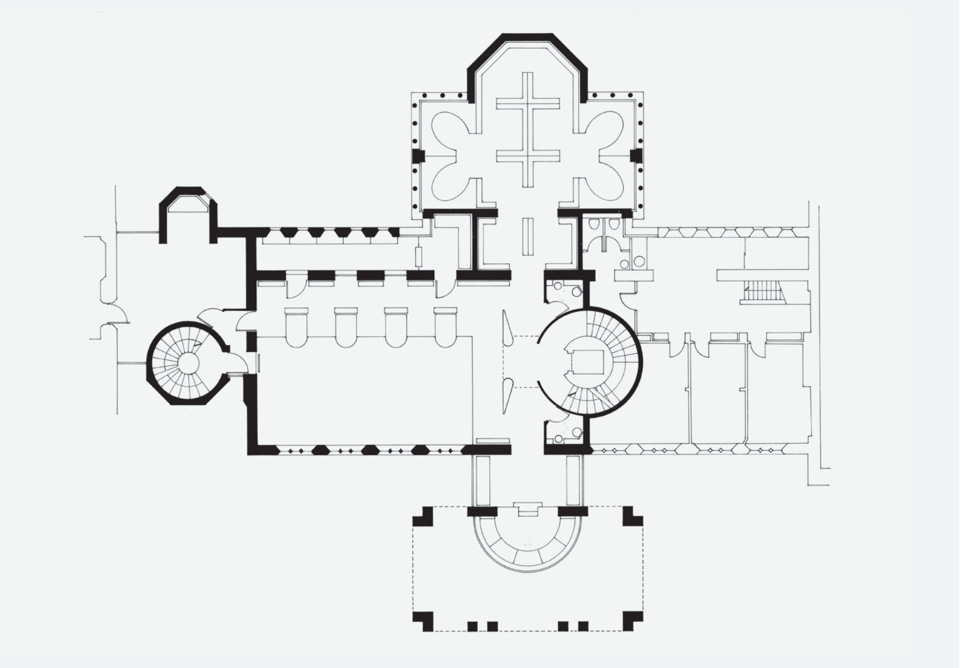

fig. 5

Plan, St. Johns College Library, Edward Cullinan,
Cambridge, United Kingdom, 1994

fig. 6

Addition to St. Johns College Library, Edward Cullinan,
Cambridge, United Kingdom, 1994

approach to detailing is not clear in this building, the methodology is, to use circles—in fact, to use as many circles as possible. The entry plaza, benches, stairs, elevators, lamps, handrails, concrete columns, steel columns, fasteners and access holes to fasteners, lamps and lamp bases, plumbing taps and tap handles, half curves of the balconies and clerestory windows, three-quarter curve of the desks, all are composed of circles—wood or metal, large or small, solid or void. The lantern of every building in Cambridge is octagonal except Cullinan's, which is round. The strategy of detail here is motific, using a repetitive geometric device at every scale and in every material to solve every problem.

Motific detailing of course long predates modernism. St. John's neighbor to the south, the King's College Chapel (1515), perhaps too perfectly illustrates the system at work. The motif of lancet with trefoil occurs throughout King's College—in the shape of the windows, where one would expect it, and where one would not, as a repetitive element in the fan vaults, where it has no structural function. *fig.* 7 There are few surfaces, excepting the wood screen and choir stalls built in 1536, to which this motif is not applied. King's College

fig. 7

Column and Vault, King's College Chapel, John Wastell,
Cambridge, United Kingdom, 1515

is an example of what Nikolas Pevsner called the decorated phase of English Gothic, but to Wilhelm Worringer, these motifs were the essence of Gothic. He wrote in 1911:

> Gothic man seeks to lose himself not only in the infinity of the great, but also in the infinity of the small. The infinity of movement which is macrocosmically expressed in the architectural structure as a whole exhibits itself microcosmically in every small detail of the building...a world which repeats in miniature, but with the same means, the expression of the whole...the crown of a pinnacle is a cathedral in miniature.[11]

Motific detailing's origins may be Gothic, but it is dispersed throughout modernism in various guises with various philosophical underpinnings. Fay Jones was a religious adherent to the motific detail. Although he used the term *generating idea*, rather than motif, both philosophically and technically, he saw it not merely as a way of detailing, but also as a way to design:

> The generating idea establishes the central characteristic, or the essence, or the nucleus, or the core; it's the seed idea that grows and generates the complete design, where it manifests itself from the large element down to the small subdivision of the details.... It's more like nature's process of having a seed or kernel or nucleus, and then letting that manifest itself as the design grows to where you feel it's an organic part of that idea.[12]

This apparent paradox, in which geometric consistency is seen as the expression of organic architecture, is the result of history. Of any school of detailing, the motif has the longest pedigree. The motif was used, and justified, in a variety of ways—as organic metaphor, as cultural symbol, as pure geometric strategy, or, strangest of all, as an expression of the nature of the material.

The most extreme of the motific detailers hold an opinion not so much the contrary as it is the inversion of the idea of the non-detail. To them architecture is nothing without details, as the whole is the sum of its parts and no more. The most conspicuous practitioner of this was Carlo Scarpa, and the most extreme theoreticians of the motific detail are those who used Scarpa's work as a paradigm. In this school of thought, consistent detailing is turned on its head, and the part generates the whole, not the whole the part. Scarpa's former student, architect and author Giuseppe Zambonini, wrote:

> An easy criticism, if not a superficial one, of Scarpa's built work is the apparent absence of a unifying structure, at least of a kind that can be communicated and explained.... If there is in Scarpa's work an idea of unity, that ideal should not be searched for in the perceived composition of the structure, which would tend to be constantly lost and found, but should be sought in the process but not perhaps in the attitude. The perceived structure is therefore merely a pretext for a cognitive one.... This may begin to explain why Scarpa was never really obsessed with the idea of completion and how difficult it is to establish at what point any of his work can be understood as complete.[13]

The motific detail obviously falls prey to the same problems as the formally consistent detail: the inability to respond to scale, the blurring of material differences between elements, and just plain styling. It is perhaps the most frequent criticism applied to Scarpa and to modernism's principal motific detailer, Frank Lloyd Wright. The issue, however, is that if we eliminate motifs from Wright's and Scarpa's work, would we be satisfied with what remained?

The Questions

Is motific detailing really any different than styling? Is it necessary that a building be a unified coherent experience, or can it be fragmentary and incomplete? Do Scarpa's buildings truly achieve the status "of a cognitive as opposed to a formal structure?" Can the whole of a building be generated from a part? Is it possible within the modernist vision of the world to discover and then demonstrate a kind of architectural DNA, not just of a building, but of a larger natural or social order?

Definition Number 3

Details Are the Articulation of Structure.

The Detail as an Order

The last twenty years have seen the construction of a number of Holocaust memorials, most of them abstract in nature. An exception, a case of a literal representation, is James Ingo Freed's Holocaust Memorial Museum in Washington DC (1993), which might be criticized by some for that very reason. Two sets of brick substructures face one another across the main lobby: one of brick and steel and one of brick and concrete. The brick and steel structure is meant to recall the steel reinforced ovens of Auschwitz, but the steel also plays a functional role, helping to support the brick around the openings. *fig.* 8 For less clear reasons, the concrete structure literally recalls Louis Kahn's Indian Institute of Management (1974). Both structures are self-supporting, and neither is part of the primary structure, a hidden concrete frame. This is a case of a constructional system, albeit not a structural one, taking on a historically evocative, even symbolic, role. It might seem something of an eccentricity, but it is part of a longer tradition.

Freed was a student of Mies, and Mies was the father, at least in modernism, of the kind of structural representation used in Freed's building. Many of Mies' early Chicago buildings, such as Alumni Memorial Hall at IIT (1946), were steel-framed buildings wrapped in concrete fireproofing, then clad in steel to demonstrate what was concealed. These facing frames, while nonstructural, had secondary purposes, like supporting a window or bracing a brick wall, but others can be explained only as symbolic structures and thus were accepted as such.

The buildings at 860 and 880 Lake Shore Drive in Chicago (1951) are clad in steel frames that represent the steel frames below. The neighboring Esplanade Apartments (1955), also designed by Mies, appear the same, but are concrete flat-slab frame-clad with an aluminum curtain wall that has similar profiles to the steel mullions of the Lake Shore Drive buildings. Thus a system that began as a symbol of the construction quickly lost the relationship of what was clad to the cladding. It is one thing to clad a steel frame with a steel curtain wall and call it representative. It is quite another to clad a concrete frame with

fig. 8

View of Lobby showing detail of steel lintel, United States Holocaust Memorial Museum, James Ingo Freed, Washington DC, 1993

an aluminum curtain wall formed into the shapes of a steel one and say the same. It is an approach to cladding that describes the history of the system, not the structure concealed within. In Mies's late work, the representative structure rarely matched with any accuracy the real structure that it clad, and the rules for acceptable deviance from this were not clear.

Peter Smithson, in his own way another disciple of Mies, attempted to codify these rules in a 1962 article entitled "A Parallel of the Orders," arguing that this is the natural course of architectural development—a construction system becomes an order and then becomes a decoration. To Smithson, the first two steps are acceptable; the third is not:

> The [Doric] Order is a form—metaphor of a once-actual structure… [William Bell] Dinsmoor uses the word 'translation' into stone of

> a wood and terracotta original, but this I suggest is an inadequate word to represent the process of change from a construction into an Order.... A metaphor is an explaining, a magical exact showing-forth. It does not involve exaggeration or falsification.

Smithson continues, noting that the order is not to be confused with decoration:

> The moment the Order is applied in a situation where the structuring it shows forth could not be that of the real building, we feel a sense of affront. The Order has been deflected from its true purpose, made meaningless.[14]

But even in their Miesian guise, the critical reception of these representative structures was mixed. Philip Johnson's East Wing Expansion of the Museum of Modern Art in New York (1964) included the sixth floor Founders Room. Although the room was small in terms of the size of the project, *Progressive Architecture* devoted two pages to it, and not because they found it a great work. Under the title "Camp Mies," they wrote:

> The immediate effect is a combination of Mies, Gothic, and a carnival midway of the nineties and it comes out somewhat Turkish.... Johnson has been taking Mies off for the past decade, of course, but the lingering and the proliferation of the Miesian idiom make this latest indoor, uplifted inversion the coolest joke on the International Style.[15]

The problem was presumably the use of so much structural steel—four eighteen-inch I-beams and six six-inch-deep wide flange columns configured in a structural way for a use that was completely nonstructural. Johnson had taken pains to make this explicit. The columns, which sit on the surface of the wall, stop eighteen inches above the floor, and the illuminated plaster vault above the beams makes clear that there is nothing to support. *fig.* 9 *Progressive Architecture* was not satisfied with this and found its only redeeming quality was that it evidently was a joke. Johnson's answer to this criticism was that he had not done anything Mies had not done. *Progressive Architecture* wrote, "Johnson

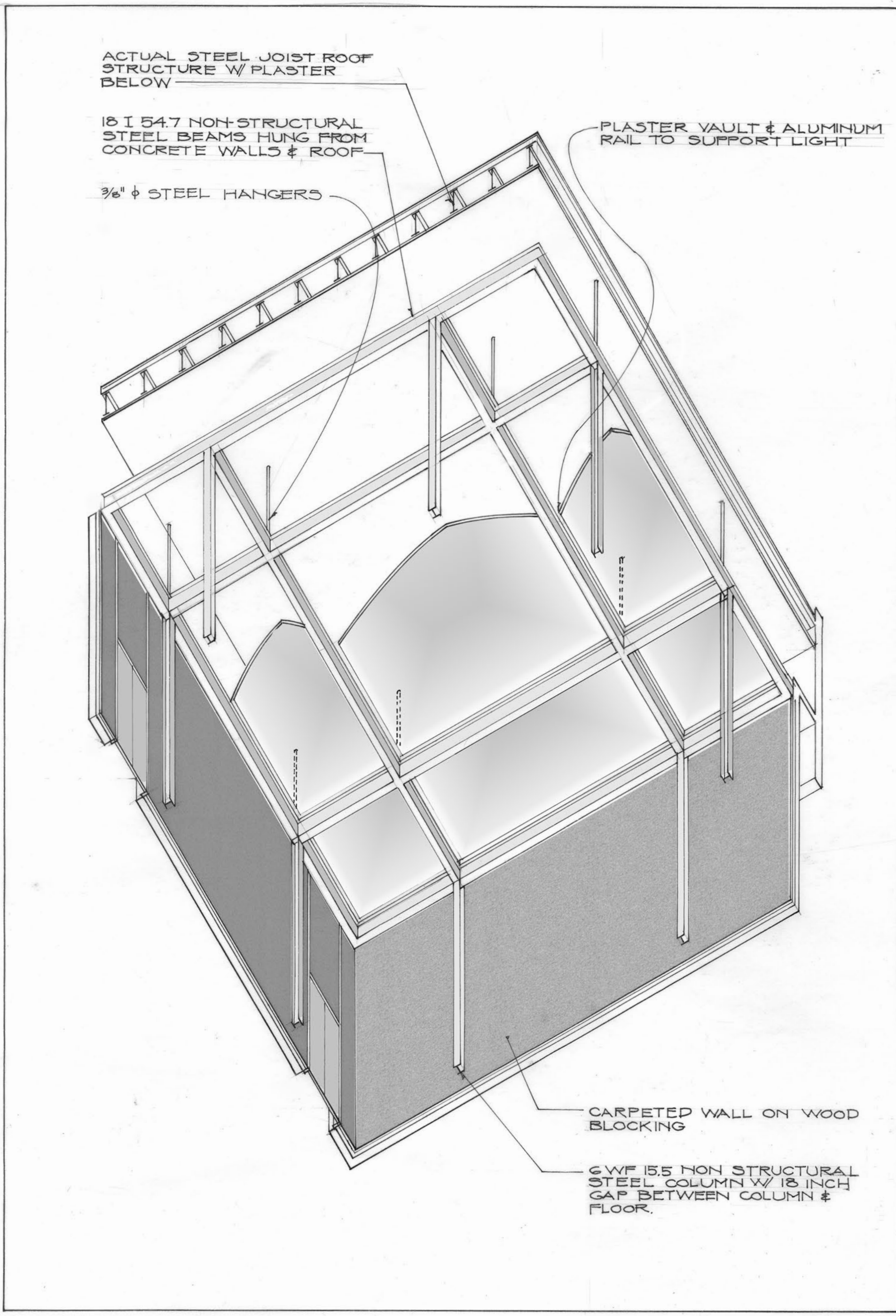

fig. 9

Founder's Room, East Wing Expansion of the Museum of Modern Art, Philip Johnson, New York, New York, 1964 points out further that the structural play is no change at all on the Miesian mullion, which was also non-structural."[16]

Clearly in the conventional wisdom of the day, Johnson had broken a rule, but what was it? He had created a decorative structure unredeemed by its explicit expression that it was not structure, and was thus acceptable only as architectural humor.

Of all of the definitions of detail, structural representation is the one that the modern architect finds the most uncomfortable, in part because of an overall uneasiness with symbolism, but also because of the difficulty in defining the appropriate relation of external symbol to hidden reality. Yet it seems a necessity in modern building as it currently exists, in which the direct exposure of structure is often impossible.

Contemporary thought is less concerned with this issue. For many it is not a question of the inaccuracy of the description given by the detail, but of the lack of necessity of the entire process. Ben van Berkel and Caroline Bos of UN Studio question the need or even the possibility of detail as an external manifestation of the internal workings, structural or otherwise, of a building:

> It has become essential to define [the detail] anew. Its classical meaning, as a part of the whole, as articulation, has become obsolete. The idea of ornamentation had long been discarded, but that the notion of articulation has been abandoned too, comes as a shock. And yet the conclusion is unavoidable, seeing that contemporary architecture has severed every link between what takes place inside a building and what can be seen of this from outside.What could possibly be left to articulate in this new architecture…? Neither its structure nor its place in its surroundings says anything about the purpose it serves. There is absolutely nothing substantial left that can be related to articulation of any sort, and when this architecture, despite its radical otherness, is suddenly imbued with 'detail' in the conventional sense the result is monstrous.[17]

The Questions

Is it possible for details to represent the hidden structure of a building in a way that transcends ornamentation?

What happens when representation and structure become separated? Is there any rule as to what is appropriate and inappropriate, what Smithson called the difference between an order and an ornament?

Should the exterior of a building describe its structure or even the nature of its interior?

Definition Number 4

Details Are the Articulation of Construction.

The Detail as Joint

The beam and column connection of Louis Kahn's Tribune Review Building (1962) are posttensioned, a process that leaves the stubs of the internal cables exposed at the beam ends. These are usually burned off by a welding torch, resulting in something of an inarticulate mess. The common, crude solution is to provide a pocket in the beam end to be filled with grout. At the Tribune Review Building, Kahn instead filled these pockets with marble blocks. *fig.* 10

"The joint," wrote Kahn, "is the beginning of ornament." These "ornamental" joints in Kahn's work were meant to replicate qualities of traditional architecture:

> I recognized that a capital had to hold its volutes out to invite the span. It had to reach out, receive it, and the receiving of it had to be bigger than what the column was. This was a tremendous realization, and it's no different now in concrete from what it was a long time ago in columns. . . . It's really the celebration of the meeting of material.[18]

Zumthor describes this type of detail:

> Buildings are artificial constructions. They consist of single parts which must be joined together. To a large degree, the quality of the finished object is determined by the quality of the joins.

fig. 10

Column-to-Beam Detail, Tribune Review Building,
Louis Kahn,
Greensburg, Pennsylvania, 1962

In sculpture, there is a tradition which minimizes the expression of joints and joins between the single parts in favor of the overall form. Richard Serra's steel objects, for example, look just as homogeneous and integral as the stone and wood sculptures of the older cultural traditions. Many of the installations and objects by artists of the 1960s and 70s rely on the simplest and most obvious methods of joining and connecting that we know. Beuys, Merz, and others often used loose settings in space, coils, folds, and layers when developing a whole from the individual parts.

The direct, seemingly self-evident way in which these objects are put together is interesting. There is no interruption of the overall impression by small parts which have nothing to do with the object's statement. Our perception of the whole is not distracted by inessential details. Every touch, every join, every joint is there in order to reinforce the idea of the quiet presence of the work.[19]

Of course in Zumthor's work, or in that of any other architect, only a few architectural joints are relevant, as the vast majority are hidden or unarticulated.

There are many architects for whom joints are not just the essence of detail, but the essence of architecture, for the way one understands the parts of a building and their relationships often become a vehicle for expressing larger intentions. The relation of part-to-whole becomes a metaphor for a larger idea, or at least codifies our relationship to a building in ways beyond structural comprehension. Peter Rice, structural engineer for Renzo Piano and Richard Rogers' Pompidou Center (1976), wrote of the design:

Making the joint the essence of the solution expressed concisely the spirit we wanted to convey. Paris, after all, has many marvelous steel structures, from the Art Nouveau entrances of the Metro stations, to the great structures such as the Gare de Lyon, the Eiffel tower or the Grand Palais. Often it is the expressiveness of the jointing which humanizes the structures and gives them their friendly feel. We were part of a noble tradition and said so.[20] *fig.* 11

fig. 11

Truss and Column Joint, Pompidou Center,
Renzo Piano and Richard Rogers,
Paris, France, 1976

Rice's idea, that there is a link between a system of joinery and a political order, has a much older history. For a number of twentieth-century art historians, the comprehension of a building, its parts, and their relationship is the key to that building's meaning, particularly those who subscribe to the idea that the configuration of the parts of a building expresses a worldview. In 1958 H. P. L'Orange described the Roman imperial massive masonry architecture of the Dominate (235–476 CE) in contrast to the Greek orders:

> Individual structural units dissolve and disappear into the total architectural design; they lose their firm inner organization, their vivid proportionality, and the clear articulation of their separate parts . . . the clearly defined form and function of each separate building element

> is no longer felt. Undisturbed by arbitrarily cut elements or a helter-skelter of undigested spolia, the eye glides over the architectural forms, follows the great movements of the masses, the grandiose rise of the vaults and the endless flights of monotonously divided walls. Characteristically abstract, peculiarly far-seeing and therefore summary, the glance skips over detail and articulation in order to rest with mass and dimension.[21]

This change in a style of building was apparently the inevitable result of a change in political and social order:

> The new 'bloc-style' in art emerged contemporary with the formation of massive structures in the state and community, and how in both contexts the traditional individualization and articulation of the various elements were gradually reduced or disappeared altogether. Such a correspondence between the structure of the state and the forms in art would be easy to comprehend if the arts were directed by the state…however, the new language of art forms emerged spontaneously as a result of a profound logical development within art itself.[22]

Despite the profound changes in the science of construction in the last century, the best explanation for many practices in modern joinery is not technical but metaphorical, particularly the kind of metaphor described by L'Orange, and many modern joints have more the qualities of a narrative than a technical expression.

Facing one another across State Street in south Chicago, on the campus of the Illinois Institute of Technology, are Koolhaas's McCormick Tribune Student Center (2003) and one of modernism's most famous details, certainly its best-known corner, that of Mies's Alumni Memorial Hall. The outermost layers of Mies's facade, built of eight-inch brick and steel, stop at the centerlines of the corner column so that the column, or at least its steel facing, is exposed, but only at this one location. *fig.* 12 Koolhaas faced the problem of a similar corner condition, that of joining two aluminum curtain wall mullions at a slightly oblique angle in front of a recessed column, and this is solved in the

fig. 12

Corner, Alumni Memorial Hall at IIT,
Ludwig Mies van der Rohe,
Chicago, Illinois, 1946

fig. 13

Corner, McCormick Tribune Student Center at IIT,
Rem Koolhaas,
Chicago, Illinois, 2003

standard inelegant way, by placing an aluminum plate to complete the corner between the two mullions. *fig.* 13 Technically it presents no problems, but visually it destroys the transparency of the wall and creates a solid larger than the column itself.

No one would suggest, however, that Mies's solution would have worked for Koolhaas. Mies's detail is too resolved, balanced and complete. The essence of the McCormick Center is the ad hoc, collaged character of its details, that many of the parts do not appear to join at all, that they remain fragments. The difference between the joinery of these two buildings is not that Koolhaas's building is not about joints; it is very much about joints, but joints as a means of fragmentation. In Koolhaas's thinking, however, joints should not be "about" anything. A joint is not an idea; it is simply a condition:

> I have always regarded with suspicion the idea that detail is actually based on turning issues into problems. That is, instead of taking a positive attitude to how a wall meets a roof, there is this amazing problem, that a roof is to meet a wall and how are we going to organize that meeting, how are we going to articulate it and how to make an issue of it. It is rooted in a negative image, an assumption that nuances can only be done justice by turning them into problems. With Scarpa as an extreme example. That is why I think that kind of detail is almost always detrimental to the idea, because how the roof meets the wall can never be an idea.... The detailing in the Kunsthal is a mode of detailing that frees the attention for other aspects such as the way the ground is read, the sensing of abstractions, of transparency and translucency, of concrete and of the conditions themselves. The sensing of a whole instead of all that fixation on the joins and the encounters.[23]

Whether fragmented or resolved, the articulated joint has fallen out of favor in recent years. From Los Angeles to Rotterdam, one hears the assertion that the joint, at least in visible form, is dead. According to Monica Ponce de Leon, we have entered the no tolerance, or no gaps, era of construction:

> Given that evolving methods of digital manufacturing are increasingly allowing for greater accuracy in building, we have become interested in revisiting the idea of constructional tolerance. Meaning, is it possible to approximate zero tolerance in the construction of a building today? How does one actually achieve precision, or the image of precision?... Our practice strives to make design of buildings more precise.[24]

Like other technological developments, enthusiasm about the possibility of a jointless architecture has obscured reservations about its necessity or desirability. Yet the proponents of the jointless future are in many cases working with technologies, concrete in particular, that long predate the digital revolution. It is not clear that the technological zeitgeist has led us to the jointless building, but if it has, it is not clear whether it is a manifestation of real technology or a symbolism of technology.

The Questions

Is the articulation of the joint technically necessary? Is the articulation of the joint aesthetically necessary? Is there not an inner contradiction in the definition of detail as joint? How can a building be an expression of the whole if it is designed to articulate its parts? Can the articulation of the construction of a building embody a meaning beyond mere construction? What is the technological and aesthetic future of the modern building—continuity, fragmentation, or neither?

Definition Number 5

The Detail as Autonomous Design

Detailing as a Subversive Activity

Some of the most fascinating details of Kahn's Kimbell Art Museum in Fort Worth, Texas (1972), are its handrails. There are two types: a curved metal rail shaped into an organic form resembling a question mark that leads one up the stairs to the museum from the lobby, *fig.* 14 usually attached to the wall but sometimes freestanding, and an oak rail, also in an organic shape, which is used with wood paneling so that it becomes a kind of surface-mounted sculpture. *fig.* 15 Formally, both seem the antithesis of Kahn's architecture, in which anthropomorphic or organic shapes seem completely out of place. This is not a consistent detail, but the building is better for its inclusion.

This type of detail, however, is much older than Kahn. The door handle of Alvar Aalto's Säynätsalo Town Hall (1952) is neither a clone nor a paradigm of the building that contains it. *fig.* 16 There is nothing in the building that is anything like it in form or material. Why is it then so easily identifiable that we know at a glance that it is Aalto's? Because the form and concept are immediately recognizable as connected to his other work—to his furniture or to his other highly distinctive door handles. Yet within the context of the building, as a detail, it is both autonomous and subversive, a manifestation of another mode of design.

fig. 14

Metal Handrail, Kimbell Art Museum, Louis Kahn,
Fort Worth, Texas, 1972

fig. 15

Wood Handrail, Kimbell Art Museum, Louis Kahn,
Fort Worth, Texas, 1972

fig. 16

Door Handle, Säynätsalo Town Hall, Alvar Aalto,
Säynätsalo, Finland, 1952

If this type of detail lacks a name, a theoretician, or a chief advocate, it has no shortage of practitioners. There are architects for whom details undoubtedly exist, but do not fit any of the four conditions described above. Details that do not relate the part to the whole, that do not establish a visual unity. In this type of detail, parts and assemblies can become autonomous, and detailing constitutes an independent arena of design. The door handle of Morphosis's Kate Mantilini Restaurant in Beverly Hills (1986) is not an organic shape, but it is a subversive detail. *fig.* 17 One of the designers, Thom Mayne, wrote of this type of detail:

> Architecture is understood as a series of intimate engagements, as something experienced haptically, by operating or moving through it, rather than via an intellectual or visual conceptualization. A large amount of our work for a number of years comprised these discrete objects: a door handle that dealt differently with entry and exit, a hand-operated window/door that juxtaposed a large-scale

fig. 17

Door Handle, Kate Mantilini Restaurant, Morphosis, Beverly Hills, California, 1986

> architectural piece with the scale and strength of the human hand.... These fragments afforded us the opportunity to express an intensity that couldn't be captured in the totality of the work. Within a generic building, one could insert moments of singularity.[25]

This type of detail is autonomous detail, disconnected from concept, unrelated to an all-encompassing composition, following its own rules, and seeking its own configurations.

The Questions

Is it possible for architectural details to become autonomous, to follow their own logic and order and not that of the building that contains them? If the systems of the larger design and that of the small are contradictory or mutually exclusive, is this a virtue or a vice? Does not inconsistency lead to incoherence? What is the difference between an autonomous detail and a misplaced or inappropriate detail?

Conclusion

Details are necessary for architectural coherence, even for architectural meaning to be conveyed, but it is more often than not by means other than unity, consistency, or abstraction. The first three definitions—the nondetail, the detail as motif, the detail as an order—are not so much bad definitions of detailing as they are definitions of bad detailing. This does not mean these three types are not worthy of analysis, in part because they include many buildings and their architects who have come to epitomize good detailing, arguably erroneously, and in part because these same architects have not been completely understood, because their details have not been understood.

While the invisible detail, the consistent detail, and the detail as constructional or structural representation are often necessary and, on occasion, highly desirable, the most meaningful types of detail are the last two—the detail as joint and the autonomous detail. The good detail is not the part from which the whole is generated, not the idea of the whole carried into the part, not the consistent application of a set of principles, not the paradigm for the totality of the building, but is rather the last of these definitions. At its best it is an autonomous activity, and, at times, even subversive.

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3 Future Systems, *Unique Building: Lord's Media Centre* (Chichester: Wiley-Academy, 2001), 85.

4 Christian Schittch, "Detail(s): 16 Statements" *Detail* 40, no. 8 (2000), 1437.

5 Marcel Breuer, "Architectural Details," *Architectural Record* 135 (February 1969), 121.

6 Robin Middleton, ed., *Architectural Associations: The Idea of the City* (Cambridge, Mass.: MIT Press, 1996), 200.

7 Augustus Welby Pugin, *The True Principles of Pointed or Christian Architecture* (London: Academy Editions, [1841] 1973), 47–49.

8 Peter Zumthor, *Thinking Architecture* (Baden: Lars Müller, 1998), 16.

9 Kenneth Frampton, *Studies In Tectonic Culture: The Poetics of Construction in Nineteenth and Twentieth Century Architecture* (Cambridge: MIT Press, 1995), 299.

10 Geoffrey Tyack, *The Blue Guide, Cambridge* (London: Black, 1999), 196; H. Webster and P. Howard, *Cambridge: An Architectural Guide* (London: Ellipsis, 2000), 4.76; Peter Davey, "Literary Device: Library, St. Johns College, Cambridge," *The Architectural Review* 194 (April 1994), 34.

11 Wilhelm Worringer, *Form in Gothic* (New York: Schocken, [1911] 1957), 166–67.

12 Fay Jones, *Outside the Pale: The Architecture of Fay Jones* (Fayetteville, Ark.: University of Arkansas Press, 1999), 54, 32.

13 Giuseppe Zambonini, "Process and Theme in the Work of Carlo Scarpa," *Perspecta* 20 (Cambridge, Mass.: MIT, 1983), 26.

14 Peter Smithson, "A Parallel of the Orders," *Architectural Design* 36 (November 1966), 558–59.

15 ___"Camp Mies," *Progressive Architecture* 48 (December 1967), 128–29.

16 Ibid., 129.

17 Ben van Berkel and Caroline Bos, *Mobile Forces* (Berlin: Ernst + Sohn, 1994), 73–74.

18 Richard Wurman, *What Will Be Has Always Been: The Words of Louis I. Kahn* (New York: Rizzoli, 1986), 197.

19 Zumthor, *Thinking Architecture*, 14–16.

20 Peter Rice, *An Engineer Imagines* (London: Artemis, 1994), 26.

21 Hans Peter L'Orange, *Art Form and Civic Life in the Late Roman Empire* (Princeton, N.J.: Princeton University Press, 1965), 13, 15.

22 Ibid., 126.

23 Arie Graafland and Jasper de Haan, "A Conversation with Rem Koolhaas" *The Critical Landscape* (Rotterdam: Publishers, 1997), 229. 010

24 Dora Epstein Jones, Julianna Morais, and Martha Read, *Zago Architecture and Office dA: Two Installations* (Los Angeles: SCI-ARC Press, 2003), 6.

25 Bernard Tschumi and Irene Cheng, *The State of Architecture at the Beginning of the 21st Century* (New York: Monacelli Press, 2003), 41.

2

Chapter 2

Definition Number 1

There Are No Details

Il n'y a pas de détail dans la construction.
—Auguste Perret

The whole and the details are one.
—Le Corbusier

Critics say the detail of [our] projects is simply bad, and I say there is no detail. . . . No money, no details, just concept.
—Rem Koolhaas

In an intricate network, there are no details per se.
—Greg Lynn

There are no details.
—Paul Rudolph

In 1964 *Architectural Record* asked seven leading American practitioners to contribute examples of their "architectural details" to the magazine, accompanied by a short essay. What is striking in retrospect is not the details but what the architects had to say about them, which was almost nothing. Several of the architects were unable to define even crudely what architectural detailing was, and the remainder could only say that it was designing on a small scale. They demonstrated little embarrassment for being so inarticulate. Philip Johnson wrote:

> Can we ever speak meaningfully of details today?... The Robie house of the 1900s is full of beautifully worked out 'details.' The Guggenheim Museum of the 1950s has none, not even a stair rail. Details today are hardly more than enlarged structural connections and corners.[1]

Paul Rudolph was more blunt, saying, "There are no details." And Marcel Breuer said, "details often fuse completely with the greater architectural form to the point that it is difficult to separate them."[2] For Johnson, Rudolph, and Breuer, the concept of detailing as an independent discipline was something they associated with traditional architecture, and *detailing*, sounded very much like *ornamentation*. Details were ornament and ornament was gone.

In 2000 *Detail* magazine undertook a similar survey with slightly more productive results, but, as in 1964, some argued for the absence of detail—not that it did not exist, but that if it did, it should be excluded from the work of architecture. Berkel and Bos of UN Studio spoke of the exclusion of detail and, although they recognized four different types of detail in their analysis, gave primacy to the first, omission: "Details have apparently vanished into a 'black hole.' Architecture itself denies them any viability."[3]

Others, if they did not call for the elimination of detail, called at least for its minimization. Alvaro Siza wrote: "In my experience, the best details are usually those that are not consciously perceived. Ironically, details that are too well designed—on which too much emphasis is laid—can impair the overall appearance of a building. That is why it is important to develop a concept that does not set the detail in the foreground too much."[4]

Particularly among the avant-garde, the idea of detail is currently held in low esteem. Zaha Hadid says that if they are done well, they will go away. Rem Koolhaas is equally blunt in his assessment of details; he wants to eliminate them: "For years we have concentrated on NO-detail. Sometimes we succeed—it's gone, abstracted; sometimes we fail—it's still there. Details should disappear—they are old architecture."[5] Despite similarities of thought between the architects of 1964 and 2000, these are two different concepts of the detail. The architects of the 1960s saw details as superfluous elements, moldings or ornaments that could be disposed of with no adverse technical consequences. The architects of 2000 more realistically saw details as small-scale intermediate elements that might be technically necessary, but whose presence needed to be hidden or minimized to avoid obscuring the greater message, or simply the abstract nature, of the building. Is modern detailing simply the act of elimination? Details in 1964 or 2000 are certainly more than technically obsolete trim. While traditional architecture is full of trim and ornament that is of no functional importance, most of the "details" referred to above are necessary elements that will be noticeable in the completed building unless the architect finds a way to conceal them. Nevertheless complete concealment, even if technically possible, is rarely desired by these advocates of the hidden detail, and in their building there are invariably instances of the detail that is not hidden. This leads to the formation of a first axiom.

Axiom 1

Detailing involves the selective presentation and suppression of information at the service of a larger understanding of the building.

Take for example two windows: the first, on the ground floor of Frank Furness' Robert Lewis House in Philadelphia *fig.* 1 (1889) and the second, a window of one of the Masters' Houses' by Walter Gropius at the Bauhaus Dessau (1926). *fig.* 2 Both solve the fundamental technical problems of a window: supporting the weight of the masonry over the opening, protecting the head of the window from water by throwing it off the face of the wall before it reaches the head, and shedding the accumulated rainwater at the sill. Furness' window, with its arch and sloped sill, solves and articulates all three, exhibiting recognizable parts that do so. The Bauhaus window solves all three, but does not, except for a rather minimal sill, tell us how. The straightforward functionalist might argue that the most articulated window is also the best detailed, but this is not the case.

A building that tries to tell us everything about itself often fails to tell us anything. Piano and Rogers' Pompidou Center (1977) is a conspicuous example. Few aspects of its construction remain unarticulated on the exterior,

fig. 1

Window, Lewis House, Frank Furness,
Philadelphia, Pennsylvania, 1889

fig. 2

Window, Bauhaus Master's House, Walter Gropius,
Dessau, Germany, 1926

and as a result, it tells us little, not because it does not speak, but because so many elements are speaking at once. We see the major structure, the minor services, the mechanical systems, the circulation system, and a great deal more. Each part is separated, each junction is explained, each element individually expressed. The typical window mullion is a double channel with a space between, essentially a split I-section. Each part is articulated by means of separation. The glass barely touches the clasp, the clasp barely touches the mullion, and the mullion barely touches the structural frame. Whether this degree of elaboration is necessary is largely irrelevant, as this individual detail is overwhelmed by the complexity of the facade as a whole.

Every building abstracts some solutions to technical problems into invisibility while revealing others. Certain types of information about the building—its function, environmental performance, structure, construction, and joinery—are either pressed into a geometric simplicity or exaggerated so that the building may be comprehended. In order for this to happen a great deal of information needs to be concealed. Complete suppression is, of course, no more feasible than complete expression. There will always be some unwanted configuration or assembly, hopefully a small one, which cannot be hidden. Thus to say that there are no details is to say that there is no design. Details exist, but they are as much about hiding information as they are about revealing it.

This leaves us with a simple typology of details:

Literal—the articulated detail that solves the problem and demonstrates the solution.

Abstract—the unarticulated or mute detail that solves the problem and does not demonstrate the solution.

Representative—the ornamental detail that is unrelated to the building's construction except in a representational way.

Much of what architects consider to be detailing is the technically complex, but conceptually simple, process of pushing and pulling on the design to make the reality conform to the designer's image—making large things small, making smaller things larger, making certain elements disappear while keeping others from disappearing. In the modern abstract building copings, moldings, windowsills, drip molds, and gutters are often made minimal or invisible. Other elements—joints between panels or between materials—may be exaggerated far beyond their necessary dimensions to ensure they will be read from a distance. The majority of modernist details are, of course, abstract. The only type of detail that may appear as a result of this process is something that we cannot see or are unaware of if we can, something we do not perceive as designed. The procedures are not arbitrary, of course, but are done in the interest of making possible other ways of understanding the building.

Modernism, in all its manifestations, has been remarkably consistent in the types of information it chooses to demonstrate and the types it suppresses. The first type, and most common, we have already encountered in the Bauhaus Master's House window—the suppression of small-scale surface modifications that detract from a minimal, abstract perception of the whole. Gropius and his modernist contemporaries applied the same strategy, and at times the same solutions, to wall bases, wall and ceiling junctions, door frames, and any other type of opening. It is not that modern construction did not require copings, baseboards, and door and window trim. It does, and it has them; they are simply minimized or hidden.

Abstraction's heyday was the International Style architecture of the 1920s, in part in the service of minimal form, in part in service of the minimal imagery associated with that style, but abstraction is not limited to International Style modernism. Kahn sought to abstract details in the service of achieving something like a built ruin, minimizing window frames, copings, and sills, albeit selectively; a real ruin has none of these. These acts of minimization were not without adverse technical consequences. The coping, for Kahn, was a particular problem. The First Unitarian Church in Rochester (1959), the Philips Exeter Academy Library (1972), and the Tribune Review Building (1962) all have had their minimally designed copings replaced, in two cases with far more visually prominent ones, redesigned with the desire to correct the original copings' technical problems regardless of the visual consequences.

Abstraction is just as often selective, mixing literal and abstract details in the service of larger issues. Wright, on first examination, is the most inconsistent of detailers. The technical solution to a problem is sometimes completely hidden and sometimes as didactic and visible as could be imagined. This is typically done to impose a pattern, typically modular, into a building's volume, often the horizontal module of the building. Thus the glazing systems of buildings such as the Unitarian Meeting House in Madison, Wisconsin (1951), are tightly spaced horizontal modules marked by mullions *fig.* 3, sloped at the same angles as the plan to be consistent with the building's geometric motifs. By contrast, there are no vertical mullions; the vertical joints are butted or glazed into notches in the stone. *fig.* 4 The typical wood Usonian wall, used in buildings like the Hanna House in Palo Alto (1936), is similar. Horizontal joints are recessed and rabbeted to mark the horizontal module; the vertical joints are mitered so that they disappear. Wright's use of the abstract detail is limited and done in the service of what he called "nature pattern" throughout his work.

Despite their frequent advocacy of the non-detail, UN Studio's REMU Electrical Substation in Amersfoort, Netherlands (1993), offers conspicuous examples of the nonarticulated and the overarticulated detail. *fig.* 5

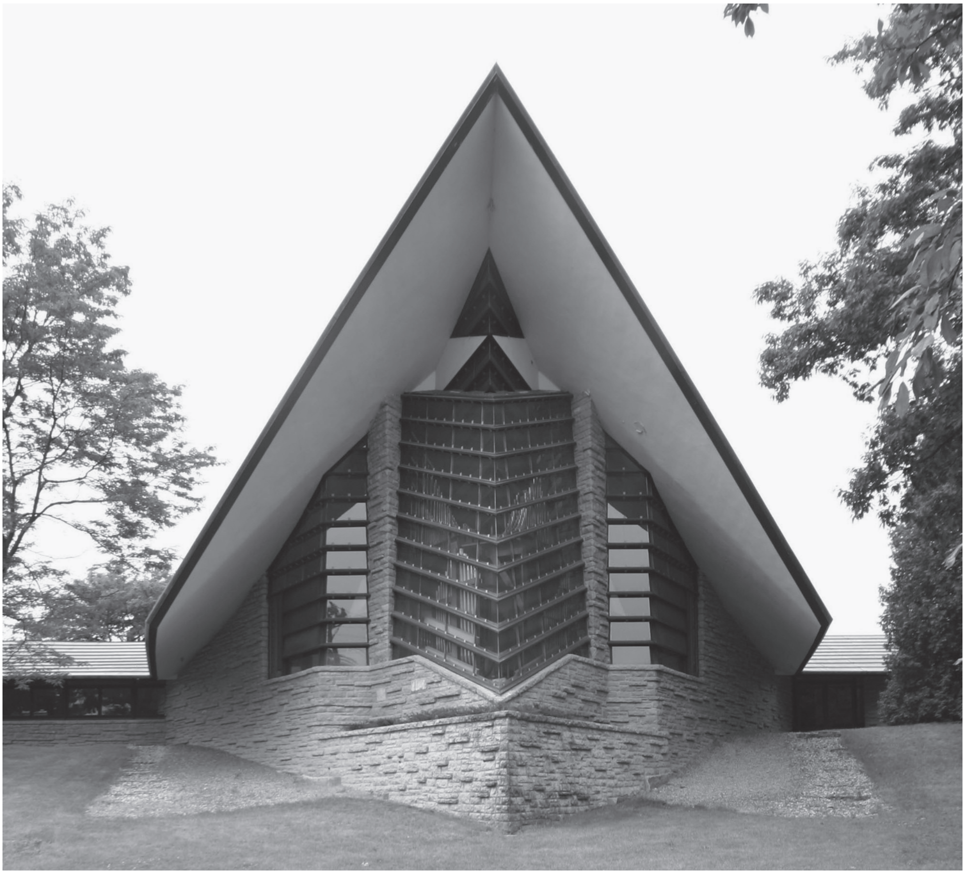


fig. 3

Unitarian Meeting House, Frank Lloyd Wright,
Madison, Wisconsin, 1951

fig. 4

Window Mullions, Unitarian Meeting House,
Frank Lloyd Wright,
Madison, Wisconsin, 1951

fig. 5

REMU Electrical Substation, UN Studio, Amersfoort, Netherlands, 1993

It is a windowless, almost scaleless building, faced with stone and aluminum panels, and the elimination of detail was critical to its architecture. Thus the coping is abstracted into invisibility:

> Instead of being occupied with underlining, emphasizing, paraphrasing, this detail is entirely a matter of excluding; leaving out the edgings along the roof of the REMU electricity station in Amersfoort is such a detail. It is a detail, which consists of an absence, a conscious discarding of a superfluous articulation.... The building, simply a covering for a place where electricity is transformed and stored, is by definition anti-material in both use and appearance. Top-heavy edgings would have anchored the building to the ground, achieving an anachronistic material solidity.[6]

Yet other joints in the building are vastly overdesigned and oversized. The necessary joints between panels of various materials are given an exaggerated emphasis by placing a strip of untreated wood in each. *fig.* 6 The architects wrote, “This detail contains within itself the whole structure of the project,... It is indicative even of the urban situation reflecting a sense of the cross-currents of the building’s surroundings.”[7] They call this a disappearing non-detail, as the wood has been allowed to weather, and presents a less-striking contrast with the facing material, but it is, in fact, the opposite, a joint that has been greatly exaggerated, as a kind of revival of trim.

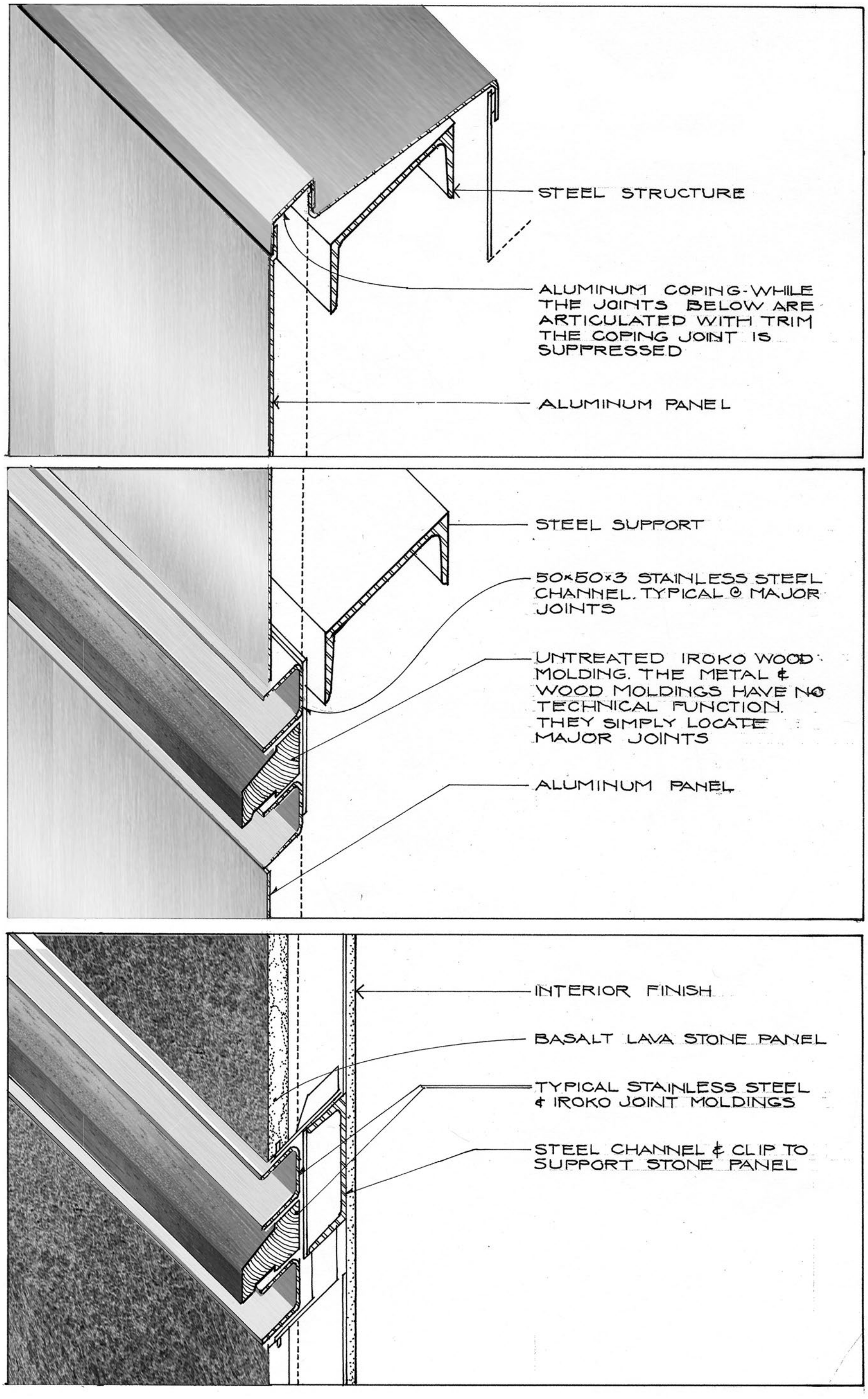


fig. 6

Wall Details, REMU Electrical Substation, UN Studio,
Amersfoort, Netherlands, 1993

Axiom 2

The inclusion or omission of a positive detail is a result of concepts that are both compositional and ideological.

While the motives that would cause one to use an abstract detail are clear, at least visually, the motives, beyond expediency, for using a literal one are not so apparent. Some are purely aesthetic; some are ideologically charged, perhaps none more so than the articulation of joints. The metal panels in Jean Prouvé's Maison du Peuple at Clichy, France (1939), have a shallow curved surface supported by springs to prevent surface warping, and the panel ends are curved back at 90° and pressed against an asphalt-impregnated strip for waterproofing. This makes both panel and joint far more noticeable than they would be if the surfaces were flat, and as a result they dominate the building at the expense of all else. Prouvé's typical joints are a manifestation of an architecture of mass production. He saw repetition and standardization as its essence, and the joints between his components are always pronounced.[8] Those who saw the condition of the modern joint in a technical and non-aesthetic light were all in favor of joints. Like Prouvé, Konrad Wachsmann saw overarticulated joints as the expression of an ideology of construction:

> The joint is not a necessary evil. Accordingly, it does not need to be concealed with seal strips and so on, like an object of shame. It stands out as a formative element.... These joints not only indicate zones of contact but scrupulously define any object they enclose.... In the perfect relationship of object, function and separation, the joint communicates a new visual attitude.[9]

If the joints of the Clichy market are the essence of mass production as a rigid discipline of fabrication, the joints of Norman Foster's Sainsbury Centre for Visual Arts in Norwich, England (1978), are the essence of mass production as a mechanism in the service of consumption. The building was originally clad with ribbed aluminum panels. Five different types were used that were to a degree interchangeable so that glazed and opaque areas could be

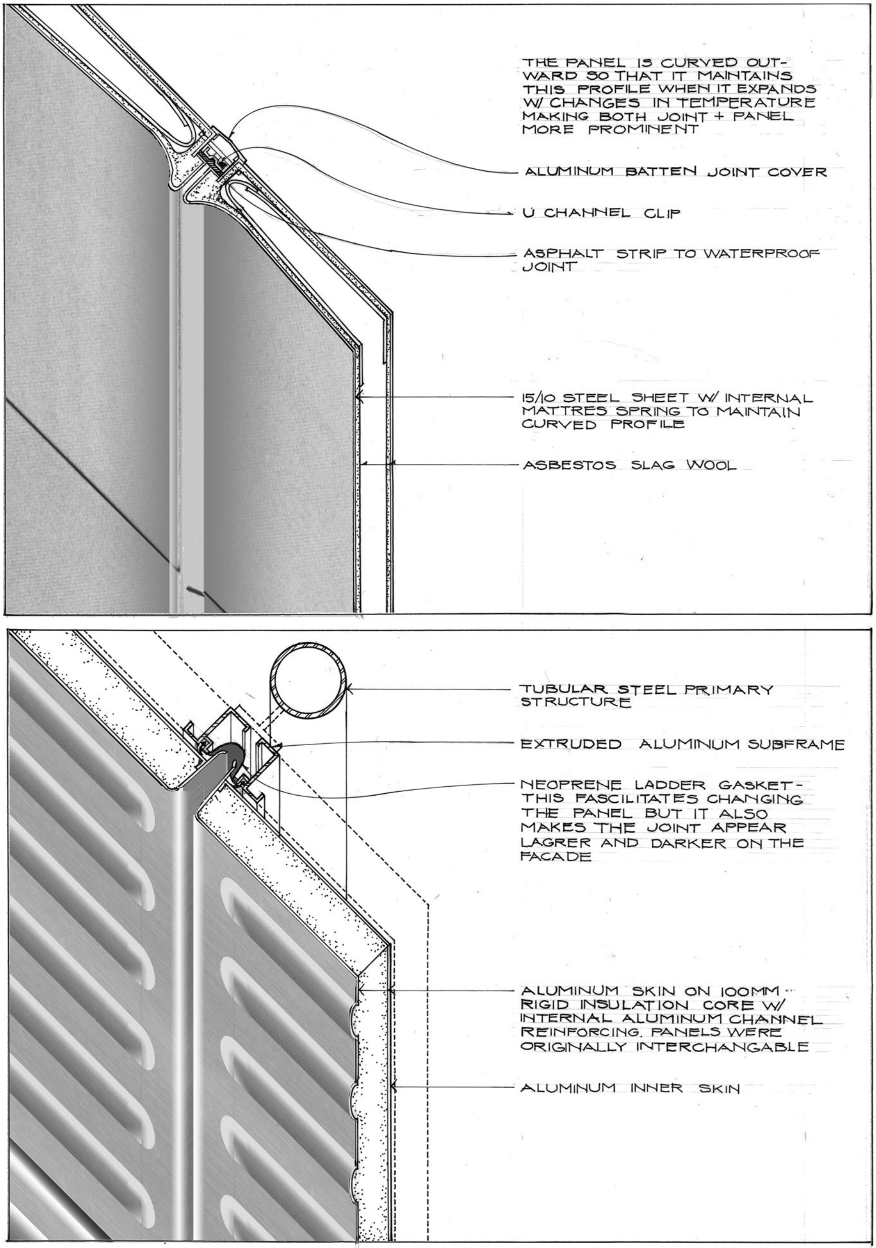


fig. 7

Metal Panel Details
Top
Maison du Peuple, Jean Prouvé,
Clichy, France, 1939
Bottom
Sainsbury Centre for Visual Arts, University of East Anglia, Norman Foster,
Norwich, United Kingdom, 1977

changed as the functions in the large, flexible shed evolved. The panels were hung on a series of triangulated tubular steel frames, and the joints between were made with neoprene gaskets that also serve to collect and draw off rainwater. Both these features made the joints more prominent, because the joints are wider and deeper than a caulked joint and the gasket is black.[10] *fig.* 7

The architectural gasket, or "dry" joint, was the key to this. It is an idea at least as old as Gropius. In order for a building to be mass-produced, it must be assembled easily and quickly, like an automobile. Glues, glazing compounds, and caulking were wet and took too long to set. The prominence of this joint was probably satisfying to the architect, as an overarticulated mark of a larger goal. A true mass-produced architecture would also have to take into account replacement and interchangeability, and the Sainsbury gaskets are a manifestation of a larger idea: an architecture not just of parts, but of interchangeable parts. Sainsbury's dry joints and interchangeable panels also owe something to the Archigram group of the 1960s and their philosophy of joinery, "plug in and clip on." Peter Cook, one of the movement's more prolific members, wrote of Archigram's concept of capsule architecture:

> We are very interested in seeing our projects as consumer objects. The capsule house is very much a shop-bought object, its parts to be traded in and changed, to be juxtaposed almost infinitely. The nature of the "place" will be transient in the definition of its parts.[11]

The Sainsbury joints are even more prominent than those of Clichy, but not because a less prominent joint was not technically possible by 1978. The white walls of Richard Meier's High Museum in Atlanta (1983) are made from porcelain enamel-coated aluminum panels. The edges of an aluminum sheet about 1/16 inch thick are bent back to form a pan about two inches deep. The joint space between two of these panels is caulked flush with the surface. The panels are flat, and while surface irregularities are not eliminated, they are minimized. The result is a slightly irregular, but flat abstract surface in which individual panels are less visible than the pattern they create. Of these three wall types, these joints are the least noticeable, and while technological advances made them possible, the less ideological agenda of the architect made them more desirable.

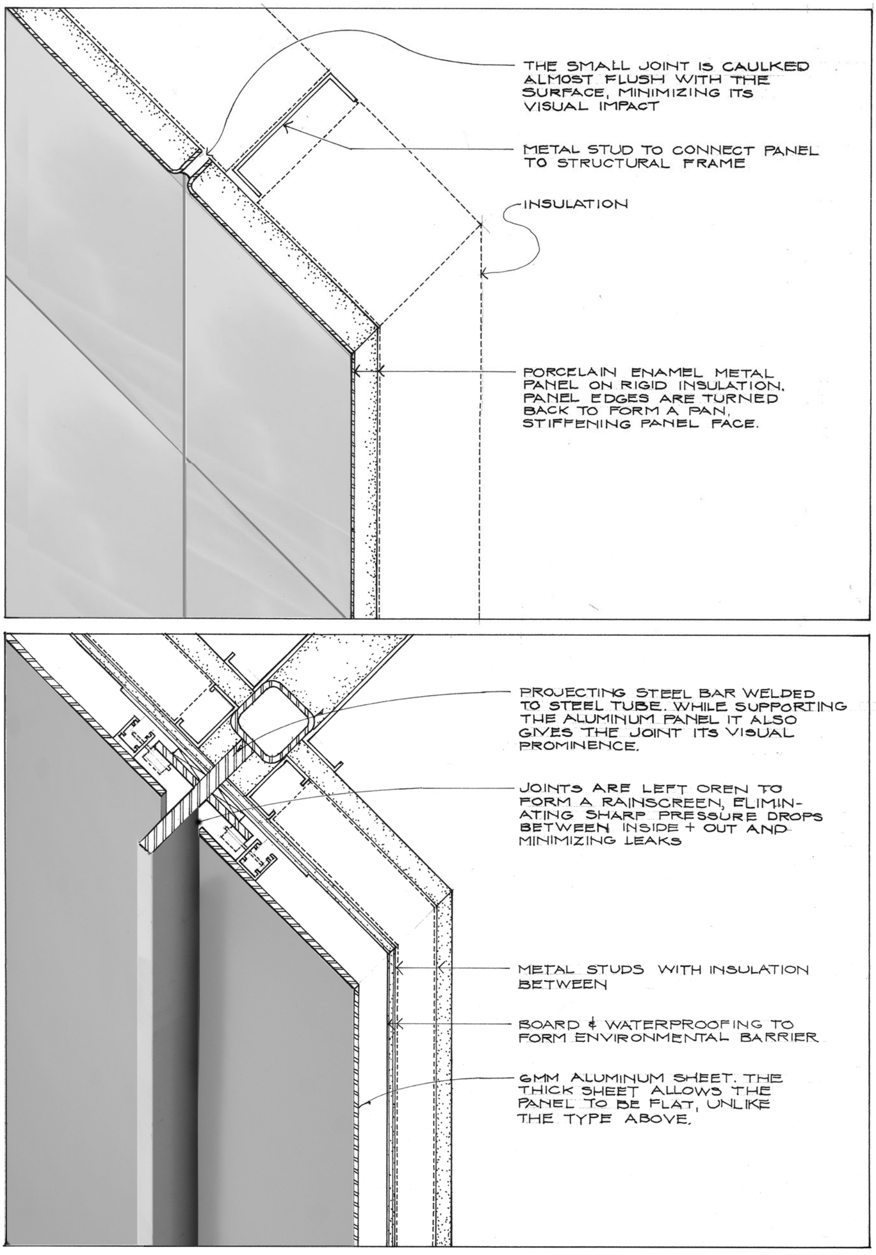


fig. 8

Metal Panel Details

Top

High Museum, Richard Meier,

Atlanta, Georgia, 1983

Bottom

Addition to the High Museum, Renzo Piano,

Atlanta, Georgia, 2005

In 2005 Piano completed an addition to the High Museum. Clad with thick flat aluminum sheets, it has none of the surface irregularities of the old Meier building, despite being the same material and the same color. Piano's joints are made prominent by the inclusion of a 1/2-inch vertical plate with a substantial space on either side. *fig.* 8 This visually eased the transition to the individual skylights at the roof, but Piano deliberately overarticulated the parts as he often does, in the interest of creating what he calls a "hierarchy" of parts, so that the building will visually explain the process of its creation.

Each of these four joints uses a different technology for different functional reasons. Each demonstrates a technological advance over its predecessors, but each is ultimately determined by ideological considerations—the demonstration of hierarchy for Piano, an ideology of mass production for Prouvé, abstraction for Meier, or interchangeability for Foster.

Axiom 3

Consistency of form in detail is neither possible nor desirable. It inevitably leads to the superficial and the stylized.

Another school of non-detail thought is the concept of detail as irrelevant, rather than extinct. Certainly there are details in architecture, but this necessitates neither ornament nor the unarticulated building. Detailing is simply small-scale design—the extension of the larger idea into the smaller element—and details are good or bad insofar as they contribute to or detract from the quality of the totality. Theo Crosby wrote in 1962: "Detailing begins with the first conception and must go purposely from there." Eliot Noyes wrote in 1966: "Details alone...cannot make architecture. Such details must play their part in relation to the overall concept and character of the building, and are the means by which the architect may underline his main idea, reinforce it, echo it, intensify or dramatize it." More recently Meinhard von Gerkan wrote: "Every detail has to be an integral part of the whole."[12] This answer is in a way no different than the idea that there are no details. Detailing therefore has no particular conceptual relevance and requires no additional skills beyond the technical.

That the consistent detail is a close relative of the non-detail is illustrated by the fact that those who advocate the one often advocate the other as well. Four years after her description of certain details as a fetish, Hadid said:

> "The details are indeed a key part! But for me the detailing no longer derives from the central European ideal of details which is still founded in the Viennese tradition. I am more interested in a modern style of detailing, in which it's more about the detail itself than how you join together material like marble, stucco, stone, and brass. Instead of material detailing, it's more a question of the detail as an integral part of the structure that is ideal for the particular purpose. Such details are very important to me.[13]

The most obvious type of consistent detail is one of form. Three years before his statement on detail in *Architectural Record,* Breuer completed the Abbey Church of St. John in Collegeville, Minnesota (1961). The most prominent of what might be called its details are the ecclesiastical furniture—altar, pulpit, chairs, etc. *fig.* 9 These are not "enlarged structural connectors," to use Breuer's phrase, but miniature pieces of concrete or stone structure. All of the furnishings are made of the same materials and given the same finish as the primary structure—stone or concrete. All have tapered profiles, as does the overall structure. In the case of the latter, this is an expression of the structural forces at work. In the case of the furniture, it is mostly styling to unify furniture and architecture. This strategy is understandable. It is arguably successful; the furniture seems to belong, but a nagging question remains: Breuer was one of the great furniture designers of modernism—the creator of the Wassily and Cesca chairs—but few of those skills and none of those techniques are on display here. What if he had taken an alternative strategy to absolute stylistic uniformity and let the design of the ecclesiastical furniture take its own course, independent of the structure and materials of the building? This approach suggests that consistency can be an unnecessary

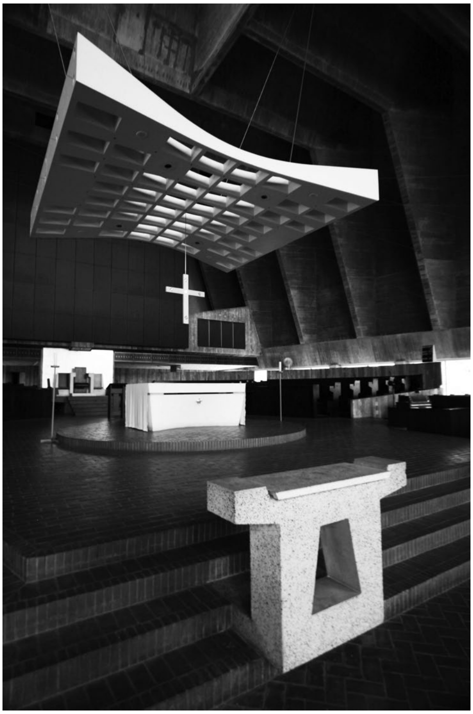


fig. 9

Altar, Abbey Church of St. John, Marcel Breuer, Collegeville, Minnesota, 1961

impediment to a type of design that would be less formally consistent, but conceptually richer.

Santiago Calatrava is another sometimes fanatical practitioner of formal consistency. He wrote in his description of his Stadelhofen Railway Station in Zurich, Switzerland (1984):

> I like very much the purity of a single idea, just as the pure expression of a single note can be a very powerful thing. . . . So, for example, in Stadelhofen, in addition to the reference to the propped head, there is also the idea of the hand—the open hand. This reference is represented throughout the project. It became a leitmotif for the configuration for most of the structural members of the station: the main buttress supports, a small canopy, the pergola. The hand mirrored makes the cross section of the underground. In many places there is a gesture that can be associated with this same geometry.[14]

But, as in the case of his Allen Lambert Galleria in Toronto, Canada (1992), this is a system with more problems than virtues. His details, the lights, rail supports, and other smaller elements, are small-scale models, perhaps paradigms, of the larger system, and this is precisely what is wrong with them; they are not very good furniture as a result. They have the effect of reducing the rational design of the larger building into superficial styling. The use of these elements at the small scale, while not irrational, is certainly unnecessary and certainly not a response to their own individual structural or functional needs.

It is not hard to determine the source of this thinking. It has been with us for some time. Virgil Exner Jr., an automobile designer and the son of one of Chrysler's chief designers, recalls the emerging design philosophy of the late 1920s and early 1930s at General Motors:

> [Automobile design] was dabbling with aerodynamics, and it was dabbling with smooth shapes with flowing, enveloping designs, as far as the body was concerned.... It was the idea of having a continuity of design where each detail, be it a bumper, and that was considered a detail at that time, or a radiator ornament, or a door handle, or any type of a molding, that every piece of ornamentation would look like it was designed to go with the basic body itself as well as every other detail. In other words, a continuity of design elements. Even headlights, for instance, were large details, but they were shaped and ornamented and designed to fit to the body much like the taillight would be. They even looked like they were—one was a smaller version of the other, attached the same way, was sculpted the same way with whatever particular shape it took—a bullet shape or a flat, thin shape looked like it belonged with the sister taillight. Bumpers looked like they were designed to go with their counterparts.... Trunk handles were designed to look like they matched the door handles.[15]

The results of this rigid stylistic consistency are problematic becasue in denying the functional differences between elements, it asserts that there is no relation of function to form. The obvious solution is to seek a consistency of detail derived from an underlying concept and not a superficial similarity of form.

Axiom 4

Consistency of concept may lead to an inconsistency of form, but one that is often beneficial.

The interior lever handle of Le Corbusier's Villa Savoye (1931) lacks a one-to-one formal correspondence with anything in the building itself, which contains no spheres, yet it unquestionably belongs there. *fig.* 10 Le Corbusier, like Gropius, believed the industrial was manifested in the geometric, but also believed the basic solids—cylinder, sphere, cone, cube—appealed to a fundamental human instinct, what he called primary sensation (thus the spheres and cylinders of the handle). This is consistency not of form, but of concept.

Conceptual consistency has perhaps fewer problems than formal consistency, but it is remarkable how many canonical modernist buildings, having established a conceptual consistency of part and whole, are unwilling to complete the process. A building to shake anyone's faith in consistency is Pierre Chareau's Maison de Verre in Paris (1932). The Maison de Verre is of course organized around the idea of light penetrating every possible surface of the building. This is done in a variety of ways with a variety of means—glass block in the walls and perforated metal on certain doors. The linen cabinet casework is made of translucent glass and contains shelves with porous caning so that light may penetrate them for hygienic purposes, just as it penetrates the walls of the building. Yet the building, despite these qualities, succeeds ultimately because of its inconsistencies: because it has a module, but no grid; because the columns and the plan are individually designed with no view toward standardization; and because of the arbitrary variety of machine-like stairs and other elements that are sprinkled throughout the plan.

Consistency, dissonance, and the virtues of the latter are illustrated by Steven Holl's Chapel of St. Ignatius at Seattle University (1997). *fig.* 11 Holl conceived of the chapel as seven "bottles" of light, and some of the chapel's furnishings, such as the slightly irregular blown-glass lights and the bottles to hold oils used in the sacraments, articulate this theme without aping the form of the building. *fig.* 12 It is consistent detailing—details thematically, but not formally aligned with the building that contains them. At the same time there are many

fig. 10

Door Handle, Villa Savoye, Le Corbusier, Poissy, France, 1931

fig. 11

Interior, Chapel of St. Ignatius, Steven Holl, Seattle, Washington, 1997

fig. 12

Sacramental Glass Vessels, Chapel of St. Ignatius,
Steven Holl,
Seattle, Washington, 1997

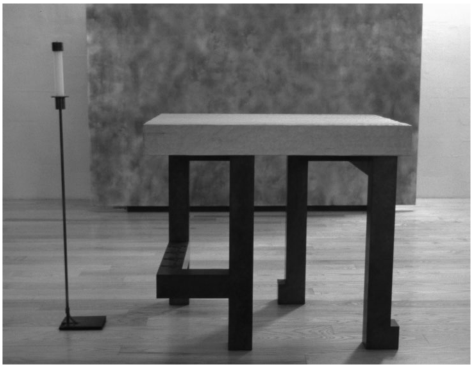


fig. 13

Altars, Chapel of St. Ignatius, Steven Holl,
Seattle, Washington, 1997

other details in the building that do not fit this description—the variety of furnishings, altars, chairs, book and candle holders that define a different language altogether. *fig.* 13 Some of the parts are to the whole as the whole is to the part, but not all. These are autonomous details, a type that we will encounter again.

Axiom 5

Detailing requires the presentation of information in degrees of importance, in hierarchies.

To other architects, the formal minimalism of the non-detail is undesirable, and a secondary level of architecture is acceptable, even necessary, provided its secondary role is made clear. This often involves the articulation of the differences between the structural and the non-structural, typically between a structural frame and a non-structural wall or between a frame and a skin. The language of architecture and the laws of every state make a distinction between that which holds up floors and roofs—structure—and that which is "non-bearing"—internal or external partitions. Structure is subject to fireproofing regulations to which non-structure may not be. These nonstructural elements, however, are still subject to structural forces, particularly wind. The articulation of these differences, especially in a glass wall, forms some of the most extreme examples of hierarchies in modern detailing. While not deceptive in their presentation of information, the same problems are solved in technically different ways to establish the parts of these hierarchies.

Foster's Sainsbury Centre is covered by a steel truss-supported roof that spans thirty meters. *fig.* 14 The two large end openings that result are filled with glass. In theory, and by law, the roof framing is structural, since it takes vertical loads, and in theory, the glass is not, since it resists only the horizontal force of wind. Yet the reality is that the forces at work are not so different. By American standards, the roof must support a load of thirty psf (pounds per square foot). But the glass is hardly without load; again, by American standards, it must sustain a load of twenty psf. But while the load on the glass is only 1/3 less, it appears to have no structural support at all. This is

fig. 14

Glazing at End Wall, Sainsbury Center, Norman Foster, Norwich, UK, 1977

fig. 15

Crown Hall, IIT, Ludwig Mies van der Rohe, Chicago, Illinois, 1956

accomplished by making the support mullions for the glass out of glass themselves. It is immensely clever, visually appealing, but it is a construction whose ultimate purpose is aesthetic clarity—to show that the wall is structurally subordinate to the roof. The detailing strategy is to make the roof read as structure and the glass read as non-structure, or at least as highly secondary structure, making the difference in load between glass wall and roof appear much greater than it is in reality. The elements that resist the lesser forces are not hidden, but are minimized through choice of material and configuration. This building illustrates a solution to a common modernist problem—the long-span structure with the large, nonstructural surface of glass supported by mullions that appear incongruously large for the message being conveyed, that one part of the building is structure and that another, the glazing, is not.

Rather than the simplistic attitude of the advocates of the non-detail, that details are simply expressed or not expressed, these examples illustrate a more realistic attitude toward the problem. There are sets of details that are articulated to varying degrees based on a hierarchy of importance. Most of the glazing systems described above are not so much hiding or suppressing information as they are simply making the window support system visually subordinate to the roof support system. They show us how the problem is solved, but they also show us how critical that problem is in relation to others. Thus a building may have a set of primary, secondary, or even tertiary components, solving similar problems but doing so in a way that demonstrates the magnitude of the problems. Mies, with his dislike of the ambiguous, was the most hierarchical of detailers. The column, mullion, and stop that holds the glass in place of his Crown Hall at IIT (1956) are all identifiable, separate elements of the facade. *fig.* 15 Thus detailing is not just a question of deciding what information to reveal or conceal. It is a question of assigning importance to that information, of placing it in a hierarchy.

It could be argued that the fundamental question of design is how one divides the parts of a building into these hierarchies and how one decides what is assigned to each part. Kahn wrote:

> If you make something, it may be that you have to have two parts, in the making, instead of one part. It's a sense of the form of something, the form of something which has inseparable parts—and these inseparable parts are the elements. That which is different from the other… That is a question of design, you see, whether you make this the same as this….
>
> Elements… must be separated in order to be great, and not be homogenized.[16]

Most of the high-tech architects agree, and as much as they have drawn from non-architectural technologies such as aircraft and automobiles, they have, for the most part, imposed upon them a type of order that is far more hierarchical in nature than those found in cars or planes. Richard Rogers wrote in 1985:

> We design each building so that it can be broken down into elements and sub-elements which are hierarchically organized so as to give clearly legible order. A vocabulary is thereby created in which each element expresses its process of manufacture, storage, erection and demountability; so that, to quote Louis Kahn, "each part clearly and joyfully proclaims it role in the totality. Let me tell you the part I am playing, how I am made and what each part does."[17]

If Kahn and Mies illustrate hierarchical detailing at its most explicit, they are distinguished by the fact that Kahn was perfectly willing to use more than one hierarchy. His Salk Institute in La Jolla, California (1965), like most mature Kahn buildings, has two separate and discreet types of space—the laboratories and the studies. Each has its own structure, its own mechanical system, and its own system of fenestration.

Kahn's approach to the divisions of the hierarchy is programmatic, based on internal function. There are many other types: hierarchies based on context, scale, and constructional history. The greatest value of a hierarchy, however, single or multiple, is that like any system of architectural rules, it can be broken.

Axiom 6

Good detailing, having created hierarchies, will often violate them, and having arrived at a system to consistently present its selective information, will present it in an inconsistent way.

There are buildings whose great virtue is their absence of hierarchy, usually composed of parts that take on as many functional roles as possible to avoid duplication, such as the combined mullion-ventilator-roof drain in the columns of Prouvé's Pavillon du Centenaire de l'Aluminum (1954), now in Villepinte. Likewise a common problem in hierarchical detailing is the opposite, a tendency to overdesign these hierarchies, to overly specialize the components of a building. The result can be rich, as in the multiplicity of windows in Le Corbusier or Kahn's fenestration, but it can also render redundancy and inflexibility. Equally important in these buildings is the hierarchy from which a component is missing, usually because it has been absorbed into another. While detailing may be described as a question of whether and how much to express a certain aspect of a building, the detail that is not expressed does not then become a purely technical issue, for the simple reason that nothing can be more conspicuous than the architectural detail that is visually absent—the window without a frame, the wall without a coping, the joint without a molding and hierarchies are often most apparent when they are missing some of their parts.

The most memorable, most powerful, most outrageous, but often least successful of modernism's unarticulated non-details are those of the Brutalist buildings of the 1950s and 1960s. In simple terms, the objective of these architects was to build a kind of ruin of pure concrete or pure brick with no other materials. Smaller elements, if they could not be eliminated, were made out of the primary material. The desire was to eliminate the middle level of detail—frames, trim, lights, even hardware—thus omitting one of the elements of the hierarchy.

Elimination, of course, has its limits, and the alternative to hiding an element was to elevate it to the scale and mass of the rest of the building. This is the "enlarge or eliminate" strategy in which elements either disappear or become so overdesigned that they become part of the architecture, and the result of the non-detail in Brutalism is often the oversized detail. The glazing of Le Corbusier's late concrete buildings, such as the Carpenter Center in Cambridge, Massachusetts (1964), is a familiar example. *fig.* 16 Operable windows have no glass, being made of wood or metal; fixed glazing has no frames; the glass is set into notches in precast concrete fins. *fig.* 17 Are these fins part of the wall or vastly oversized concrete window frames? The middle level of detail is gone, and with it an element of the hierarchy.

It is no accident that the apogee of Brutalist detailing coincides with the *Architectural Record*'s unsuccessful attempt to solicit philosophies of detail from practitioners. Breuer, who had declared that modern "details fuse

fig. 16

Carpenter Center, Le Corbusier, Cambridge, Massachusetts, 1964

completely in the architectural forms around them," was the most consistent American practitioner of the Brutalist non-detail. An example is the oversized concrete scupper, as in his Library for the Abbey Church of St. John's (1961). The oversized, overweight scupper is one of the more common Brutalist details. Le Corbusier used it in the Maisons Jaoul (1956) and the Chapel of Notre Dame Haut in Ronchamp, France (1955); Stirling and Gowan used it at Ham Common in London (1957); Denys Lasdun built it in precast at Christ's College New Court in Cambridge (1970); and Breuer brought it to America. *fig.* 18 All of these gutters blend with the concrete structures from which they emerge, usually because the concrete is treated in a softer, curvilinear, more sculptural way. One can even think of them as pieces of sculpture, as representations in concrete of gutters of wood or metal. This is a common byproduct of the Brutalist detail, that it results in a sculptural transformation of the architecture.

A Brutalist detail that tests one's faith in both providence and technology is the ladder leading to the roof of Breuer's Church of St. Francis de Sales in Muskegon, Michigan (1966). *fig.* 19 Made of projecting concrete rungs of a rather thin profile, it ascends to a height of ninety feet. Although they appear to be extensions of the cast-in-place wall, they are actually precast inserts. This illustrates another side effect of the Brutalist detail, a kind of Dadaist execution of an element that is usually small, light, and thin out of

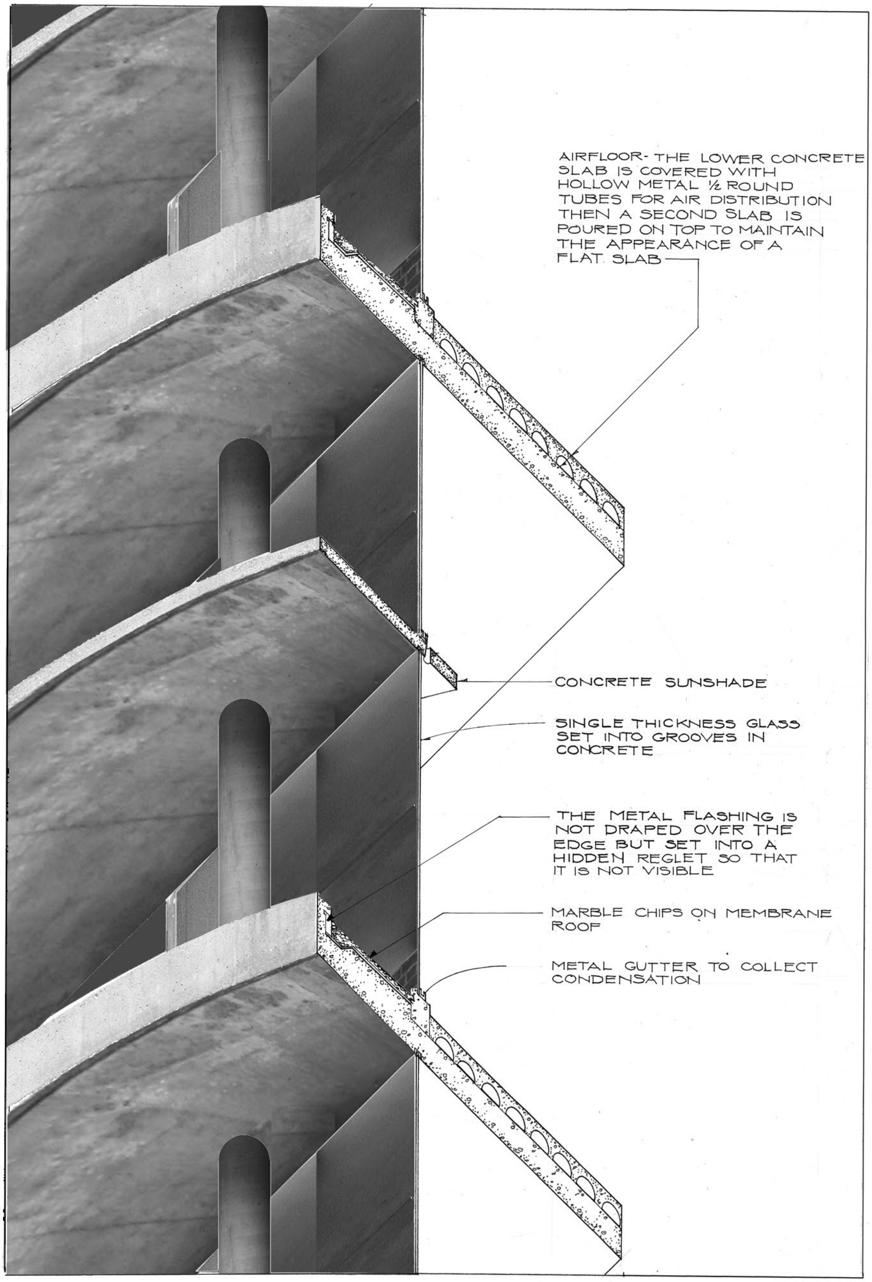
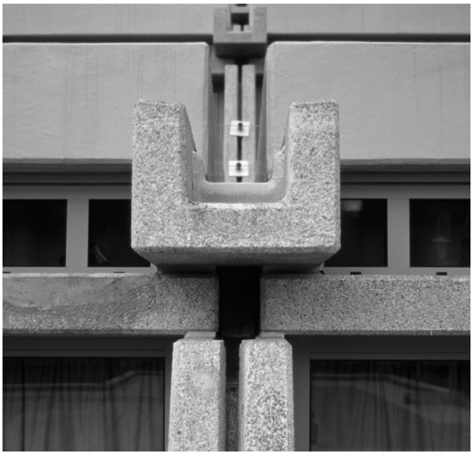


fig. 17

Wall Section, Carpenter Center, Le Corbusier,
Cambridge, Massachusetts, 1964



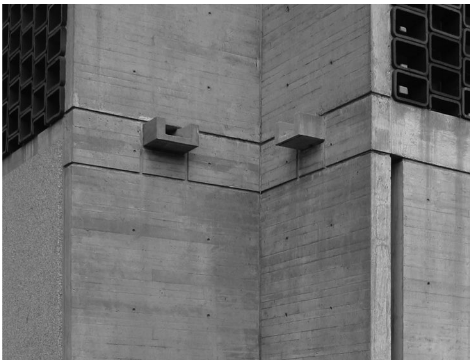


fig. 19

Ladder, Church of St. Francis de Sales, Marcel Breuer, Muskegon, Michigan, 1966

fig. 18

Concrete Scuppers
Top
Le Corbusier, Hostel of Notre Dame du Haut, Ronchamp, France, 1955
Middle
Christ's College New Court, Denys Lasdun, Cambridge, United Kingdom, 1970
Bottom
Library, Abbey Church of St. John's, Marcel Breuer, Collegeville, Minnesota, 1961

a material that is not, usually concrete, and that of course is what is appealing about it, provided one stays on the ground.

It is this type of detail that characterizes some of the best of Brutalism, as in Le Corbusier's Church of Saint-Pierre in Firminy, France, a project from 1961 completed by José Oubrerie in 2006. *fig.* 20 The sanctuary is a hyperbolic paraboloid that transitions from a round opening at the top into a square at its base. Built of concrete and little else, the middle-scale level of detail seems to be largely missing. Window frames, if they exist at all, are minimal; there are no copings, no sills, and few visible elements that could be called trim. An unfurnished church, however, is arguably not a church at all, and although Firminy is not a consecrated church, it contains, for reasons of historical accuracy, all the ecclesiastical paraphernalia of one—altar, pulpit, bishop's chair, and benches—and the architects had to come to terms with the integration of these finer, smaller elements into the minimalist totality. *fig.* 21 The solution is to make the furniture architecture, to build it of concrete so that all are simply assemblies of thin concrete slabs or large simple concrete prisms. Only the pews—built of oak slabs—and the occasional metal handrail break the uniformity of material. The concrete furnishings, like most Brutalist architecture, succeed where they fail, by not becoming one with their container, but not really becoming independent either. They are, rather, freestanding sculptures in concrete.

An equally dramatic, but more dissonant element is the large concrete bar that rings the outer shell, doubling as both gutter and support for interrupted slits that allow minimal light into the interior. Combined with the equally oversized vertical gutter for the high roof that runs down the face of

fig. 20

Church of Saint-Pierre, Le Corbusier, completed by José Oubrerie, 2006, Firminy, France

fig. 21

Church of Saint-Pierre, Le Corbusier, completed by José Oubrerie, 2006, Firminy, France

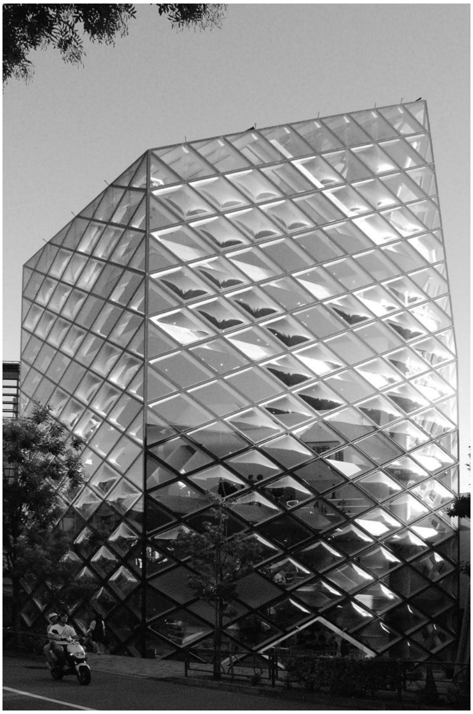


fig. 22

Prada Store, Herzog and de Meuron, Tokyo, Japan, 2003

the shell, they appear to the purist as a finicky intrusion, yet the building is unquestionably better for their inclusion, as they ground the abstraction of the form in the realities of the demands of material and the elements. Ultimately, Firminy is not as much about the non-existence or the elimination of detail as it is about crossed boundaries—the window frame that crosses the boundary into the realm of structure, the concrete structure that crosses into the realm of furniture. The success of Brutalist architecture is, to a large extent, a product of its failures—its inability to reduce everything to simple abstract material volumes. It is a building highly dependent on a certain level and a certain kind of detail—the isolated, discreet, singular element growing out of the basic structure of the building.

The missing elements may not be so conspicuous in the context of a concrete monolith with no window frames. Recent architecture has made challenging the hierarchical division of structural frame and nonstructural curtain wall something of a priority, seeking multifunctional and ambiguous

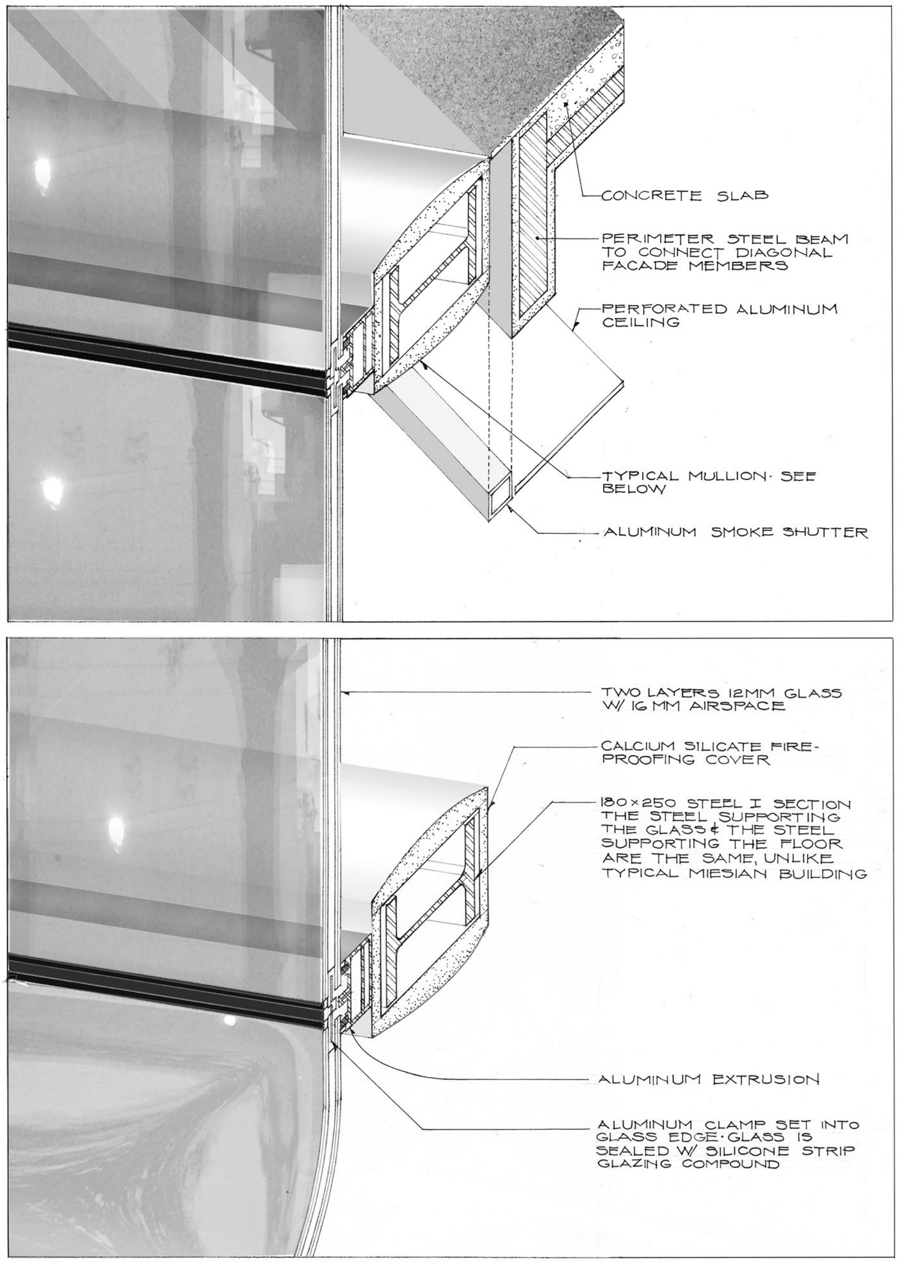


fig. 23

Curtain Wall Details, Prada Store, Herzog and de Meuron,
Tokyo, Japan, 2003
Top
Mullion at Floor
Bottom
Typical Mullion

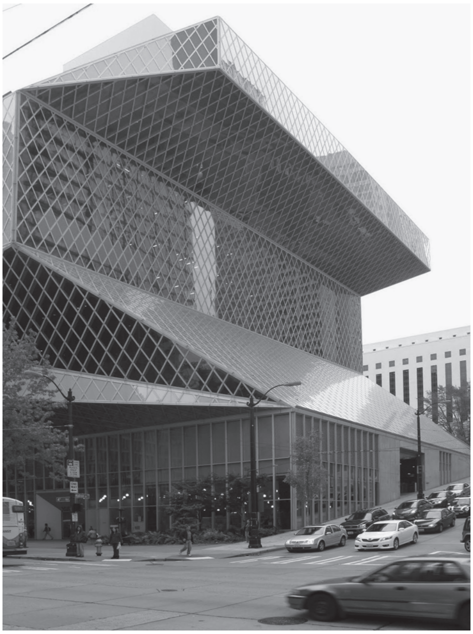


fig. 24

Seattle Public Library, Rem Koolhaas, Seattle, Washington, 2004

combinations of frame and skin. Herzog and de Meuron's Prada Store in Tokyo (2003), although seven stories tall, has no columns of the traditional type. *figs.* 22–23 An exterior lattice of tubes supports both glass and floor edges. Internal support is provided by vertical shafts and horizontal circulation tubes. The transparent, non-structural skin has become structure. "[E]very single visible part of the building (except for the glass) is structure, space and facade all at the same time."[18]

Koolhaas pursued a similar combined system in the structural development of the Seattle Public Library (2004). *fig.* 24 The size of the building and the large variations in the lengths of the spans and the size of the loads made this difficult, but the transparent lattice in this building is also structural, providing lateral bracing to the more conventional structure of the internal volume by means of diagonal struts, connecting the exterior lattice with the inner frame. Unlike Prada, the diagrid members are far more varied, using different glass, support material, and profiles to meet the great variation in conditions. The differences, while not hidden, are usually visually minimized. *fig.* 25

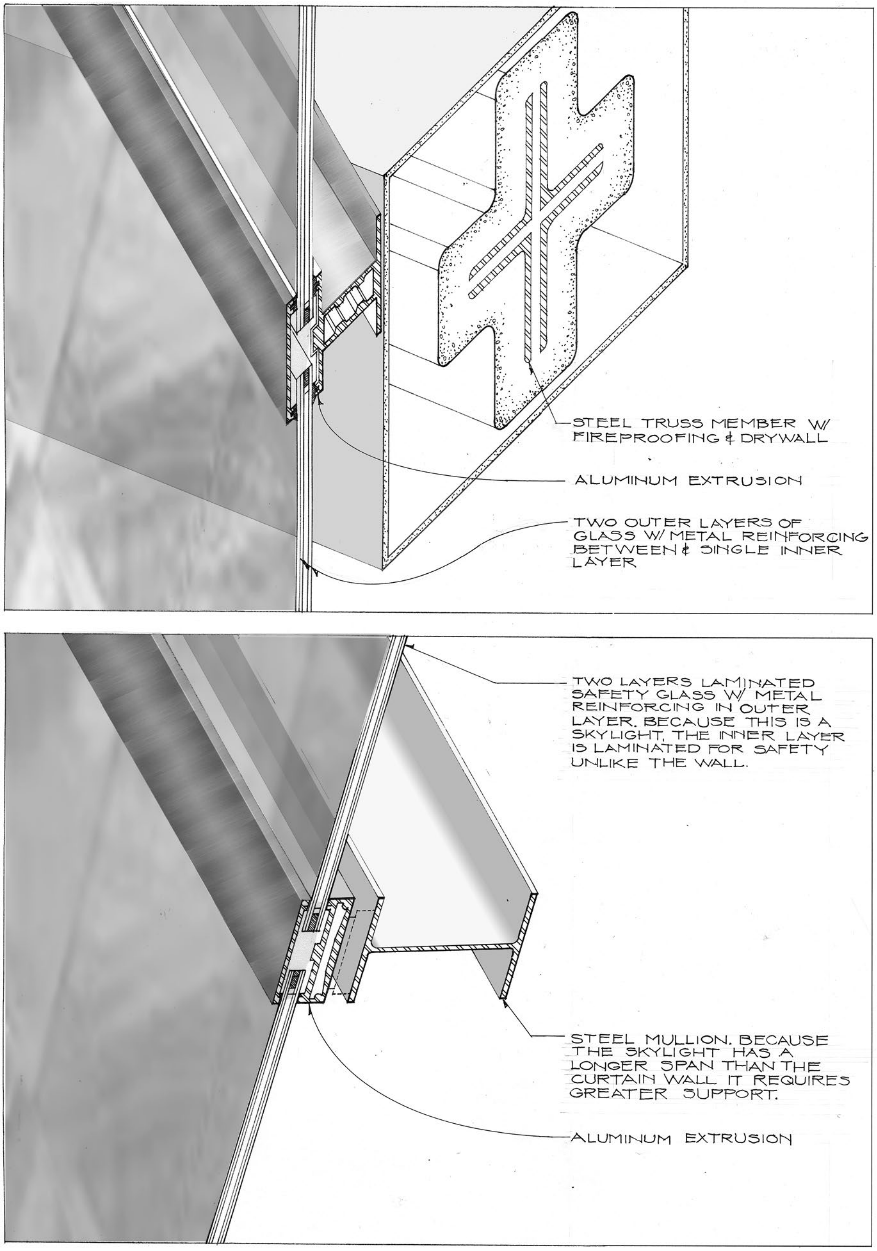


fig. 25

Curtain Wall and Skylight Details, Seattle Public Library, Rem Koolhaas,
Seattle, Washington, 2004
Top
Curtain Wall Mullion
Bottom
Skylight Mullion

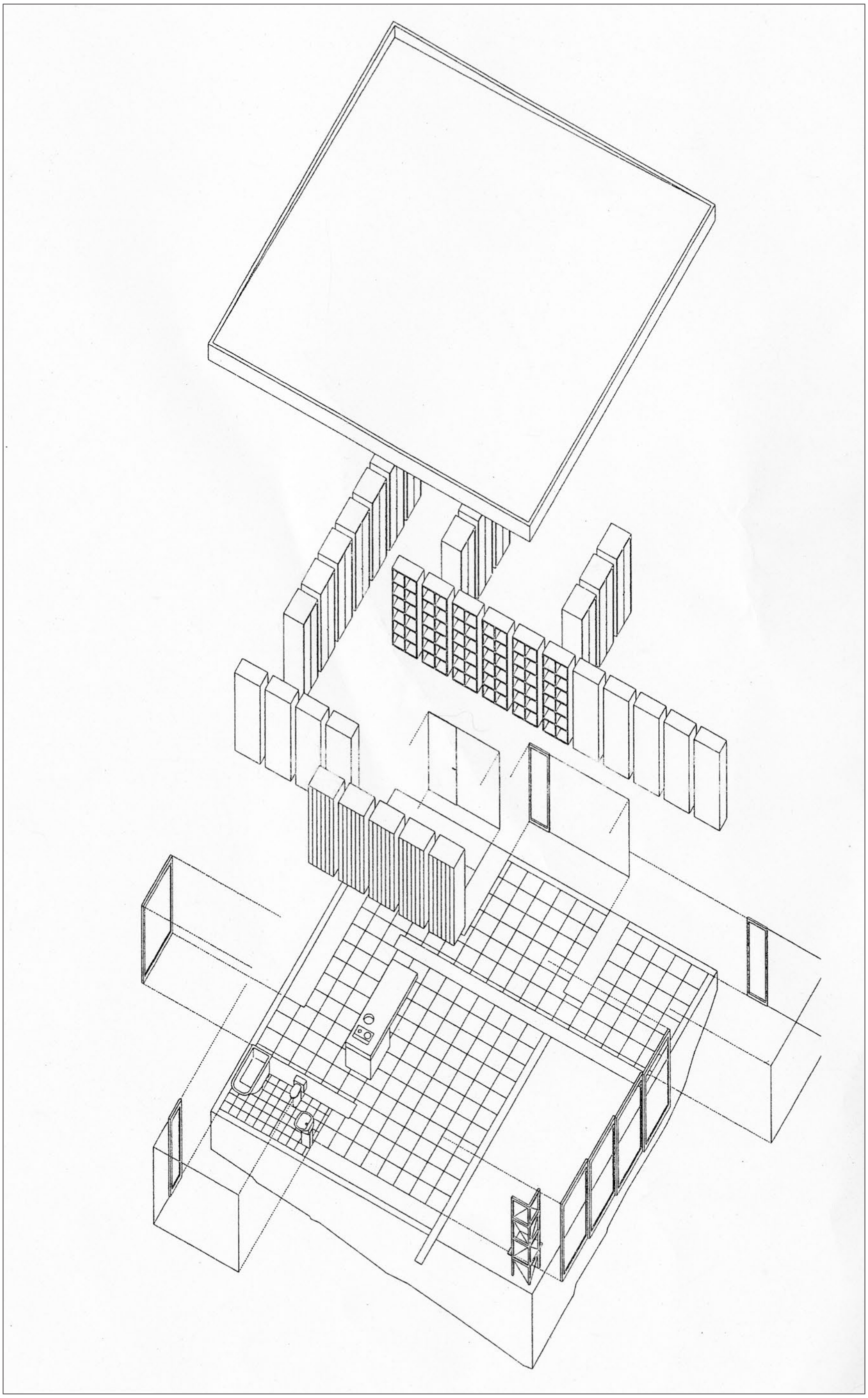


fig. 26

Axonometric, Furniture House 1, Shigeru Ban, Lake Yamanaka, Japan, 1995

Many of Shigeru Ban's houses are the result of a similar operation, combining structural frame and non-structural partition. His early houses were direct descendants of Mies van der Rohe's Pavilion for the Barcelona Exhibition (1929), with clearly separated structural columns and non-structural freestanding cabinets and partitions. At one point in the construction of his Library of a Poet (1991), Ban realized that the furniture could support the roofs without the columns. Thus was born the first of his furniture houses, built at Lake Yamanaka, Japan, in 1995. *fig.* 26 It is spatially the epitome of Mies, but structurally the opposite. If Ban's building is a kind of mannerist commentary on Mies, there is the implication that to understand Ban's work we must understand Mies, not because of something Miesian that is in the building, but because of something Miesian that is not: columns. Modernism, no less than classicism, requires a historical understanding as a precondition for an architectural understanding.[19]

Anti-hierarchy

Hierarchy, which has over time become a staple of high-tech architecture, has fallen out of favor in recent years, not because it proved technologically problematic or because it failed to accomplish its perceptual intentions, but because it has become philosophically unpopular. Much of the current advocacy of the non-hierarchical building is the direct result of the influence of philosopher Gilles Deleuze. Greg Lynn writes:

> Intricacy is the fusion of disparate elements into continuity, the becoming whole of components that retain their status as pieces in a larger composition. Unlike simple hierarchy, subdivision, compartmentalization or modularity, intricacy involves a variation of the parts that is not reducible to the structure of the whole. The term intricacy is intended to move away from this understanding of the architectural detail as an isolated fetishized instance within an otherwise minimal framework. Detail need not be the reduction or concentration of architectural design into a discreet moment. In an intricate network, there are no details per se. Detail is everywhere.[20]

UN Studio writes of what they call "the radical break with a hierarchical design approach":

> All mediation techniques have in common that they abandon the hierarchical way of building up the architectural body, which starts with the ground plan. Not the object itself, but the relationships between the component parts are articulated and defined.

And elsewhere:

> The architecture of hybridization, the fluent merging of constituent parts into an endlessly variable whole, amounts to the organization of continuous difference, resulting in structures that are scale-less, subject to evolution, expansion, inversion, and other contortions and manipulations. Free to assume different identities, architecture becomes endless.[21]

Even if the more recent buildings of UN Studio show a conspicuous absence of detail at the small scale, their ultimate goal is not the elimination of detail but, as stated above, disengagement from its role of constructional and structural explanation, constructional information, in the digital age, being irrelevant:

> Modernism was responsible for making possible an understanding of the outer surface of a building as four or five elevations, rather than the facade-mask. Now we can see beyond elevation to the black hole and white wall system that produces an integral effect, irreducible to a single meaning…
>
> There is no mask to pull off; the skin does not "represent" some rigid presumption about functionalist goings-on behind it; it is what it is, inside and outside.[22]

In their NMR Facilities at the University of Utrecht (2000), the role of the detail was not structural, constructional, or even performance based, but programatic: *fig.* 27

> The organization of the building is in its surfaces. Inside, experiments are conducted with sensitive research equipment emitting Gauss radiation. The clouds of radiation are essentially untouchable space, around which the planes of floor, ceiling and wall surfaces are wrapped. These thin wrappers contain the construction, installations and routing system of the laboratory. Together they form a loosely knotted assembly of smooth planes that flip over from floor to wall to ceiling.... The unusual research technique itself and the molecular structures that it uncovers have strongly influenced the architecture of the laboratory...the radiating powers of the magnets constitute the virtual core of the project, and modify the organization of the building.[23]

The result of this disdain for constructional expression is often a detail that is more stylized than articulated. The parapet, for example, is missing some elements of the standard solution. A typical parapet extends above the roofline to receive the turned up edge of the roofing membrane. The wall is given a cap to discourage water from entering the wall, which slopes back toward the roof so that water runs toward the roof and not down the face of the wall. In the interest of a kind of streamlining, the top of the NMR wall curves downward toward the outer wall face. *fig.* 28 It is not really anti-hierarchical; it is just styling. This might be a new form, but it is not a new language. It is encrusted with the panel joints and form tie holes we associate with the work of Kahn, and its use here in a precast building is difficult to understand.

Contemporary architecture is replete with images borrowed from Brutalist construction reduced to a set of symbols. For the architects highlighted here, and for many of their contemporaries, Brutalist detailing has become by default the language of contemporary modernism. If the contemporary condition is so radically different, it is difficult to understand why it has not produced its own constructional imagery, rather than selecting by default, rather than design, the language of recent history.

But the trend toward non-hierarchy, like many other trends in architecture, might be yet another cyclical process in which the taste for parts or non-parts, or hierarchy or no hierarchy rises and falls. Greg Lynn, the apostle of the non-hierarchical, recently wrote:

fig. 27

NMR Facilities, University of Utrecht, UN Studio,
Utrecht, Netherlands, 2000

Architecture has a disciplinary history and responsibility to express parts-to-whole relationships and hierarchy. At first, because we were amateurs, we didn't express this and instead buildings were proposed as seamless monolithic hulking masses. To ignore the history and richness of assembly is to miss the real impact of calculus.[24]

Conclusion

The contemporary modernist, or rather the contemporary minimalist, wishing to write off detailing as a concept of no great consequence, typically professes one of three beliefs. First is the chaos theory—the notion that attempting to control the plethora of details in modern construction is futile; we should not try. The second alternative is that we should not worry about it; just be consistent and all will be fine. Alternative three, the minimalist school, is that we should eliminate all the articulated details in favor of a building composed completely of mute details, as they are not articulating information of

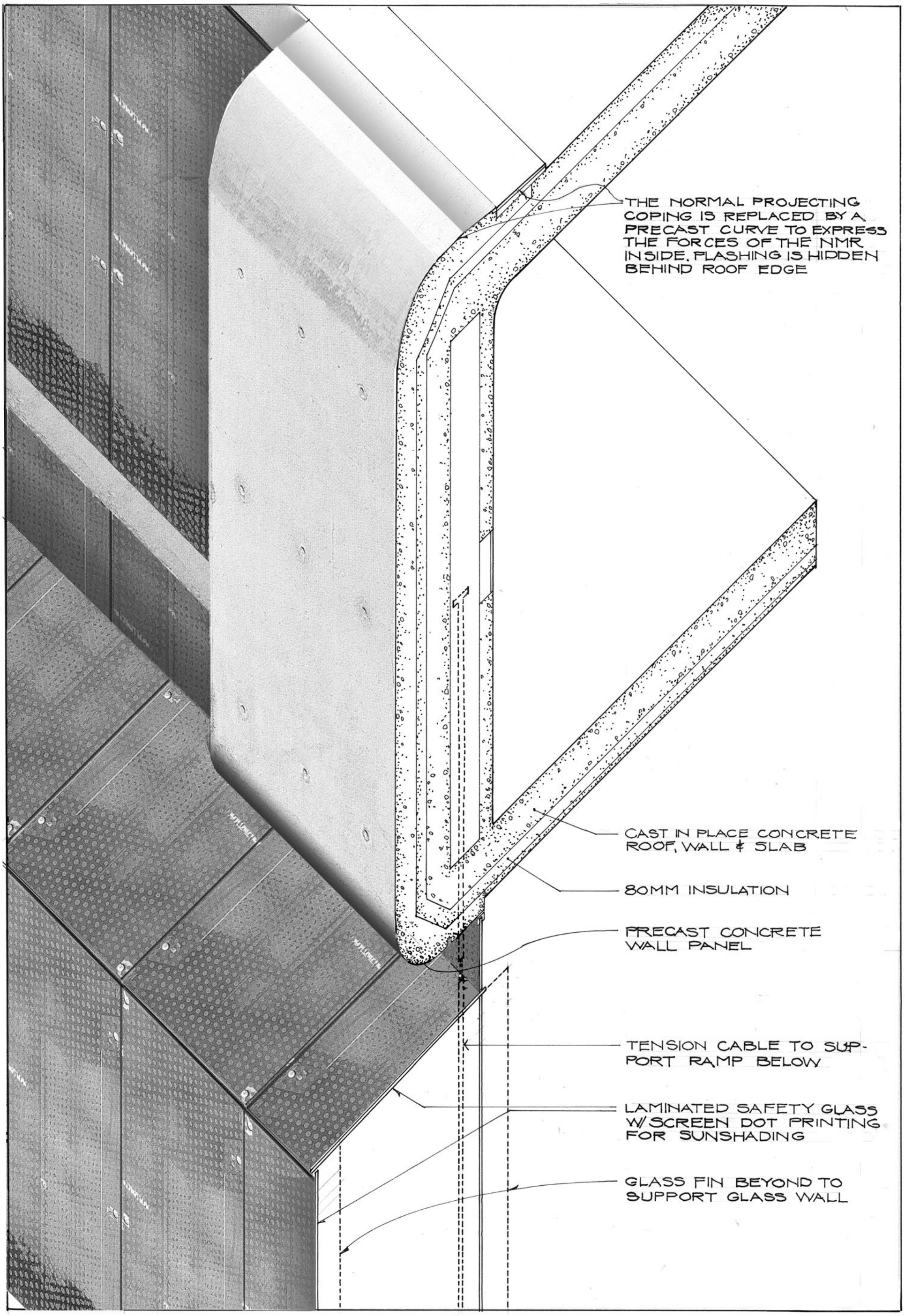


fig. 28

Wall Section, NMR Facilities, University of Utrecht, UN Studio,
Utrecht, Netherlands, 2000

any importance. All three of these, however, are problematic in practice and simplistic in their analysis.

To say it is impossible to control the vast quantities of details that occur in the late modern building is understandable, but one can just as easily argue that poetry is impossible given the plethora of printed text in the modern world. This type of non-detail is merely the bad detail, and we might thus add two categories to the list of detail types—the incompetent and the indifferent. The architect cannot control all details of a building, but the architect must control the important ones.

The consistent detail is, in itself, too simple an answer to these questions. It is inescapable that only certain aspects of the building are to be expressed. What then are they—structural, environmental, the part, the whole, the program, the site? To what degree is a detail part of a hierarchy? The consistent detail cannot exist without the hierarchical detail; it must be expressed at the appropriate level or not at all in relation to all the other details. We inevitably place a detail in its architectural context and in its historical context. Its absence in one building is made evident by its presence in another. Thus it is insufficient to say that details are abstract or literal, unarticulated or articulated; how articulated are they? What is the primary and secondary information? Yet even when these questions are answered, the consistently detailed building often remains the most problematic, the one that is the most stylized, the one that is motific. The information that is the most interesting is hidden, and the architect is unable to respond to the particular nature of a problem.

The third of these options, the non-detail or negative detail, requires, for the most part, the manipulation of the constructional status quo in favor of minimalism, abstraction and simplicity, and the visual elimination of certain aspects of the building in the service of representation. It may be the elimination of unnecessary elements, but more often it is the suppression of necessary ones. It is doubtful that small-scale elements will disappear from construction in the future, even if precise digital fabrication becomes commonplace. Even if a zero-tolerance architecture is possible, problems such as differential thermal expansion or dissimilar materials remain. This rarely happens, in any case. More often than not, the details used by these architects are the residue of older modernist ones used as kind of shorthand for abstraction. The detail-less building rarely if ever exists, by intention. A building may be composed primarily but not entirely of negative details, but the result will be to make the positive details, which can never be completely eliminated, all the more powerful. There is always a selective presentation of information. The non-detail is still at times a detail; its absence conveys a message far stronger than its presence ever could. And while it is true that the articulated detail may separate the building from our abstract perception of it, it may make us conceive of it as a construction that has been assembled, that is composed of parts and not as a unified, singular, and permanent form; this is hardly a condition that can be universally undesirable.

Of the above examples, the most successful are those that are the most imperfect, in which the elimination of detail is not complete, in which consistency of concept is not completely carried through, those that do not completely eliminate the literal detail in favor of the abstract. It seems doubtful that the architects wish to see them eliminated. No one wants a perfect abstraction; some elements must remain that remind us that the building is a structure, a construction, a shelter, although it may go against the grain of the image the design wishes to project.

But the true lovers of architectural detail will not be satisfied by this neat analysis, simply because their favorite details cannot be fit into this typology. They do not belong to any of these descriptions. Even within these few examples, the great details are the ambiguous, the missing, the overdesigned, those that cross boundaries and those that break rules. The architect who rigorously addresses this question achieves results that are often not non-details, but ones of a different type—the sculptural detail, the autonomous detail, or, finally, the subversive detail.

Epigraph. Kate Nesbitt, *Theorizing a New Agenda for Architecture* (New York: Princeton Architectural Press, 1996), 496; Lucien Hervé, *The Architecture of Truth* (New York: Phaedon, 2001), 7; Alejandro Zaera-Polo, "Finding Freedoms: Conversations with Rem Koolhaas," *El Croquis* 53 (1993), 10; Greg Lynn, ed., *Folding in Architecture* (Chichester: Wiley-Academy, 2004), 9; Philip Johnson, "Architectural Details," *Architectural Record* 135 (April 1964), 137.

1 Johnson, "Architectural Details," 137.

2 Marcel Breuer, "Architectural Details," *Architectural Record* 135 (Feb. 1964), 121.

3 Schittch, "Detail(s)," 1437.

4 Ibid., 1438.

5 Middleton, *Architectural Associations: The Idea of the City*, 81; Ed Melet, *The Architectural Detail* (Rotterdam; Nai, 2002), 15.

6 Van Berkel and Bos, *Mobile Forces*, 75.

7 Caroline Bos, "The Waves," *El Croquis* 72 (1995), 99.

8 Christian Sumi, *Immeuble Clarté Genf 1932* (Zürich: ETH, 1989), 57.

9 Konrad Wachsmann, *The Turning Point of Building: Structure and Design* (New York: Reinhold, 1961), 76.

10 The wall failed, but not because of its gaskets. In 1988, ten years after its opening, the entire cladding was replaced, its aluminum panels having deteriorated beyond repair. Ian Lambot, *Norman Foster: Buildings and Projects, Vol. 2* (Hong Kong: Watermark, 1989), 113.

11 Peter Cook et al., *A Guide to Archigram* (London: Academy Editions, 1994), 29.

12 Theo Crosby, "For Students Only: Detail," *Architectural Design* 28 (January 1958), 31.; Eliot Noyes, "Architectural Details," *Architectural Record* 139 (January 1966), 121.; Schittch, "Detail(s)," 1435.

13 "Discussion" *Detail* 1/2 (2006), 9.

14 Cecilia Lewis Kausel and Ann Pendleton-Jullian, eds., *Santiago Calatrava: Conversations with Students, The MIT Lectures* (New York: Princeton Architectural Press, 2002), 93–94.

15 "Automobile in American Life and Society: Automotive Design Oral History Project," interview with Virgil Max Exner Jr., http://www.autolife.umd.umich.edu/Design/Exner_interview.htm.

16 Wurman, *What Will Be Has Always Been*, 78, 86.

17 Charles Jencks, ed., *Theories and Manifestos and Contemporary Architecture* (Chichester: Academy, 1997), 252.

18 Germano Celant, ed., *Prada Aoyama Tokyo: Herzog & de Meuron* (Milan: Fondazione Prada, 2003), 125.

19 Matilda McQuaid, *Shigeru Ban* (London: Phaidon, 2003), 153.; Shigeru Ban, Lecture at the School of Architecture, University of Virginia, April 12, 2005.

20 Lynn, *Folding in Architecture*, 9–10.

21 UN Studio, *Techniques: Move, Vol. 2* (Amsterdam: Architectura & Natura, 1999), 160–61, 84.

22 UN Studio, *Imagination: Move*, vol. 3 (Amsterdam: Architectura & Natura, 1999), 137.

23 Ibid., 106, 109.

24 "Calculus-Based Form: An Interview with Greg Lynn" *Architectural Design* 76 (August 2006), 90.

3

Chapter 3

Definition Number 2

The Details as Motif

A bit of carved stone, the profile of a molding, a few drawn lines, or a single letter from a piece of writing often possesses for the observer the quality of the complete work and can be dated precisely; before these fragments, we have the conviction of insight into the original whole. . . . The feel of the whole is found in the small parts.

—Meyer Schapiro

The same way that the individual type of a living being determines the form of each single part of it, so the principle for the whole structure of the classical building is contained within each single element of it.

—H. P. L'Orange

[Details are] a generalizing particle—a ubiquitous symbol of linkage and connections of parts and pieces. . . . [Detailing is] an intense concern for the smallest of parts—the preoccupation with detail often leads back to a reconsideration of the scheme as a whole. . . . The seed idea can now produce a growth that is integral.

—Fay Jones

Nature furnished the materials for architectural motifs out of which the architectural forms as we know them today have been developed.

—Frank Lloyd Wright

Robert Richardson's biography of Henry David Thoreau points out that in November 1837, Thoreau was studying the geometric similarities between the patterns of ice crystals and the veins of leaves. Thoreau wrote in his journal, "Those ghost leaves [of frost] and the green ones whose forms they assume, were the creatures of the same law."[1] To the contemporary mind, scientist or architect, this seems both odd and superficial. As one interested in the organic nature of the world, should he not have rather been studying the differences between the two materials—an organic and an inorganic one—to look for their particular inner character rather than their superficial similarities? But in fact this attitude was at the time the norm, not the exception. That there is universal geometric structure, even a pattern, to nature was a basic tenet of American Transcendentalism and German Romanticism. Fellow Transcendentalist Ralph Waldo Emerson wrote in his essay "Compensation:" "The universe is represented in every one of its particles. Every thing in nature contains all the powers of nature.... Each new form repeats not only the main character of the type, but part for part all the details.... Each one is an entire emblem of human life."[2]

The source of this idea was Johann Wolfgang von Goethe's epiphany in the Palermo Botanical Garden, his realization that the tree was a large leaf; the leaf was small tree. Emerson wrote in *Representative Men:* "Thus Goethe suggested the leading idea of modern botany, that a leaf, or the eye of a leaf, is the unit of botany, and that every part of the plant is only a transformed leaf to meet a new condition and by varying the conditions a leaf may be converted into any other organ; and, any other organ into a leaf."[3]

Thoreau describes the leaf in similar terms:

> Every where it is nature's business constantly to create new leaves and repeat this type in many materials. [Nature is] a vast manufactory of leaves—the leaf is her constant cipher. It is grass in the field...it flutters on the oak, it springs in the mould on a jar—and in animal, vegetable, and mineral—in fluids and in crystals—plain or variegated—fresh or decayed it acts how large a part in the economy of the universe.[4]

If Goethe and the American Transcendentalists were seeking to find geometric connections between disparate materials, it was not because they were indifferent to what we would today call the nature of material. Goethe also wrote:

> The architect learns the characteristics of his materials, and either allows himself to be controlled by them...or he imposes himself on his material....Sensible harmony...can only be judged within the framework of these conditions.[5]

However paradoxical the idea that the true nature of materials was in fact in their geometric similarities and not their structural differences, it did not take long for it to find its way into architecture, bringing its paradoxical thinking with it.

Given Wright's Transcendentalist background, it is not surprising that his initial methodology of architectural design was analogous to the leaf/tree principle. A single pattern or motif controls both the large scale and the small details of a building. Like Emerson and Thoreau, Wright saw a natural connection between organic and inorganic natural elements:

> Wood is the flowering of a process proceeding from the same principle as the crystal, it is true, subject to the same law as stone but having apparently more volition, going further along the way to some ideal freedom in its acts...because more is left to the individual of any tree species than is given to any mineral and even the mineral species itself.[6]

The sources of Wright's belief in the universal nature of the motif were multiple. Wright said that what he learned from Japanese prints was not literal architectural forms but the concept of the quality the Japanese call *edaburi*, "the formative arrangement of the branches of a tree," precisely what Thoreau was looking for.[7] Owen Jones, another early Wright influence, wrote, "The single example of the Chestnut leaf...contains the whole of the laws which are to be found in Nature....We may see in an assemblage of leaves of the vine or the ivy, that the same laws which prevails in the formation of a single leaf prevails also in the assemblage of leaves." [8] For Wright the architectural motif has a clear analogy to the musical motif, in which he was particularly interested. Authors Roger Friedland and Harold Zellman write, "Wright told apprentices that he heard Beethoven in his head as he designed. 'When you listen to Beethoven,' he told them, 'you are listening to a builder. You are seeing him take a theme, a motif, and building with it.'"[9] But Goethe, Thoreau, and particularly Emerson seem to be the primary source. Wright wrote as early as 1900:

> So slight a thing as a willow wand, for instance, will find fullness of expression as a willow tree . . . with that absolute repose which is of destiny fulfilled. Inevitably, the secret of the acorn is the glory of the oak. The fretted cone arises as the stately pine. . . . We walk in the cool, calm shade of the trees, and they say to us as they said to Emerson long ago, "Why so hot my little man?"[10]

The description of this concept as a "motif" might sound like a pejorative label, but it was the one Wright favored. He wrote in 1908 of his Dana-Thomas House in Springfield, Illinois (1902):

> From one basic idea all the formal elements of design are in each case derived and held together in scale and character . . . Its grammar may be deduced from some simple plant form that has appealed to me, as certain properties in line and form of the sumac were used in the Lawrence [Dana] house at Springfield, but in every case the motif is adhered to throughout.[11]

There are actually several motifs in the Dana house—a pattern abstracted from wisteria is used both literally and abstractly in the planters and windows of the main entry; others include the butterfly, used in the glazed arch opening, and the sumac—used in the frieze, windows, and lamps. *fig.* 1

The use of a unifying motif and theme drawn from nature is hardly unique to Wright. Charles Rennie Mackintosh and M. H. Baillie Scott used plant motifs to generate patterns of decoration, and they are among the

fig. 1

Window, Dana House, Frank Lloyd Wright, Springfield, Illinois, 1902

fig. 2

Eave, Dana House, Frank Lloyd Wright, Springfield, Illinois, 1902

many antecedents of modernist motific detailing, but what distinguished the use of the motif at the Dana house is not only the geometrization of the plant form as a decorative device at the small scale, but its use at the large scale, to affect both the plan and the elevation. The upturned curve of the gable roof, for example, rare in Wright's work, is a reflection of this pattern. *fig.* 2 Wright wrote, "Ornament is to architecture what efflorescence of a tree or plant is to its structure.... the character of structure revealed and enhanced."[12] This exemplified the role Wright saw for detail, the subordination of the part to the totality:

> I believe no one thing in itself is ever so [simple], but must achieve simplicity... as a perfectly realized part of some organic whole. Only as a feature or any part becomes a harmonious element in the harmonious whole does it arrive at the state of simplicity.[13]

The motif's actual connection to material in Wright's work seems tenuous if not non-existent. Insofar as there exists an example of this, Unity Temple in Oak Park, Illinois (1908), is a good one. *fig.* 3 The handles of the double doors of the entry form a complex configuration made from sections of a uniform square size. *fig.* 4 The square is the motif of Unity Temple, the one basic idea with which "all the elements of the design are held together in scale and character." Squares form the plan of the building, the lamps, the skylights, the patterns of the art glass, and the floral capitals of the clerestory piers. *fig.* 5 Wright wrote that he made the plan of the building square for the sake of economic use of concrete formwork, but economy is a less convincing explanation for the use of the cube and the square throughout the rest of the building. Yet the square and the cube were to Wright inherent in the nature of concrete, largely because of the difficulty in casting a form that had greater complexity: *figs.* 6–7

> Unity Temple in Oak Park was entirely cast in wooden boxes, ornamentation and all. The ornament was formed in the mass by taking blocks of wood of various shapes and sizes, combining them with strips of wood, and where wanted, tacking in position inside the faces of the boxes. The ornament partakes therefore of the nature of the whole, belongs to it. So the block and box is characteristic of the forms of this temple. The simple cubical masses are in themselves great concrete blocks.[14]

Wright neglects to mention that the most complex of the ornaments are precast rather than cast in place, but his reasoning remains valid.

It might be assumed that this detailing methodology disappeared from Wright's work in the 1930s as it became more abstract, but although often subdued, it never disappears completely. The later motifs however are of two distinct types: one drawn from plant forms and one from geometry.

One of the most obvious and least successful of the plant-inspired motifs is the Hollyhock pattern of the Aline Barnsdall House in Los Angeles (1921), used principally in the cornice and trim designs. *fig.* 8 It represents the motif at its most obvious, and, in the case of the high-backed chairs, most uncomfortable. *fig.* 9 The plant motif continued in more subtle ways, but later motifs are

fig. 3

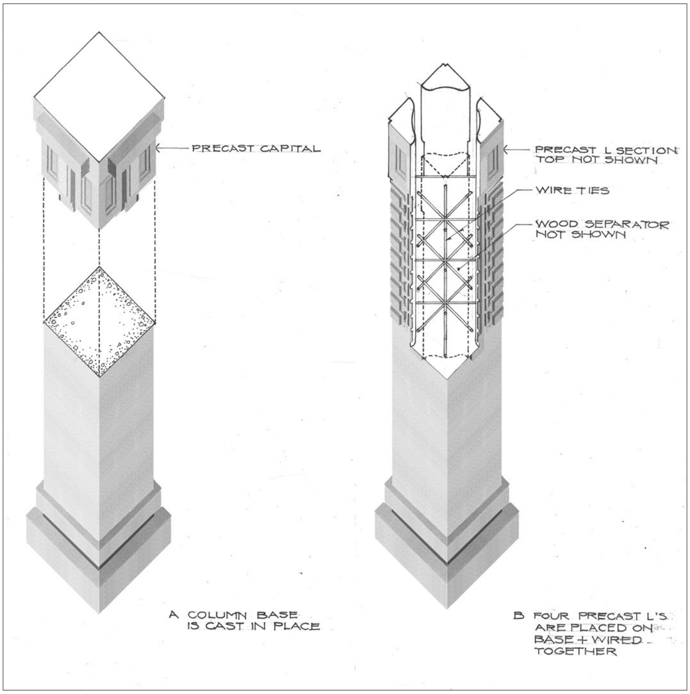
Unity Temple, Frank Lloyd Wright,
Oak Park, Illinois, 1908

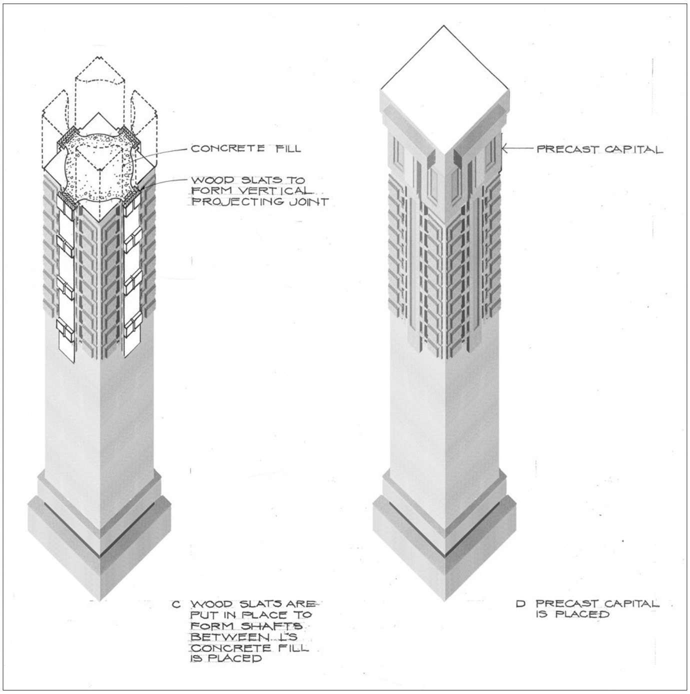
fig. 4

Door Handle, Unity Temple, Frank Lloyd Wright,
Oak Park, Illinois, 1908

fig. 5

Lamp, Unity Temple, Frank Lloyd Wright,
Oak Park, Illinois, 1908





figs. 6–7

Construction Sequences of Precast Columns, Unity Temple, Frank Lloyd Wright, Oak Park, Illinois, 1908

fig. 8

Detail, Barnsdall "Hollyhock" House, Frank Lloyd Wright, Los Angeles, California, 1921

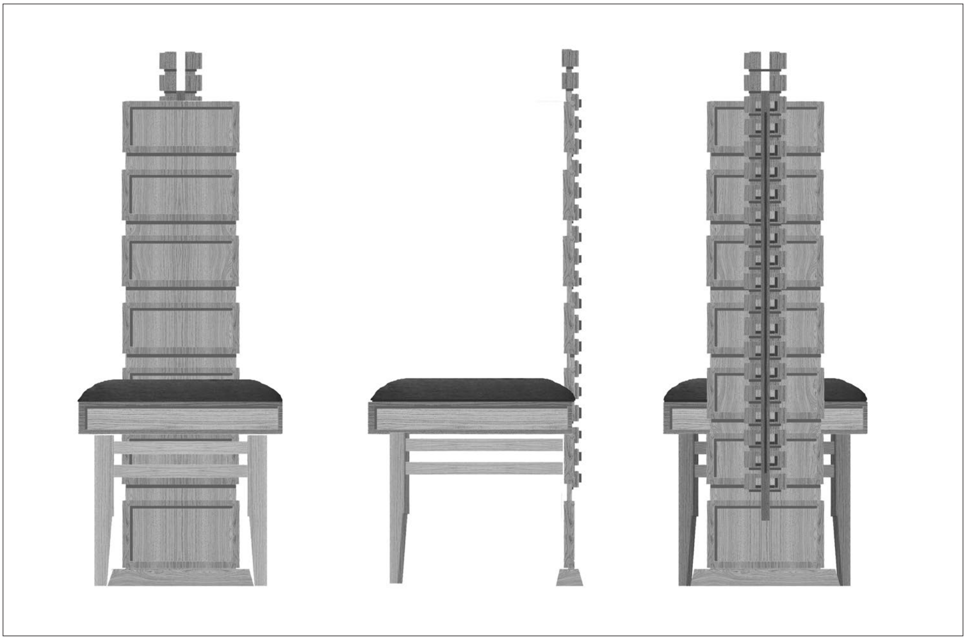


fig. 9

Dining Room Chairs, Barnsdall "Hollyhock" House, Frank Lloyd Wright, Los Angeles, California, 1921

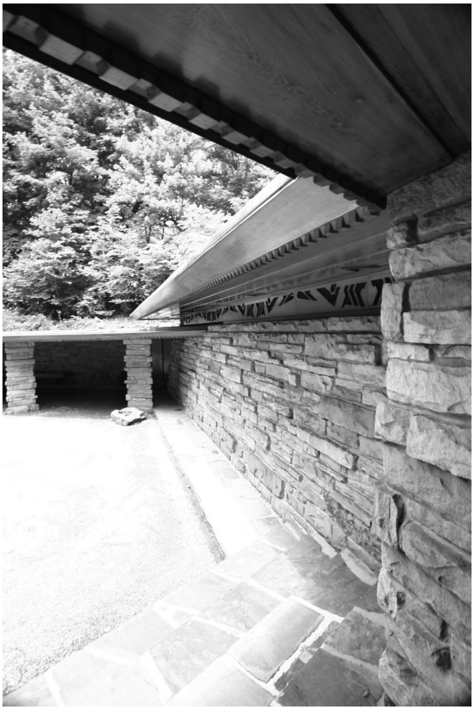


fig. 10

Clerestory Screen, Hagan House, “Kentuck Knob,”
Frank Lloyd Wright,
Ohiopyle, Pennsylvania, 1956

fig. 11

Taliesin West, Frank Lloyd Wright,
Scottsdale, Arizona, begun 1937

fig. 12

Entrance Sign, Taliesin West, Frank Lloyd Wright,
Scottsdale, Arizona, begun 1937

fig. 13

Edgar J. Kaufmann House, “Fallingwater,”
Frank Lloyd Wright,
Bear Run, Pennsylvania, 1935

more often of the geometric type, a direct description of some constructional aspect of the building. A number of Usonian houses of the 1930s and 1940s have clerestory windows formed with boards with repetitive cut-out openings. That of the Hagan House, Kentuck Knob, Pennsylvania (1956), contains within it all of the angles that occur in the plan of the building. *fig.* 10

On one occasion, the motif had historical origins. The dominant motif at Taliesin West in Scottsdale, Arizona (1937), is a kind of spiraling, square J-shape. *fig.* 11 It is an element used in some Japanese prints, but it is also a Native American symbol. When he first saw the site, Wright found a petroglyph of two interlocking Js. This formed the motif of the Taliesin West entrance sign and eventually the letterhead logo of the Taliesin fellowship, but its role is more than decoration. *fig.* 12 The J is also used as structure, at the ends of walls to strengthen their unbraced ends and at the truss ends of the drafting room supports, although here it has no particular structural advantages.[15]

Wright's motifs are often most successful when they are most restrained and least numerous, and while one might assume motifs are absent from the Edgar J. Kaufmann House, "Fallingwater" (1935), it contains several types. *fig.* 13 One is the five-sided shape abstracted from the hanging leaves of the nearby forest, perhaps the Rhododendron, which is seen in the light fixtures within the concrete trellis and the steel supports of the curved cantilevered walkway to the guesthouse.[16] The J motif, formed with a semicircle, puts in an appearance here to make some odd connections. The J hooks to hang pots over the fireplace are identical to the steel supports for the hanging stair. *figs.* 14–15 The circle is another, appearing most prominently in the walkway to the guest house, the moss garden that is split by a window between inside and out, and the spherical kettle of the fireplace, but more commonly as quarter circles in the openings cut in desks for the in-swinging casements and the ends of almost all the metal shelves.

In what way can the forms of Fallingwater be said to grow out of the nature of the materials? If they are not precisely inherent in its materials, they are highly dependent on them. The walls are built with stone quarried on the site, used structurally, as it is in nature, with minimal lintels, and laid in its natural bed. Yet it is in other ways, if not precisely motific, the product of a superimposed geometric pattern. Every third or fourth course is made slightly thinner

fig. 14

Pot Hangers at Fireplace, Edgar J. Kaufmann House, "Fallingwater," Frank Lloyd Wright, Bear Run, Pennsylvania, 1935

fig. 15

J Hook Stair Supports, Edgar J. Kaufmann House, "Fallingwater," Frank Lloyd Wright, Bear Run, Pennsylvania, 1935

fig. 16

Stone Coursing and Pentagonal Lights, Edgar J. Kaufmann House, "Fallingwater," Frank Lloyd Wright, Bear Run, Pennsylvania, 1935 and projects beyond the wall, marking the sixteen-inch horizontal module of the building that is made explicit in the long horizontal window mullions. *fig.* 16

Wright's use of motifs is also more successful in buildings with few if any articulated details. In his Ocotillo Camp (1929) in the desert outside Phoenix, the structure is a nature-based motif: *fig.* 17

> The one-two triangle used in planning the camp is made by the mountain ranges themselves around the site. And the magical one-two triangle is the cross section of the talus at their bases. This triangle is reflected in the general forms of all cabins as well as the general plan. We will paint the canvas eccentric one-two triangles in the gables scarlet. The one-two triangles of the Ocotillo bloom itself are scarlet. This red triangular form in the whole plan and treatment is why we called the camp "Ocotillo": "Candle flame."[17]

fig. 17

Ocotillo Camp, Frank Lloyd Wright,
Scottsdale, Arizona, 1929

Despite the prevalence of the triangular motif, it did not determine the form of the plan. It occurred frequently in section, but is primarily a means of styling the smaller elements. Built of wood and canvas, the complex has few elements that could be called details. Lacking the small-scale elements, it also lacks the small-scale motifs that often make this strategy superficial.

The process of motific detailing was fundamentally altered, however, when Wright began to depart from rectilinear geometries. When the motifs became hexagons and triangles, there was the danger that they would lose their recognizable qualities as motifs and simply become geometry. The handle of the screen door on the terrace of Wright's Hanna House (1936), although a simple pull, contains within it the geometry of the house. *figs.* 18–19 As the Sumac motif is for the Dana House, the hexagon is the motif of the Hanna and governs every aspect of its design. The plan is a hexagon—or honeycomb, as Wright called it—and the corners of the house in plan or section, large or small, brick or wood, are never 90º angles, but rather 30º, 60º, or 120º, all three of which occur in this simple pull—in its profile and in the slope of the top and bottom. *figs.* 20–21 The walls are perpendicular, but the fascia and its trim are sloped at 15º.

fig. 18

Detail, Hanna House, Frank Lloyd Wright, Palo Alto, California, 1936

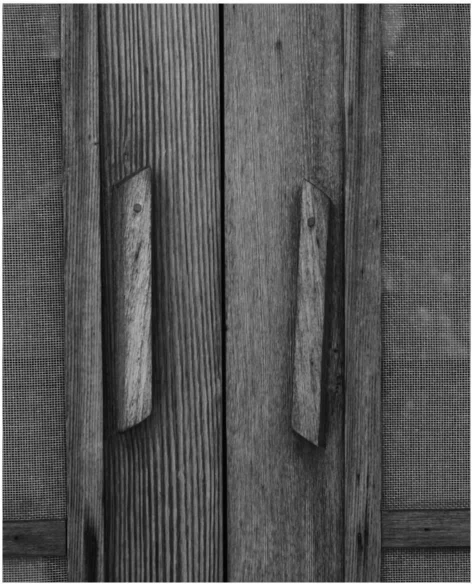


fig. 19

Door Handle, Hanna House, Frank Lloyd Wright, Palo Alto, California, 1936

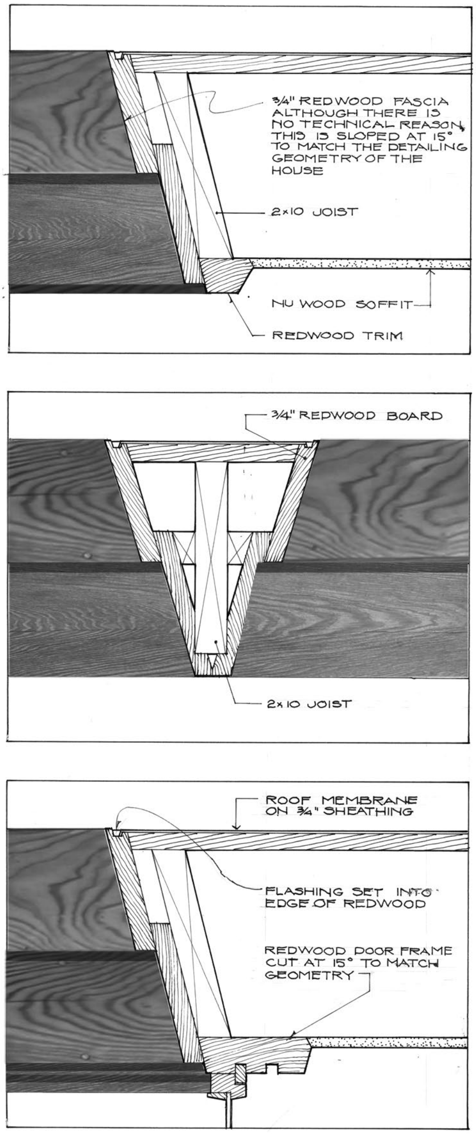


fig. 20

Roof Details, Hanna House, Frank Lloyd Wright, Palo Alto, California, 1936

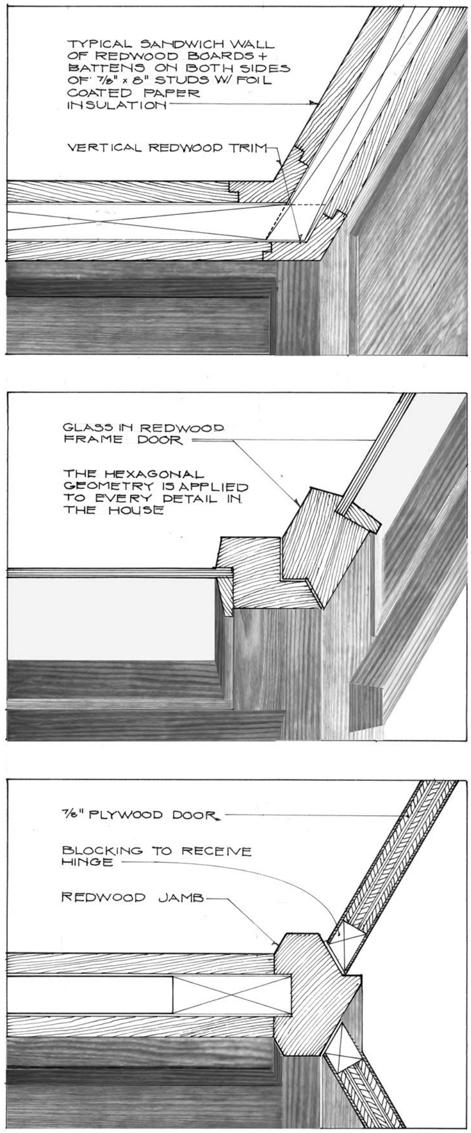


fig. 21

Corner Details, Hanna House, Frank Lloyd Wright, Palo Alto, California, 1936

The use of the hexagon in the Hanna House is not quite the same as the use of the square in Unity Temple. At the latter, the square is always a recognizable figure. At Hanna, there are many places where one sees the 30/60° geometry with no hexagon in sight. It has ceased to be a motif or figure and has become simply a controlling geometry; the results descend all too easily into styling.

The motif, subdued in Wright's work of the 1930s and 1940s, returned with a vengeance in his work of the 1950s, predominately the double circle that became the universal solution to every task, decorative or functional. It is difficult to agree with Philip Johnson that the Guggenheim Museum in New York (1959) has no details if one understands detail as Wright did. The double circle motif serves as a pattern for the floor plan, the fountain at the base of the ramp, the window mullions and terrazzo paving, and even the gate to the truck dock. At the Marin County Administration Building in California (1957), the circle, single or double, is inescapable, pervading every aspect of the building from the site plan to the window mullions.

It has been a popular assessment of Wright's work that its motific aspect, e.g., its decoration, was a flawed, nineteenth-century leftover in the purity of its abstract, spatial, and constructive qualities, and that in the late work in particular the motific aspect supersedes all the others, to the detriment of the buildings. But if the motifs, so critical to his thinking, were removed, would it be Wright's architecture that then remained? I think in many cases the answer would be yes, but the motific aspects are not without their successful moments. Using the above examples, one may divide Wright's motific details into two strategies. In Unity Temple and the V. C. Morris Gift Shop in San Francisco (1948), *fig.* 22 it is primary: the square and the circle respectively determine plan, section, and the smallest detail. In Taliesin West and Fallingwater, the motifs, the Js or circles, while present, are not dominant. If anything, they are a leitmotif within a framework to which they are unrelated, and the buildings are better for it. Yet if the motif is the exception rather than the rule, if it is not universal, what it gains in effectiveness it loses in legitimacy in denying the theoretical underpinnings of its role.

Given the influence of Wright, it is not surprising to find the motific strategy cropping up at the end of the twentieth century. Fay Jones was a student of Bruce Goff, another motific detailer, before he apprenticed under

Wright. He is the best of the design progeny of Wright's late career, but if he came a great distance, he brought a great deal of Wright with him. Rather than motif, he referred to the "generating idea":

> Organic architecture has a central generating idea; as in most organisms every part and every piece has a relationship. Each should benefit the other; there should be a family of form, of pattern. You should feel the relationship to the parts and to the whole.
>
> [The] generating idea establishes essential characteristics, essence, nucleus, core; a seed that grows and generates the complete design—it manifests itself from the larger elements down to the minutest subdivision of detail.[18]

fig. 22

V. C. Morris Gift Shop, Frank Lloyd Wright, San Francisco, California, 1948

fig. 23

Thorncrown Chapel, Fay Jones, Eureka Springs, Arkansas, 1980

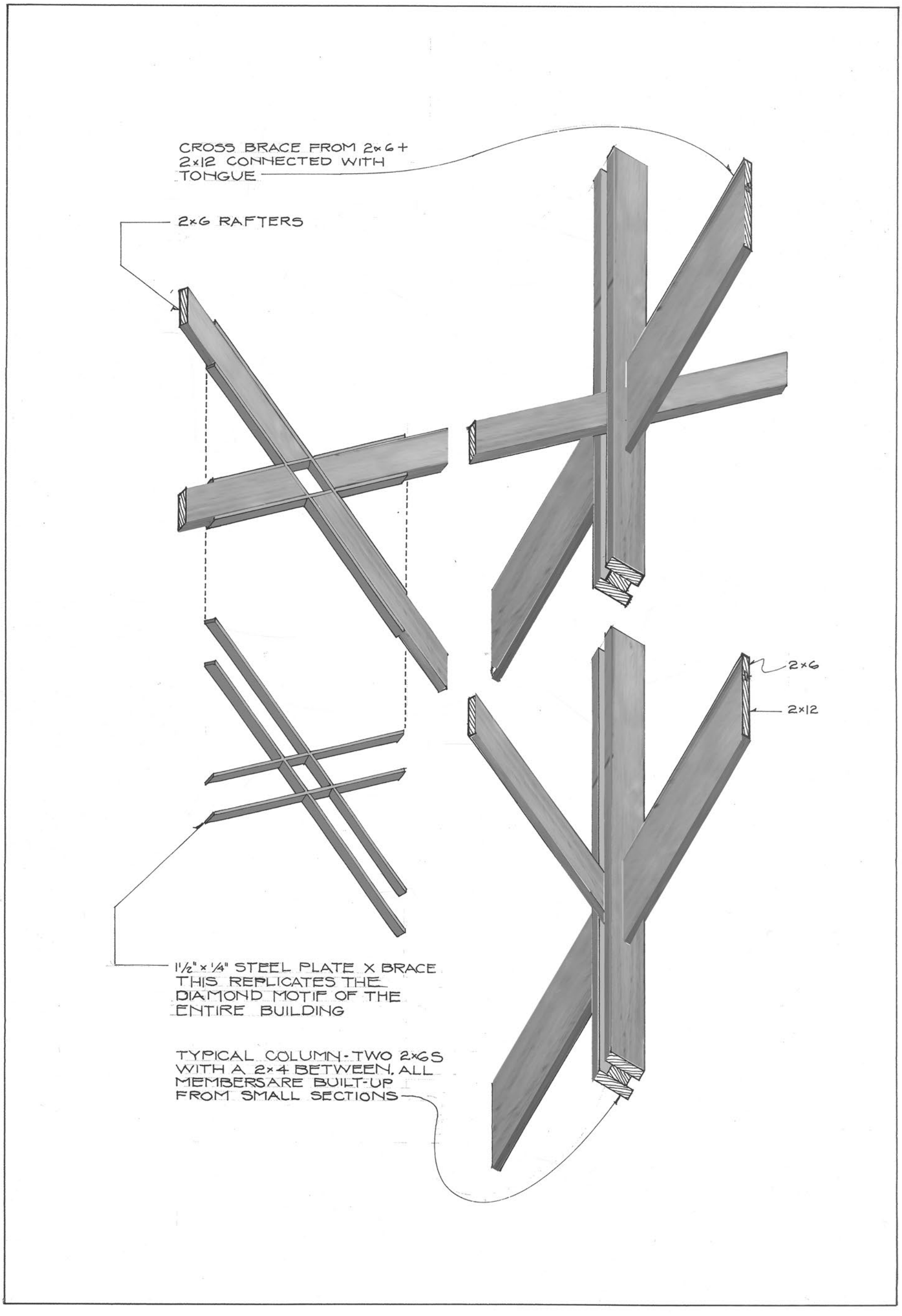


fig. 24

Partial Structural Frame, Thorncrown Chapel, Fay Jones,
Eureka Springs, Arkansas, 1980

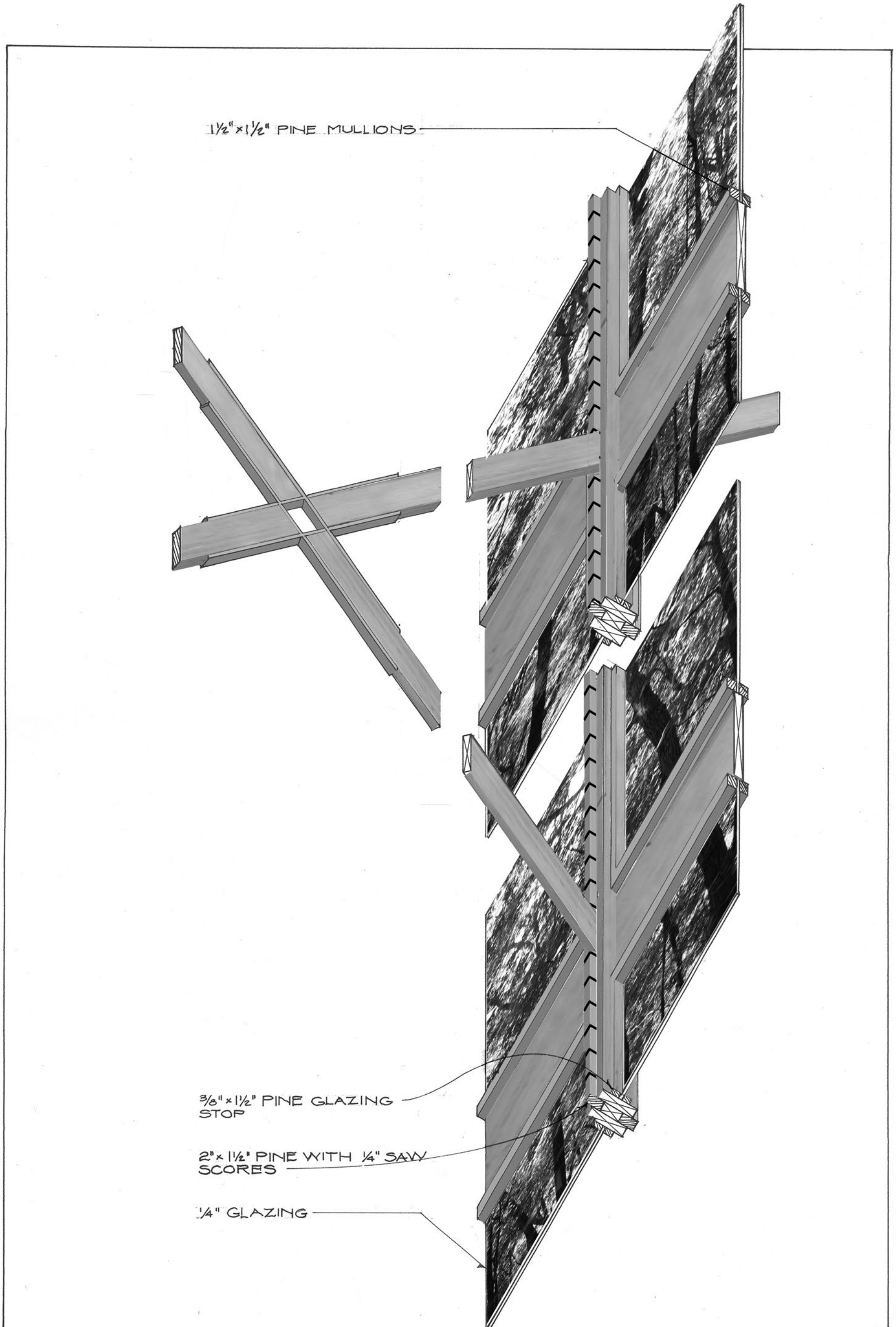


fig. 25

Partial Structural Frame with Finishes, Thorncrown Chapel, Fay Jones, Eureka Springs, Arkansas, 1980

fig. 26

Seat, Thorncrown Chapel, Fay Jones, Eureka Springs, Arkansas, 1980

fig. 27

Door Handle, Thorncrown Chapel, Fay Jones, Eureka Springs, Arkansas, 1980

Jones' cellular analogy is seen at its best at the Thorncrown Chapel in Eureka Springs, Arkansas (1980). *fig.* 23 In order to minimize disturbance to the forested site, no structural member is larger than what two men could carry, making the basic unit, the cell, 2x4s and the 2x6s that, when multiplied, make up almost all of the major column and truss members. *figs.* 24–25

If Thorncrown is Jones' best work, it is certainly due to its economy, in every sense of the word, which is one reason that its motifs are subdued, albeit plentiful. The pattern of flat rhomboids of the door handle of the Thorncrown replicates almost exactly the design of the interior wood truss, and the rhomboid occurs in both the window mullions and in the high-backed chairs behind the altar. *figs.* 26–27 More critically it is the primary joint of the building, as a steel rhomboid connector used at the intersection of the truss

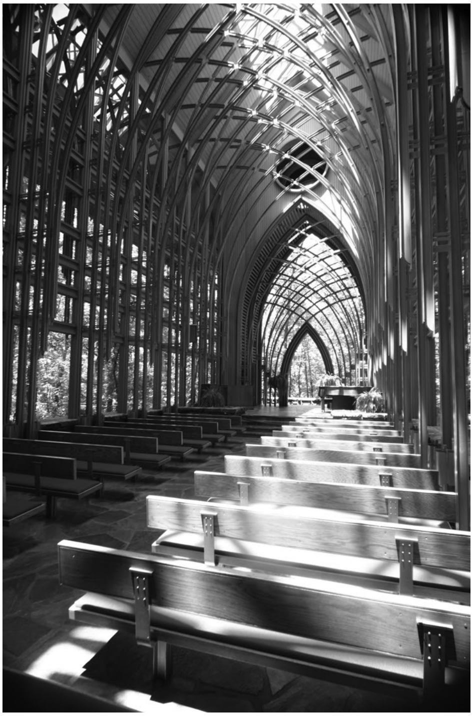


fig. 28

Mildred B. Cooper Memorial Chapel, Fay Jones, Bella Vista, Arkansas, 1987

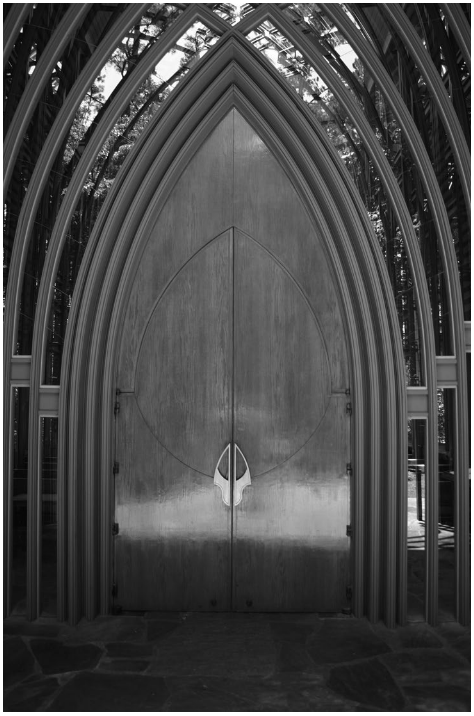


fig. 29

Handle, Mildred B. Cooper Memorial Chapel, Fay Jones, Bella Vista, Arkansas, 1987

chords. The rhomboid pattern is also, not by coincidence, the primary motif in Wright's Frederick Robie House in Chicago (1909), and Jones' motifs are typically drawn less from nature than from Wright's own work. Jones wrote:

> As Frank Lloyd Wright has so clearly and simply stated "The part is to the whole as the whole is to the part."
>
> The details these decorative adjuncts might seem trivial when isolated. They reach significance only as an obbligato accompaniment to some specific architectural theme being orchestrated. They are visual notes of enrichment of clarification. They are always meant to be an integral part of an all-encompassing continuity.[19]

Despite the simplicity of the structure, Thorncrown is a building that is highly dependent on motifs, and seems an architecture of form rather than one of material, but like Wright, Jones saw it otherwise:

> The nature of materials is a very fundamental principle of organic architecture.... Materials should be used in a way that conveys their strength and best qualities, letting each material—whether it is wood, stone, or steel—express its basic nature.[20]

The density of motifs in Jones' work after Thorncrown at times exceeds that of Wright. The Gothic origin of motific detailing is overt in Jones' Mildred B. Cooper Memorial Chapel in Bella Vista, Arkansas (1987). The pointed Gothic arch appears in everything from the steel roof arches to the wood door to the aluminum door handle to the cut ends of the steel channels and wood slats, and, since the arch is a form whose functional purpose is clearly associated with stone, its use in a building built of wood and metal confirms its decorative character. *figs.* 28–29 In the Cooper Chapel Jones simply accommodates, rather than expresses, requirements of structure, construction, and comfort, sacrificing all other articulation to geometric unity. While some of Jones' work shows what can be accomplished with motific detailing, the Cooper Chapel does not. It is motific detailing at its most superficial.

Both the organic ideal and the organic motif have seen something of a resurgence in recent architecture. In Herzog and de Meuron's Ricola Storage Building (1992), the glazed facades are translucent polycarbonate panels imprinted with a photograph of a plant motif, somewhat like a glazed version of Wright's textile block. Wiel Arets' Utrecht University Library (2005) repeats the same image of willow trees on almost every exterior surface, silkscreened onto glass, on the surface of precast panels, and on the surface of cast-in-place concrete through the use of rubber form liners. Presenting his competition winning design for the New Scottish Parliament Building in Edinburgh (2004), Enric Miralles explained its overall pattern of skylit rooms as leaves. The leaf appears as a decorative motif through cutouts in the concrete walls of the finished building. But here, as in the best of Wright's work, it is most effective as a leitmotif, not as the dominant theme.

The Motific Detail as Cultural Symbol

In 1942 Aldo van Eyck, a twenty-four year old Dutch architect, browsing in a used book store in Zurich, found an old copy of the Surrealist journal *Le Minotaure* containing an article on the Dogon people of Mali. It was one of the beginnings of a life-long fascination with non-Western cultures in general, and the Dogon in particular. What van Eyck valued in Dogon culture was the tight fit between the structure of a society and the structure of its habitations, but there was more. The entire physical culture of the Dogon is, according to van Eyck, based on a single motif: the circle in the square. This same motif is used in baskets, granaries, and ceremonial masks. It represents the Dogon model both of the cosmos and of the individual. *fig.* 30 Van Eyck wrote:

> There is no limit to what the Dogon basket can hold, for with its circular rim and square base, it is at once basket and granary; at once sun, firmament and cosmic system.... In order to be at home in the universe man tends to fashion it in his own image, accommodate it to his own dimension. Constructed enclosure as such was indeed seldom sufficient, for there was always the limitless exterior beyond—the incomprehensible, intangible, and unpredictable.... So his cities, villages and houses—even his baskets—were persuaded by means of symbolic form and complex ritual to contain within their measurable confines that which exists beyond and which is immeasurable; to

fig. 30

Dogon Granaries,
Youdiou, Mali, circa 1600

> represent it symbolically. The artifact—whether small or large, basket or city, was identified with the universe or with the power or deity representing the cosmic order.

And elsewhere:

> What is true of the Dogon basket is also true of the Dogon house and the Dogon village. Their symbolic meaning is likewise expansive, for they represent man, city and universe all at once.[21]

The equation of the image of the home with the image of the world is common in many cultures. Art historians Andreas Volwahsen and Henri Stierlin wrote of the role of the Vastu Purusha Mandala in Indian Architecture of the Vedic Period. A square that is then divided in various ways into a number of smaller squares, it was a universal cosmic symbol: "All existence is reflected in this magic square. It is an image of the earth, which is a square derived from a circle; at the same time it is also the sacrificed body of the primeval being, Purusha. Man and earth correspond to one another in this image." A series of design manuals of the period describe in detail how the mandala and its variants were to be used to determine the plans of cities, temples, houses, the thickness of walls and the proportions of doorways.[22] The Iroquois understand their entire nation, from Niagara Falls to the Hudson River, to be one great long house, with the Senecas guarding the door to the west and the Mohawks guarding the door to the east. Native Americans were van Eyck's other great "primitive" cultural fascination, particularly those of the American Southwest—the cultures of the Anasazi, Hopi, and Zuni. The physical culture of these groups is at times similar to that of the Dogon in the use of a single cosmic symbol at a variety of scales to determine the design of an artifact. According to Native American scholar Rena Swentzell, the Tewa people conceive of their world as a hemispherical basket—the sky—over a hemispherical bowl with serrated edges representing the world. But the serrated edges can also represent mountains enclosing a village, buildings surrounding a square, or walls enclosing the kiva—the cylindrical underground meeting places; the bowl can represent all three.[23]

The physical cultures of both the Dogon and Anasazi, despite major differences in time and location, have remarkable formal similarities. Both cultures built communities of repetitive, nearly similar units, often forming agglomerations rather than geometric totalities or formed spaces. Each unit had a formal autonomy. Both cultures used circular forms to denote places of communal and spiritual importance, most prominently the kiva.

These symbols and their distribution through entire physical cultures became, for van Eyck, an example of a strategy of architectural design that eventually led to another type of motific detailing—the motif as cultural symbol. Like his fellow members of Team X, van Eyck's larger goal was urban re-identification. Unlike most of them he sought to do so by not just literal but symbolic means. Writing in 1962, he called for the use of "identifying devices" in architecture and urban design:

> Without these [identifying devices] a house will not become a house, a street not a street, a village not a village and a city not a city. . . . I am not so sure we are sufficiently aware of the fact that it is those identifying devices—call them images—which not only articulate visually but also frame civic association between people.[24]

Van Eyck was another reader of Goethe, and used the leaf and the tree analogy in support of the idea of identifying devices:

> Tree is leaf and leaf is tree—house is city and city is house—a tree is a tree but it is also a huge leaf—a leaf is a leaf, but it is also a tiny tree—a city is not a city unless it is also a huge house—a house is a house only if it is also a tiny city.[25]

Van Eyck's transformation of this source material into a modern equivalent of the identifying device was not a complex one; it was quite literal. His best-known building, the Amsterdam Orphanage (1960), uses the Dogon motif, the circle and square, for everything. *fig.* 31 Van Eyck saw his design process and its motifs as resembling musical composition, particularly the fugues of Bach. His assistant recalled, "In the ground plan of the

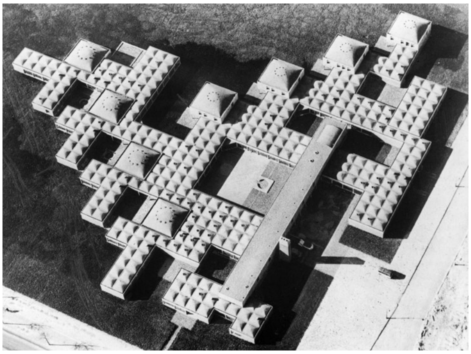


fig. 31

Amsterdam Orphanage, Aldo van Eyck, Amsterdam, Netherlands, 1960

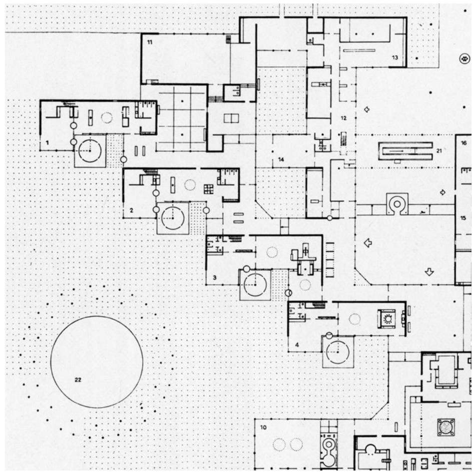


fig. 32

Partial Plan, Amsterdam Orphanage, Aldo van Eyck, Amsterdam, Netherlands, 1960

Orphanage you can see the motifs interweaving contrapuntally, just as in a fugue."[26] *fig.* 32

Although van Eyck's motifs, unlike Wright's, did not find justification in the nature of material, some, like the cultures they embodied, had a material significance, as in the basic unit of the orphanage, a precast dome with a square base. But there are endless motifs without material significance. Meeting places, large and small, are invariably made using a circle in a square. Far more problematic is the adaptation of the circle, sphere, or cylinder to almost every detail in the building—benches, lights, stools, and fountains. The kitchen is a cylindrical vent over a circular table surrounded by cylindrical stools, within a square room. As the motifs become less structural, their use becomes increasingly superficial.

It was perhaps presumptuous for van Eyck to assume the ability to create a whole culture of symbology in a single building; what was for the Dogon people a spiritual symbol became, in twentieth-century Amsterdam, little more than superficial styling. In van Eyck's subsequent work, the circle lost whatever cultural or spiritual significance it might have had. At his Hubertus House (1980), a home for single mothers in central Amsterdam, the motif loses most of its spatial character and becomes simply a geometric interruption in windows, walls, or stairs. In the office block that surrounds the orphanage building today, also designed by van Eyck, it is simply an irregular modification of the curtain wall, barely recognizable as a circle.

The motific detail as cultural symbol had a life after van Eyck, particularly in the work of other Team 10 members and Herman Hertzberger. Likewise the expropriation of cultural symbols remains popular in contemporary modernism. However suspect this strategy of instant cultural appropriation may be, we should be grateful that it has yet to return as a wholesale strategy for detailing.

The Motific Detail as Fragment

In 1951 Scarpa was asked to design an exhibit of the work of Wright in Florence. Although the exhibit encompassed the work of Wright's entire career, among the highlights were the solar hemicycle houses of the 1950s. These houses marked a resurgence in the motific aspects of his work, particularly in the double circles and the shape defined by their intersection. This is a motif that dominates Wright's late work, rarely to its advantage. Scarpa, who for many in the 1980s defined the concept of the architect as detailer, was the foremost practitioner of motific detailing after Wright's death. If his theoretical debt to Wright was minimal, his formal debts were considerable, with many of his motifs drawn directly from Wright, the most common being the double circle. Like Wright Scarpa's motifs are made with different materials and occur at different scales to perform different functions. Despite or perhaps because of this, Kenneth Frampton singles out Scarpa as the paradigmatic detailer:

> [His] work may be seen as a watershed in the evolution of twentieth-century architecture. . . . Throughout his work, the joint is treated as a kind of tectonic condensation; as an intersection embodying the whole in the part, irrespective of whether the connection in question is an articulation or a bearing or even an altogether larger linking component such as a stair or a bridge.[27]

fig. 33

Entry Pavilion for the Venice Biennale, Carlo Scarpa, Venice, Italy, 1952

The most literal of these Wright-inspired buildings is the Entry Pavilion for the Venice Biennale (1952). *figs.* 33–34 It closely resembles the plan of Wright's Llewellyn Wright House in Bethesda, Maryland (1953), a shape defined the intersection of the two circles, but there is no evidence that this had any larger significance for Scarpa. The predominate motifs here are the circle and the eye shape formed by two intersecting circles and its division by three 120° radials. The eye shape forms the pavilion in plan, the concrete base, the glass wall above, and the profile of the tapering metal roof. The circle forms the room below the desk, the stool for the desk, the rotating gate, and the outer wood facing of the column. The 120° angle locates the shelves and two of the glass walls and also forms the pattern of the roof supports—three pylon columns located 120° from one another. They sit outside rather than under the roof by means of an outrigger; the tapering midsection is reinforced with steel fins. Scarpa's columns are the recapitulation of the building and are identical

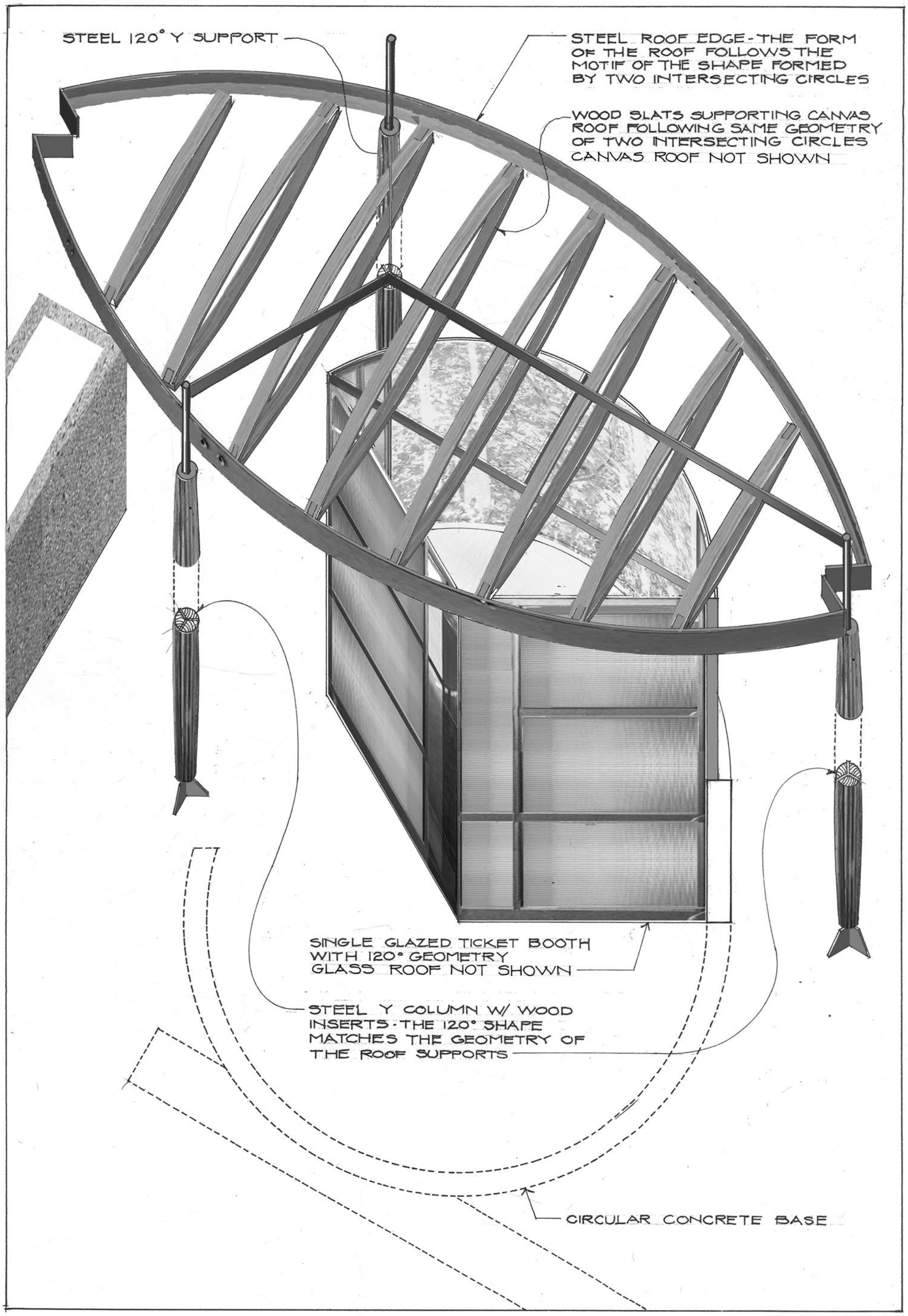


fig. 34

Wall Section, Entry Pavilion for the Venice Biennale, Carlo Scarpa, Venice, Italy, 1952 despite the other complexities of the building. All these elements have highly different functions, and while the geometric pattern is not illogical in any one case, it erases the possibility of differentiation and articulating the individual elements. If Scarpa saw any correlation between motifs and material, he never said so in his admittedly slim written work, but on the evidence of his buildings, it would seem that he felt the opposite, that the motif transcended and was independent of material.

Scarpa's other favorite motif, the chevron, is missing from the gate pavilion, but is present in abundance in his other work. The chevron seems to be Scarpa's modern equivalent of the traditional molding combinations of the classical orders as confirmed by its use at the cornice and string course at the Bank of Verona and its juxtaposition with fragments of classical moldings, at the entrance to the Venice University Institute of Architecture. Like Wright's early classical moldings such as those of the Larkin Building (1904), they have no curves or softening contours, and are no less visually harsh and have proved no less unpopular with critics.

These two motifs, the double circle and the chevron, are present in each of Scarpa's later buildings. According to architectural historian Maria Crippa, the double circle "of Chinese origin, symbolizes the union of man and woman, the reconciliation of opposing polarities." Frampton lists three other possibilities—the mystic ideogram the *vesica piscis*, the yin-yang symbol representing the "opposition between solar universality and lunar empiricism," and a label on a pack of cigarettes.[28]

One of the most troubling qualities of the Scarpa motif is its indifference to scale; any shape can be used at any size. The beam/column connection of the Borgo Condominium in Vicenza, Italy (1975), is an elegant detail as a stand alone element, but it is yet another motif—back to back Ls. *fig.* 35 Inverted, it reappears in one of the large sculptural supports of his interior reconstruction of the Castelvecchio in Verona, Italy (1967), as a split cross, and reappears at a much smaller scale as a beam support on the exterior, then as a support for a rolling concrete door at the Brion Cemetery in San Vito d'Altivole, Italy (1970).

In his essay "The Tell-the-Tale Detail," theorist Marco Frascari defined the detail as a joint and singled out Scarpa's work as its best illustration.

fig. 35

Beam/Column Connection, Borgo Condominium,
Carlo Scarpa,
Vicenza, Italy, 1975

This has become a widely quoted article, yet there is a problem. To many, Scarpa's works are little more than agglomerations of details, or worse, motifs. The whole is less than the sum of its parts, if there is a whole at all. In 1984 Bruno Zevi, Scarpa's colleague at the University of Venice, said that certain Scarpa works were "stupendous fragments of an inchoate discourse, one deliberately negated."[29] A number of explanations have been offered to provide a conceptual unity to Scarpa's work that, in the finished work, seems absent. The characteristic defense has been that the work, if fragmented in its physical form, is unified by other, more conceptual factors. Architectural historian and critic Francesco Dal Co says of the Brion tomb, "It is difficult to think of it as a completed work. The labor that the architect incessantly devoted to this project merely confirms the impression of incompleteness that its baroque narrative ends up generating." Frascari alludes to this when he writes, "While it is whole, Scarpa's architecture cannot be characterized as complete. An architectural whole is seen as a phenomenon composed by details unified by a 'device,' a structuring principle." And it is possible that Scarpa agreed. He once said, "There is no such thing as a good idea. There is only good expression." Frampton sees the work as connected by structures of edges and thresholds remarking that, "Scarpa's architecture was invariably predicated on the idea of an architectural promenade in which the qualities of 'nearness' are successively evinced through a series of fragments." They establish "a semblance of unity through the establishment of a topographic narrative." Architect and author

Richard Murphy agrees, explaining the layers and layered circulation of the Castelvecchio museum and Querini Stampalia Gallery in Venice, Italy (1963), as literal explanations of the layers of history.[30]

But the reality of Scarpa's work is that if it lacks a conceptual structure, it has no shortage of formal unity; the excess of the typical Scarpa motifs is, if anything, oppressive in its unity in works such as the Bank of Verona in Verona, Italy (1973), or the Brion Cemetery. It cannot be said that there is no system to the use of these motifs. As Dal Co points out, the step-like echelon motif at Brion is used at the ends of all planes of concrete and stone. In the Bank of Verona, it is in the locations where classical ornament would be used: atop the cornice and at the string course. If one understands them as multiple chevrons, the equivalent of classical moldings, then his building is no more incomplete than Palladio's.

It is not the absence of a system that is problematic here; it is that the system is primarily a decorative one indifferent to material and function, and used to excess.

Conclusion

> It must be said, too, that form elements of motifs, although very striking and essential for the expression, are not sufficient for characterizing a style.
>
> —Meyer Schapiro

There are, as we have seen, contemporary instances of motific detail, albeit usually in fragments. Nevertheless, the motific approach to architectural detailing seems to have as many critics as advocates. To the conventional functionalist, it betrays insincerity. How can the same complex shape be applied to a carpet, wood paneling, and a metal fastener? It may unify the whole, but in so doing it erases the differences between structure, material, and construction. To others, this repetition often seems irritating, reducing design to pattern-making and obscuring meaningful material and utilitarian differences.

The motific detail, at its worst, crosses the treacherous border between design and styling. Styling is best understood by those most responsible for its widespread use: automobile designers, particularly American ones, who see their task as making the headlight look like the glove compartment or the fender, not by the use of small repetitive forms, but by the use of a similar language, a language that is not particularly suited to the design of headlights, side mirrors, or fenders. The parts of my Honda are consistently designed. The headlight is consistent with the glove compartment, the fender with the dashboard, the door handle with the bumper; all is stylized into a seamless unity so that it has no perceptible parts other than the wheels. Does this make it well designed?

Motific detailing may have had its origins in Gothic architecture, but it entered modernism in the guise of material expression through Wright. It is a measure of Wright's greatness that he bequeathed to modernism two methodologies of the expression of material, one profound and one superficial. The first was based on the economic use of material, using the smallest amount to accommodate the largest space or longest span. But for the most part, the nature of material was, to Wright, a question of motifs. It seems odd that one who spoke so eloquently and could design so elegantly with regards to the nature of material should adopt this strategy that would seem to ensure that material differences are glossed over, but it was a theme that was based far more on the ideological heritage of Goethe and Emerson than on an objective analysis of reality. Wright and Jones both saw the motif as the key to understanding the nature of materials. In the end, however, it was their chief impediment to achieving such an understanding. For Wright at least, faith in the geometric unity of the works of nature and hopefully the works of man was unshakable. He wrote in his last book, *A Testament*:

> This abstraction we are calling Civilization—how was it made and how is it misused or being lost now? By "abstraction" I mean taking the essence of a thing—anything—the pattern of it, as the substance of reality.[31]

It could be successfully argued that if Emerson and Wright were wrong at the small scale, they were correct at the large, that the unraveling of the genetic codes of life has revealed a kind of natural unity of geometry. They merely had the wrong geometry. To re-embark on a pursuit of the motific detail with more accurate information, however, seems unlikely to produce results that are any less superficial.

Unity of technique renders a unity of pattern and, when done well, a unity of form. Whether it renders a unity of concept is less certain. It is easy to see why one would not take this approach. A unity may be achieved by motifs, but it is likely to be superficial, one that erases differences in function in the cause of a disingenuous stylistic uniformity. It is true that this approach characterizes most of the work of many architects that we value—such as Wright and Scarpa—but is it what we value in their architecture? The motific detail at its best is a counterdetail, going against the grain of the formal strategy of the totality of the building. The more the detail is used, the less powerful it becomes. And herein lies the problem. If it is no more than a leitmotif in the building rather than the primary controlling device, it loses most of its philosophical underpinnings.

Whether or not the universe is represented in every one of its particles, as Emerson maintained, or if modern cultures are in need of identifying devices that can encapsulate their entire worldview in a single geometric form, as van Eyck believed, the motific detail is of little consequence, as the idea the architect has the power to create or determine either seems to the modern sensibility arrogant at best. The motif in contemporary architecture has become what it was for Scarpa and is for Cullinan: a mechanism for stylistic unity and not an embodiment of a spiritual, scientific, or cultural reality.

Epigraphs. Meyer Schapiro, *Theory and Philosophy of Art: Style, Artist and Society* (New York: Braziller, 1994), 59–60; L'Orange, *Art Form and Civic Life*, 10–11; Fay Jones, "Details; Theme and Variation" (Fay Jones Papers, University of Arkansas), date); Frank Lloyd Wright, *In the Cause of Architecture* (New York: McGraw-Hill, 1975), 53.

1 Robert Richardson, *Henry Thoreau: A Life of the Mind* (Berkeley: University of California Press, 1986), 312.

2 Emerson, *Essays and Lectures* (New York: Literary Classics of the United States, 1983), 289.

3 Ibid., 753.

4 Richardson, *Henry Thoreau,* 157.

5 John Gage, ed., *Goethe on Art* (Berkeley: University of California Press, 1980), 196.

6 Frederick Gutheim, ed., *Frank Lloyd Wright on Architecture* (New York: Grosset & Dunlap, 1941), 118.

7 Wright, *In the Cause of Architecture*, 54.

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4

Chapter 4

Definition Number 3

The Detail as a Representation of Construction

I would argue that all architecture is somehow always already implicated by a level of tolerance between fact and fiction. . . . Problems of representation are never really about what a building 'is.' When you look at a Greek temple, the fact that it is stone, but it is representing wood construction.

—Nader Tehrani

Or when you look at the Seagram building, where the I-beams are just standing for the columns which had to be encased in concrete. There is always a gap between that which you see and that which it represents.

—Monica Ponce de Leon

The Doric Order is a form-metaphor for a once actual structure. . . . [It] is not an absolute part in the Renaissance sense, it is an explaining part in the primitive sense.

—Peter Smithson, on the Parthenon

In 1838 essayist and historian Thomas Carlyle published his breakthrough book, *Sartor Resartus* (The Tailor Retailored). It was, he explained, a history of clothes, but clothes in a broad sense, including among other things, architecture. He wrote of clothes: "Hast thou . . . never rejoiced in them as in a warm movable house, a body round thy body, wherein that strange thee of thine sat snug, defying all variations of climate?" To Carlyle clothes are more than analogous to buildings. All clothes are symbols, and in fact, "all symbols are properly clothes; that all forms whereby spirit manifests itself to sense, whether outwardly or in the imagination, are clothes."[1] Carlyle is somewhat equivocal about the virtues of clothes, arguing at times that they act to conceal reality, then that clothes and the self are indivisible, but ultimately saying that clothes as symbols do not conceal the truth, they reveal it through the very act of concealing:

> In a symbol there is concealment and yet revelation; here therefore, by silence and by speech acting together, comes a double significance. . . . Thus in many a painted device, or simple seal-emblem, the commonest truth stands out to us proclaimed with quite new emphasis.[2]

Carlyle's subsequent writings, such as *Past and Present*, are probably of greater architectural importance, but if the body as building was a key to understanding clothes for Carlyle, then the building as body was to become the key to understanding construction for architects.

Thirteen years later the Crystal Palace opened in London, making 1851 a convenient date to mark the beginning of modern architecture. The years 1851–55 also saw the publication of four books that, while not altogether modern in their outlook, dealt with what was to become a central issue of modern architecture. What was good building? Was it solid, bare-bones, no finishes, exposed construction, or were layered construction and clad structure acceptable; and if so, should the cladding describe the construction within or speak to other themes?

The first of these books was the most popular, John Ruskin's *Stones of Venice*. He favored layered construction and his model was the Venetian Gothic. Describing the "incrustation" of St. Mark's Basilica, he wrote:

> This incrusted school appears insincere at first to a Northern builder, because, accustomed to build with solid blocks of freestone, he is in the habit of supposing the external superficies of a piece of masonry to be some criterion of its thickness. But, as soon as he gets acquainted with the incrusted style, he will find that the Southern builders had no intention to deceive him. He will see that every slab of facial marble is fastened to the next by a confessed rivet, and that the joints of the armour are so visibly and openly accommodated to the contours of the substance within that he has no more right to complain of treachery than a savage would have, who, for the first time in his life seeing a man in armour, had supposed him to be made of solid steel.[3]

Ruskin's argument, simply put, was that structural expression was unnecessary, but structural deception was unacceptable. Thus cladding was allowed, provided it was not deceitful about the nature of the clad structure. It could, however, remain silent; incrustation had no obligation to describe the construction beneath the surface. The extent of Ruskin's influence has been debated, but architect George Gilbert Scott said essentially the same thing nine years later at the Royal Academy of Arts in London:

> In the Middle Ages, either constructive parts were exposed to view, or the decorations which concealed them were designed simply as decorations without in any degree professing to be constructive; plain, honest common sense being the ruling principle, as it ought to be, and once was, in other styles.[4]

Two years after the publication of the last volume of *The Stones of Venice,* the second of the four books appeared. Architect George Edmund Street offered a dissenting opinion in *Brick and Marble in the Middle Ages*. Like Ruskin, Street saw Northern Italy as the model, but preferred the "constructional" buildings of Bergamo or Como, with their solid walls of alternating bands of stone and brick, to those of Venice:

> The Venetian mode was rather likely to be destructive of good architecture, because it was sure to end in an entire concealment of the real construction of the work; the other mode, on the contrary, proceeded on true principles, and took pleasure in defining most carefully every line in the construction of the work. It might almost be said the one mode was devised with a view toward the concealment, and the other with a view to the explanation, of the real mode of construction.

Street allowed that veneering might be used in certain circumstances, but not to conceal structure:

> In other parts of [St. Mark's] we have this system carried to a length which I cannot but think most mistaken, and which, I most heartily trust, may never find imitators here. In these the arches were constructed in brick, and then entirely covered with marble.... The whole system was excessively weak.[5]

Street's argument, that cladding minimized structural expression and eventually led to structural deception, has no better illustration than his own work. The Royal Courts of Justice in London (1882) shows the strong influence of the constructional architecture of Verona and uses minimal incrustation, but it does contain, along with its stone vaults, a considerable amount of concealed iron framing, a characteristic that it shares with buildings by his contemporary Gothic revivalists, Scott and William Butterfield.

To Ruskin, this was of little importance. An absence of structural expression was of no concern. He wrote, "The builder's mind is far too busy in other and higher directions to care about construction. It is full of theology, of philosophy, of thoughts about fate, about love, about death.... If the thing stands, that is all that is wanted."[6]

At the same time, a similar debate was going on in German architectural theory regarding incrustation, or as it came to be described, *Bekleidung*—cladding or raiment. In 1851 the third of the four books, the last volume of theorist Karl Bötticher's *Die Tektonik der Hellenen,* was published. Rather than the almost universal metaphors of architecture as skin and skeleton or clothing and body, Bötticher preferred to speak of husk and kernel:

> The Kernform (core form) of every [architectural] member is that which is mechanically necessary, the statically functional schema; The Kunstform (art form), on the other hand, is only the functionally descriptive characteristic.

Though not functional, the Kunstform demonstrated function:

> These structural components appear in an expressive form that represents most apparently and suggestively the internal concept, the essence of the mechanical function of each component for itself, as well as the reciprocal conceptual-bond-juncture-among all within the whole. This is the decorative or artistic form (Kunstform) of each component.[7]

The fourth of these books was a German language publication of 1851, Gottfried Semper's *Die vier Elemente der Baukunst.* Semper, who was to become one of Bötticher's chief critics, extensively explored the issue of cladding, but he was less interested in the constructional reality of layered building than its historical origins. Semper's arguments were based on the assumption that architecture originated with wood frame buildings that were then wrapped in carpets, skins, and textiles; and that architectural decoration must make reference to those origins. He wrote: "The wall should never be permitted to lose its original meaning as a spatial enclosure by what is represented on it; it is always advisable when painting walls to remain mindful of the carpet as the earliest spatial enclosure."[8]

Ten years later in *Der Stil,* Semper described the textile origins of most of the ornamental elements by which this wall's "meaning" was conveyed—seams, bands, and hems. The representation of these elements took precedent over the expression of actual construction: "I think that the dressing and the mask are as old as human civilization and that the joy in both is identical to those things that led men to be sculptors, painters, architects." Semper countered the "materialist" ideas of Bötticher, saying, "The destruction of reality of the material is necessary if form is to emerge as a meaningful symbol, as an autonomous human creation. The truly great master of art… also masked the material of the mask." But Semper was not indifferent to the structure that was clad. "Masking does not help when the thing behind the mask is not right or when the mask is no good. If the material, the indispensable, is to be completely destroyed in the artistic creation..., then the material must first be completely mastered."[9]

Despite their similarities, a fundamental question separated Semper and Ruskin: if cladding were necessary and desirable, must it be descriptive of construction, whether contemporary or historical? The dispute between Bötticher and Semper deals with a question equally fundamental to nineteenth-century rationalism. Do classical orders represent the actual construction of the buildings in which they occur, as Bötticher argued, or do they represent an architectural language at its point of creation, a historical portrait of a technology long left behind? For Semper, the answer was the latter, and this ancient technology, in the case of the wall, was the textile arts. More commonly, scholars of this latter school saw the orders, Doric in particular, as stone representations of ancient wood construction. This was the Vitruvian explanation, and writers from Antoine Quatremère de Quincy in the nineteenth century to Joseph Rykwert in the twentieth have agreed. But Bötticher's position had its advocates: architectural historians Eugène Emmanuel Viollet-le-Duc and Auguste Choisy argued that, given certain cultural and material conditions, the Doric order was the logical solution, in stone, to the problem of building a temple.

To all of these writers, an "order" implied something that had a legitimacy beyond a mere decorative system. Most believed that the orders expressed construction, if not directly originating in construction. Otto Wagner's position was typical, that architectural languages developed from constructional necessity into art: "Every architectural form has arisen in construction and has *successively* become an art form." This remained the prevailing view of the development of the orders, and thus Semper and Bötticher, along with Ruskin, Street, and Carlyle, were to have influence that ran deep into modernism.[10]

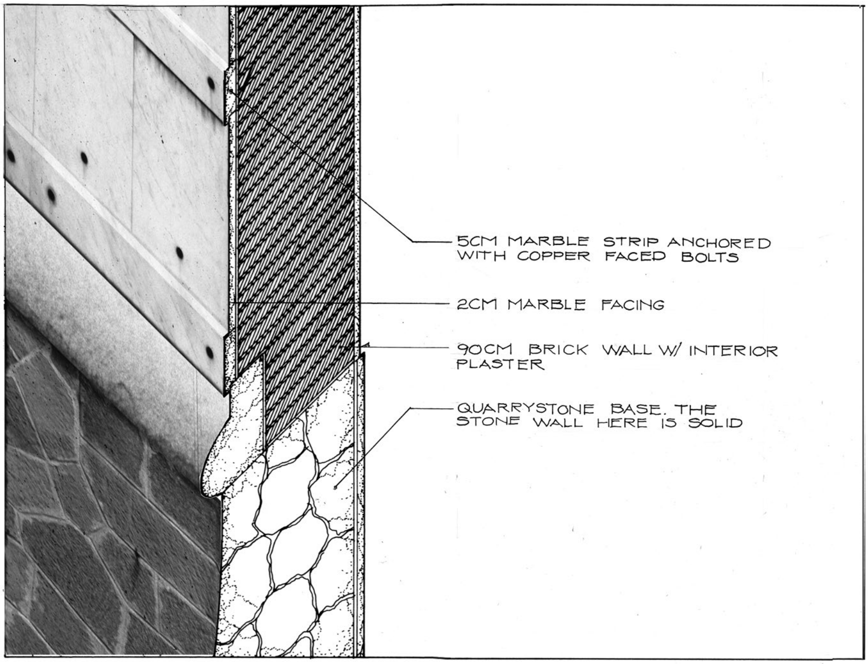
Otto Wagner and H. P. Berlage

The 1884 competition for the Amsterdam Stock Exchange is of interest largely because of two unsuccessful entries, both neoclassical—one by Wagner, age forty-three, and one by H. P. Berlage, age twenty-eight. Their work diverged in subsequent years. Berlage, who lost the competition but went on to build the Exchange, veered toward the Romanesque; Wagner remained in spirit, if not in style, a classicist. Their constructional opinions diverged as well. Berlage advocated monolithic construction; Wagner explored cladding as a constructional methodology. Ironically, both had a common starting point, the writings of Semper.

Wagner said that Semper "lacked the courage to complete his theories...and had to make do with a symbolism of construction," and, in fact, in his architecture, Semper, as a practicing architect, had little interest in cladding as a constructional system.[11] Wagner sought to develop the idea into a constructional reality. Unlike many modernists, Wagner thought that modern construction, particularly in stone, should be layered, not solid, and that the layers should be constructed independently, not simultaneously. This ran counter to the conventional theoretical wisdom. In 1540 Sebastiano Serlio wrote that "the sensible architect will...build the live [finish] stones into the wall, bonding them simultaneously to the bricks."[12] But Wagner had a point. Modern stone is sawn, dressed, polished, and pre-fitted off site, requiring large quantities of planning, calculation, and drafting. As a result, stone is one of the last items to arrive at the building site. Serlio's integrated veneer meant that construction could scarcely begin without the stone on site. Wagner's layered, independent system of veneers allowed for the less tightly coordinated process of construction.

The partially exposed building may simplify structural reality; the clad building can only represent it, but what to represent: the concealed structure or the nature of its own construction, e.g., the means of attaching a layer of cladding that was nonstructural? Wagner emphasized the latter. Lintels are often ignored or implied, since they are covered by the cladding, but he exposed the bolts that appear to hold it on. Elements that Street found beyond the pale—the clad lintel or arch—Wagner used freely. Bases varied in construction and design. The base of the Church of St. Leopold outside of Vienna (1907) appears solid and functional; but that of the his Postal Savings Bank (1906), also in Vienna, although rusticated granite in contrast to the smooth marble above, is symbolic, built of applied panels and detailed to demonstrate its layered construction. *fig.* 1

Despite his criticism of Semper, Wagner adopted many of Semper's symbolic constructional devices, and many of Wagner's details can



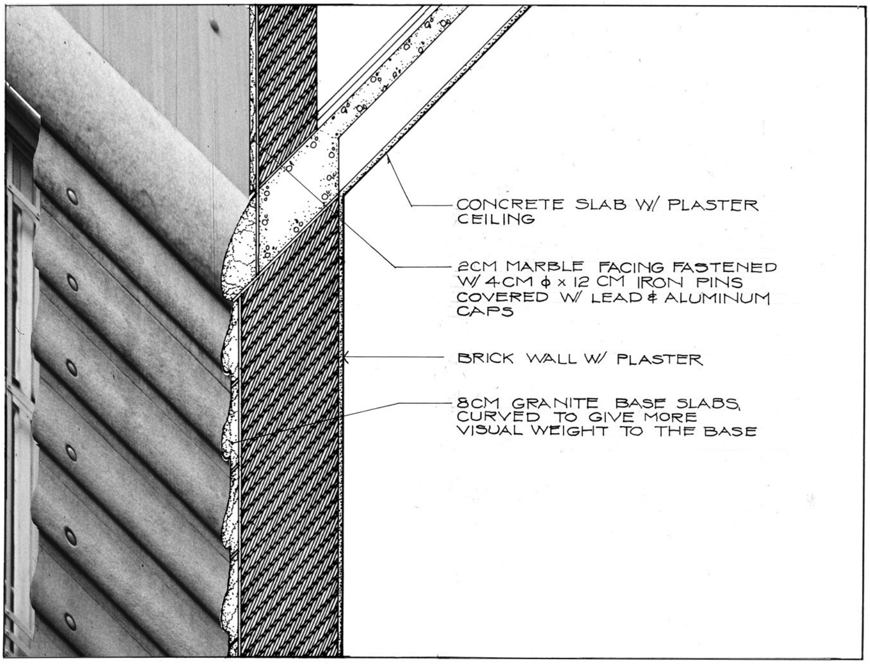


fig. 1

Top
Base, Church of St. Leopold, Otto Wagner,
Vienna, Austria, 1907
Bottom
Base, Postal Savings Bank, Otto Wagner,
Vienna, Austria, 1906

only be understood as historical references to older constructional systems rather than explanations of the concealed construction. Wagner stopped short of the application of unnecessary orders, but some of his facings contain orders by implication, such as those of the Postal Savings Bank or the Villa Wagner in Vienna (1913). Windows are located to create narrow bands of column-like proportions that are then given capitals, bases, and in some cases flutes via applied tiles or aluminum buttons. The elevations of his stucco buildings, such as the Neustiftgasse Apartments also in Vienna (1912), have seam-like corner moldings and flattened representations of rustication. Despite Wagner's claims to the contrary, Semper may have stopped short of a symbolic construction, but Wagner did not proceed by dispensing with one. This is a common phenomenon in cladding in every era: the inclusion of historical references not directly related to the particular structure that is being clad.

Berlage's biographer Pieter Singelenberg wrote that Semper marked the beginning and end points of Berlage's formal education, but by 1905, Berlage thought clad construction should be left behind. He wrote:

> We architects must also first study the skeleton, just as painters and sculptors do in order to give their figures the correct form. For the cladding of every natural object is, so to speak, an exact reflection of the inner skeleton, which, in that it presents us with the perfect construction, can be called a work of architecture. But logical construction is the dominating element here, and the cladding is not a loose covering entirely negating the construction like a badly fitting suit but is totally rooted in the inner building and ultimately a form of decorated construction. This is how we want to find our way back again to the body. . . . For the present, therefore, it is necessary to study the skeleton—dry construction in all its simple robustness—in order to arrive at once again the full body, but without the confusion of clothing.[13]

Berlage's Amsterdam Stock Exchange (1903) is built of solid brick, exposed iron, and little else, paint, plaster, and trim having been dispensed with, but his work is not so pure as it appears. *fig.* 2 The boardroom ceiling is built of iron beams clad with wood that were added in 1909. Despite its monolithic character, it shows a number of references to

Semper's *Der Stil*. Berlage's biographers Pieter Singelenberg and Iain Boyd Whyte point out that the stepped cornice of the interior brick wall is drawn from unhemmed textile edges, and the corner details recall Semper's discussion of the seam.

Berlage's allegiance to an architecture of exposed structure, at least in iron, was short-lived. Less than two years after the completion of the Exchange, Berlage doubted that it could be built in the same way and completely altered his attitude toward iron, as changes in fire protection laws were rapidly prohibiting its use in exposed applications. He wrote, also in 1905:

> We may consider it to be a rule that iron in buildings has to stay out of sight, that it needs to be covered; as a construction material it, therefore, has meaning only as a core and is also stylistically no longer of immediate importance. This development is certainly regrettable, but to fight against it is like beating one's head against a brick wall.[14]

Berlage's solution was to abandon iron in favor of concrete, a system that he again explained through analogy with the body:

> If one compares the new material (concrete) with the body of an animal, one can see many similarities between the two, for both have a core: iron for one, the skeleton for the other. One could further compare the envelope of flesh with the envelope of concrete.
>
> Just as in the human body the external form is an indirect reflection of skeleton. . . . so the concrete envelope could correspond to the structure in the same way and could also show the same deviations at certain points determined by aesthetic considerations.[15]

Berlage's subsequent large-scale work is built of exposed concrete and masonry, but on one occasion he experimented with clad steel construction, the Holland House in London (1916). This departure from his typical methodology could be a result of location, but it could also be the influence of Berlage's fascination with America. In 1905 he had condemned the clad steel frames of American office buildings, but after seeing Louis Sullivan's work in

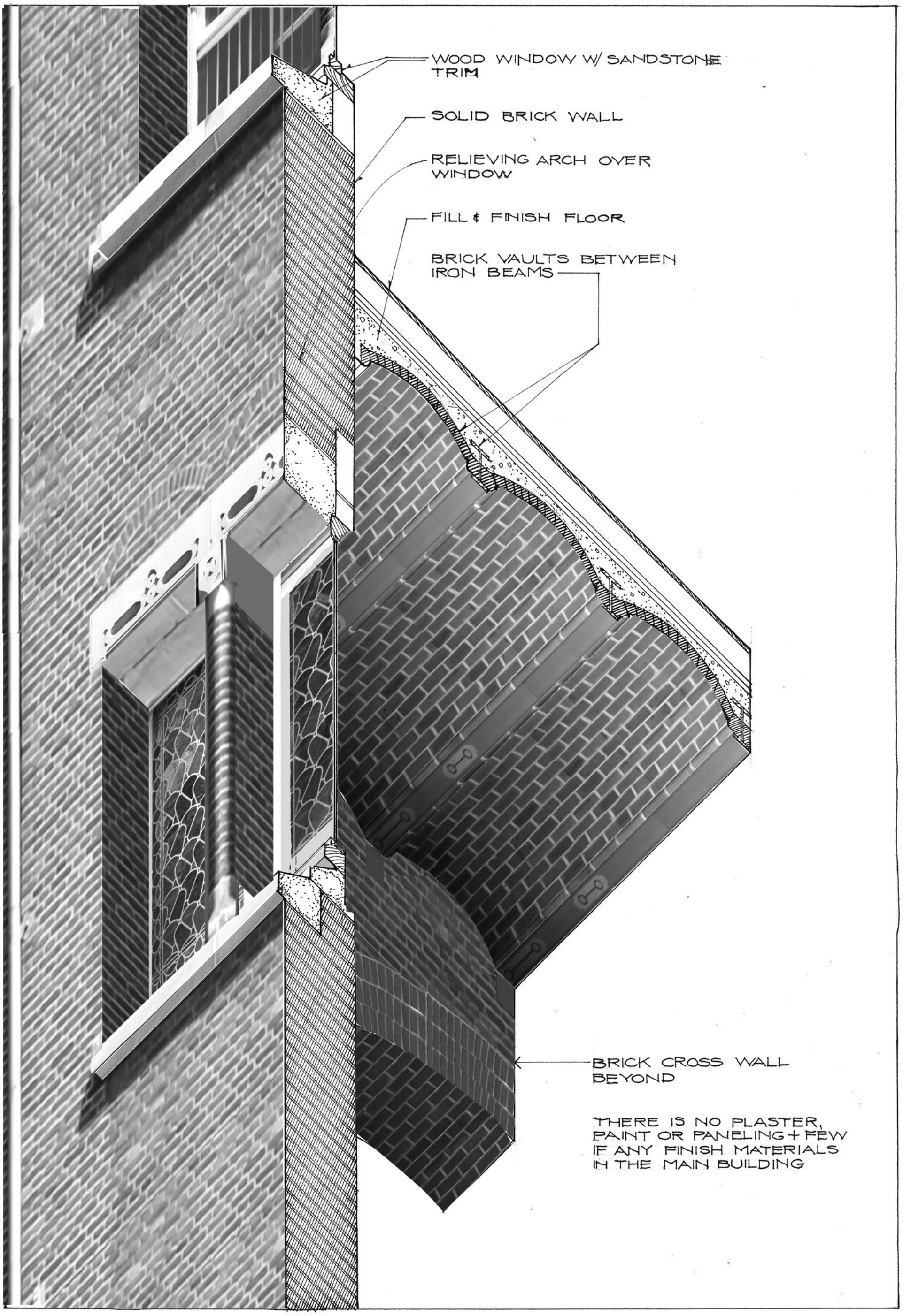


fig. 2

Wall Section, Amsterdam Stock Exchange, H. P. Berlage, Amsterdam, Netherlands, 1903

1912, Berlage argued that clad steel could be used in a way that was structurally expressive, if not structurally exposed: "In the 'classical' skyscraper one is not aware of the iron core or skeleton, although it is the main principle of its construction. In contrast, Sullivan... began to let the construction show; that is, the stone covering followed the iron skeleton."[16]

Berlage's other American discovery was Frank Lloyd Wright, in particular, his Larkin Building in Buffalo (1904). The construction of the Larkin Building is more of a structural hybrid than Sullivan's office buildings, which are made using clad, structurally autonomous steel frames. The Larkin Building mixed bearing walls and a steel and concrete composite internal frame into a far more integrated structure. Like other Chicago school architects, Wright accepted that the steel-frame office building requires fire protection and thus, cladding. Architect John Root, writing in 1890, was critical of the early exposed iron buildings built in America, calling them fire hazards, and said that piers in the modern office should be built either of masonry reinforced with iron or steel, a composite integrated construction; or of self-supporting steel encased in terra-cotta, an independent one. Sullivan's office buildings are of the latter type; the Larkin Building is of the former, but neither exposed any structural iron or steel.[17]

Root was also a reader of Semper, and architectural historian Barry Bergdoll, among others, has explored Semper's influence in Chicago, but insofar as the clothes as cladding analogy and Wright are concerned, there was another readily available influence, for Wright had read Carlyle's *Sartor Resartus* at the age of fourteen, and the architecture as clothing analogy is one key to understanding the construction of his architecture before 1920. Like Carlyle's clothed body, his buildings revealed by concealing.[18]

It might be argued that, in 1918, the year of his death, Wagner, along with Berlage and Wright, had arrived at the same critical position. Berlage's conversion to clad construction was never complete, while Wright was to become an advocate of exposed construction, although not until many years later, effectively following the opposite trajectory to Berlage. Nevertheless, Berlage's development from an advocacy of exposed construction to an acceptance of the clad was one that many were to follow, and fire protection was only the first of a series of problems that exposed framing would encounter.

Bernard Maybeck

The San Francisco-based magazine *Architectural News* ceased publication in 1891 after only three issues, so there is no way of knowing what the specific contents of a planned future issue, a translation of Semper's *De Stil* by Bernard Maybeck, might have been. There is no evidence that the translation was ever made, of what sections he would have chosen, or what Semper's influence on Maybeck's work might be. His biographers have found possible links the polychromy of his work and tent-like wood roofs over stone hearths, but how Maybeck interpreted Semper's ideas on cladding, whether metaphorical or real, is uncertain. Maybeck's first client and subsequently first biographer, Charles Keeler, described Maybeck's devotion to the no finishes, bare bones, unclad structural architecture. Keeler wrote in 1904,

"If wood were to be used, then it should look like a wooden house. He abhorred shams. A wooden house should bring out all the character and virtue of wood—straight lines, wooden joinery, exposed rafters, and the wooden surface visible and left in its natural state."[19]

Much of Maybeck's work prior to 1904 confirms this. The Keeler House (1895) exposes every stick of its construction. The University of California Faculty Club at Berkeley (1902) is a bit more complex, showing only part of its structure. The Berkeley Hillside Club (1904) for the most part followed a no finishes style, although it appears the lower columns were clad in thin redwood boards. *fig.* 3 The Leon L. Roos House in San Francisco (1909) is another matter. *fig.* 4 Although its interiors are almost entirely wood and have similar cross-section and detail to these earlier buildings (split pediments and double columns), not one stick of the exposed wood is structural. *fig.* 5 This is evidence that Maybeck was, at least in his middle career, entirely comfortable moving back and forth between the clad and the exposed, between the symbolic and the literal, or between the scenographic and the real.

One explanation is programmatic. The Roos House is more refined than its rustic predecessors, necessitating the more precise, nonstructural moldings. Another explanation is pragmatic—the difficulty of obtaining large-scale timbers of adequate size and the difficultly of maintaining such timbers in their precise configuration after drying. Warping and cracking inevitably occurred.

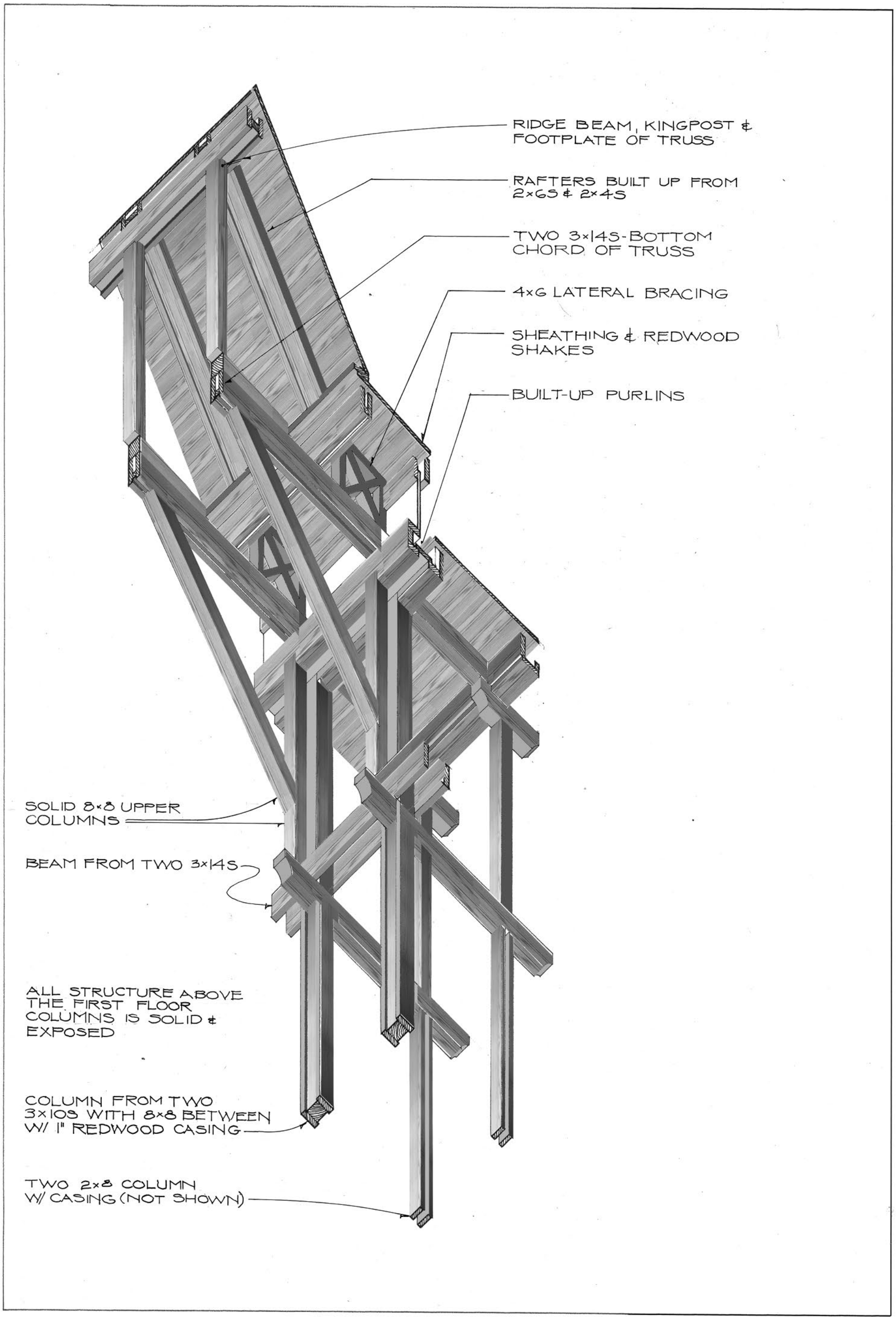


fig. 3

Wall Section, Berkeley Hillside Club, Bernard Maybeck, Berkeley, California, 1904

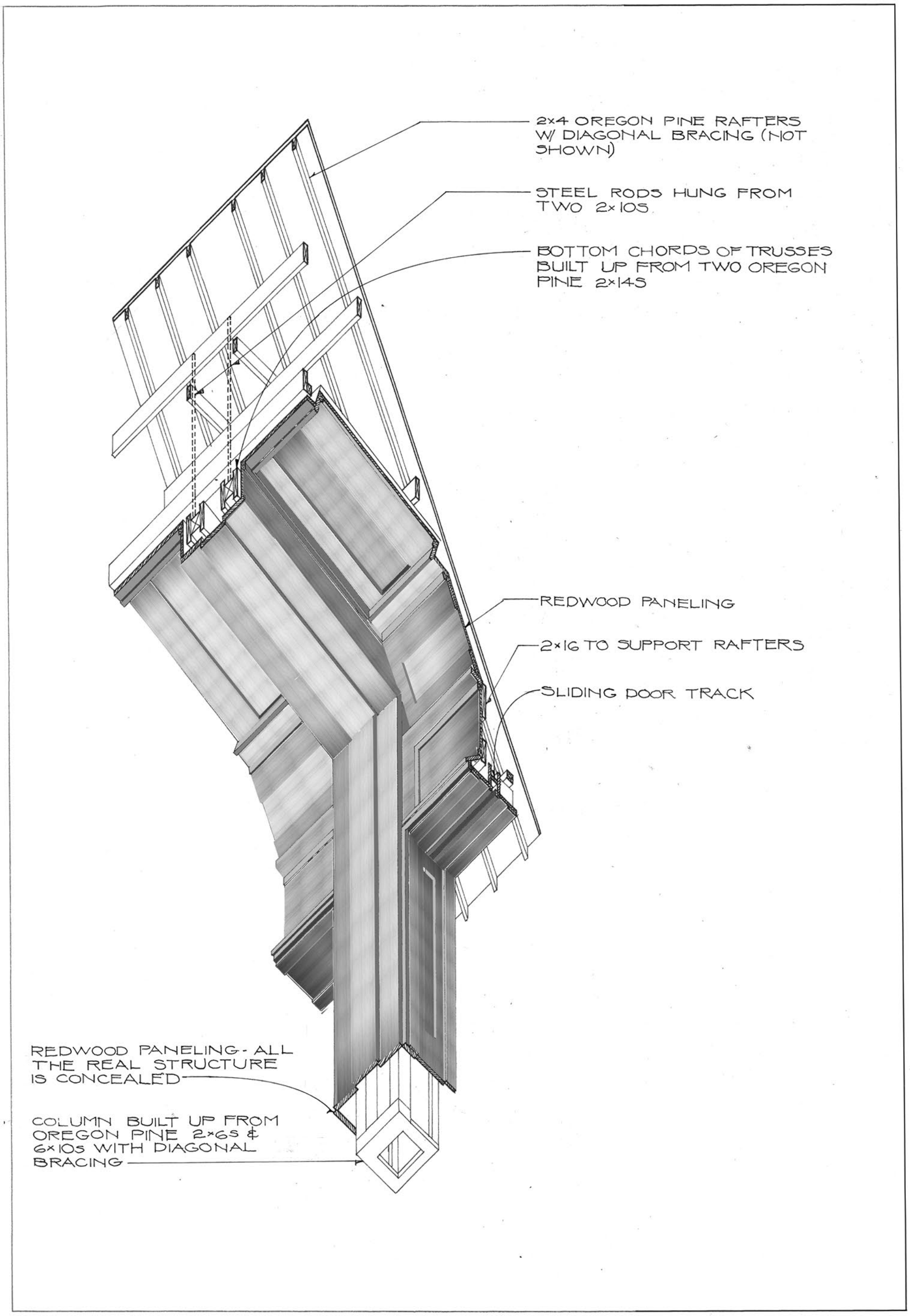


fig. 4

Wall Section, Roos House, Bernard Maybeck,
San Francisco, California, 1909

fig. 5

Interior, Roos House, Bernard Maybeck, San Francisco, California, 1909

But the only unique character of Maybeck in regard to the question of structural expression is his possible interest in Semperian ideas of cladding, for this mixing of constructional styles is almost universal in architects who built wood houses in the late nineteenth and early twentieth century. Charles Voysey, Greene & Greene, and many others moved easily back and forth between the clad and monolithic, even between the false structure and the real. Dogmatic adherence to one style or the other is clearly a phenomenon of the late twentieth century.

A second explanation for this apparent contradiction of attitudes toward cladding is a product of Maybeck's eccentricity or, more specifically, of the dual nature that many historians see in his work. Architectural historian Esther McCoy wrote in 1960, "There was an honesty in his approach to structure that was little understood because of his apparently conflicting interest in decoration. He was not content to follow the modern concept that structure itself was the ideal form." William Jordy sees Maybeck's buildings as divided between the craft tradition of his father's wood carving shop and the academic tradition of his education at the Ecole des Beaux-Arts, the latter of which, according to Jordy, was characterized by engineering "dressed in historical costume, in contrast to the modernist's delight in its exposure."[20]

But a third explanation is that Maybeck was comfortable with either form of structural expression, the clad and symbolic or the exposed and literal, and it is intriguing to speculate if Semper's thought on this matter had any resonance in Maybeck's work.

Auguste Perret

The historical reality behind the development of the architectural frame is that it is not so much a history of wall opposed to a frame as it is a history of frames—some real, some symbolic, and some ambiguous—superimposed onto walls. This was even truer of classicism than of the Gothic, and was the assessment of Auguste Perret, who wrote:

> How did the Romans give architectural form to the Coliseum's huge volumes of masonry? They surrounded it with engaged columns that support nothing.... Why are there these columns and pilasters on Italian Renaissance facades? Another tribute to the frame... Whether we're talking about early antiquity or the so-called Classical period, there is no architecture that is not an imitation of the structural frame.[21]

Despite his insight into the frame versus wall dichotomy, the mature Perret had no interest in ambiguous structural narratives, partially exposed frames, or any type of structural expression that was not the literal skeleton as demonstrated by the Musée des Travaux Publics in Paris (1939): *figs.* 6–7

> If the structure is not fit to be exposed, the architect has not done his job properly.
>
> *Anyone who hides a column or a load-bearing part, weather interior or exterior, is depriving himself of architecture's noblest and most legitimate element, and its finest ornamental feature.*
>
> *Architecture is the art of making supports sing.*
>
> *And if the person who hides a column, pillar or any load-bearing part is making a MISTAKE, the one who builds a false column is committing a CRIME.*[22]

fig. 6

Musée des Travaux Publics, Auguste Perret,
Paris, France, 1939

Perret, although a classicist at heart, was a dedicated reader of Viollet-le-Duc, and his views on the frame reflect the influence of the latter's analysis of Roman and Gothic buildings. It was an influence that Perret would pass on to one of his employees, Le Corbusier.

Ludwig Mies van der Rohe and Le Corbusier

In 1912 Mies saw Berlage's Amsterdam Stock Exchange for the first time. He later said, "Berlage . . . would not accept anything that was fake and it was he who had said that nothing should be built that is not clearly constructed. . . . The idea of a clear construction came to me there, as one of the fundamentals that I would accept."[23] Despite this testament, the type of exposed

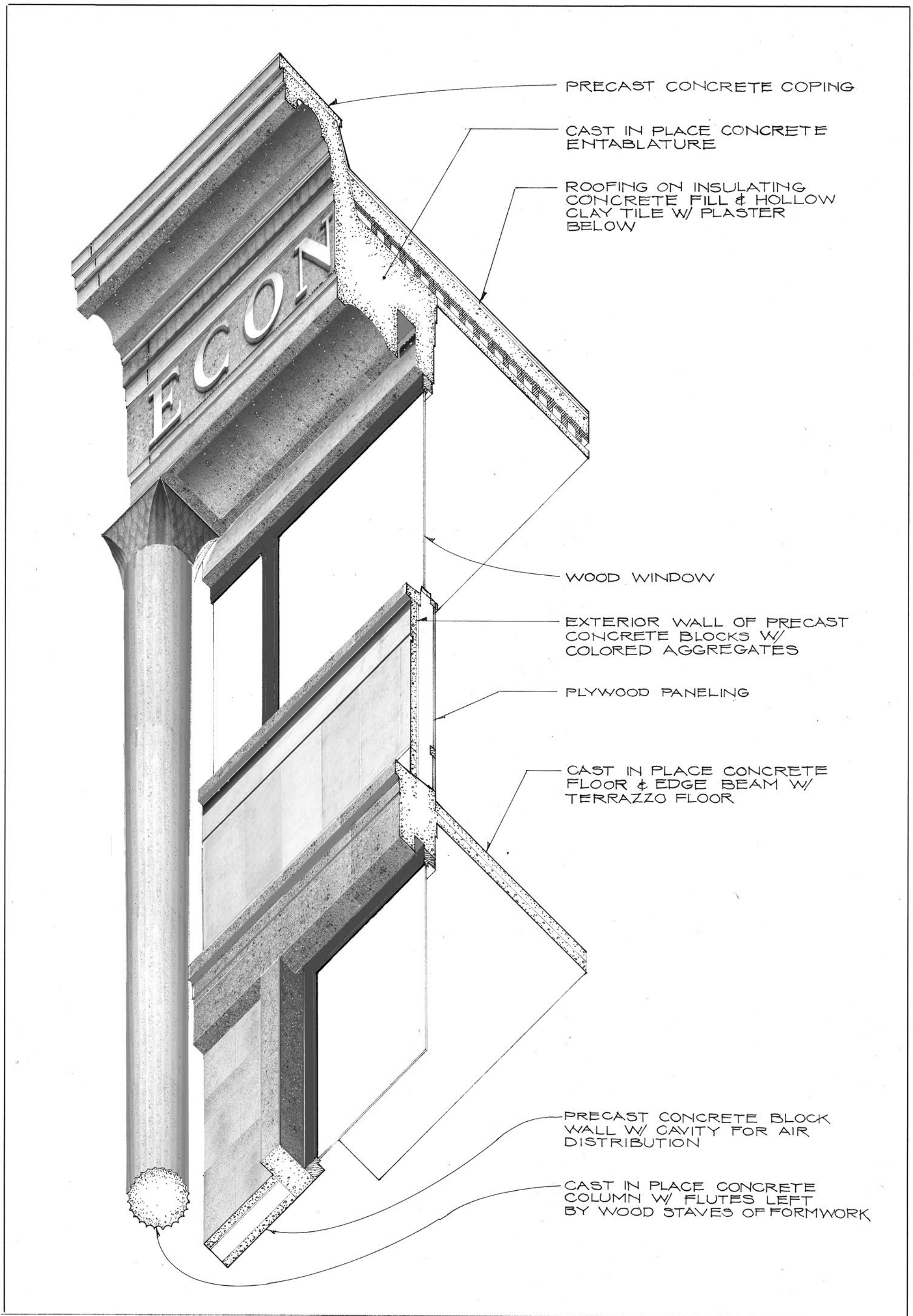


fig. 7

Wall Section, Musée des Travaux Publics, Auguste Perret, Paris, France, 1939 construction exemplified by Berlage's Exchange is rare in Mies' work. Sixteen years later, Mies was the master planner for the Weissenhofsiedlung Exhibition in Stuttgart (1927) and the architect of its largest building. Given Mies' advocacy of exposed structure, one would expect to see this in the building, but in fact there is almost no exposed structure; steel columns, steel beams, and steel purlins are all hidden in slabs and walls. The possibility of structural expression was admittedly limited by the program—an apartment building—but when Mies built the German Pavilion at the Barcelona Exhibition (1929) the following year, there were no programmatic limitations. The structural expression was nevertheless limited to eight metal-clad columns. The steel frame of the apartment is implied by fenestration; the expression of the Barcelona Pavilion is abstracted and simplified. Only the flat ceilings in both buildings that conceal the beams and purlins are inaccurate in their description of what they cover. The structures are abstracted and implied, not complex and exposed.

Mies' attitude was typical rather than unique for the time. Le Corbusier's two buildings at the Weissenhofsiedlung contain no exposed beams and more than half of the columns are contained within the walls. *figs.* 8–10 Like Mies, he used openings and fenestration to imply the frame without showing it. This is not surprising given what he had written four years earlier: "To show the construction is all very well for an Arts and Crafts student who is anxious to prove his ability. The Almighty has clearly shown our wrist and our ankles, but there remains all the rest! ...Architecture has another meaning and other ends to pursue than showing construction."[24]

fig. 8

Weissenhofsiedlung Exhibition, Le Corbusier, Stuttgart, Germany, 1927

This attitude owes as much to desire as to technical necessity. Raw structure was never a tenet of International Style modernism; its structure was typically clad, abstracted, and simplified, sometimes oversimplified. It could be said that the flat ceiling supported by a grid of columns used at the Weissenhofsiedlung became a kind of modern order, regardless of the degree of oversimplification, as in the case of Mies, and was and is used in situations where it had little correspondence to structural reality.

Nevertheless, the contrast between the attitude of Berlage and Perret on the one hand and Le Corbusier and Mies on the other is striking. Despite his admiration for the bare bones construction of Berlage's exchange, Mies did not attempt to replicate this style of building until he came to America, even then he did little of it. Despite his apprenticeship with Auguste Perret and their mutual admiration for Viollet-le-Duc, Le Corbusier took a critical position early in his career that was the opposite of them both.

Mies' American buildings appear to display more structure, but they faced the same problems as Berlage's, primarily fireproofing. Mies' solution was conceptually closer to Wagner's, the use of a representational frame. What appear to be exposed steel buildings of the period are more often secondary frames covering real structure. Only the frames of small single-story buildings such as Crown Hall (1956) and the Farnsworth House (1951) are exposed. Most of Mies' buildings at IIT and 860-880 Lake Shore Drive are steel frames encased in concrete for fire protection. The steel networks of their exteriors combine window mullions, brick supports, and simply ornamental frames to describe what is concealed within, often in ways that are not entirely accurate. The 8-inch by 8-inch H-columns at IIT's Alumni Memorial Hall, spaced at twenty-four feet and encased in concrete, are faced with a cladding of 5-inch by 8-inch H-sections spaced at twelve feet. *fig.* 11

Mies' argument, or that of his apologists, was that the cladding describes the hidden construction. In reality, Semper's argument for a historical cladding was just as often the operable one as over time the claddings and the constructions they covered began to dramatically diverge. The aluminum imitations of steel wide flanges in the late buildings, particularly the apartments, were not describing the concrete slabs and columns they faced; they were describing the steel structure of earlier buildings such as Lake Shore

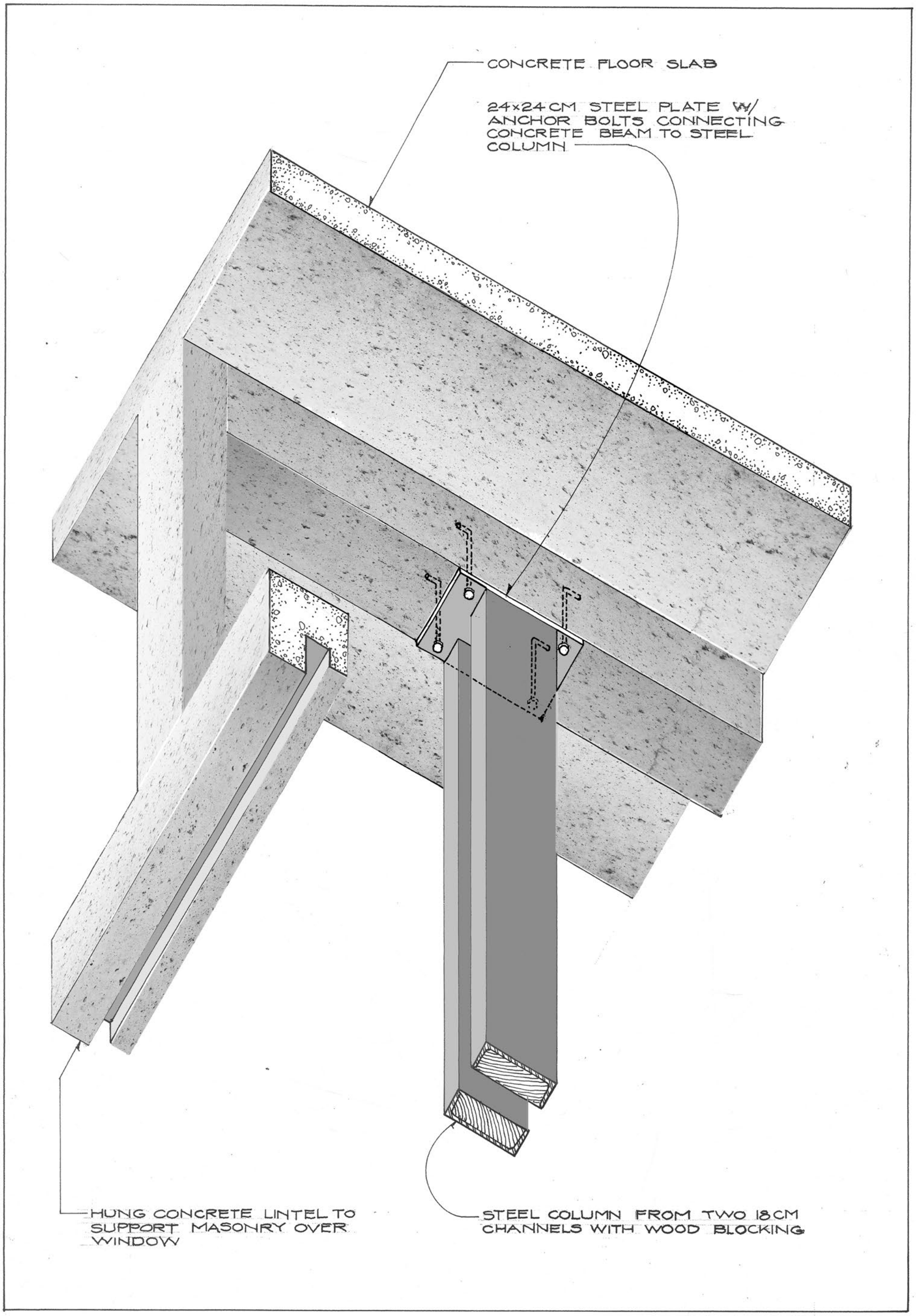


fig. 9

Wall Section Showing Structure Only, Weissenhofsiedlung Exhibition, Le Corbusier, Stuttgart, Germany, 1927

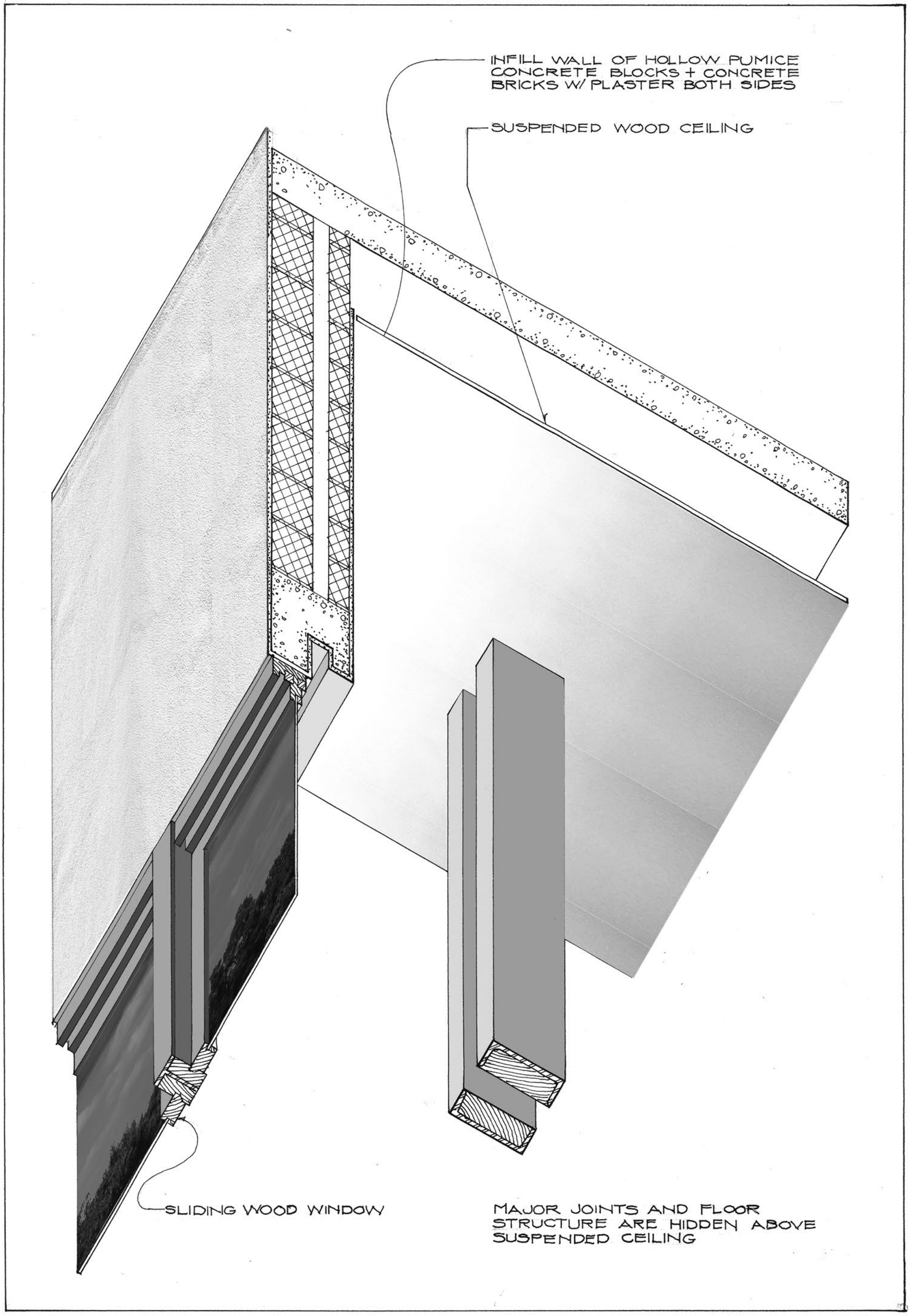


fig. 10

Wall Section Showing Structure with Finishes, Weissenhofsiedlung Exhibition, Le Corbusier, Stuttgart, Germany, 1927

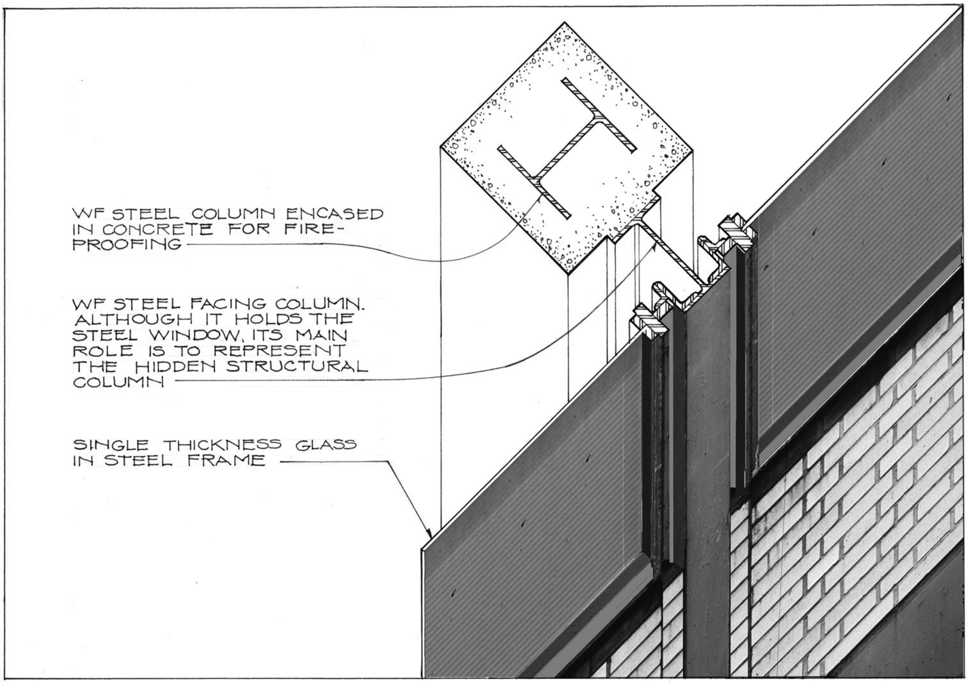


fig. 11

Wall Detail, Alumni Memorial Hall, IIT, Ludwig Mies van der Rohe, Chicago, Illinois, 1946

Drive and had precisely the same legitimacy as the ornaments imitating wood that make up the Doric order. Mies followed a course of development similar to Berlage's, from advocacy of exposed construction to acceptance of layered, but strangely, just as it seemed that the issue of literal construction might have been put to rest, it returned with a vengeance.

Louis Kahn and the Smithsons

Few buildings owe more to Mies' IIT buildings than the Hunstanton School in East Anglia (1954), designed by Alison and Peter Smithson, yet historically it is not an end but a beginning. Hunstanton contains far more exposed construction than the typical Mies building, largely because building codes allowed for an exposed frame, but the building nevertheless contains a facing frame in the manner of the IIT buildings.

The Smithsons continued to explore the possibilities of the facing frame but in a very non-Miesian way. In their Economist Building in London (1964), a structural frame of precast columns and cast-in-place floors is clad with red Portland stone mullions and spandrel panels. *fig.* 12 In order to make the cladding communicate the structural forces that it concealed while simultaneously conveying its nonstructural nature, the stone mullions decrease in depth as the building rises, in accordance with reduced loads on the columns, although they themselves carry no load. This is made explicit at the ground floor arcade where the stone cladding stops short of the pavement and the rear of the concrete column is exposed. Peter Smithson called it "a support-cladding architecture, more or less in the way that the columns and entablatures are applied to the outside of the structural frame of a Roman amphitheater."[25]

It is not farfetched to think that the Smithsons saw themselves performing a transformation analogous to the creation of the Doric order, translating an architecture of metal into one of stone in the way that the Doric translated wood construction into stone. In the year that the Economist Building was completed, Peter Smithson wrote of the quality of the Doric order as "a metaphor for the once actual construction" and argued that there was a difference between a construction and an order, which were acceptable practices, and ornamentation, which was not.[26]

The Smithsons' critics were unconvinced. The Economist Building was on the whole well received, but not so much its "order." The stone-faced columns were called "theatrical," "paper maché Portland stone," and "falsies." To many, the replication of a Miesian steel facade in stone seemed dubious at best, but the ultimate critical problem was the disparity between the properties of the structural material (concrete) and the cladding material (stone).[27]

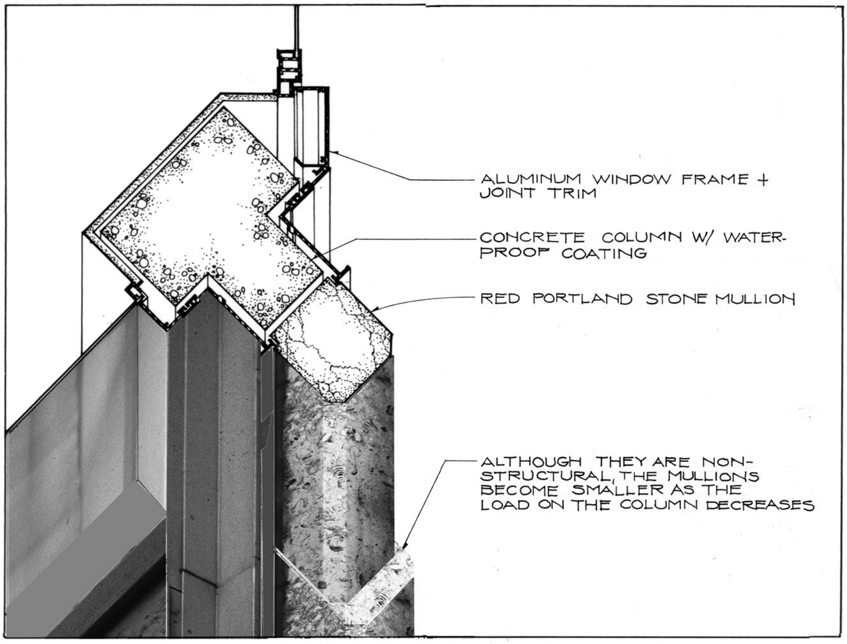
The Smithsons were troubled neither by the disparity of structure and cladding nor the criticism it received; in subsequent buildings in this series, the difference between cladding and frame was accentuated. In the Garden Building for St. Hilda's College (1967), the cladding is of a different material than the structural base (wood on concrete), a different structural

fig. 12

Economist Building, Alison and Peter Smithson, London, United Kingdom, 1964

system (frame on wall), and another technological era (Tudor England). *figs.* 13–14 Clearly, the language of the cladding and the language of the structure had gone their separate ways. Yet this cladding is no more deceptive than that used by Mies at Lafayette Park in Detroit (1956), where steel mullions face the ends of masonry bearing walls, to no end other than the ornamental effect.

One year after the opening of the Economist Building, Louis Kahn completed, with Anne Tyng, the Erdman Hall Dormitories at Bryn Mawr College (1965). *fig.* 15 Like many Kahn buildings, it is a concrete structure composed of three dining and common rooms, surrounded by a second structure of load-bearing masonry walls and concrete floors—the dorms themselves. *fig.* 16 The client refused to consider exposed concrete as an exterior finish, so while the inner concrete structure is exposed, the outer masonry structure is wrapped with slate and cast stone. It is thus unique in contrast to his later work in that it is completely clad.



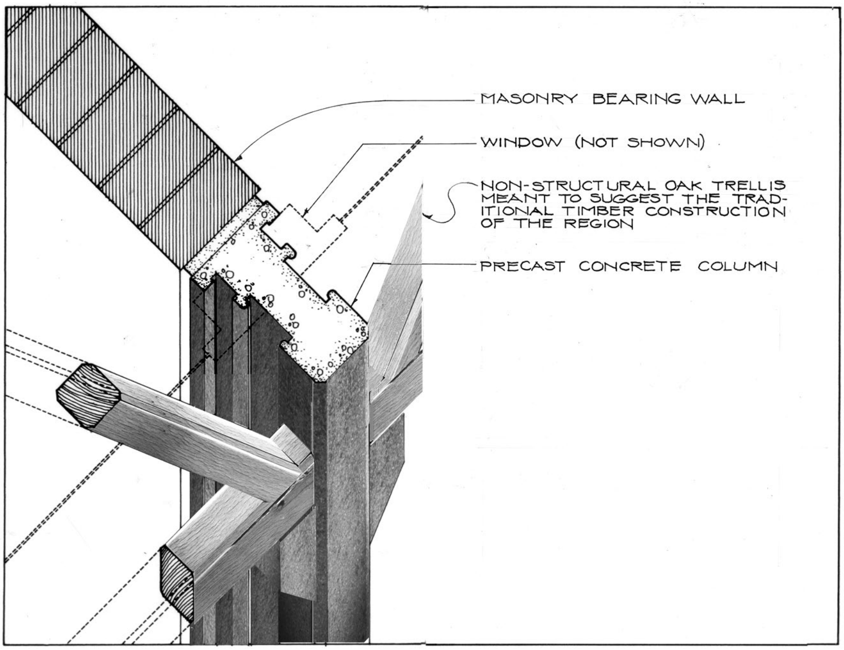


fig. 13

Top
Wall Detail, Economist Building, Alison and Peter Smithson,
London, United Kingdom, 1964
Bottom
Wall Detail, Garden Building, St. Hilda's College, Alison and Peter Smithson,
Oxford, United Kingdom, 1967

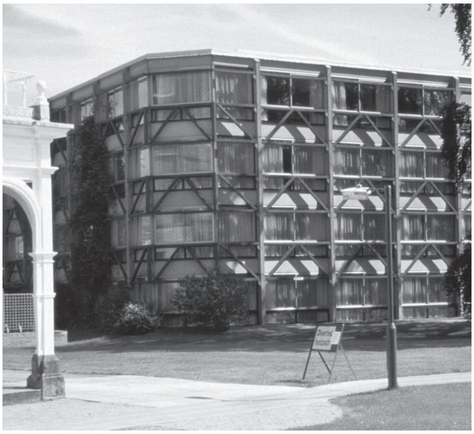


fig. 14

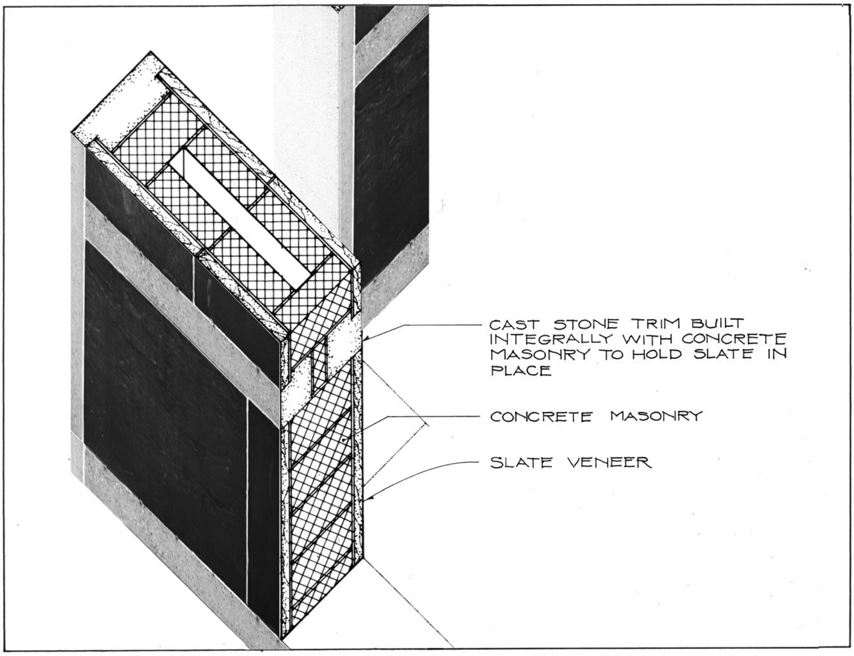
Garden Building, St. Hilda's College,
Alison and Peter Smithson,
Oxford United Kingdom, 1967

fig. 15

Erdman Hall Dormitory, Bryn Mawr College,
Louis Kahn, with Anne Tyng,
Bryn Mawr, Pennsylvania, 1965

This was, at the very least, unexpected. No modernist architect was more committed to exposed structure and solid, unlayered construction than Kahn. He wrote in 1973, "Design habits leading to the concealment of structure have no place in this implied order.... The sense of structure of the building and how the spaces are served would be lost." He had said that stone veneers lacked "validity," but if the wall of Bryn Mawr was to be constructionally expressive, it would have to do so through its cladding.[28]

This partially accounts for the eccentricities of the exterior. The cast stone is used both to locate the structure and fasten the stone to the masonry back-up. The wide, upright cast stone caps mark the thickness of the bearing walls that they cover; the narrow, horizontal cast stone ribbons are the thickness of floor slabs behind. The band that marks the windowsill is several inches wider than that at the floor slab, since it supports a greater quantity of stone. While the slate is a veneer, the cast stone is not, as it is set within in the coursing of the back-up masonry, making it an interlocking, integrated system, as described by Serlio. The idea used at Bryn Mawr, a descriptive cladding of a structure, was an experiment that Kahn never repeated, but it was not the end of the stone veneer in his work.



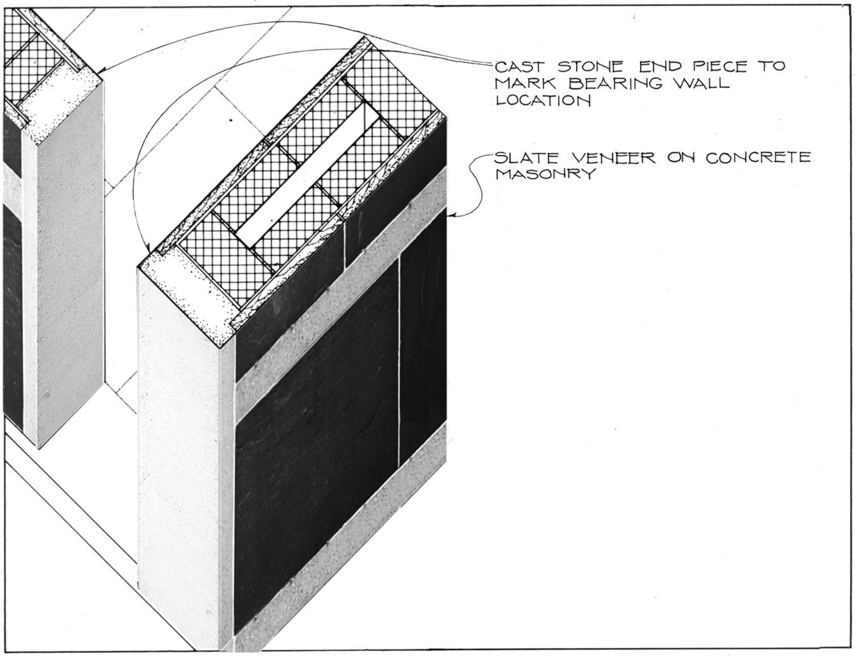


fig. 16

Stone Details, Erdman Hall Dormitory, Bryn Mawr College, Louis Kahn with Anne Tyng, Bryn Mawr, Pennsylvania, 1965

Although the concrete walls of the Salk Institute (1966) are left unfinished, Kahn intended the Meeting House (unbuilt) to be faced with red sandstone. Kahn wanted to avoid a veneered wall masquerading as a solid one, and details were developed to literally demonstrate the layers of the wall. The Kimbell Art Museum (1972) was the partial realization of this system. The concrete columns and vault are exposed; the large expanse of non-bearing masonry walls between is faced with travertine.

Despite the fact that Mies, the Smithsons, and Kahn all used constructionally symbolic claddings, history has judged them differently. It was the judgment of the critics of the day that Kahn built an architecture of reality, dispensing with all but literal ornament, that Mies built an architecture of metaphorical cladding while staying within the boundaries of propriety, and that the Smithsons built an architecture of metaphorical cladding that transgressed them. But the difference between Mies and the Smithsons is too subtle for so harsh a judgment, and even Kahn could escape neither layered construction nor the use of unnecessary—or at least deceptive—historical motifs.

But the future of cladding in modernism was to be determined less by aesthetic preference than by environmental necessity. If it is necessary to give a date for the end of the Brutalist era, 1973 would be a good one, as it was the year of the first oil crisis of the decade and the resulting push for energy conservation. If the need for fireproofing was problematic for unclad buildings, the need for thermal protection was even more so. Walls like those of IIT, although clad, are, by contemporary standards of environmental performance, appalling, not only because of the absence of insulation, but because of the presence of numerous thermal bridges between interior and exterior.

Williams and Tsien, the Patkaus, Hadid, and Ando

The modernism of the last forty years thus inherited an aesthetic at odds with constructed reality. The aesthetic preferred solid, unlayered, exposed mono-material construction in which each part performed multiple tasks. The reality strongly encouraged—if it did not demand—the opposite, layered construction, clad structure, and multiple materials performing specialized tasks. The modern architect was left with three choices: first, to build a new aesthetic reflective of layering; second, to build a layered building that appeared to be monolithic; or third, to simply, when possible, build in the old way using solid, unlayered construction.

We live in an era of context, in which even technology is contextualized, and for several buildings of 2002–2003, the context meant, to their architects, the work of Kahn. Tod Williams and Billie Tsien's Neurosciences Institute in La Jolla (1995) is located less than a mile from Kahn's Salk Institute. *fig.* 17 It is an example of the first type, a building that attempts to construct a narrative of its layered construction. The outer layers of limestone and stainless steel are peeled back to expose an inner layer of concrete, thus illustrating the layered nature of the wall. *fig.* 18 This is admirable, but it is not a literal construction. The metal and stone panels are backed not with concrete, but metal studs. Additionally, aluminum trim faces the edge of the layers, and we see only three of the many layers that make up the wall. The facade of the Neurosciences Institute might be a constructed narrative; but in terms of describing what is being hidden, it is a far more accurate one than many of its contemporaries. It is also a description of the real construction, not a recollection of an historical one. This was not because the architects were indifferent to history; the original intent was to match the concrete of Salk, but this proved unfeasible and the

fig. 17

Neurosciences Institute, Williams and Tsien,
La Jolla, California, 1995

fig. 18

Detail, Neurosciences Institute, Williams and Tsien,
La Jolla, California, 1995

fig. 19

Canadian Clay and Glass Gallery, Patkau Architects,
Waterloo, Ontario, 1992

concrete was sandblasted. Williams said: "We didn't have the budget; we didn't have the mock-ups, and we didn't have the time."[29]

This problem, craft, is another factor that tends to make layered construction preferable. The modern concept of craft is that only the exterior finish layer of a building needs to be precisely executed, allowing the interior structure to be more inaccurately assembled. The division of the modern wall into specialized, constructionally independent layers executed by specialized, independent subcontractors is one of a series of problems that have always existed, but that have become exacerbated in recent years.

Monolithic concrete attempts to do all its tasks simultaneously, with one material, at the same level of precision. In theory, this seems much simpler, but in practice, it is often far more difficult. Developments such as insulated concretes may change this, but the introduction of improved fireproof paints in the 1980s has done little to foster exposed steel construction. There have been somewhat isolated attempts to come to terms with this constructional phenomenon. Patkau Architects' Canadian Clay and Glass Gallery in Waterloo. Ontario (1992), exposes the edges of its layered brick and concrete masonry wall in a conscious effort to reveal this phenomenon, but it is of course far more a constructed narrative of the assembly than a reality that has simply been exposed. *figs.* 19–20

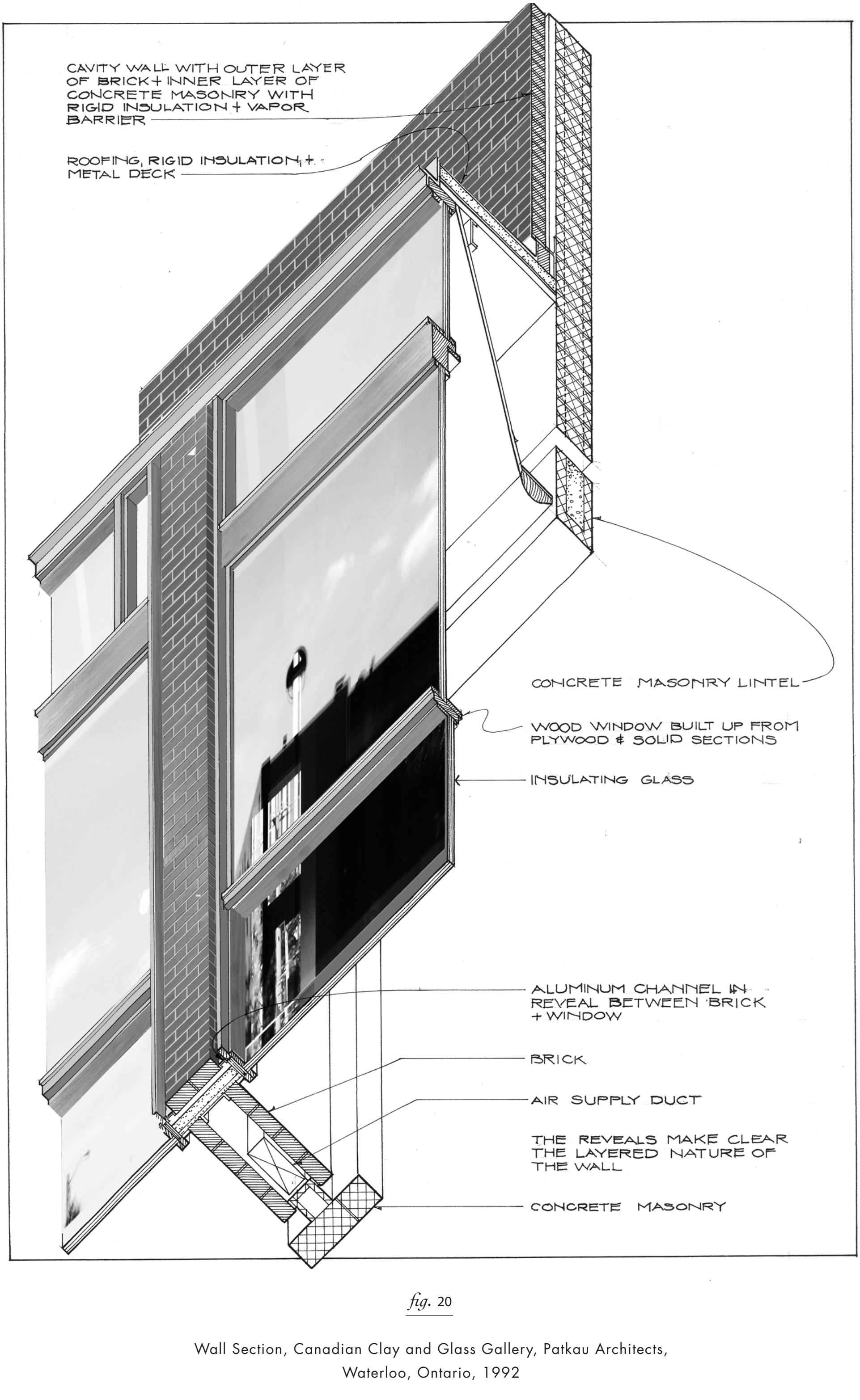


fig. 20

Wall Section, Canadian Clay and Glass Gallery, Patkau Architects, Waterloo, Ontario, 1992

fig. 21

Contemporary Arts Center in Cincinnati, Zaha Hadid, Cincinnati, Ohio, 2003

The second approach, the layered building masquerading as a monolithic one, is exemplified by Hadid's "concrete" building for the Rosenthal Contemporary Arts Center in Cincinnati (2003). *fig.* 21 Hadid is another who has little use for the detail:

> I don't understand the preoccupation with detailing in the European sense—this over-obsessive idea. But on the other hand if you want to do a really good modern building, then the work has to be very well detailed.... I realized that I had to invent a new language for drawing and painting, to reinvent certain detailing methods to make it seem as if there is no detail.[30]

This attitude may account for some of the problematic aspects of the Contemporary Arts Center. To all appearances an exercise in Corbusian *béton brut*, or raw concrete, it is in fact steel-framed building clad with precast concrete panels, and steel columns, where exposed, are wrapped in concrete, an assembly that is not inherently deceptive, but, that is used here in a deceptive way.

Even more problematic are the "exposed" parts of the construction. In the ground-floor lobby, a metal mesh ceiling reveals what appear to be the uncovered internal workings of the building. We see conduits and ducts, but not a hint of a steel beam. The implication is that the finishes have been peeled back to reveal the real construction, but Hadid is selective about what elements are shown. Peeling aside, this is in part what happens, but nowhere do we see a hint of the greater reality of a steel frame that has been clad with concrete panels fabricated offsite.

The details are, on first examination, Brutalist; the middle layer of detail, window frames in particular, are eliminated or minimized, but much of this is done in a superficial way. The jambs of the major curtain wall are absorbed into a notch in the adjacent concrete walls. The long horizontal projecting glass box appears as a clear uninterrupted prism of glass, but the reality is that the mullions are hidden behind the glass, and all that is really eliminated is the exterior cover plate. It is no more transparent than a typical thick-mullioned store front. The detail has neither technical advantages nor real visual ones. From the outside, it looks as if it might be transparent. From the inside it is not.

This is a practice seen in many contemporary buildings, the application of superfluous constructional features in combination with the suppression of real ones, to the end of achieving a "modern" image. It is, in its way, no less historicist than the neo-Colonial work of Robert A. M. Stern. This is not non-detailing; it is selective detailing. Its intent is to be the paradigm of the construction of the building as a whole, and it is a highly legitimate form of detail, but also a highly deceptive one. At best, it is a modern equivalent of the Doric order. This is modernism in its late decorative phase imitating mainly itself, mimicking its traditional formal technological motifs now deprived of any useful purpose other than historical association.

Another building in the shadow of Kahn is Tadao Ando's Modern Art Museum of Fort Worth (2002), and it is the third type of response to Kahn's constructional legacy, attempting to literally build in the manner of Kahn. *fig.* 22 The concrete is marked throughout with the rectangles and grids of

fig. 22

Modern Art Museum, Tadao Ando,
Fort Worth, Texas, 2002

small round holes associated with Kahn's Kimbell Museum across the street. The concrete finish used by Kahn (and in theory by Ando) was to leave the surface untouched after stripping away the formwork. At Kimbell, the rectangles are the mark of the plywood formwork, the round holes the mark left by the form ties that held them together. In Ando's building, every other row of form ties is ornamental, and many of the surfaces were treated after form removal to leave the impression that the walls resulting from form stripping had been perfect. At the same time, many of the real joints are suppressed. The concrete Ys that support the roof were to be cast in place. Because of the difficulty of vibrating these upright forms, the upper legs of the Ys are precast, and the joint between precast leg and cast-in-place column is hidden. *fig.* 23 Thus while false joints are added to the walls to make references to historical precedent, the real joints of the frames are hidden, because they are at odds with a predetermined image.

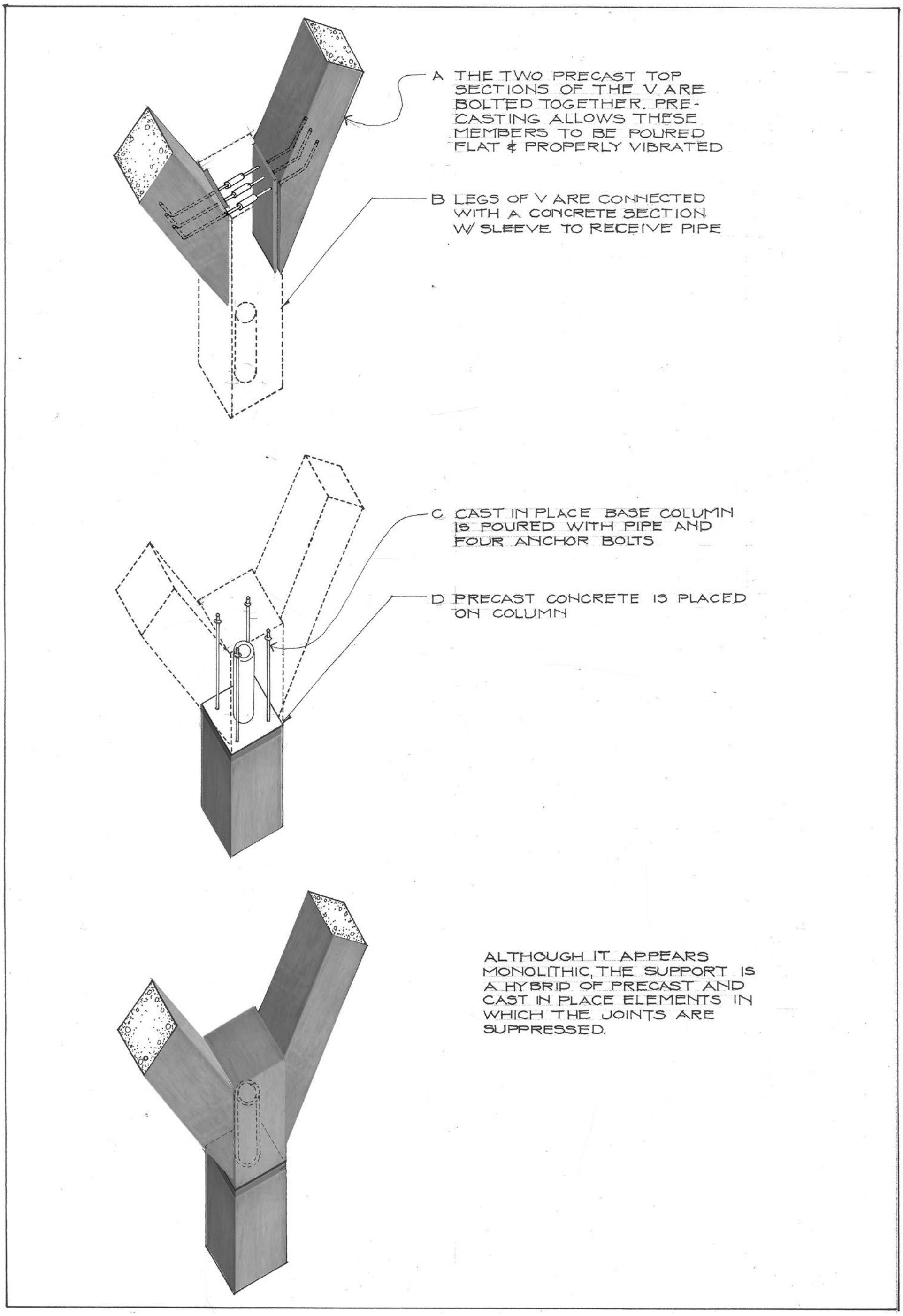


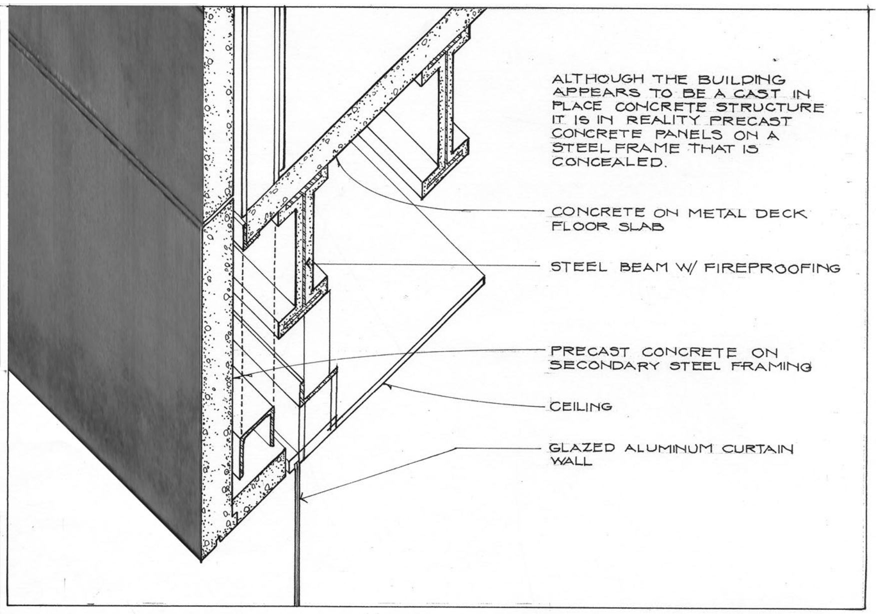
fig. 23

Column Joint Construction Sequence, Modern Art Museum, Tadao Ando,
Fort Worth, Texas, 2002

A fourth option for contemporary architects is, of course, to accept the necessity of cladding, and thus if structure is to be expressed it can only be done so through the descriptive qualities of the cladding. This is not a new theory. Semper, who was, at best, a minor character in modernist histories from 1920 to 1970, has received considerable attention in the last twenty years, a renewed interested that has run parallel to an increasing interest in the building as body with clothing as a metaphor. The design of Herzog and de Meuron's Addition to the Walker Art Center in Minneapolis (2005) is a highly accelerated Semperian evolution from literal to metaphorical fabric on a steel frame. *fig.* 24 After investigating various types of metal, a literally translucent fabric exterior was proposed. A mock-up demonstrated that it acted as a giant light to attract insects and the design was changed to perforated metal panels, stamped with a repetitive pattern. *fig.* 25 The architects argue that it resembles crumpled paper, but the fabric analogy is everywhere. The architects proposed to line the auditorium with organza, and throughout the building, the architects applied a pattern they call paisley, used primarily at transitions from exterior circulation

fig. 24

Addition to the Walker Art Center, Herzog and de Meuron, Minneapolis, Minnesota, 2005



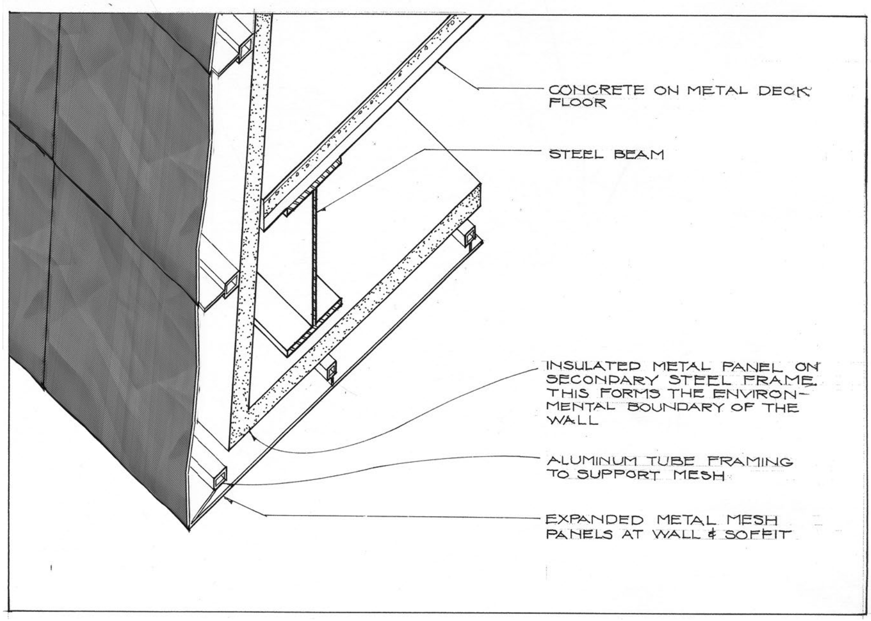


fig. 25

Wall Detail, Contemporary Arts Center in Cincinnati, Zaha Hadid,
Cincinnati, Ohio, 2003
Bottom
Wall Detail, Addition to the Walker Art Center, Herzog and de Meuron,
Minneapolis, Minnesota, 2005

to interior room, at the seams. According to *Architectural Record,* the pattern was drawn from women's underwear.[31]

Like most contemporary modernists, Herzog and de Meuron are well aware of their position within modernist history. They commented on the Miesian legacy in their description of the facade of their Tokyo Prada Store (2003):

> The steel profile is not visible on the outside because it is concealed behind the glazing, which is variously flat, concave, or convex. The glass covers the steel structure like a gelatin layer with thin black silicone seams. The rhombus-shaped structure of the steel remains visible on both sides without revealing the materiality of the steel itself. International Style architecture in the tradition of Mies van der Rohe clad the steel profiles with steel in keeping with a basically classicist impetus. An approach of that kind would be absurd in our Tokyo project, because the architecture targets a strategy of perception based on ceaselessly changing vantage points and seeks to undercut any fixed or final image of the world.[32]

Modernist Myths and Modernist Orders

The paradoxical qualities of Ando and Hadid's exposed concrete buildings are all too typical of a large number of modernist buildings. Smithson's model of the development of an order-construction to order decoration is a fairly accurate one in describing the modern condition, which is one that largely and unconsciously works with a set of orders no less rigidly prescriptive than the precise ratios of Andrea Palladio. The most common of these is the Corbusian flat slab.

Le Corbusier's Five Points of a New Architecture are linked invariably to the image of the frame of the Maison Domino (1915), two flat slabs supported by six cylindrical columns with no beams and no evident lateral bracing. The Maison Domino is based on the lost tile system, in which hollow clay tile blocks added to the forms are left in the concrete to give the exterior appearance of a flat slab while, in reality, creating a ribbed slab.

The structural and spatial image of a grid of columns supporting a flat, unbroken slab, exemplified by the Maison Domino, is typical of the modernist work of Le Corbusier, Mies, Aalto, and many others. In most cases, this is achieved not through a true flat slab of concrete but by using ceilings to conceal the beams, but exposing the columns. The reason for this construction method was that it created the spatial continuity of a free plan. It was an image whose popularity rapidly dispensed with its structural origins. Nevertheless, it has had a remarkably resilient life, appearing in the houses of Walter Gropius, Rafael Soriano, Richard Meier, Michael Graves, and others, built of round steel columns and wood joists behind a drywall ceiling to replicate the Domino image. That this convention was creating something of a problem became evident in Koolhaas' competition entry for the National Library of France in Paris (1989), a cube of impossibly thin flat slab floors supported by a grid of large and small columns.

Koolhaas was unconcerned by the gap between conceptual structure and structural reality, and turned the Corbusian slab into its all too common contemporary descendent, the continuous plane of equal thickness, most conspicuously at his Educatorium at the University of Utrecht (1997), a building that houses an auditorium, cafeteria, and classrooms. *fig.* 26 Conceptually, the building is a continuous concrete ribbon of uniform thickness that forms the ceiling of the cafeteria and the floor, rear wall, and roof of the auditorium above. We might assume from appearance that the Educatorium is a solid, monolithically structured, bare-bones building of unadorned construction in concrete and glass, with only the curving plywood and its exposed edge as an added layer, but this is hardly the case. Not surprisingly, the thin, continuous concrete plane forming the floor and roof is neither constructionally adequate for all its tasks nor particularly honest. It is too thin to support the long span above the auditorium, and the tight curve at the rear of the auditorium proved impossible to pour. The first problem is solved rather cleverly, by projecting steel trusses below the ceiling; the second, rather clumsily by building the curve out of cement plaster in imitation of concrete. *fig.* 27 This is clear on the interior where the plaster framing is exposed, but not at all on the exterior. The curve is visible on the glazed face of the building, but not really exposed as the edge is faced with travertine.

fig. 26

Educatorium, University of Utrecht, Rem Koolhaas,
Utrecht, Netherlands, 1997

The Educatorium was a primary event in the next development of this order: the morphing of the flat slab into the continuous surface, merging wall and floor, ground, and building. Few orders achieved such instant success and instant triteness as the continuous concrete ribbon that soon appeared in the work of Hadid, MVRDV, and Diller + Scofidio. The continuous concrete ribbon is only one example of the creation of the "orders" of modern building, a process made inevitable by the dominance of constructional images over constructional realities and the evolution of those images over time. The result is a constructional style that, in Smithson's terms, becomes first representational, then ornamental, in this case rather rapidly.

In any case by 1980, if modernism had not quite jettisoned the idea that its languages had constructional origins, it had at least concluded that these origins were irrelevant. Modern architecture was about the modern vision and the modern predicament, not about modern construction and modern technique. The problem, however, is that modernism has discarded none of the formal and structural elements that the constructional philosophy of modernism has generated. All of Le Corbusier's Five Points remain in place, allowing for the occasional truss or even constructionally articulate detail. The language of modern construction remains; the philosophy does not.

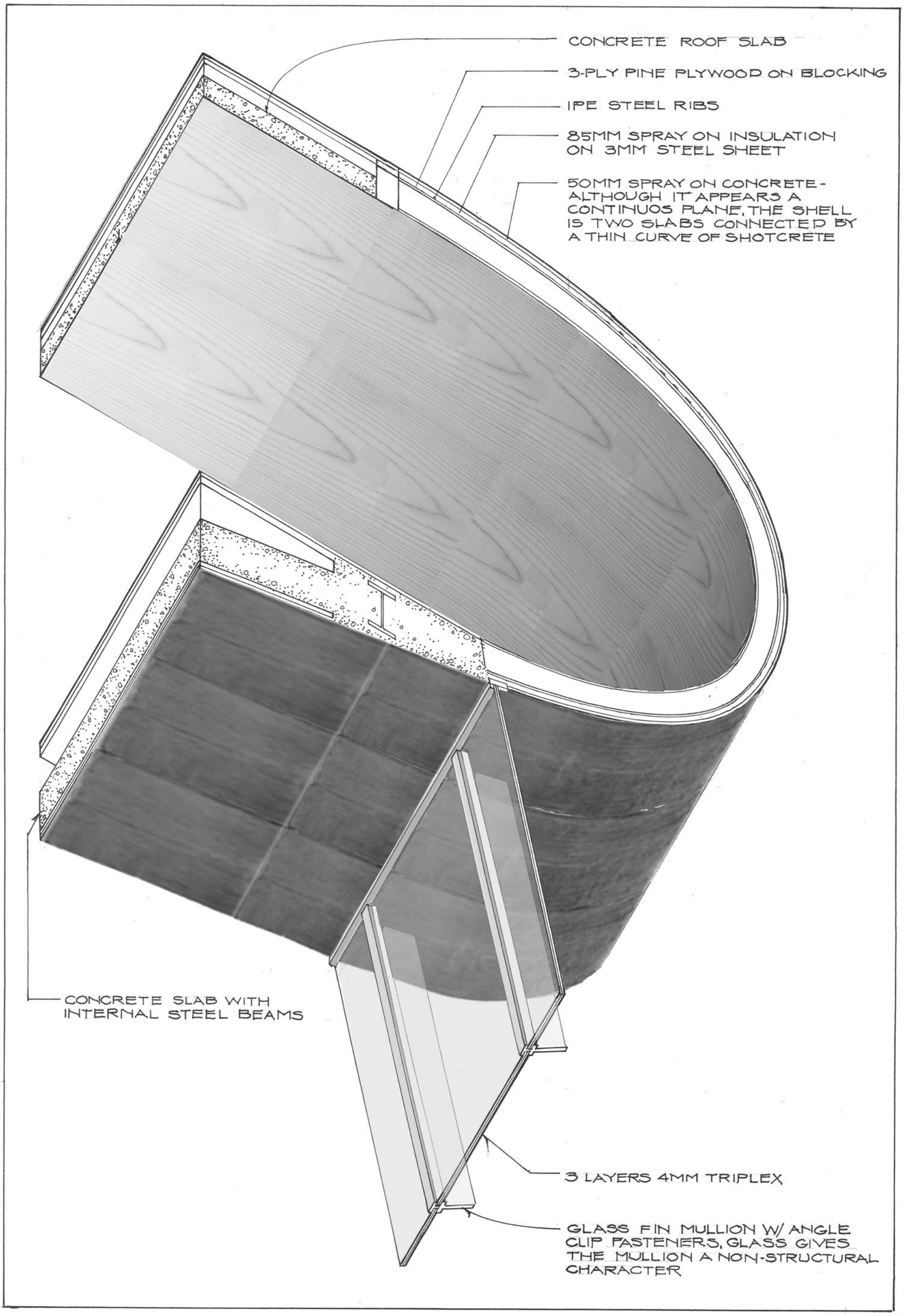


fig. 27

Wall Section, Educatorium, University of Utrecht, Rem Koolhaas, Utrecht, Netherlands, 1997

Conclusion

A Nikolas Pevsner of the distant future might describe our era as the late-decorative stage of modernism, imitating the constructional images of earlier modern buildings, with little concern for the constructional legitimacy of the result, while suppressing indications of its actual construction methods. The modern architect, having discovered that the factory-made house was not only not just around the corner but also nowhere in sight, having discovered that the new forms made possible by concrete and steel were not in themselves functionally desirable, having found that the building composed of off-the-shelf standardized parts, in fact, required a large amount of customized craft, and having decided that if the zeitgeist were not necessarily technological, and even if so, it might just as easily be about its negative aspects, was quite willing to dispense with the reality of modern construction. The modern architect would not, however, let go of the images of modern construction. Lacking any obvious alternatives, he or she was all too happy to retain what modernism had created, and seeking a cause, was thus left with little more than a vaguely defined, and rapidly changing, zeitgeist.

It is difficult to argue that contemporary modernism does not have something like its own set of orders, images that originated in constructive systems, but are now far removed from their constructional origins, and owe more to modernist history than to constructional reality. When structural expression does occur more often than not, it is not a logical construct, but an icon borrowed from early modernism. What can be said to legitimize these orders over pure decoration, other than examples of their continuous use? Upon reflection, it is disturbingly analogous to the contemporary uses of Doric or Ionic orders.

Yet while the present situation—a constructional language that is many times little more than decorative—is in large part due to a lack of interest in construction and a lack of imagination, it would seem that the concept of orders is to a degree necessary. There is a necessity for the construction of a narrative, of articulating some pieces of constructional information while suppressing others. The reason for covering the frame and services of a building are numerous and difficult to dispute. The arguments for exposing them—constructional clarity and economy through simplicity—are more often than not less convincing. In any case, the "honest" building in which everything is exposed, nothing is concealed, and everything is explained is largely unknown in antiquity or the present day. What appear to be entirely literal constructions are inevitably only partially exposed ones. Although many of the architects discussed here advocated a literal, no layers, no finishes style of building, all came, either through theoretical realignment or response to practical requirements, to build clad and layered buildings. They argued that the role of the resulting cladding was to describe the hidden construction, but rarely could they escape history. None has been able to dispense completely with the symbolism of older constructions, many of them constructionally unnecessary.

Smithson's argument was that there is a natural progression from a literal construction to an order to a decorative system—and that an order, although symbolic in its constructional expression, has a constructional legitimacy that decoration does not. In recent years, art historians have called into question the historical basis of Smithson's positions. Barbara Barletta has disputed the wooden origins of the Doric order, and Mark Wilson Jones argues that elements such as the triglyph, which traditionally represented a beam end, are decorations whose origins have nothing to do with construction.[33] Much of the historical analysis of Gothic rationalism has been disputed as well. But while Smithson's thesis may not be true of the totality of history, in modernism, we have seen no end to literal construction evolving into decorative systems. The question is rather if there exists an intermediate stage—an order—that finds a place as legitimate expression between the literal and the decorative, and what role tradition, history, and language, as opposed to the facts of the actual construction, play in its design.

Many would argue that this is of no consequence, that there is no need for structural expression in contemporary architecture, and therefore, that structural concealment is no problem. In a 2005 lecture at Rice University, Antoine Picon, enumerating the changes brought by the digital age, stated that "structural rationalism is probably dead."[34] Whether this is true and whether, if true, it is the result of the digital revolution is not clear. Certainly, the role of the structural frame in many contemporary modernist buildings is conceptually absent or appears only as an afterthought. In any case, regardless of the intentions of contemporary modernism, the contemporary viewer is still likely to look at a building in a structural way. Gottfried Semper's argument that constructional information is a distraction to the understanding of architecture is contradicted by a great number of traditional as well as modern buildings, and if immensely unpopular as a concept with modern theoreticians, weight remains, in the eye of the architectural beholder, the point of departure for an architectural understanding that transcends glib association and symbolism.

If one believes that architecture is the art of building, then it must tell us how it is built, and if this can be done only by partial exposure or by a symbolism of construction, how is it to be designed? If architecture is the art of building, then the partially exposed structure will be preferable to the clad one; the cladding that is descriptive of construction will be preferable to the cladding that is descriptive of history, and the cladding that is descriptive of the history of construction will be preferable to the cladding that is descriptive of the history of anything else. Thus it could be argued that the buildings discussed here are successful insofar as they make reference to the layered constructions that they clad, and unsuccessful insofar as they make references to historical constructions. Smithson is probably right, however, that the non-validity of an order is less the result of a lack of adherence to a strict set of guidelines for accuracy in cladding than the result of inevitable loss of vitality in the development of an order. The points at which architecture escapes precedent, whether an order, a style, or a tradition, are transcendent, but we should be mindful that none of these architects has been able to completely do so, and all admit the possibility that the inclusion of the historical reference is perhaps a necessary condition for this transcendence to occur.

Epigraph. Jones , *Zago Architecture and Office dA*, 35; Smithson, "A Parallel of the Orders," 561–62.

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2 Ibid., 165.

3 John Ruskin, *The Stones of Venice* (New York: Hill and Wang, 1960), 151.

4 George Gilbert Scott, "On the Rationale of Gothic Architecture," *The Builder* (March 3, 1860), 131.

5 George Street, *Notes of a Tour of Northern Italy* (New York: Hippocrene, [1855] 1982), 458.

6 Kristine Garrigan, *Ruskin on Architecture* (Madison: Wisconsin, 1973), 77.

7 Werner Oechslin, *Otto Wagner, Adolf Loos, and the Road to Modern Architecture*, trans. Lynnette Widder (New York: Cambridge University Press, 2002), 189, 191.

8 Gottfried Semper, *The Four Elements of Architecture* (New York: Cambridge University Press, 1989), 127.

9 Gottfried Semper, *Style in the Technical and Tectonic Arts, or, Practical Aesthetics*, trans. Harry Francis Mallgrave and Michael Robinson (Los Angeles: Getty Publications, 2004), 439.

10 Otto Wagner, *Modern Architecture* (Los Angeles: Getty Trust Publications, [1902] 1988), 92.

11 Ibid., 93.

12 Sebastiano Serlio, *Sebastiano Serlio on Architecture* (New Haven: Yale University Press, 1996), 372.

13 Ian Whyte, ed., *Hendrik Petrus Berlage: Thoughts on Style 1886–1909* (Los Angeles: Getty Trust Publications, 1996), 136.

14 Ibid., 171.

15 Ibid., 176.

16 Don Gifford, ed., *The Literature of Architecture* (New York: E. Dutton, 1966), 608.

17 Donald Hoffmann, *The Meaning of Architecture: Buildings and Writings by John Wellborn Root* (New York: Horizon, 1967), 138.

18 In *A Testament*, Wright says he read *Sartor Resartus* at 14; in his *Autobiography*, he says that he read it while attending the University of Wisconsin.

19 Charles Keeler, "Bernard Maybeck: A Gothic Man in the Twentieth Century," http://www.oregoncoast.net/maybeckgothicman.html.

20 Esther McCoy, *Five California Architects* (New York: Reinhold Publishing Corporation, 1960), 11; William Jordy, *American Building and Their Architects: Progressive and Academic Ideals at the Turn of the Twentieth Century* (Garden City, NY: Oxford University Press, 1972), 280.

21 Karla Britton, *Auguste Perret* (London: Phaidon Press, 2001), 245.

22 Ibid., 243.

23 Peter Carter, "Mies van der Rohe: An Appreciation" *Architectural Design* 31 (March 1961), 97.

24 Le Corbusier, *Vers une architecture* (London: Francis Lincoln, [1928] 2007), 102.

25 Alison and Peter Smithson, "The Economist," *Architectural Design* 35 (February 1965), 78.

26 Smithson, "A Parallel of the Orders," 561,

27 Peter Blake, "The Establishment strides again," *Architectural Forum* 122 (May 1965), 18.

28 Wurman, *What Will Be Has Always Been*, 125, 44.

29 Todd Williams and Billie Tsien, "The Neurosciences Institute," *GA document* 50 (April, 1997), 48.

30 Robin Middleton, ed., *Architectural Associations: The Idea of the City,* 81–82.

31 Sarah Amelar, "Herzog & de Meuron: Walker Art Center" *Architectural Record* (July 2005), 93.

32 Celant, *Prada Aoyama Tokyo*, 160.

33 Barbara Barletta, *The Origins of the Greek Architectural Orders* (New York: Cambridge University Press, 2001); Mark Wilson Jones, "Tripods, Triglyphs, and the Origin of the Doric Frieze," American Journal of Archaeology 106 (2002) 353–90, http://www.ajaonline.org/pdfs/106.3/AJA1063.pdf#jones.

34 Antoine Picon, Lecture at Rice University, December 2, 2005.

5

Chapter 5

Definition Number 4

The Detail as Joint

The architect must look for rational constructions and forms for edges and joints.... Details express what the basic idea of the design requires at the relevant point in the object: belonging or separation, tension or lightness, friction, solidity, fragility.

—Peter Zumthor

The object of any detail (apart from its functional ones) is to assist in revealing the nature of the material and techniques employed.... This is not to say that we reject or fail to be moved by the aesthetic which produces that other-worldly feeling that no human hand conjured up the dream-palace, where no effect remains of any human process or assembly. It's just that the sort of techniques we find ourselves working with seems to us to demand this kind of rather literal communication.

—Bill Howell

Good joinery....should be thought of as an investment, an unseen morality.

—George Nakashima

The joint is the beginning of ornament.

—Louis Kahn

"It is possible to observe," wrote Marco Frascari, "that any architectural element described as a detail is a joint. Detail can be 'material joints,' in the case of a capital, . . . or they can be 'formal joints' as in the case of a porch."[1] Whether this is true or, how useful a definition it is if it is true, is dependent on other questions—some smaller, some larger. Firstly:

What is a joint or rather, what is a part?

The East Porch of the Erechtheum (406 BCE) consists of a plinth, six columns, and an entablature; these parts are joined in two ways. The four drums that make up the column shafts are perfectly connected, without trim, and in the original building, the joints were probably imperceptible; these are invisible joints. The column-to-entablature or column-to-plinth joints, by contrast, are highly ornamented, with volutes at the top, tori and scotia at the bottom. These elements are as much sculptural as they are architectural, and for some, the expression of an inner force. This joint type could be called animated, and the combined result of the invisible and the animated joint is that the actual number of parts and the apparent number of parts are not the same.

Any building of moderate size must be divided into a certain number of parts in order to be understood as a whole, even if those parts are not always well defined, and the number of those perceived parts will always be smaller, at times exponentially smaller, than the number of actual parts. This is a principle largely independent of technological sophistication, and it is the role of the articulated joint to create these perceived parts. In the modern building, this has changed only in their quantity. The number of apparent parts is a tiny fraction of the reality, and the number of articulated joints is a tiny fraction of the total number of joints. On a certain level, it is a simple question of perception. It is impossible to perceive a building one brick at a time. But this is ultimately an ideological, not a perceptual issue. Arguably, there is a third type of joint, such as that between the frieze and the cornice. The parts are perceptible as parts, but there is no particular emphasis given to their joining; there are no moldings. These joints are adjacent. But perception alone cannot explain the difference between the second type of joint—the articulated—and the third—the adjacent joint. This leads to a second question: Why is the articulation of parts necessary? Or:

What is the appropriate relation of one part to another part?

The Ionic volute is precisely what Kahn was thinking of when he said that the joint was the beginning of ornament: "A capital had to hold its volutes out to invite the span. It had to reach out, receive it, and the receiving of it had to be bigger than what the column was.... It is really the celebration of the meeting of the material."[2]

The idea that ornament is structural articulation is much older than Kahn. Professor of art history Alina Payne has pointed out that to key writers of the Renaissance, classical ornaments have structural origins and structural implications, if not structural functions. To Palladio, "Column bases... represent members literally crushed by the weight placed on them" and the carved members of his orders are always those that are "crushed." To Vincenzo Scamozzi, the torus and scotia at the base of a column and the capitals at the top are distortions of the structure caused by the weight bearing down on them.[3] *fig.* 1

Bötticher, writing in 1844, tried to codify the idea that classical Greek ornament can be understood as sculptural interpretations of the structural forces at work:

> Aside from the particular function of the structural component the decorative characteristic should also represent that component's integration—juncture—into the concept of every tangential structural component, the reciprocal organic relationship of the each other and thus, to a large degree, the work's totality, as if it had developed from a single formal organism.... If, however another component is adjacent, the end will be characterized by symbols that represent the concept of the ending as well as the concept of the static force that the adjacent component—in accordance with its essence—exerts upon it.... The essence of the adjacent structural component thus determines the symbol of the juncture.[4]

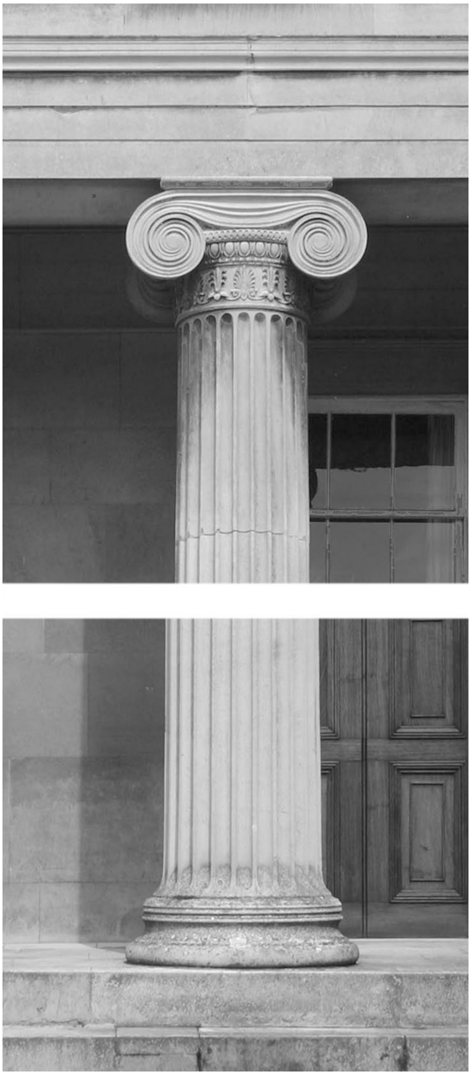


fig. 1

Capital and Base of Ionic Column, Downing College,
William Wilkins,
Cambridge, United Kingdom, begun 1800

Contemporary archeology would dispute many of the theories of the structural origin of these decorative elements, but that is the way that Palladio, Scamozzi, and Bötticher understood them, and does not preclude us from understanding them that way as well. Thus the question of joining is not just one of whether the joint is hidden or articulated, but also whether it is adjacent or animated. This leads to a third question, why is either articulation or animation necessary?, Or:

What is the relation of part to whole?

Heinrich Wölfflin, over a period of twenty-seven years bracketed by two books, *Renaissance and Baroque* (1888) and *Principles of Art History* (1915), wrote of "the relation of part to whole." Early Renaissance or classical art, he wrote, "achieves its unity by making the parts independent as free members," while "Baroque art abolishes the uniform independence of the parts in favor of a more unified total motive."[5] Wölfflin makes it clear that he does not see this as a positive development:

> What then the baroque brings as something new is not merely unity, but that conception of absolute unity in which the part, as an independent value, is swallowed up in the whole. No longer do beautiful elements combine in a unity in which they continue to breathe independently, but the parts have submitted to a dominating total motive, and only the co-operation with the whole gives them sense and beauty.[6]

Paul Frankl was one of a number of historians who saw the issue of part and whole in a similar way. Writing in 1914, he made the same distinction between an architecture of parts and an architecture of totalities, but saw its consequences in a different way. Each mode is expressive of a worldview: an architecture of parts is a social metaphor, expressive of "freedom," and an architecture of totalities is expressive of "constraint." What he called the first phase of post-Medieval architecture (1420–1550), the early Renaissance, exemplified by the work of architects like Filippo Brunelleschi, is characterized by an architecture of parts, by buildings that are generators and centers of force, that express a worldview of "freedom of personality" and "the world as finite." The importance of parts in harmony during this first phase is exemplified by the orders, which Frankl called "an organism composed of easily disconnected members." He wrote:

> The common characteristic of all tectonic forms of the first phase is that they seem capable of withstanding external forces;...they do not passively resist a superior force but on the contrary stand triumphant

> and indestructible. . . . The tectonic forms of this phase are seen, as a whole and in part—even to the last profile—as generators of force. . . . each part, like the whole, attains its individual perfection, its specific integrity.[7]

The second phase (1550–1700), that of an architecture of totalities, is characterized by buildings that are transmitters and channelers of forces expressing a worldview of "constraint of personality." More recent historians had similar thoughts. H. P. L'Orange saw the massive unity of the Roman vaulted architecture of the Dominate, such as the Baths of Diocletian in Rome (306 CE), as representative of the authoritarian order of the Empire, while the Greek or early-Roman orders, with their distinguishable parts working in harmony, were seen as a manifestation of the democratic. Norris K. Smith saw the individual columns of the Greek temple as a metaphor of a society, of members standing together, while to John Onians, they hold more specific, and more militant, meaning, representing the members of a phalanx—a Greek military formation consisting of a regular grid of soldiers.[8] All saw an architectural arrangement of parts as an analogue of a social and political order; this is not a mode of thinking confined to classicism.

There are understandings of the architecture of parts other than the political. For art historian Erwin Panofsky, the Gothic cathedral is a metaphor for a system of order, but an intellectual order rather than a spiritual or political one. The cathedral was the built manifestation of medieval scholastic writing, of "distinctness and deductive cogency":

> The individual elements, while forming an indiscerptible whole, yet must proclaim their identity by remaining clearly separated from each other—the shafts from the wall or the core of the pier, the ribs from their neighbors, all vertical members from their arches; and there must be an unequivocal correlation between them. We must be able to tell which element belongs to which.
>
> A man imbued with the Scholastic habit would look upon the mode of architectural presentation, just as he looked upon the mode of literary presentation, from the point of view of a manifestation. He would have taken it for granted that the primary purpose

of the many elements that compose a cathedral was to ensure stability, just as he took it for granted that the primary purpose of the many elements that compose a Summa was to ensure validity.[9]

Obviously, the architectures of the Roman Empire and the Baroque Era have their advocates, and obviously, it is not because they see this type of building as repressive, constraining, or intimidating. They are commonly characterized not as monoliths, but organisms, sometimes without readily defined parts. This leads to a fourth question, how autonomous should the parts of an assembly be? Or:

> Is a building a mechanism or an organism? Is it more like a watch or a tree?

Writing in 1802, theologian William Paley, seeking to make an argument for what today would be called intelligent design, asked a hypothetical question. A man walking through a field finds a stone and makes assumptions about how it got there. What assumptions would the same man make if he found a watch?

> When we come to inspect the watch, we perceive . . . that its several parts are framed and put together for a purpose, e.g., that they are so formed and adjusted as to produce motion, and that motion so regulated as to point out the hour of the day; that if the different parts had been differently shaped from what they are, of a different size from what they are, or placed after any other manner, or in any other order, than that in which they are placed, either no motion at all would have been carried on in the machine, or none which would have answered the use that is now served by it. . . . The inference, we think is inevitable; that the watch must have had a maker.[10]

Nature was to Paley, as it was to many in the eighteenth century, like a watch. A dissenter to this view was philosopher Immanuel Kant, for whom the watch was a deficient organic model. He described the natural object as an "organized being," as opposed to a watch that was "a mere machine." Twelve years before the publication of Paley's book, Kant had written:

> In a watch one part is the instrument for moving the other parts, but the wheel is not the effective cause of the production of the others; no doubt one part is for the sake of the others, but it does not exist by their means. In this case the producing cause of the parts and of their form is not. Hence a watch wheel does not produce other wheels, still less does one watch produce other watches, utilising (organising) foreign material for that purpose; hence it does not replace of itself parts of which it has been deprived, nor does it make good what is lacking in a first formation by the addition of the missing parts, nor if it has gone out of order does it repair itself—all of which, on the contrary, we may expect from organised nature.

A far better example of the nature of an organized being is the tree:

> In the first place, a tree generates another tree according to a known natural law.... Secondly, a tree produces itself as an individual. This kind of effect no doubt we call growth; but it is quite different from any increase according to mechanical laws.... Thirdly, each part of a tree generates itself in such a way that the maintenance of any one part depends reciprocally on the maintenance of the rest.
>
> In such a product of nature every part not only exists by means of the other parts, but is thought as existing for the sake of the others and the whole, that is as an (organic) instrument... but also its parts are all organs reciprocally producing each other.[11]

The architectural consequences of this were obvious. For Kant, as for many others, "Beauty in nature can be rightly described as an analogue of art," and Kant is one of the founders of one school of organic thinking in architecture, as Caroline van Eck has shown.[12] Kant is certainly closer to the truth in his description of nature than Paley. Whether it is correct to apply Kant's description of an organism to a building—which must have parts and most of which, like those of a watch, cannot reproduce themselves or reciprocally modify each other—is less certain. The contemporary building, at least in its constructional if not conceptual status, seems very much a watch. Nevertheless the question remains open. What is the nature of the modern building—a watch-like mechanism or a tree-like organism?

The Modern Organism

Berlage's Municipal Museum in The Hague (1935), like many brick and concrete buildings, has few joints of consequence, and the building's minimal ornament is unrelated to these joints. To Berlage, concrete made a jointless modernism technically possible, and if joints were the beginning of ornament, then for Berlage, the end of ornament was a product of the end of the joint. He said in a 1905 lecture:

> For what has now become possible? Nothing more or less than the construction of the surface without a seam, the wall without a joint, something that a stone wall, even after it was covered with plaster, was unable to give.... Does not reinforced concrete fall entirely in line with the architectonic development of our time? Does it not fulfill completely this noticeable desire to create jointless and seamless surfaces.[13]

But if Berlage's technology was a relatively new one, his reasoning was older. The modern building was an organism, very much like a human body:

> Just as in the human body the external form is an indirect reflection of the skeleton—I say indirect, because the envelope of flesh follows in essence the core of the skeleton but at certain points deviates from it to form denser areas—so the concrete envelope could correspond to the structure in the same way and could also show the same deviations at certain points determined by aesthetic considerations.[14]

fig. 2

Meeting Room, Diamond Workers' Union Building,
H. P. Berlage,
Amsterdam, Netherlands, 1900

Wright agreed. Concrete made the jointless building possible, and the result was not a repressive monolith, but rather an organism. He wrote in 1931, reflecting on the development of his early work and his master Sullivan's concept of plasticity:

> Why not a larger application of this element of plasticity considered as continuity of the building itself?...Why not throw away entirely the implications of post and beam? Have no beams, no columns, no cornices, nor any fixtures nor any pilasters nor entablatures as such. Instead of two things one thing. Let walls, ceilings, floors become part of each other, flowing into one another, getting continuity out of it all or into it all.[15]

Both Wright and Berlage were highly conscious that they were entering a new phase of the machine age; but that this new age did not make the modern building a mechanism, but rather an organic unity. Nevertheless, if Wright and Berlage did not exactly disbelieve their own dogmas, there is some indication they felt obliged to subvert them.

Five years before his lecture, Berlage had designed the Diamond Workers' Union Building in Amsterdam (1900), one of modernism's most precisely and completely detailed buildings in terms of joinery. In the ceiling of the

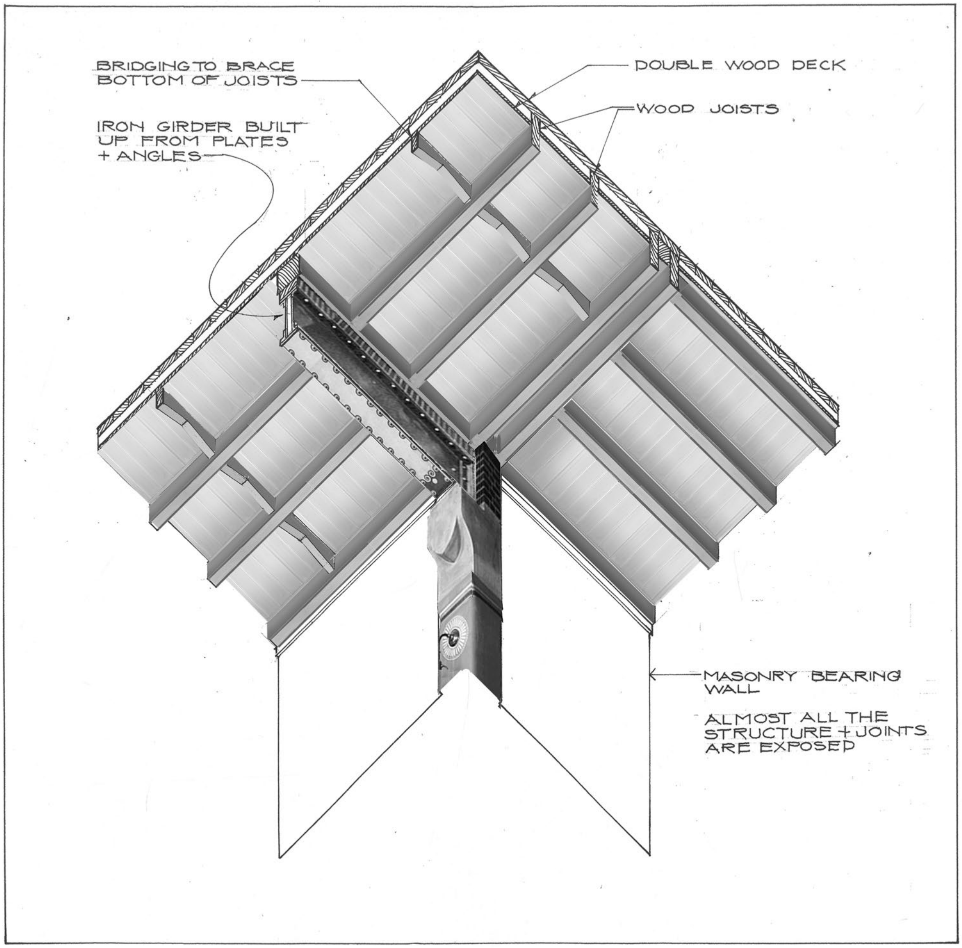


fig. 3

Wall Section, Diamond Workers' Union Building, H. P. Berlage, Amsterdam, Netherlands, 1900

fig. 4

Amsterdam Stock Exchange, H. P. Berlage, Amsterdam, Netherlands, 1903

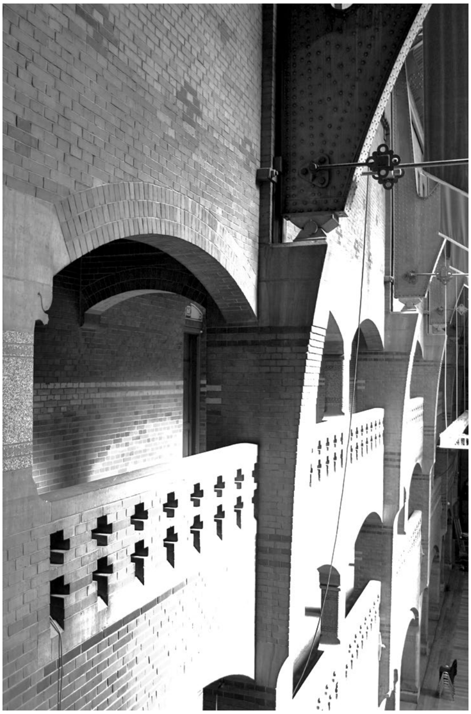


fig. 5

Truss to Wall Joint, Amsterdam Stock Exchange, H. P. Berlage, Amsterdam, Netherlands, 1903

ground-floor meeting room every structural part is exposed and each juncture precisely described—wood deck to wood rafter, wood rafter to steel beam, steel beam to stone capital, and stone capital to brick pier. *figs.* 2–3 Each board of the deck is beveled; each joint and each bolt of the steel beam is exposed. Even the bridging finds its place in the complex assembly. One year before Berlage's lecture, he had designed one of the most mechanistic, most animated, and least continuous joints in modernism in the Amsterdam Stock Exchange (1903). *fig.* 4 The joint of the steel arch and brick pier is structurally continuous since it completes the catenary line of the arch, but discontinuous since the end of the truss sits on a pin, allowing the connection to rotate. *fig.* 5 This is an example of the dissonant joint, one that is conceptually at odds with its container, but belongs there nevertheless. It is a moving joint in a static building, a mechanism within an organism. It is not just discontinuous, but animated by an articulation of movement within the otherwise immobile mass of the brick vessel. It is a resolution of a contradictory aspect of the building, that the monolithic, stable brick mass is covered by a light, elastic iron frame. This joint is not typical of the building; and if we define the joint as a condensation of the concept of the totality of the building, this is its opposite, a paradigm of another order of joining altogether.

Wright was equally inconsistent in applying the ideal of the jointless organism, never building an explicit mechanism, but often subverting the continuity of the organism. The most conspicuous detail in the concrete monolith of Unity Temple (1908), completed three years after Berlage's lecture, is a joint, the tall narrow window that separates the stair towers from the mass of the building. It is a break within the organism, yet the building is made stronger by its presence.

Eight years after Unity Temple, Wright designed the Frederick Bogk House in Milwaukee (1916), whose expression is one of precisely articulated parts, although its actual construction is not. *fig.* 6 It is structurally one of his more continuous works; in appearance it is one of his more articulated. The brick walls are divided into thin upright shafts with infill panels between, but all, in fact, are structurally part of the same wall. It is a masonry and brick monolith, but detailed with a variety of reveals and projections describing what appears to be almost a frame and infill building. *fig.* 7 To a degree, Wright was dealing with the inner contradictions of his own thinking. Organic architecture was about continuity, but it was also about the part being a representation of the whole, and for this to happen, there had to be parts.

The Arts and Crafts Joint

If the new architecture was, in theory, about the absence of joints, then by all appearances the old architecture was about their presence, even abundance, and in 1906 there was much evidence of this. Four years after Berlage proclaimed the death of the joint, Greene & Greene completed the Gamble House in Pasadena (1909). If not precisely a watch, or even a mechanism, it is certainly

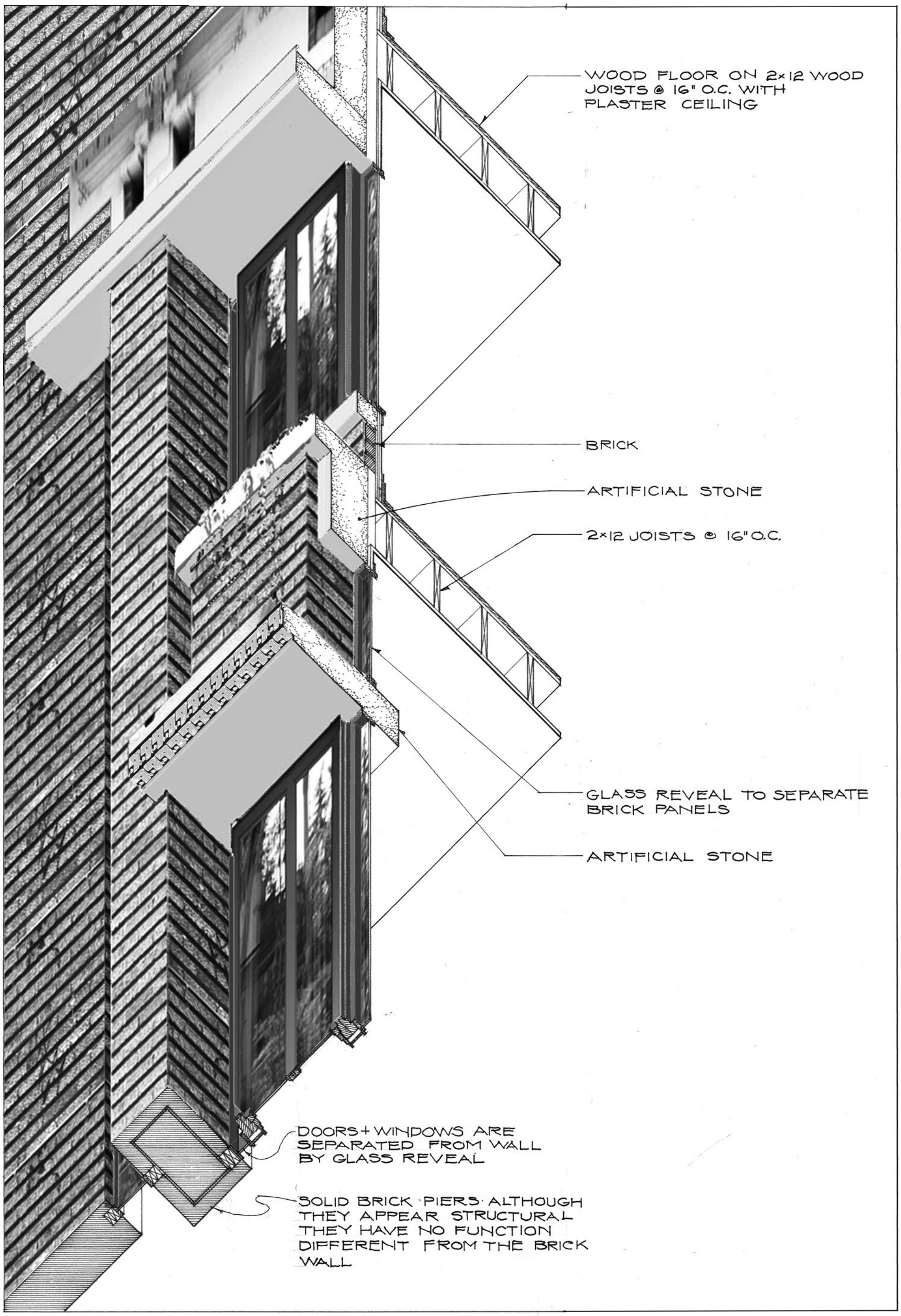


fig. 6

Wall Section, Bogk House, Frank Lloyd Wright,
Milwaukee, Wisconsin, 1916

fig. 7

Bogk House, Frank Lloyd Wright,
Milwaukee, Wisconsin, 1916

an assembly of semi-autonomous parts. Many of the connections do not seem to connect. Each individual piece of wood maintains a recognizable independent form. Beams and columns are interlocked, extended, rounded off, and appear to be fastened with exposed pegs so that the pieces maintain their individual character. Pieces are lapped and notched rather than mitered so that there is a visual discontinuity between elements, even if there is a structural continuity. *figs.* 8–9 Even the shingles are spaced with irregular gaps and cut with irregular ends so that they fail to merge into the familiar arrangement of regular rows.

One might interpret the loose assembly of parts that is the Gamble House, in the manner of Frankl or Wölfflin, as a metaphor for a society or system of thought, but there is a more direct social message in its joints. One objective was deliberate inaccuracy, to avoid the effect that the Greenes' contemporary, M. H. Baillie Scott, called "that monotonous and cast-iron regularity which is the ideal of modern work."[16] But the main principle was consciousness of assembly. To the arts and crafts devotee, this profusion of joinery was a manifestation of the teachings of John Ruskin and William Morris. The visible joint

fig. 8

Porch, Gamble House, Greene & Greene, Pasadena, California, 1909

fig. 9

Joint, Gamble House, Greene & Greene, Pasadena, California, 1909

was a necessary practice to evoke the consciousness of the one doing the joining. Despite the fact that many of the connectors are ornamental; despite the fact that most of the concealed frame is fairly standard wood construction; and despite the fact that the Greenes' adherence to arts and crafts ideals are subject to some skepticism, this ideology was the origin of this type of joinery and the message interpreted from it.

Despite all the archaic associations, there is much in the Gamble House that became characteristic of later modernism. Using the descriptions given above, the joints are animated, not by scotias and volutes, but by fasteners—bindings, pegs, rabbets, and dowels—and every animated joint has a mechanism that describes the manner of connection and, in doing so, displays its internal forces. The parts, although discontinuous, are resolved through articulated fasteners. In particular, the bindings have the power to suggest great forces being resisted, just as they do in classicism.

It would be overly simplistic to say that traditional architecture is about the presence of joints and that modern architecture is about their absence. There is a modernism of joints and a traditionalism of monoliths. These types of joinery—the mechanism and the organism—transcend changes in architectural style and technology, and like any style, they prospered and waned, rose and fell over time. It would be equally simplistic to say that the ornamental but structurally descriptive joints of classicism are absent from modernism. They are present in abundance, but not in their most recognizable form.

Thus on the eve of the International Style era, the construction of a building, and with it the relation of part-to-whole, was seen in a variety of ways: as a real or metaphorical organism, as parallel to the organization of a society, as a methodology of thinking, as a diagram of spiritual relationships, or as an explanation of construction. Whether a modern building was a watch or tree, a mechanism or an organism, remained to be seen.

The International Style Joint

It is doubtful that Charles Sorenson, president of the Ford Motor Company in its formative years, ever read Paley or Kant, but he had a clear idea of the relationship of part to whole. Mass production, he wrote, is characterized by "machine-produced interchangeable parts and orderly flow of those parts first to subassembly, then to final assembly."[17]

One might assume that the International Style, with its love of the machine, the car and plane in particular, would see a building as a mechanism, but this was not the case. The vast majority of International Style architecture is about eliminating joints, and if that proved impossible, hiding them. For this reason, much of International Style detailing was about suppression, not articulation. There are few real joints in Le Corbusier's Villa Savoye (1929). More properly, they might be called junctions—one form stops, another starts. It appears—and partly is—a concrete monolith. The kind of explicit joinery that characterizes the work of the arts and crafts or art nouveau architects is gone from International Style modernism. To the International Style architects, the modern building was an organism.

It is odd that so much of the machine age architecture of the 1920s is so unlike a machine. It may resemble a grain elevator or a Cunard cruise liner; it may have a geometric similarity with complex machines such as the Bugatti engine, all illustrated in *Vers une architecture,* but in the watch/tree dichotomy, these are mostly trees. Arguably, there are objects in *Vers une architecture* that are watches, but many are jointless monoliths, particularly the concrete grain elevators. Most of those illustrated were built using the continuous slip-form system introduced around 1900 in which the formwork moved continuously, albeit slowly, upward as the concrete is poured, leaving a surface that is, in theory, jointless. Airplanes and ocean liners hid most of their frames, and thus their joints, behind thin skins. But there were other reasons, and other models, for the absence of articulated joinery. Le Corbusier, the son of a watch case decorator, saw the machine not as a watch, but as an organism, if not exactly a tree. He described the modern machine in *The Decorative Art of Today:*

> Organized like living beings, like a powerful or delicate species of animal of astounding ability, that is never wrong since its workings are absolute. . . . The miracle of the machine thus lies in having created harmonious organs. . . . Broadly, one can say that every machine that runs is a present truth. It is a viable entity, a clear organism.[18]

It might be assumed that a Corbusian building built of steel would be of a fundamentally different character than one built of concrete, since the necessity of numerous joints would inevitably alter their mode of expression. But while articulated steel elements began to appear in his work in the late 1920s—the double steel columns of the Immeuble Clarté in Geneva (1932) or the unbuilt Maisons Loucheur (1928)—the critical joints—column-to-beam or -slab—are hidden above the ceiling and soffit. Despite the fact that its columns are steel, the larger of Le Corbusier's two houses at the Weissenhofseidlung Exhibition (1927) could be mistaken for a building built entirely of concrete. The two channels of the column, although separated, form a rectilinear section, and the beam-to-column connection is covered by the ceiling. Many of the columns are simply reinforced piers contained within the walls. As a result, it appears little different from his work in concrete, simply lighter and thinner.

Le Corbusier was no less prone to inconsistencies of thought and practice than Berlage or Wright, but he was much slower and reluctant to introduce animated joints into his seamless organisms. They eventually appear and in a dramatic way, but in two unbuilt competition entries for the League of Nations (1927) and the Palace of the Soviets (1931). He called these elements biological and said he wanted to avoid the "static" nature of traditional long-span buildings such as St. Peter's Basilica or the French National Assembly.[19]

The Body Politic

Those who find political, social, and philosophical metaphors in the architectural joinery of fifth-century Greece or fifteenth century Italy see the same metaphors in modern architecture, and in some surprising places. Wright clearly thought of the dendriform columns of his S. C. Johnson Administration Building in Racine, Wisconsin (1939), as trees. *fig.* 10 But according to Norris K. Smith, they are a hypostyle hall, "the chief symbol of the body politic."[20] To Smith the grid of columns represented, quite literally, a society and its members. For this to visually occur, the structural members of the building and the way they are joined must have a certain autonomy. In contrast to the monolithic brick envelope, the columns of the Johnson Building seem almost freestanding. *fig.* 11 The connecting beams are hidden by the skylight, making the column minimally connected to any of the other surfaces. The shafts taper toward the ground, and the steel crow's-foot fixture at the base makes a tenuous looking connection even more so. The rotating base joint is necessary because the tree is actually a rigid frame, but there are few if any joints of consequence that could be called articulated in the remainder of the windowless brick and glass-tube block. Wright added a steel flared base in some locations to provide space for telephone and electrical connections. The effect of the column base and the reading of the columns in this way are dependent on the joint's singularity. Without the monolithic brick wrapper, the reading of the building—whether as trees or people—would have no context in which to occur.

fig. 10

Interior, S. C. Johnson Building, Frank Lloyd Wright, Racine, Wisconsin, 1939

fig. 11

Column Bases at Porch, S. C. Johnson Building, Frank Lloyd Wright, Racine, Wisconsin, 1939

Wright and Le Corbusier's exceptional joints deliver a message far more critical to an understanding of the building than the joints, present or absent, in the typical International Style building, and it is for this reason—their singularity—that they form a paradigm of another order of joining within structures that are their opposite. This is not to say that the Johnson Building is a superior building to the Villa Savoye, only that the joinery of the former contributes to the building in a way that the non-joints of the latter do not, adding an additional layer of meaning, one that may be separate from the totality.

Arne Jacobsen's Aarhus Town Hall in Denmark (1941) is a steel structure in reality, but since the steel is fireproofed with concrete and the corners of the concrete are rounded, it has a soft and malleable quality. This composite structure is largely exposed and continuous—a frame of steel bones surrounded by concrete flesh. A glaring exception to this quality is the series of cruciform columns that support the floor of the main council chamber that floats above the entry lobby. *fig.* 12 Here the frame is broken and the council chamber does not connect with the remainder of the building. At the base and top of the columns, brass connectors form a kind of "ornament." There is differential

fig. 12

Column/Beam Joint, Aarhus Town Hall, Arne Jacobsen, Aarhus, Denmark, 1941 movement that might make this necessary, although probably no more so than in other joints. There is something else as well; that this joint occurs adjacent to a particular program element is, of course, no accident. One might say that the meaning is simple: it makes the council chamber more important by making it structurally autonomous. Although Jacobsen never commented on this, there is an obvious political metaphor in the structural semi-independence of the council chamber from the rest of the building. This is a detail at odds with the building that contains it. It is a moving joint in the static building, animating what is otherwise a fixed building, implying a larger relationship, social and political order as disparate parts in the midst of a monolith.

The Constructivist Joint

There was an obvious tension between the idea of a building as an organism, usually without joints, and the realities of the actual machines of the machine age. One person who did see the modern building as a mechanism, or at least as an assembly of articulated parts in equilibrium, was the Russian constructivist Iakov Chernikhov. In his 1931 book, *The Construction of Architectural and Mechanical Forms*, he categorized four types of construction: amalgamation, combination, assemblage, and conjunction. *fig.* 13 The noblest of these is assemblage, a type characterized by, but not limited to, machines. He wrote, "'Assemblage' can be characterized by that constructive look which finds particular reflection in the machine. The elements maintain their separate identities whilst being grouped into one whole."[21]

Chernikhov did not believe details were joints so much as he believed that all the arts were about joints. Like Smith and L'Orange, he saw what he called "constructive assemblies" as social and political metaphors. The constructive order was a parallel to the constructive society. "In every constructive amalgamation lies the idea of humanity's collectivism. In the close cohesion of the diverse elements is reflected the concord of all man's fine aspirations."[22]

Chernikhov's observations are relatively free of technical analysis. He is more interested in describing the appearance of machine forms than in

fig. 13

Page from *The Construction of Architectural and Mechanical Forms,* Iakov Tchernikov, 1931

understanding the forces that produced them. Many of the constructions illustrated in his book are not physically connected, but are simply adjacent.

Chernikhov's thought is illustrative of a model of joinery that did not predate modernism—the assemblage of recognizable parts in equilibrium, but without any apparent means of connection or in many cases no sense of load being transferred from one member to another, e. g., an assembly of adjacent, weightless parts, certainly not an organism, but not quite a machine.

Another Russian, Kazimir Malevich, although best known as an abstract painter, was a prolific theoretician of this school. He desired formal arrangements, in painting or architecture, that would be assemblies of separate parts, existing in an abstract world, without explicit or animated joints. This was Suprematism. Malevich wrote, "The Suprematist apparatus, if one may call it so, will be one whole without any fastenings."[23]

These Suprematist forms were to be technologically inspired, but it was important that they have no overt technological manifestation, e.g., fasteners:

> The form clearly indicates a state of dynamism and, as it were, is a distant pointer to the aeroplane's path in space—not by means of motors and not the conquering of space by disruption, caused by a clumsy machine of totally catastrophic construction, but the harmonious introduction of form into natural action, by means of certain magnetic interrelations in one form. This form will perhaps consist of all the elements, emerging from interrelations between natural forces, and for this reason will not need motors, wings, wheels, and petrol, i.e. its body will not be built from various organisms, creating one whole.[24]

Malevich thought of all these forms as objects liberated from weight, floating in a gravity-free environment. He wrote "All technical organisms, too, are nothing other than little satellites—a whole living world ready to fly off into space and occupy its own special place."[25] Like Chernikhov, he saw in the order of the parts an assembly that forms a parallel to a society. "Economical forms," as he called them, were the expression of an economical society. Independent parts were the equivalent of independent individuals, and an economic society was a free one:

> In Suprematism action on one plane or in one volume has been achieved by means of economic geometricism. If every form is the expression of purely utilitarian perfection, then the Suprematist form also represents, surely, the signs of a force has been recognized—the acting force of utilitarian perfection in a coming concrete world.[26]

To find something approximating a realized work of this model of the weightless, jointless assembly, we must look at a work of Gerrit Rietveld, the Rietveld Schröder House in Utrecht (1925). *fig.* 14 The connection of vertical support to balcony rail, like the rest of the house, is an assemblage of planes, steel sections, and wood sticks in gray, white, black, and primary colors. It has no real structural frame, and the members themselves are technically, but not visually, joined. Elements seem to touch and pass by one another without actually connecting. This joint type originated in Rietveld's furniture, in which it had clear constructional advantages. But there are obvious technical problems

fig. 14

Balcony Supports, Schröder House, Gerrit Rietveld, Utrecht, Netherlands, 1925

fig. 15

Column/Beam Connections, Farnsworth House, Ludwig Mies van der Rohe, Plano, Illinois, 1951

with this joint that might limit its application at a larger scale—the lack of direct support and the asymmetry of the indirect support—and the subsequent use of this joint is often isolated and dissonant. His argument is less convincing in the case of the steel, concrete, stucco, and wood of the Schröder House, where connections are actually made by other means.

A similar joint is the beam-to-column connection of Mies' Farnsworth House (1951). *fig.* 15 The connection is side-to-side and facilitated by the substitution of the flat surface of a channel for a wide flange for the beam and by the fact that the welds occur inside the construction. In fact, there are a number of bolted connections in the building, but they are hidden in the floor and roof construction. There is no visible means of connection, not even welds; no fasteners, no apparent weight. The remainder of the building is seamless; its

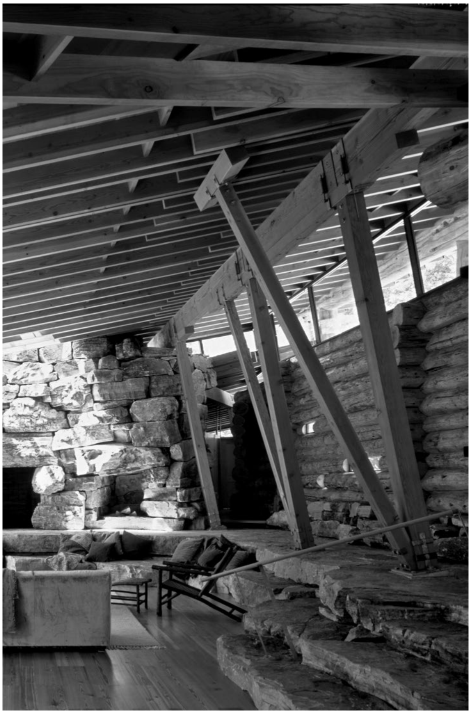


fig. 16

Ledge House, Bohlin Cywinski Jackson,
Catoctin Mountains, Maryland, 1996

fig. 17

Interior, Ledge House, Bohlin Cywinski Jackson,
Catoctin Mountains, Maryland, 1996

countless connections are all concealed. The beam-to-column connection is, in fact, the Schröder House detail, but built here using all steel parts. This joint, one closely associated with Mies, seems, upon close examination, to be at odds with his thought. It is the Rietveld type of joint, non-supporting and non-connecting, in the work of an architect whose overriding aim was structural clarity. This is dissonance. Like Rietveld's joint, it denies the force of gravity where it would seem to be most needed. It is apparently discontinuous where continuity would seem to be most critical.

Mies usually used this joint as a mullion, but rarely as a column. This is the case at Crown Hall at IIT where it connects window mullions to fascia, while the more important joint of column-to-girder is made by merging the two in a more continuous conventional arrangement, web-to-web and flange-to-flange. The Crown Hall arrangement is clearly a hierarchy of joints where the side-to-side connection is used for secondary structural connection, while the direct support is used for the primary system, to indicate that the loads are smaller. Its use at Farnsworth is not so easily explained, but it is this aberrant, dissonant nature of the Farnsworth column that makes its display of non-weight far more assertive than Rietveld's plethora of these details.

Peter Bohlin is quick to acknowledge the influence of Rietveld, as in what he calls the "De Stijl" casework of his Ledge House in rural Maryland (1996). *figs.* 16–17 [27] The major walls are logs, but the house contains three separate languages of wood detailing operating at three different scales. The first is the log

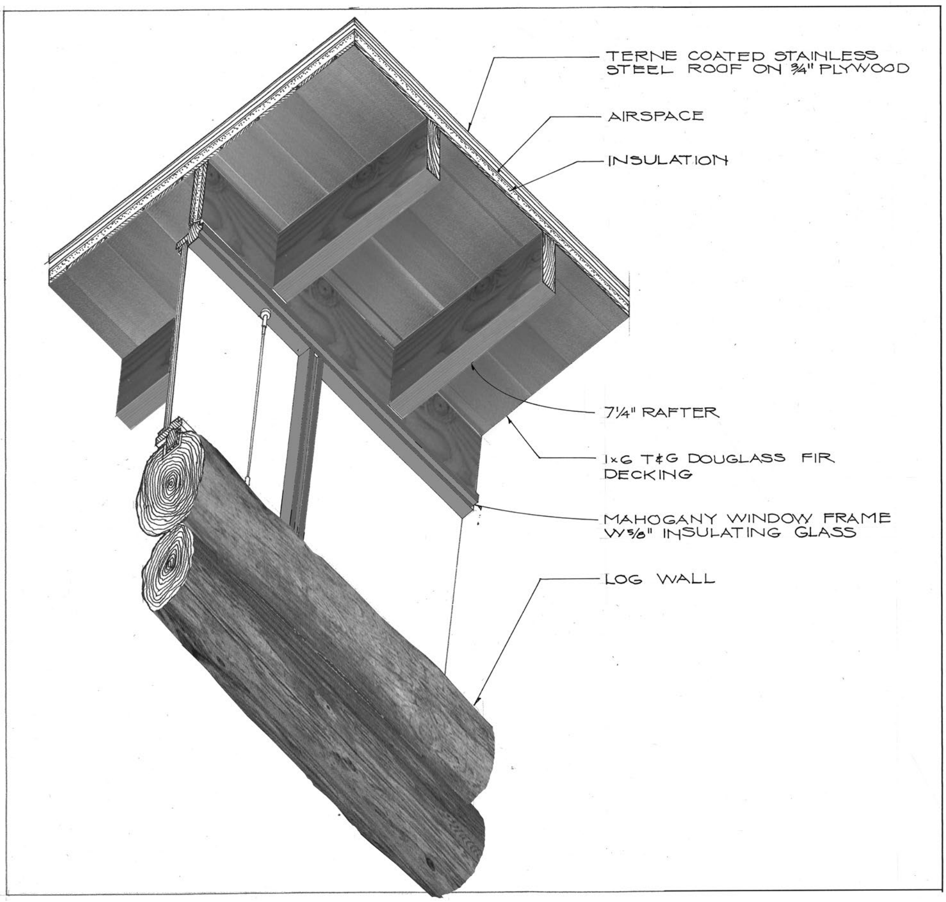


fig. 18

Log Wall Detail, Ledge House, Bohlin Cywinski Jackson, Catoctin Mountains, Maryland, 1996 walls and skin; the second is the post-and-beam roof structure of resawn timber joined with black metal fittings; the third is that of the casework built of small, square members of identical size joined by lapping rather than mitering, in the manner of Rietveld. *figs.* 18–20 The lap joint, although structurally adequate for the job at hand, is considerably less strong and less structurally sound than the typical column-and-beam connection of the large timber frame, and it does a great deal toward establishing the hierarchies and scales of the house. The uniform size of all the casework members and the non-connected nature of the joinery act to deny the weight and structural forces of the piece, in contrast to mass of logs and timbers, placing a largely abstract language in a building that is fairly literal.

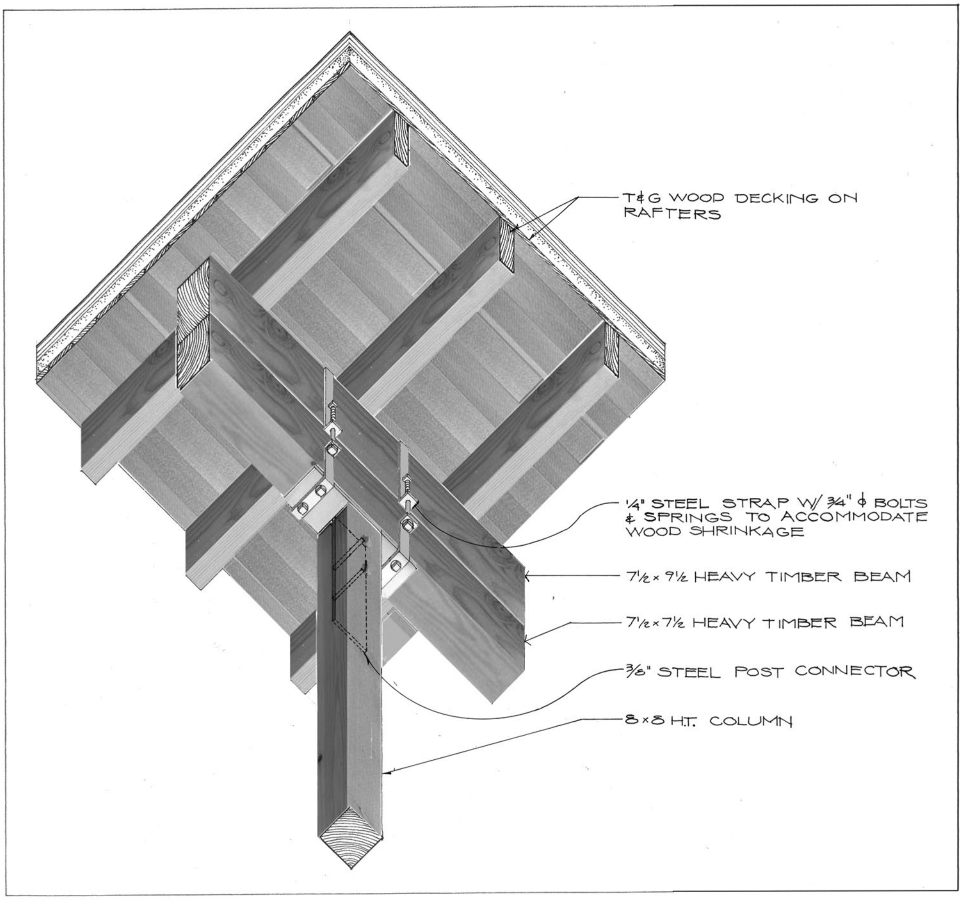


fig. 19

Column and Beam Detail, Ledge House, Bohlin Cywinski Jackson, Catoctin Mountains, Maryland, 1996

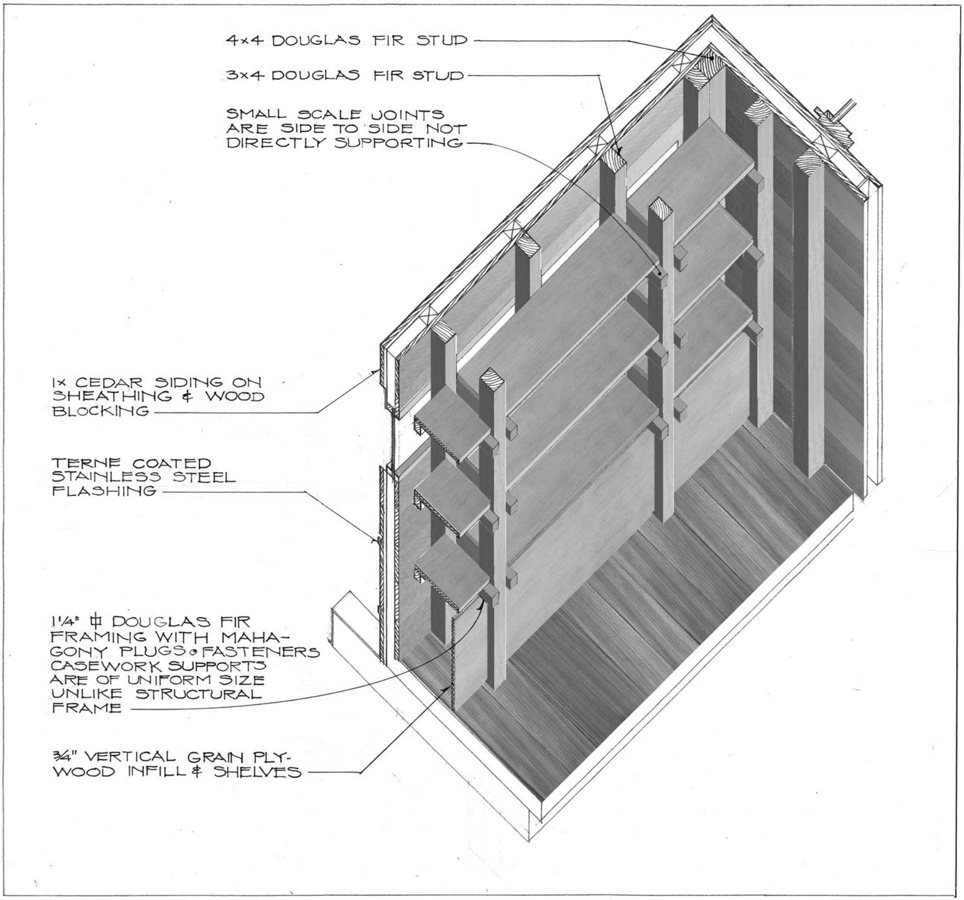


fig. 20

Casework Details, Ledge House, Bohlin Cywinski Jackson, Catoctin Mountains, Maryland, 1996

The lapped joint without apparent fasteners has a life of its own in modernism. As Rietveld used it, it appears—and to a degree is—structurally problematic. The load is not directly transferred, and is asymmetrical, creating torsion, or twisting the joint. The asymmetry can be solved by splitting the column and putting the beam between, which makes it appear more stable, or by splitting the beam and putting the column between. An excellent example of this joint is found in Kenzo Tange's Kagawa Prefectural Office (1958), which is problematic in only one way: it is a cast-in-place concrete building. *fig.* 21 The side-by-side connections and split beams are not an expedient, but are accomplished only with great difficulty. *fig.* 22 It looks like a wood building made of concrete, and that is exactly what it is. This conformed to Perret's view of the modern concrete joint, that since it is made with wood forms, it should have the character of wood. However, Tange more specifically wanted to recapture the qualities of traditional Japanese architecture in his modern buildings.[28]

Tange was less concerned with the expression of material than that the articulation of the parts aligned with the Japanese tradition of building. Tange describes the two poles of traditional Japanese art based on its two oldest modes of building: those of the Jomon and Yayoi eras. Houses of the Jomon era were pit dwellings with primitive wood roofs. Houses of the later Yayoi period were raised floor wood buildings of more regular geometries.

The Jomon period, according to Tange, was characterized by strong emotions and sheer vitality; the Yayoi period, by platitudinous stability and a recognizable order imposed on vitality. Jomon architecture was characterized by volume, movement, and vital organic volumes; Yayoi architecture, by peace, calm, geometrical, and purely abstract concepts. Jomon society was rebellious, dynamic and characterized the spirit of the common people; Yayoi society was resigned and still, and its style was that of the aristocracy. While the regular of order of the Yayoi spirit informed the ordered geometric framing of the Ise Shrine (4 BCE) and Katsura Palace (1615 CE), both were also informed by the vitality and animism of the Jomon spirit. Tange said of Ise that despite its Yayoi-like aesthetic systemization, "There is a cloud of animalism… hanging over the building."[29]

In Tange's mind, the Yayoi tradition dominates the Kagawa building. Tange, like many of his predecessors, saw joinery as a political and cultural metaphor; interestingly enough, he interpreted them in a way that was the opposite of his Western counterparts. The articulated parts of the Yayoi tradition were those of a repressive class structure, the vital and far less-articulated monoliths of the Jomon era were those of the common people.[30]

There is something unsettling about this. These are cast-in-place concrete buildings masquerading as wooden ones, or at best, cast-in-place buildings masquerading as precast ones. Yet it was a common phenomenon

fig. 21

Kagawa Prefectural Office, Kenzo Tange, Takamatsu, Japan, 1958

of the time. The same system, concrete, that was, for Wright and Berlage, the key to a jointless modernism became the mechanism to make an assembly of discrete, autonomous parts, using a constructional system that, if not a perfect organism, at least made the articulation of discrete parts difficult.

Whether it is a real constructional narrative or one that is at least partially illusory, the double column-single beam detail, like many joints, finds its most effective application as an atypical and not a typical condition. There are few columns of any consequence in Juha Leiviskä's Myyrmäki Church outside of Helsinki (1984). *fig.* 23 Beams are regularly spaced and clearly delineated, but the primary vertical supports are piers and walls. Columns support only balconies and pick up the odd beam in inconspicuous places. An exception is the single column at the entry, where a double wood column supports a single beam. *fig.* 24 Both beam and column ends are extended well beyond the junction and are pulled from under the canopy to make their joinery even more

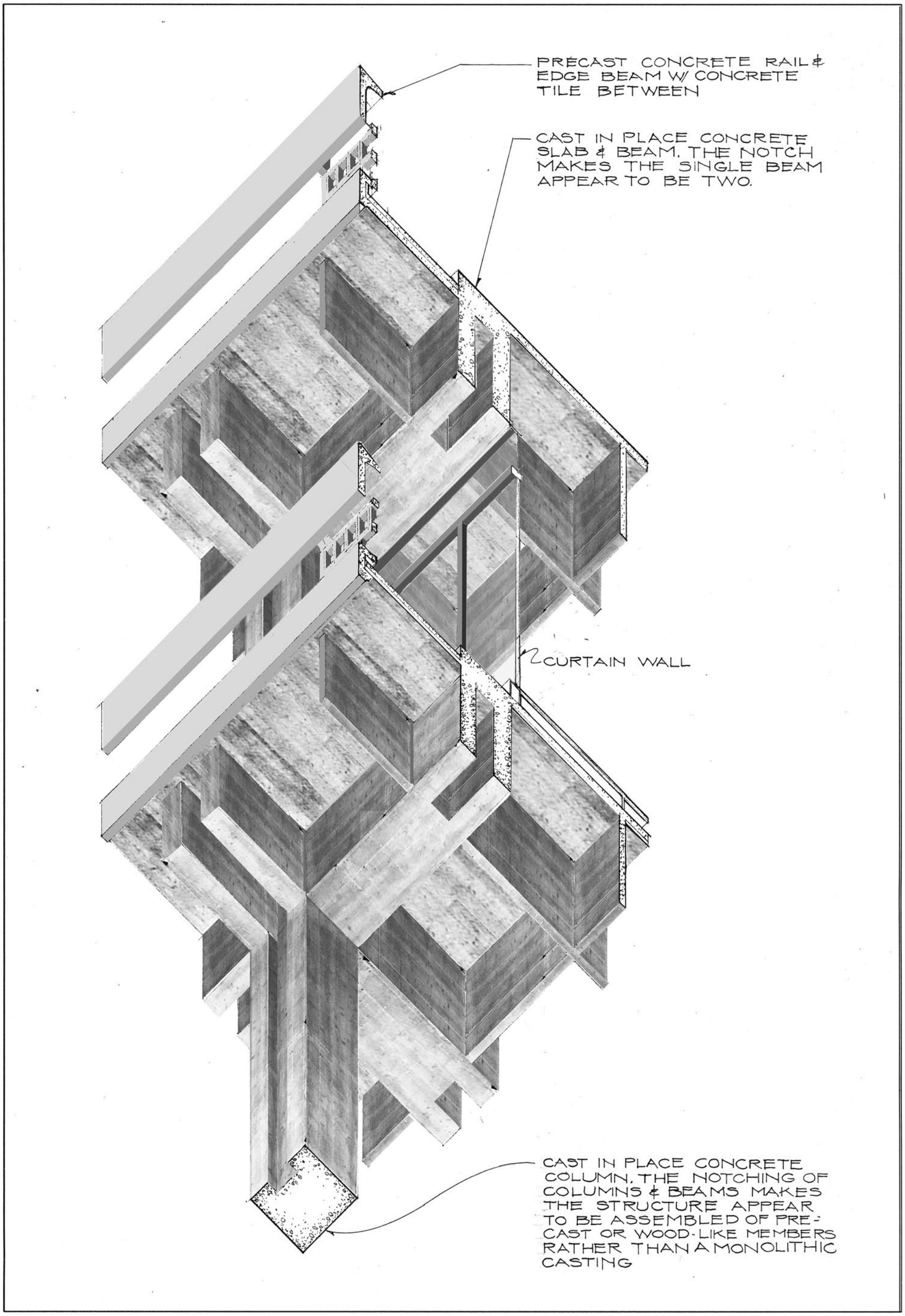


fig. 22

Wall Section, Kagawa Prefectural Office, Kenzo Tange,
Takamatsu, Japan, 1958

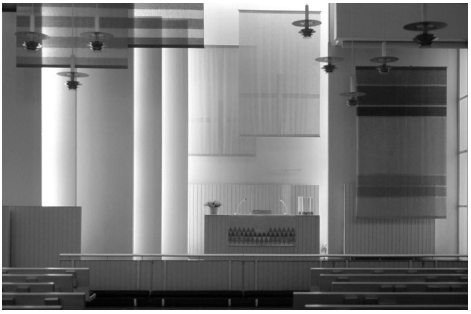


fig. 23

Altar, Myyrmäki Church, Juha Leiviskä,
Helsinki, Finland, 1984

fig. 24

Column at Entry to Church School, Myyrmäki Church,
Juha Leiviskä,
Helsinki, Finland, 1984

fig. 25

Rosen House, Craig Ellwood,
Brentwood, California, 1963

conspicuous. Although this detail only occurs once in this building, it occurs often in Leiviskä's work. A steel version is used at the entry to the Kuopio Parish Center (1992), where it is equally dissonant. These are icons of construction, but not of construction of the building in which they occur, which has no wood or steel columns, doubled or otherwise.

The Steel Organism

Esther McCoy wrote that Craig Ellwood's Rosen House in Brentwood, California (1963), that it had achieved "perfection." *fig.* 25 It is certainly an example of a steel building with perfect joints, if perfection means the absence of joints. The typical beam-and-column connection not only appears continuous but, because of the addition of stiffener plates, there is an implication that the beam and column interpenetrate one another. The stiffener plates are necessary because of the large size of the bay, and to accommodate earthquake loads, but clearly there is aesthetic intent as well.[31]

A comparison of the Rosen House with some later versions of this joint in the work of other architects reveals some interesting truths. While structurally explicit on first reading, the Rosen House joint is, in retrospect, highly abstract, suggestive of neither frame nor material. It is highly unlikely that Ellwood thought of the Rosen House as any type of abstraction. Rather, it was an example of perfection that the machine made possible, and to many, that perfection was a jointless one. Like Wright and Berlage, the modernist advocates of the jointless organism in steel took ample opportunity to subvert it with the insertion of mechanisms and animations.

On the surface, there is a great deal of similarity between the Rosen House detail and the beam-to-column detail at Eduardo Souto de Moura's Residential Block on the Rua do Teatro in Porto (1995), but the means of connection and the forces being transferred in the latter are made explicit—bolts, visible joints, and the means by which that connection resists the loads, the 45° reinforcing plates. *figs.* 26–27 It is the exact descriptions of the specific means of connection and the particular forces at work, a technically descriptive animation within an abstract, otherwise jointless frame.

fig. 26

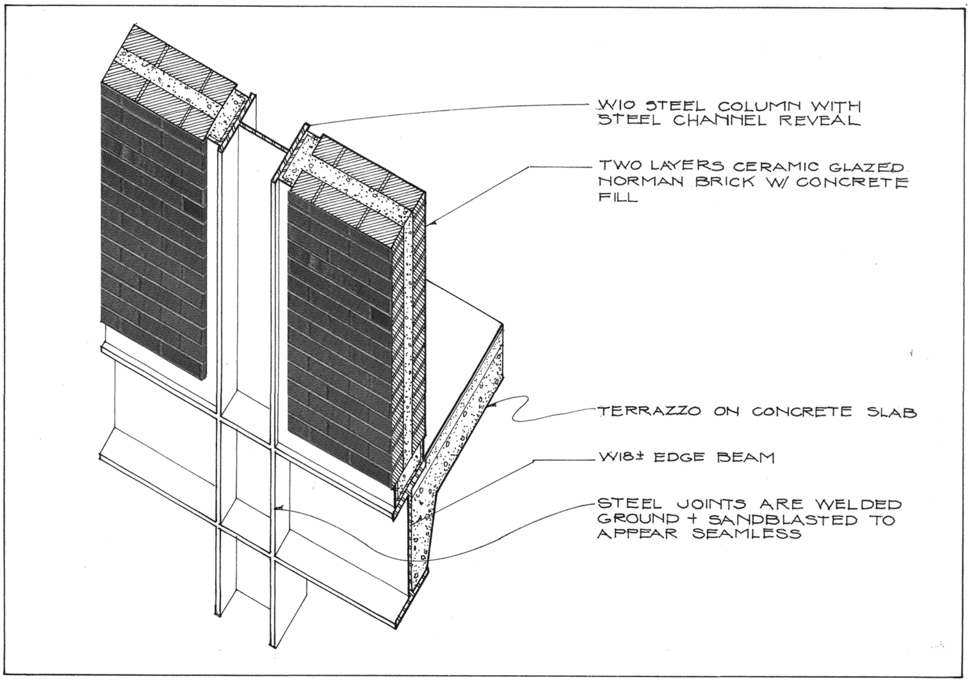
Residential Block on the Rua do Teatro,
Eduardo Souto de Moura,
Porto, Portugal, 1995

If the organism dominated the first half of the twentieth century, the mechanism dominated the second. There are a multiplicity of explanations for the plethora of joints that appear in the late twentieth century, all of which worked in tandem: the desire to create discrete hierarchies of components; the sense that a true role of mechanization in a democratic society was to create a world of standardized interchangeable, but highly diverse and individually responsive parts; and a much older idea that goes back to Wölfflin and Frankl, that an architecture of parts is a humanistic architecture.

The Animated Joint

For both Renzo Piano and Richard Rogers, co-architects of the Pompidou Center (1977), the building was about parts—interchangeable parts—partially in the service of mass production, but more importantly to make an architecture that benefited society through flexibility. This was the legacy of Archigram, with its idea of buildings with "parts to be traded in and changed, to be juxtaposed almost infinitely," of a construction that would be "transient in the definition of its parts," and the ideology of flexibility, change, and impermanence. Thus the plug-in and clip-on aesthetic pervades the early work of high tech.[32]

For Rice, the engineer of Pompidou, these joints had a deeper significance, again a social and political one. Rice said Pompidou made the joint the essence of the solution.... It is the expressiveness of the joining which humanizes



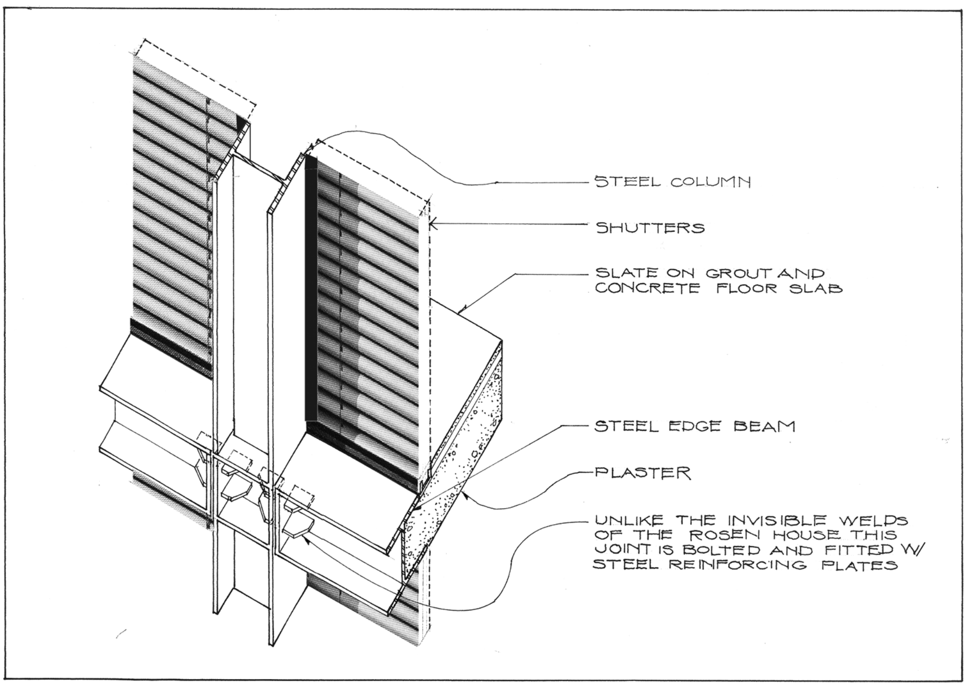


fig. 27

Top
Wall Section, Rosen House, Craig Ellwood,
Brentwood, California, 1963
Bottom
Wall Section, Residential Block on the Rua do Teatro, Eduardo Souto de Moura,
Porto, Portugal, 1995

[older iron] structures and gives them their friendly feel." Rice wished to return joinery to its pre–International Style organic roots in art nouveau:

> I had been wondering for some time what it was that gave the large engineering structures of the nineteenth century their special appeal. . . . One element I had latched on to was the evidence of attachment and care their designers and makers had lavished on them. Like Gothic cathedrals, they exude craft and individual choice. The cast-iron decorations and the cast joints give each of these structures a quality unique to their designer and maker, a reminder that they were made and conceived by people who had labored and left their mark.[33]

This quality has been lost in modern steel buildings because of the use of rolled steel sections with welded connections, as in the Rosen House. The use of cast steel was the key to correcting this:

> Steel structures in building are usually made from standard steel sections, I-sections, channel sections, tubes and angles. These are produced by rolling and by extrusion in continuous lines that guarantee their quality. They also guarantee a visual and geometrical uniformity which leaves very little room for personal expression. . . . Surprise and personality are missing, particularly for the general public and with it the feeling of contact and warmth between the person looking and the maker, whether designer or fabricator. The introduction of cast steel seemed a way to break this deadlock . . . The scale of the Centre Beaubourg would be the scale the pieces rather than the scale of the whole.[34]

Piano, the co-architect of Pompidou, agrees:

> I am using these elements to reintroduce the theme of ornament—not decoration, but ornament. . . . I believe that architecture has to be given back its richness. It should show the mark of the person

fig. 28

Curtain Wall, American Air Museum at Duxford,
Norman Foster,
Cambridgeshire, United Kingdom, 1997

fig. 29

Base Joint of Curtain Wall, American Air Museum
at Duxford, Norman Foster,
Cambridgeshire, United Kingdom, 1997

who made it, what Peter Rice used to call 'the trace of the hand.' The quality of the building is also expressed through the quality of the detail.[35]

As it did for many of his predecessors in the theory of joinery, this thinking had political overtones. Rice's advocacy of an architecture of parts over one of monoliths is exactly that of L'Orange:

It was, after all, one of the express aims of the [Pompidou] competition and of the solution offered by Piano & Rogers, to create a popular palace of culture, one in which ordinary people would not

> feel intimidated. The sense of intimidation by culture was one with which I had a clear personal affinity. Coming from rural Ireland, where the only culture was a foetid freedom of sound in language, by way of the technical departments of an austere Protestant university, places like the Louvre and the National Gallery in London overwhelmed me.[36]

However admirable the intentions of Piano, Rogers, and Rice, this subject returns to an old problem: the general visual incoherence of much of Pompidou. On a perceptual level, this type of joinery would obviously be more effective in a more limited number, and as part of, or in contrast with, a more monolithic building. The reasons for this, however, are only partly perceptual, for under these conditions, meanings alter as well.

Norman Foster's American Air Museum at Duxford in Cambridgeshire (1997) is a monolithic bunker, a half-buried concrete vault spanning ninety meters. *fig.* 28 It is not, however, without detail, particularly at its joints. The vault is precast concrete with visible panel joints. The most noticeable detail is the eighteen-meter-high mullion that supports the glass in the large window. Its doubled, flat, catenary shape tapers toward its ends that are then pinned and detailed in such a way that movement seems underway. All joints move; but a base joint shows that it moves, as it must because the huge size and different qualities of the materials make expansion a problem. *fig.* 29 The moving joint is not typical, but the exception. There is a technical reason for the moving joint to occur at the base, but it could have been detailed in a way that did not reveal its movement.

The studio spaces at Jourda & Perraudin's Lyon School of Architecture (1994) are housed in a light, triangulated wood-frame loft set atop a massive arched concrete base that holds the class and review rooms, a series of concrete cubes with arched openings. *fig.* 30 Although primarily precast with visible joints, it is a solid monolith in comparison to what is overhead in the studio loft, floor-deep triangulated wood trusses. *fig.* 31 The loft is very much an assembly of parts that maintain their visual identity, held in a somewhat precarious relationship by a series of highly articulated joints. Not surprisingly Peter Rice was also the structural engineer for this project. The entire structure is triangulated, and the steel end connectors not only demonstrate their pinned, rotating nature but taper almost to a line at the point of contact with the adjacent member. *fig.* 32

There is a fairly obvious parallel drawn between the constructional opposition of these two spaces, and the polarity of their programmatic content. The lightweight assembly of the upper space that is composed of semi-autonomous parts and articulated joints is the studio, the space for individuals, and the solid, monolithic concrete base that houses the review space, the place of groups and analysis. A passage from Jourda & Perraudin's monograph:

> This strict disassociation of space entails a strong architectural opposition between foundation and superstructure, materializing the legendary antagonism between the necessary acquisition of knowledge and the indispensable, inevitable, personal experimentation.
>
> The thick, heavy, representational, megalithic (tedious) structure of the base in contrast to the continuous, light, transparent, (exhilarating?) superstructure is intended to express the mythical relationship between Dedalus (father, knowledge, reaction) and Icarus (son, doubt, protest)
>
> Thus the base is both support for the workshop space above the materiality of the earth, and the necessary anchorage for the light, articulated structure which houses the student's work areas.[37]

The joints were explained as the expression of their structural capacities and properties of the material:

> We sought to make the passage of the stresses in the parts legible. . . .
>
> The solution was very simple, make each piece in the form of a cone.
>
> Then all the problem was to make visible the forces which pass THROUGH the blades of the wood to the metallic part. . . . One cannot dissociate from the whole of the building this research on the level of the detail.

fig. 30

Loft, Lyon School of Architecture, Jourda & Perraudin,
Lyon, France, 1994

fig. 31

Gallery, Lyon School of Architecture, Jourda & Perraudin,
Lyon, France, 1994

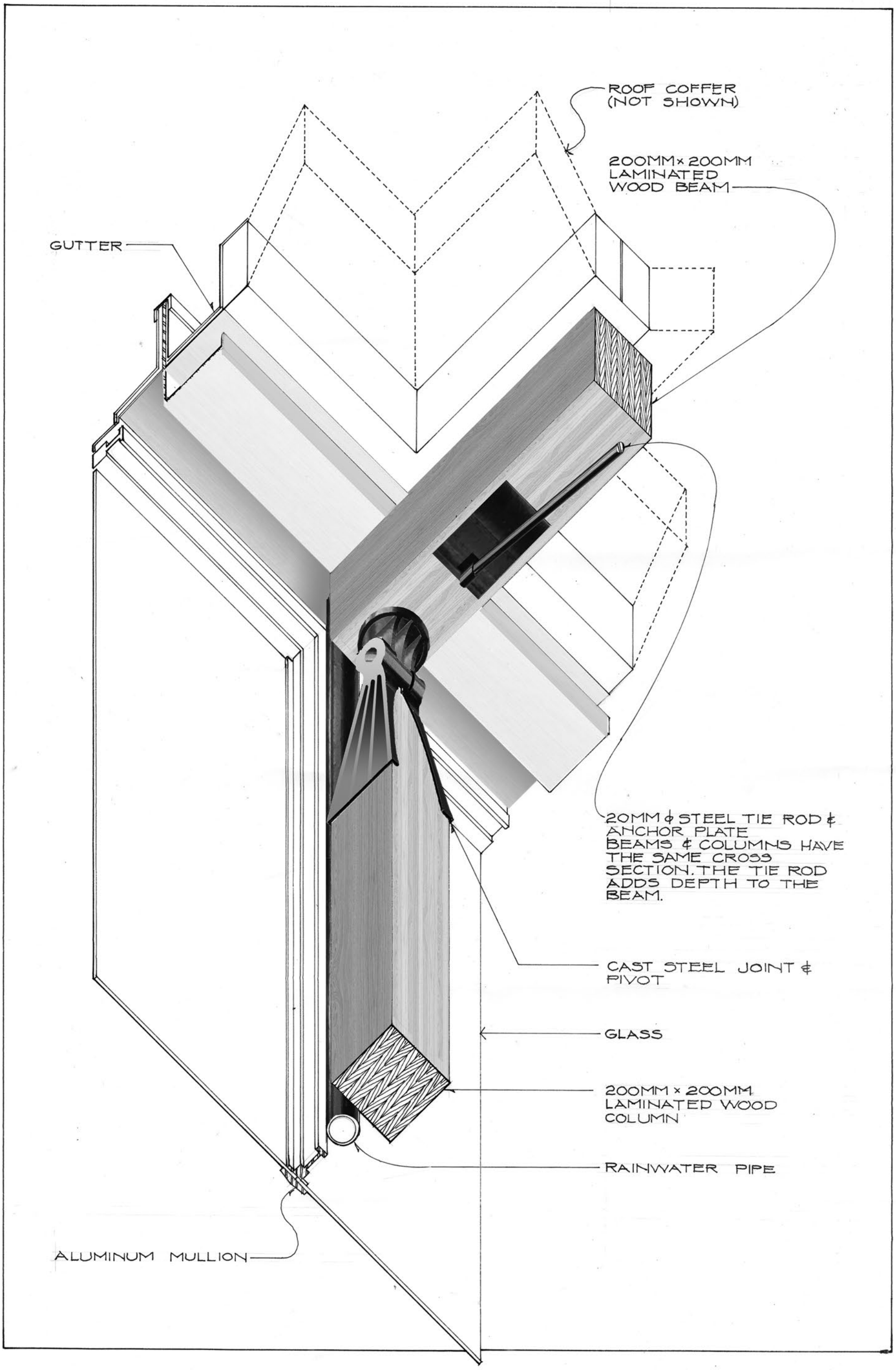


fig. 32

Wood Joint, Lyon School of Architecture, Jourda & Perraudin,
Lyon, France, 1994

fig. 33

Carol Cobb Turner Branch Library,
Scogin and Elam,
Morrow, Georgia, 1991

fig. 34

Joint/Gutter, Carol Cobb Turner Branch Library,
Scogin and Elam,
Morrow, Georgia, 1991

> The arches at the ground floor express the way in which one reduces the forces through a specific form . . . with a continuity of compressive forces, whereas that above one is a systems of much finer forces which work successively in tension and compression.[38]

These joints are far more than force diagrams. They are animated but in a different way than Souto de Moura's joint, as the steel joints reduce the structural members nearly to points at the connection so that they have a minimal visual association. Because of its explicit movement, this joint has an ability to literally animate the structure so that we have a sense of its inner structural life.

Rice's intentions of a "friendly" structure seem more clearly achieved at Lyon than at Pompidou, largely because the steel-made wood joints are not the typical condition, but, at best, half of the typical condition. In combination with the concrete mass below, the joints generate a fundamentally different reading than the similar joints of high-tech buildings, since they are the universal, not the exceptional, condition.

The Fragmented Joint

If the column-to-beam joint of the Rosen House exemplifies perfection, the column-to-beam joint of the covered walk at Mack Scogin and Merrill Elam's Carol Cobb Turner Branch Library outside of Atlanta (1991) must thus exemplify imperfection. *fig.* 33 It has little in common with the steel joinery of Mies or Ellwood. The parts are structurally joined, but visibly disconnected and seemingly on the verge of coming apart. *fig.* 34 Ellwood's joint was about continuity; Mies' joint was about autonomy, with a sense of repose; Scogin and Elam's joint is about fragmentation.

Although it is common in their work, the architects offer little explanation for this type of detail. There are inflections to site and allusions to weightlessness and flight, but this detail is part of a larger compositional trend of fragmentation in contemporary architecture, a much discussed subject in the 1990s. But while much discussed, it was not much agreed upon by critics.

Architecture critic Aaron Betsky, taking the classic view that an order of building—or in this case unbuilding—was a metaphor of a social organization, saw it as the result of the fragmented nature of culture at that point:

> The anarchistic strain in avant-garde architecture, and its connection to the political movement, is fully intentional. Its actions are proposed as the active pulling apart of the false coherence that culture and politics throw over the project of the modern through techniques such as juxtaposition, decontextualization, fragmentation, and changes in scale, material or proportion.[39]

Others saw fragmentation in more beneficial light, as an indication of an order that was physically incomplete, but conceptually complete. Theoretician Dalibor Vesely sees the fragment as an essential—but positive—condition of modernity. The nature of the modern world was not just one of parts, but of fragments:

> The fragment also has a second, altogether different, meaning . . . positive, restorative and symbolic. The positive meaning of the fragment has its source not in personal experience but with a dialogue with the latent content and structure of our world. It cannot be grasped in a single intuition; it relies on a sequence of stages bringing together individual phenomenon and the universal ground in a process that may be described as the restorative mapping and articulation of the world.[40]

Whatever its virtues, fragmentation has fairly provocative and highly problematic architectural consequences. The fragmented building is neither watch nor tree. It must appear to be an assembly of parts in disarray, discontinuous with minimal or partial connection. In reality, as a construction, the fragmented building must be a series of connected elements in equilibrium, regardless of what its imagery might indicate. Thus fragmentation is likely to produce a condition in which the actual joint and the narrative fracture are completely at odds with one another. The significant joint, in this case, is not the joint that fragments the building, but the joint that technically resolves the reality of fragmentation without destroying the illusion. These dissonant joints, like many others, convey a different, in fact opposite, meaning then the majority of the details in the building, articulating the act of connection and the maintenance of equilibrium in a building whose overall expression speaks of neither. For whatever reason, fragmentation seems to have run its course rather quickly. If so, it is not because of its technical difficulties, for the next stage of joinery was to have no joints at all.

The Modern Organism—Again

For Deleuze, writing in 1980, neither the watch nor the tree were adequate models to describe the world in which we live, He preferred the rhizome, a root system that can produce new plants and is thus more of a decentralized network than a tree: "Any point of a rhizome can be connected to anything other, and must be. This is very different from the tree or root, which plots a point, fixes an order." [41] Deleuze's view of the part-to-whole seems the opposite of Emerson's "the whole is to the part as the part is to the whole." Deleuze wrote:

> The whole not only coexists with all the parts; it is contiguous to them, it exists as a product that is produced apart from them and yet at the same time is related to them. . . . As a general rule, the problem of the relationships between parts and the whole continues to be rather awkwardly formulated by classic mechanism and vitalism, so long as the whole is considered as a totality derived from the parts, or as an original totality from which the parts emanate, or as a dialectical totalization. Neither mechanism nor vitalism has really understood the nature of desiring-machines, nor the twofold need to consider the role of production in desire and the role of desire in mechanics. [42]

While Deleuze's direct commentary on architecture is rather small, it is not altogether surprising that he sounds so very much like Berlage when he speaks of it:

> Consistency is the same as consolidation, it is the act that produces consolidated aggregates, of succession as well as of coexistence.... Architecture, as the art of the abode and the territory, attests to this: there are consolidations that are made afterward, and there are consolidations of the keystone type that are constituent parts of the ensemble. More recently, matters like reinforced concrete have made it possible for the architectural ensemble to free itself from arborescent models employing tree-pillars, branch-beams, foliage-vaults.[43]

Like much of contemporary philosophy, this thinking moved quickly along the well-worn path between critical thought and architectural theory. In 2006, precisely one hundred years after Berlage's prophesy of a jointless architecture, Lynn made essentially the same proclamation: that the jointless building had arrived. The technological change in Lynn's case was not the development of concrete, but of digital information, which happily coincides with Deleuze's view of nature as a network. Lynn's model of the jointless building is like Berlage, Wright, and Le Corbusier's, an organic one:

> Deleuze and [Félix] Guattari have proposed such a model for a 'body without organization; the organic, bound by a unified and internally consistent model of the organism, is reformulated as a multiplicity of affiliated organs without any single reductive organization. In architecture, the present static alliance between rigid geometry and whole organisms cannot be entirely overcome but it can be made more flexible and fluid through the use of suppler, deformable geometries.[44]

Like all of his predecessors, Lynn sees a relationship between the constructional organization of a building and the society that produced it.

> Deleuze and Guattari's 'body without a organs' suggests an alternative to the organic paradigm of the whole body. Such a multiplicitous body is always both less than a single organism and an affiliation of many organs. Their extension of Elias Canetti's paradigm of the pack, swarm, or crowd is one model for engaging a less-than-whole building

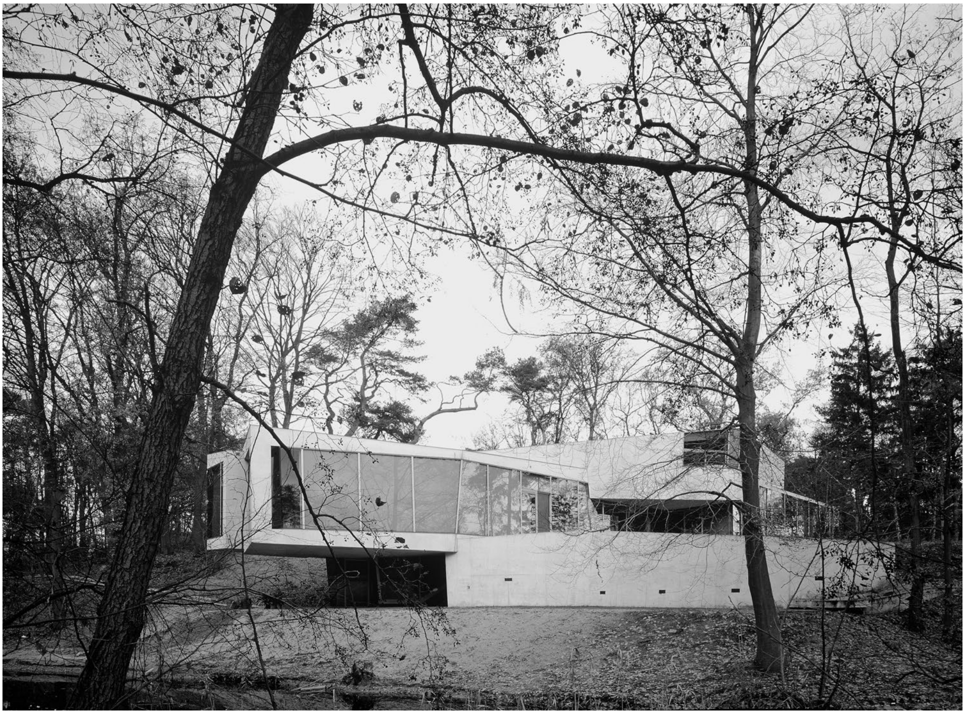


fig. 35

Mobius House, UN Studio,
Bussum, Netherlands, 1998

> within a context that is an assemblage of often disparate morphologies rather than a continuous fabric. The behavior of the pack does not turn on the distinctions between part and whole, autonomous individual and collective. To become intensely involved with such an organization, an individual must enter into the affiliative alliances of the pack. . . . This generates a body that is essentiality inorganic.[45]

In practice, this thinking has, unfortunately, moved fairly quickly into a series of clichés—blobs, folds, and continuous ribbons. To UN Studio, the architects of the Mobius House built near Amsterdam (1998), the building is a representation of its program, a house for two people. *fig.* 35 The intersecting curves are a reflection of the interlocking lives of its occupants:

> The diagram of the double-locked torus conveys the organization of two intertwining paths, which trace how two people can live together, yet apart, meeting at certain points, which become shared spaces. The idea of two entities running their own trajectories but sharing certain moments, possibly also reversing roles at certain points, is extended to include the materialization of the building and its construction. The structure of movement is transposed to the organization of the two main materials used for the house, glass and concrete, which move in front of each other and switch places, concrete construction becoming furniture, and glass facades turning into inside partition walls.[46]

But despite this program-specific explanation, the seamless detailing is part of a larger condition. Its jointless design is again a metaphor for a larger sociopolitical system. The architects argue that this jointless system is a structural metaphor for the zeitgeist:

> The cultural and economic changes caused by the intensification of infrastructure and virtual media exchange patterns are generally seen as virtual, taking shape mostly in textual descriptions and statistics. But we believe that these virtual processes can in fact be viewed as constructional paradigms, as actual structures, complete with load bearing mechanisms, expansion joints, grid systems and space-frame equivalencies; and we are interested in exploring the new organizations that emerge from engineering of virtual and physical constructions.[47]

Unfortunately, this is all accomplished through the use of an inner structure of cast-in-place concrete, which is covered with insulation and in some places a precast concrete exterior facing, along with a fair amount of false concrete, i.e., plaster, all seamlessly held together with a large number of hidden joints. All evidence of the mechanics of joinery is rigidly suppressed—widow mullions, the joint of window and skylight, the junction of glass and concrete, and door head and jambs. There are sills, mullions, frames, and trim—the details would not work without them—but on the interior, these elements are hidden, and on the exterior, they are minimized to the point that they almost disappear.

One might argue that the presence, rather than absence, of a joint between the two parts of a house that is intended to express "how two people live together" would aid this reading of duality, but to the architects this is not the case, nor is this attitude atypical of the work of their contemporaries. This architectural methodology requires the suppression of both any reading of weight and any thought of connection. Unlike their REMU Station, with its exaggerated, oversized trim, the Mobius House is filled with a far more typical modernist condition, suppressed trim. This has been a longstanding modernist practice. Modernist buildings use no fewer intermediate joining members than traditional joinery, but they are typically suppressed, and recent technological developments have made this all the more possible.

Conclusion
The Necessity of the Joint

What then is the nature of the modern building, the jointless monolith or the assembly of parts in equilibrium? An organism or a mechanism? A watch or a tree? What is the nature of the modern joint? Permanent or demountable? Continuous or fragmented?

The modern watch, of course, is digital; it has no parts. The modern building, however, remains very much a mechanism. Even if we set aside the simple fact that most buildings are sequentially assembled from parts that have little or no organic qualities, in Kant's terms, the question of technological possibility remains. The modern seamless architectural organism is less often the result of technological innovation than it is of the repression of any real constructional information. It must always be more a symbol than a reality, something even a fundamental change in the way buildings are built is unlikely to alter. Thermal expansion and imperfection are unlikely to disappear, with or without digital technology. But the history of the last century suggests that the role of the joint in the next century—its existence or its absence—is less a question of technological possibility or necessity than it is of stylistic whim. Ultimately, it is not a technical question.

In 1906 Berlage proclaimed the death of the joint; in 2005 Lynn proclaimed the death of the detail and, with it, the joint. Thus five years into the twenty-first century we found ourselves precisely where we were five years into the twentieth. Yet the one hundred years between saw both the Villa Savoye (1929) and the Pompidou Center (1977). Have we at last achieved the modernist dream of the jointless organism, or are we witnessing simply a cycle of changing taste from all joints to no joints and back again? Will there not be an inevitable reaction against the jointless blob made possible, in theory, by digital perfection? This was Wölfflin's view, that the change in attitude of the part-to-whole relationship from the Renaissance to the Baroque Era is the inevitable process of development of any style in art, what he called *periodicity*.[48] Allowing for cultural and geographical differences, the change from an architecture of parts to one of unities had happened before and would happen again.

Is it not possible to escape the trends of stylistic whim and answer this question with more conviction, with a clearer sense of what modern construction is and a clearer idea of—if not what the zeitgeist dictates—then exactly what the role of the joint is in communicating whatever ideas architecture manifests? There is not much evidence that even the strongest advocates of the jointless organism find it aesthetically desirable in its pure form.

My sense is not that joints are necessary for construction, but that they are necessary for coherence, for architectural meaning to occur, even if jointlessness is technically possible. It is clear that long before the modern era, the understanding of the parts of a building and their constructional relationship was a key to a larger understanding of the building as a manifestation of ideas. The assembly of parts in precarious equilibrium can be understood as a parallel for another system: a social order, a political order, a philosophical order, a natural order.

An understanding of assembly communicates values on a level far more basic and far more profound than association or symbolism can. Association can occur without these interpretations, but while the nature of association will alter with time, the constructional messages will not, even as our responses to those messages may change. If a building's messages are not architectural messages that grow out of the fundamentals of building itself, they will remain little more than billboard slogans. At the same time, we cannot ignore the understanding of a building as an abstract totality. The monolith may be read as a real or narrative organism, but it may also be read as a repressive agglomeration. Both readings are necessary; we cannot eliminate either.

We may understand a construction in two ways: as a watch or as a tree, as an assembly or as a totality, as a set of parts in a discreet relationship or as a unified organic continuum. We demand not just completeness, but permanence. We believe that in order to be profound, buildings must have mass and the manifestation that great forces are at work and being resisted. We must be able to abstract a building into a recognizable form. Likewise, we must understand it as an assembly, as co-dependent parts, as elements in equilibrium, as a configuration that has been constructed, and this building, the building of parts, is something much closer to ourselves, less massive and imposing than the great mass of institutional building. We must, however, recognize that both types of expression are not only necessary, but unavoidable.

This argument—for the necessity of joints and the necessity of parts if architecture is to communicate anything of substance—would be an unconvincing one if the next step would be to say that the Villa Savoye, the Barcelona Pavilion, or the Mobius House is inferior to the S. C. Johnson Building or the Aarhus Town Hall, or even to argue that the latter are better detailed buildings than the former. There are a number of modern buildings that, if they are not without joints, are without significant joints. We are dealing with a history of detail that is to a degree autonomous, one in which a detail may succeed where a building fails, that conveys meanings that are not communicated by the buildings in which the detail occurs.

The Necessity of the Dissonant Joint

While much of modern architecture is characterized by parallel systems of contrasting joinery, there are limits to the assembly of parts in equilibrium. Obviously there are perceptual factors at play; we can only perceive a limited number of parts in any organization. But perception is only one reason, and we could argue that if we cannot make out the individual part in a field of flowers, a forest of trees, or a crowd of people, it is not necessarily problematic. It is rather a question of two attitudes we take toward buildings, which on the surface are mutually exclusive. Ultimately, a building can be neither watch nor tree. On neither a purely aesthetic level nor a technological level can we omit the organism or eliminate the parts, and there is a certainty of the dissonant joint, of the expression of the part as assembly in buildings that are organic monoliths.

The most powerful details are often the singular, dissonant joints that are more often present in the work than in the thought of the most dogmatic advocates of the organism. The power of the dissonant joint is not a question of strength through difference, but rather a manifestation of the inner contradictions of our understanding of a building as an image versus a building as an assembly within a work of architecture. Dissonant joints are not merely isolated instances of structural expression; they are intrusions of another order. They are far more than an expression of parts or a consciousness of assembly. The dissonant joints of modernism—the lapped, the bound, the clustered and doubled, the moving, the structurally explicit, and the sculpturally deformed—are all a kind of animation. The articulated joint is an expression, often an exaggeration of weight, connection, or movement within an assembly. It may contain within it the suggestion of anthropomorphism or of another material. It may appear to be a mechanism within an organism. It may appear to be an organism within a mechanism.

One mode of reading buildings is about permanence, mass, and stability, and thus by implication, about authority, power, and intimidation. We are not part of the building, but stand outside of it. In the other mode, we are in the building, in fact part of it. It is temporal and changeable. Thus the type of joint that is dissonant from the monumental, institutional understanding of a building is necessary, taking the form of an animation, or at times a de-animation, of the forces being articulated in the joint. It may be animated by the suggestion of another material, of movement, of deformity. The animation may be achieved technical explicitness by a kind of mathematical diagram of force transfer and connection, or it may be symbolic and intuitive, by sculptural intrusion. It may be a symbolic representation of structure or a technically explicit one. It may be animated by a volute or torus; it may be animated by a pivot or hinge.

Buildings will probably always be nailed, bolted, or welded; supported, lapped, or clustered; mitered, dovetail, or butted; or some undiscovered equivalent of these. Opinions may differ as to whether architecture is an arrangement of members standing together, as it was for Smith; an arrangement of parts expressing the place of the individual in society or the universe, as it was for Frankl; an arrangement of parts suggesting the political order of a society, as it was for L'Orange; or an arrangement expressing the fragmentary nature of the modern condition, as it is for Vesely; as to whether a building is a watch or a tree, but all agree that the understanding of parts is essential to the understanding of architecture. Simple representation or association is insufficient. It is not just the perception of parts, but the perception of the loads they carry and transmit, of the stress put on the connection, that is also essential. To L'Orange, the political meaning of classicism cannot be understood without an understanding of its joints. To Frankl, the Gothic cannot be understood without perceiving the partiality created by the rib. And to Smith, Greek society cannot be understood unless one understands the Parthenon as members standing together.

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1 Frascari, "The Tell-the-Tale Detail," 24.

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6

Chapter 6

Definition Number 5

The Autonomous Detail

Whenever a new system of forms arrives, it goes without saying that at first the detail is rather obtrusive. The consciousness of the higher significance of the whole is not lacking, but the detail is apt to be felt as a separate entity and to assert itself as such in the general impression. This was the case when the modern (renaissance) style lay in the hands of the primitives. They are masters enough not to let the detail get the upper hand, but the detail in its turn must be seen for itself alone beside the whole.

—Heinrich Wölfflin

Obviously detailing does not necessarily depend on an overall guiding concept; even if it has inherent relations with such a concept, it is not simply a declination of general decisions; but gives them form, rendering them recognizable and articulated in their various parts.

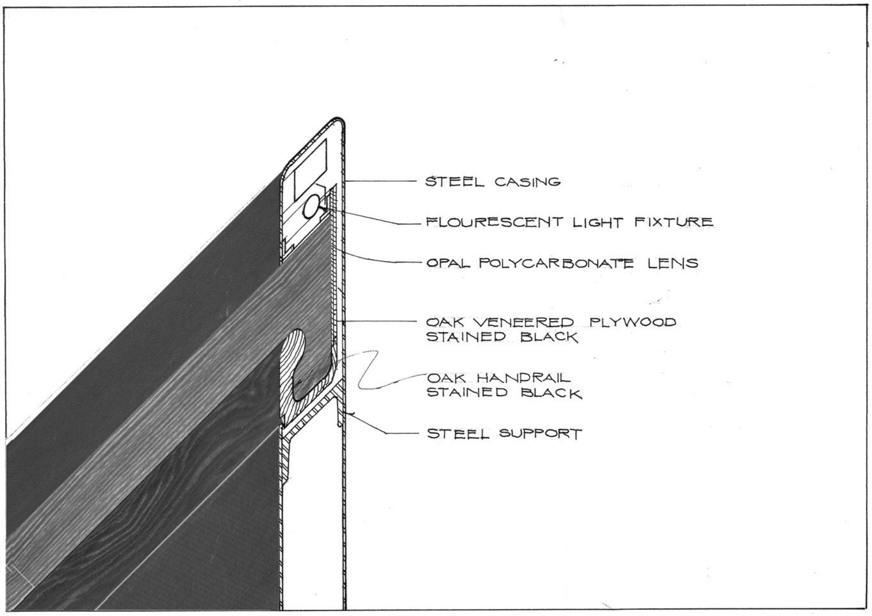
—Vittorio Gregotti

So I decided to introduce errors, things that wouldn't look right. . . . I noticed a radicalism in always adopting the same solutions, which could hurt me. Then I managed to admit, or I attempted to introduce the idea that the house or building has more to do with a certain naturalness of activity that resides inside the person.

—Eduardo Souto de Moura

I'm interested in the circumstance when two forms don't conform to one another but share enough of the congruent aspect to be read as both reinforcing and contradictory.

—Eric Owen Moss



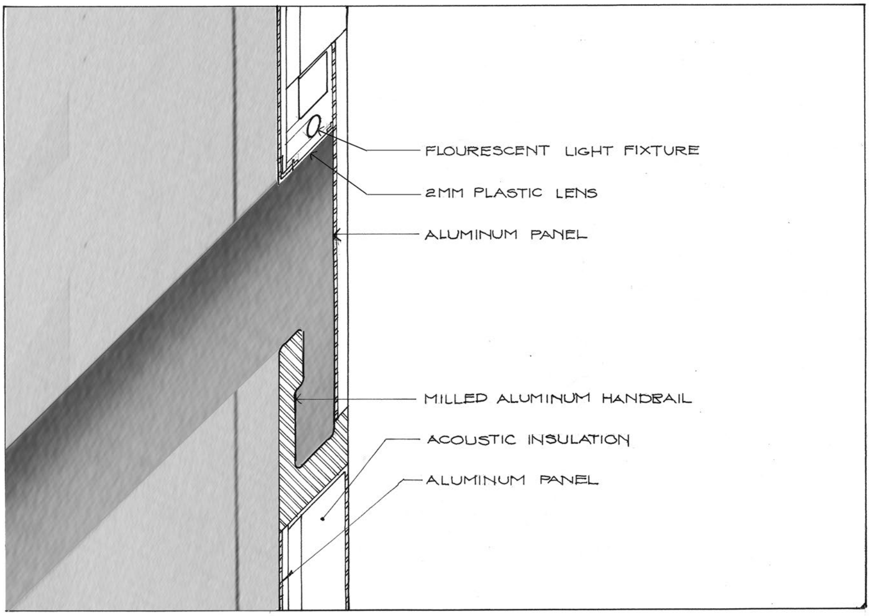


fig. 1

Top
Handrail, Tate Modern, Herzog and de Meuron,
London, United Kingdom, 2000
Bottom
Bottom: Handrail, Dutch Embassy, OMA/Rem Koolhaas,
Berlin, Germany, 2004

There are not many elements of Herzog and de Meuron's Tate Modern in London (2000) that could easily be identified as articulated details. One is the recessed, illuminated, organically shaped handrail of the main stair. Jacques Herzog said of it:

> When you touch the black-stained wooden handrail, it is not cold steel. It is not back to the natural; it is back to your self. You stand, you sit, you touch, you look you smell. It is neither old nor new; it is, I hope, contemporary. The bigger cities are, the bigger museums are, the more we have to be basic.... [Our}work is not about style; it is about how people live today.[1]

Three years later the same detail, with a slightly different profile, appeared in Koolhaas' Dutch Embassy in Berlin (2004). *fig.* 1 There is more affinity than stylistic unity between the works of these two firms, but the lack of similarity of the two buildings is of little consequence given the lack of affinity between both handrails and the buildings that contain them. I do not mean to suggest that Koolhaas is borrowing from Herzog and de Meuron, or that either are borrowing from Kahn's similar organic handrails of the Kimbell Art Museum, equally unlikely occupants of the building in which they occur. It is far more likely that all four are borrowing from Aalto. All form a striking contrast to details such as the handrail of Hadid's Contemporary Arts Center in Cincinnati (2003), a detail so preoccupied with its need to be stylistically equivalent with the building that it becomes functionally indifferent. *fig.* 2 It has all the virtues of consistency, but in doing so has lost all sense of being a handrail.

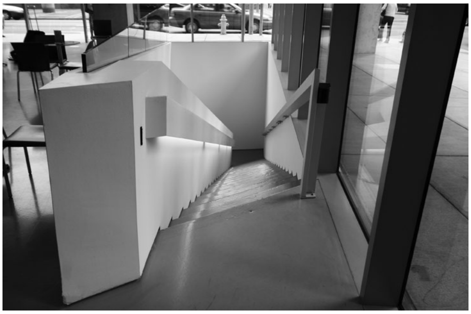


fig. 2

Handrail, Contemporary Arts Center in Cincinnati,
Zaha Hadid,
Cincinnati, Ohio, 2003

How is it that despite the disparity between detail and overall concept, the four organic handrails seem to belong in these buildings in a way the Cincinnati handrail does not? The architects would say that they answer to a different design consideration; they are the points where the hand touches the building. From this viewpoint, the good detail responds to the exceptional condition and the special function that must be accommodated. But clearly there is more at work here than functional accommodation.

This is the fifth type of detail, the autonomous detail, one that is less popular, but more intriguing than those already presented. In this mode, detailing is an autonomous or semi-autonomous activity that follows different rules, responds to different criteria, employs different modes of expression, and follows different precedents than those of the building. Many autonomous details are simply exceptional conditions and many are inversions of the expected, but others are deliberate intrusions of another order of design. These details are not of a piece with the buildings that contain them, in form or concept, but are rather independent, autonomous elements. While autonomous details may have functional origins, they do not all have functional purposes. Many can only be called ornamental; nevertheless their origin is in the fundamentals of building—shelter, construction, structure, and accommodation.

A categorization of autonomous details would yield results that are both complex and overlapping. The four handrails discussed above are exaggerated, isolated responses to a programmatic need—for the building to respond to touch—but program is only one such area in which the autonomous detail is found. There are three others: joinery, structure, and the building's response to the elements. Our direct engagement with a building, as opposed to our representative understanding, can be divided into four different modes: (1) construction—an awareness of how the building came to be—its parts, and the way in which they are joined and assembled; (2) structure—an awareness of the forces of gravity and wind upon the building and the way in which these are resisted; (3) program—an awareness of our own engagement with the building, of how it serves us as a piece equipment to help us move about or accommodate an activity—eating, sleeping, working, or not working; (4) performance—an awareness of the building as shelter, how it keeps us dry, warm, or cool. Most autonomous details articulate a response to one of these conditions in a building in which that articulation is otherwise absent.

Autonomous details may be characterized as positive/literal or negative/abstract. The positive or literal autonomous detail is the expression or exaggeration of the means of accommodating one of these four factors. For each of these details, there is an opposite type of detail that denies rather than asserts, that disconnects rather than connects. If the concept of the building appears to us as a totality, the positive/literal detail reminds us that it is an assembly. In the negative or abstract autonomous detail, an articulated response to those factors is missing; not just eliminated, but conspicuously absent. If the building speaks to us of weight or structure, the negative/abstract autonomous detail denies it. If the building accommodates a specific pragmatic need, the autonomous detail ignores it. And if the building speaks of shelter from the elements, this type of detail ignores their existence. The majority of autonomous details are positive/literal, but a smaller number of the second type contains some highly significant ones.

Most autonomous details deal with the expression or denial of certain polar opposite perceptions of the way a building appears or does not appear to function: the building as a totality versus the building that is an assemblage; the building that explains how water is shed or heat is retained versus the building that does these things without telling us how; the building that expresses itself as built of a particular material versus the building that uses that material to suggest another material, or suggest no material at all. In short, the way that a building explains its function, performance, structure, and construction, as opposed to the way it suggests geometric abstraction or symbolic representation. In the autonomous detail, information that has for the most part been suppressed is suddenly brought forward, even exaggerated. The autonomous detail crosses a line between these two languages of expression, between the abstract and the representational. But it may cross other boundaries as well between the primary and secondary elements of a building, between the structural and the non-structural, between furniture and architecture.

The autonomous detail may even be more than autonomous; it may be subversive. The subversive detail is an extreme version of the autonomous detail, a detail that often not only is conceptually disconnected from its container, but also actively works against it, proposing alternative attitudes, using other materials and other forms that seem contradictory to the building as a whole. Thus a sixth definition is the detail that is not only autonomous, but also actively subversive—the detail that not only follows different rules, but also contradicts the concepts of the totality of the building.

The autonomous details already examined—the handrails of Aalto, Kahn, Koolhaas, and Herzog and de Meuron—demonstrate a fairly universal characteristic of this type, that the autonomous detail often has an equally autonomous history, one that makes fewer allusions and associations to the total building and more to the world outside, to history, to other buildings, to the architect's previous work. Thus one can find an affinity between two details, although the buildings that contain them may have little else in common. These histories fit into the same categories of detail defined above:

Construction—a change in our awareness of parts and whole
Structure—a change in our awareness of the forces acting within a building
Program—a change in our awareness of our own engagement with a building
Performance—a change in our awareness of the environmental forces acting on a building

What follows are some of these histories, one for each type described above.

Construction—a change in our awareness of parts and whole

Let us begin not with architecture but with art, with a sculpture by Alexander Calder—*Cheval Rouge*. *fig.* 3 Despite its imagery, it is also explicit about construction, using joints with welds, bolts, and folded plates, and is even reinforced with additional steel at certain points. The joints have an ad hoc, unsystematic quality, in keeping with the nature of the piece, and are appropriate to its scale. Their presence is as essential to Calder's work as the absence of such joints is critical to the work of a sculptor like Richard Serra. Ultimately,

fig. 3

Cheval Rouge, Alexander Calder, National Gallery of Art, Washington DC, 1974

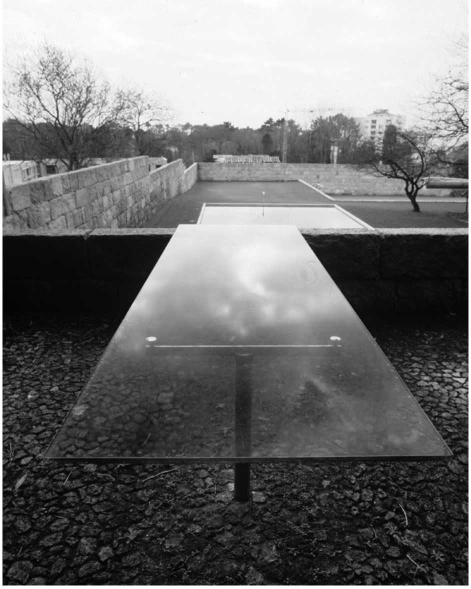


fig. 4

Table in the Garden Annexes at the Rua da Vilarinha, Eduardo Souta de Moura, Porto, Portugal, 1986

they enhance rather than diminish the illusion of Calder's work. Its representational quality emerges from its everydayness, and we can look at it as either representational or, merely, as itself.

Semper, I think, could not have been more wrong when he argued that "formal combinations, of whatever sort, will be most satisfying to the eye when *nothing in them evokes even the idea of material existence and duration, much less raises doubt about either*."[2] The selective presentation of constructional information in Calder's work seems appropriate, even necessary, in a work of art. Architecture may be a kind of abstract sculpture or a kind of representative sculpture, but in neither case is this phenomenon any less applicable to a building.

There are, of course, a number of architectural equivalents to the isolated but significant joint of the Calder stabile. This is the autonomous detail as joint, the dissonant joint—the non-supporting supports of the Farnsworth House; the non-connecting connections of the Gamble House; the isolated, dissonant power of the slit windows at Unity Temple or the moving joints of the Amsterdam Stock Exchange.

Souto de Moura's glass table in the Garden Annexes at the Rua da Vilarinha (1986) is a high-tech element in a handcrafted setting. *fig.* 4 A pristine, transparent plane is supported on one side by a rough stone wall and on the other by two slim legs. The stone wall and glass are connected and leveled by two polished metal connectors that, despite their tiny size in the large space, seem to hold the entire composition together. They are totally unlike the level of craft used in the remainder of the garden, explicitly describing the act of connection in a context that has few such descriptions.

In the case of Calder's stabile, the detail was a reminder that the work was constructed and assembled, a thought that runs counter to the abstraction that the work is suggesting. While there are no images beyond the buildings themselves in the work of Souto de Moura, this joint is nevertheless dissonant, not because it is about construction, but because it is about a different kind of construction. It has a certain opposition of intention to that of the building that holds it. This detail is not Frampton's condensation of the totality of the building, but rather an indication of a different order of building.[3] It is the intrusion of an alternative mode of expression, of sophisticated technology into builder's craft, of the technologically explicit into an abstracted vernacular context. The typical autonomous joint of this type is a reminder of assembly. Our first thought on seeing a building rarely concerns its construction; it is usually about the building as a permanent object, not the sequence and manner of its assembly. This type of autonomous detail is an assertion that the building before us was not always permanent, stable, or whole, that it is a set of components that are codependent, that it has parts that exchange forces, and that as a result, is not inert, but animated.

The autonomous detail as joint is not always an isolated condition. It may be pervasive while still being generally dissonant. There is much of Wagner's Postal Savings Bank that speaks of permanence—the rusticated base and the relatively small openings in the thick masonry walls. There is also much that speaks of assembly—the metal button-like fasteners of the stonework or the exposed sheered-off ends of the cladding of granite slabs at the base. What is so effective about the bolts is not just that they speak of construction and layering, but that they do so in a building that in its totality is a classical monolith

fig. 5

Museum of Prehistory, J. P. Kleihues,
Frankfurt, Germany, 1986

fig. 6

Lift-Slabs, Chapel of St. Ignatius, Seattle University,
Steven Holl,
Seattle, Washington, 1997

expressive of solidity and stability. Not surprisingly, since Wagner's exposed bolts are autonomous joints, they have an autonomous history, appearing in a number of buildings since 1906. Similar bolts are conspicuous in the work of many architects, particularly J. P. Kleihues, as in his Museum of Prehistory in Frankfurt(1986). *fig.* 5

Holl's Chapel of St. Ignatius at Seattle University (1997) was built using the lift-slab process. *fig.* 6 The technique is simple, a concrete floor is poured to form a base. Then another concrete slab is poured on top of the first and tilted up to form the walls. The process requires that lifting hooks be cast into the wall slabs that remain visible in the finished wall. Holl probably could have concealed these marks of construction if he wished, but he chose to cover them with oval cast bronze covers that dot the facade like so many beetles climbing the wall.

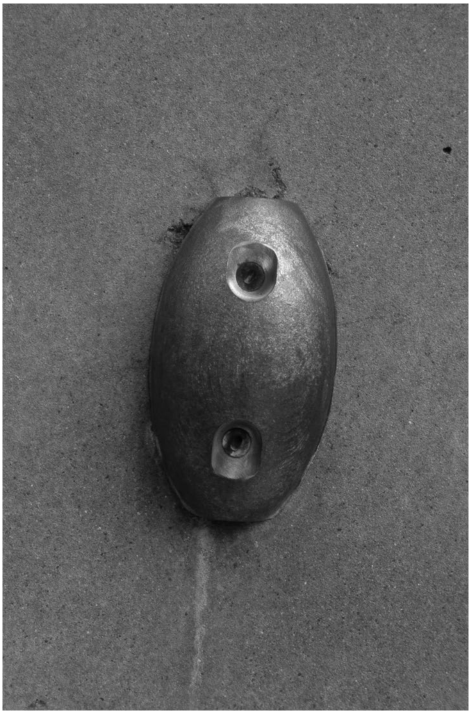


fig. 7

Knob Covering Lift-Slab Hook, Chapel of St. Ignatius, Seattle University, Steven Holl, Seattle, Washington, 1997

fig. 8

Wall Detail, Chapel of St. Ignatius, Seattle University, Steven Holl, Seattle, Washington, 1997

figs. 7–8 It is a commendable detail, but a curious one. The building tells us very little about itself constructionally. How is the roof structured? What is the mechanical system? Where does the rainwater go? The observer is left with no clue, but the precise location of each lifting hook is revealed, a relatively minor piece of information under the circumstances. It is the explicitness of the detail in its silent context, a building that is otherwise non-descriptive of its technology, that makes it significant. Holl is certainly aware of these contradictions of expression:

> An architecture of matter and tactility aims for a 'poetics of revealing' (Martin Heidegger), which requires an inspiration of joinery. Detail, this poetics of revealing, interplays intimate scale dissonance with large scale consonance.[4]

The isolated fasteners of Wagner's and Kleiheus' buildings tell us something about construction in buildings whose exteriors are not about construction or, in Wagner's case, not about its actual construction. There is an apparent need for these reminders. We need to see the building as complete, permanent, and stable; but also we need to understand it as an assembly of parts in a dependent relationship with one another.

The fragmented joints of Scogin and Elam's work might seem to fall within this category of autonomous joints that are an expression of construction, but the significant detail in the fragmented building is not the one that creates the fragmentation; this type of joint is, for the most part, ornamental and as fictive as a fiberglass Corinthian column. The significant detail is that which technically resolves the fragmentation in a way that is apparent, but does not destroy the illusion, or at least the suggestion, of fragmentation.

Eric Owen Moss was one of many architects who explored an interest in fragmentation in his work of the 1990s, arguing, like Vesely, that his architecture "would be conceptually incomplete if it were to represent itself as complete."[5] Moss writes of what he calls Picaresque order—fragments as part of a larger order:

> James Joyce has a method which I call the Picaresque theory. It has to do with discontinuity in a literal sense and continuity in a psychological sense. You can look at a building and see a series of pieces, and those pieces in terms of methodology, might or might not be tightly connected. More likely, they're loosely connected, even perceived as disconnected.[6]

Moss also speaks of "[v]isual hedonism—or pleasure—in the making of things and in the process of putting them together in a certain way."[7] But arguably, many of his details are about taking them apart. His Paramount Laundry in Culver City, California (1989), is a large-scale intervention in an existing long-span building. It contains both missing columns and unnecessary columns, as well as real fragmentations of the existing structure. The significant detail here is not the fragment, but the element that makes it possible. Moss creates a constructionally impossible abstraction then displays,

fig. 9

Debating Chamber, New Scottish Parliament Building, Enric Miralles and Benedetta Tagliabue, Edinburgh, United Kingdom, 2004

even exaggerates, the mechanism by which the abstraction and construction are reconciled.

We have already seen that singular joints in monolithic buildings are not merely dissonant. The column-to-beam joint at the Aarhus Town Hall and the pivoting base of the S. C. Johnson Building make possible a larger reading of these buildings as a statement—of political autonomy in the case of Jacobsen, or democratic unity in the case of Wright. These joints also have a second quality: they are not just articulated; they are animated, implying that the structure, at this point at least, is not static, but in motion, which in fact it is.

There are other examples of the isolated animated joint; not surprisingly one is found in another political institution—Enric Miralles and Benedetta Tagliabue's New Scottish Parliament Building at Holyrood Palace

fig. 10

Joint in Debating Chamber, New Scottish Parliament Building, Enric Miralles and Benedetta Tagliabue, Edinburgh, United Kingdom, 2004

in Edinburgh (2004), finished four years after Miralles' death. The architects offered a number of metaphors for the building design, including scattered leaves and boats in a stream, and the building also makes references to traditional Scottish ways of building, but what is striking about the arrangement of the Debating Chamber is its manifestation, both politically and architecturally, of opposition. *fig.* 9 In the traditional parliamentary seating arrangement, as in the Palace of Westminster, the opposing political parties sit facing one another. But while the joint of the inverted wood truss at Holyrood divides the assembly space into halves, the seating, a flat parabola in plan, does not. *fig.* 10

While it is a highly configured building, there are few details in the complex that are as technically explicit and precisely articulated as in these joints. They owe a great deal to Arup Engineers, but there is no reason to think

Miralles would have been dissatisfied with the final design. Since the truss is inverted, there is a heightened degree of dynamic, if not precarious, equilibrium to the whole arrangement, an impression made rather more anxiety provoking by the failure of one of the truss joints in 2006. It is thus difficult to escape the type of political metaphor that Smith and L'Orange might have applied to this type of assembly of parts, but only to the precarious arrangement that is the truss and not to the solid, unified base.

Whatever its political or contextual implications, the most effective use of the technically explicit joint here, as elsewhere, is as a counter-theme rather than a universal rule. In contrast to the jointless mass of the building's concrete base, the character of its roof comes not just from the fact that it is a wood structure joined with steel, but that it is an assembly that is technically explicit—moving, flexible, and animated—within a static, monolithic mass. At other locations, Miralles demanded the absence of joinery.[8] When the associate architect suggested a stone panel faced wall with open joints for the building's exterior, Miralles insisted that they be invisible to render the wall monolithic, but in the roof, the expression of joints was critical. It requires the heavy base and walls of the building to function symbolically. It is a condensation of the idea of the building only in that it is a detail and that it is the exception and not the rule. Applied universally, a joint that is such a specific explanation of assembly would make the entire building about assembly, as it does in the Pompidou Center. At the New Scottish Parliament Building, it is an isolated incident, and its symbolic implications are enhanced accordingly.

The Constructionally Narrative Detail

The autonomous joint that is about construction can describe a more complex process of construction, one indicative not just of assembly, but of a constructional history. This particular type of autonomous detail is the narrative joint, one that tells us, often in a somewhat fictive way, the history of the building's assembly. The creation of the Hedmark Museum in Hamar, Norway (1979), required the enclosure of an existing ruin. Rather than inserting new windows, the architect, Sverre Fehn, covered the existing openings

fig. 11

Entrance, Hedmark Museum, Sverre Fehn,
Hamar, Norway, 1979

with frameless glass sheets that sit beyond the exterior surface of the medieval wall, literally revealing the layers of history that make up the building. *fig.* 11 He wrote, "Don't touch those walls. Don't imagine anything. We'll make the construction of glass. Do not fit the openings, but let the openings be the historical openings; fix the glass outside the walls and the whole story can be told from the middle ages up to this day."[9] This detail describes a real historical layering, but it is the progeny of a number of fictional constructional histories, particularly Sigurd Lewerentz's Church of St. Peter in Klippan, Sweden (1966). In his earlier thick-walled brick buildings, Lewerentz placed the glass far back in the wall openings to be evocative of a ruin on the exterior. At Klippan he did the opposite, placing glass forward of the wall openings to give the appearance of a ruin from the interior. It is a fictive historical layering, an artificial ruin, but one without specific historical reference.

fig. 12

Flower Stand at the Malmo Cemetery, Sigurd Lewerentz, Malmo, Sweden, 1969

This became another autonomous detail that took on a life of its own. Why Lewerentz used the same detail at his concrete Flower Stand at the Malmo Cemetery (1969), a totally new building, is not entirely clear; perhaps to avoid the appearance of a ruin from the exterior. *fig.* 12 Jørn Utzon used this detail in more subtle ways at the Bagsværd Church in Copenhagen (1976). The glass is once again frameless and allows the concrete to stand free. Jensen & Skodvin used an entire curtain wall in the same way in their Mortensrud Church in Oslo (2005). *fig.* 13 Here too, the base wall is stone, but in this case, the stone wall is new. *fig.* 14 It is historical but is a fictional history.

There are more complex forms of the autonomous joint as historical narrative that present more complex histories, and the second type is one of the fabrication process. The *tokobashira*, the isolated tree trunk columns of the traditional Japanese house or teahouse, is the introduction of a literal fragment of unprocessed raw material into a construction in which the same material is processed, geometrically regularized, and abstracted. *fig.* 15 It appears in the work of modern Japanese architects such as Fumihiko Maki and Kisho Kurosawa,[10] but the tree trunk column is also common in Shingle Style and Adirondack architecture. As with the *tokobashira*, it is most effective in isolated dissonance, as in A. C. Schweinfurth's First Unitarian Church in Berkeley (1898). *fig.* 16 It has a long modernist life as well. One can understand it as a history of the construction process, from natural wood to finished wood.

fig. 13

Mortensrud Church, Jensen & Skodvin,
Oslo, Norway, 2005

fig. 14

Structural Support, Mortensrud Church, Jensen & Skodvin,
Oslo, Norway, 2005

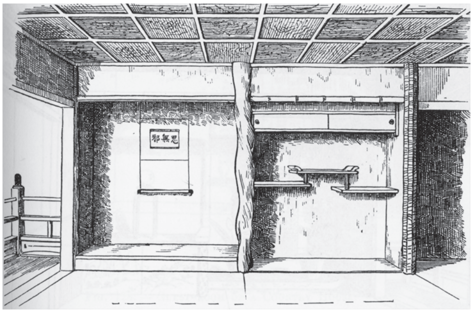


fig. 15

Toko-bashira (Edward Morse, *Japanese Homes and their Surroundings* Boston: Tichnor, 1886.)

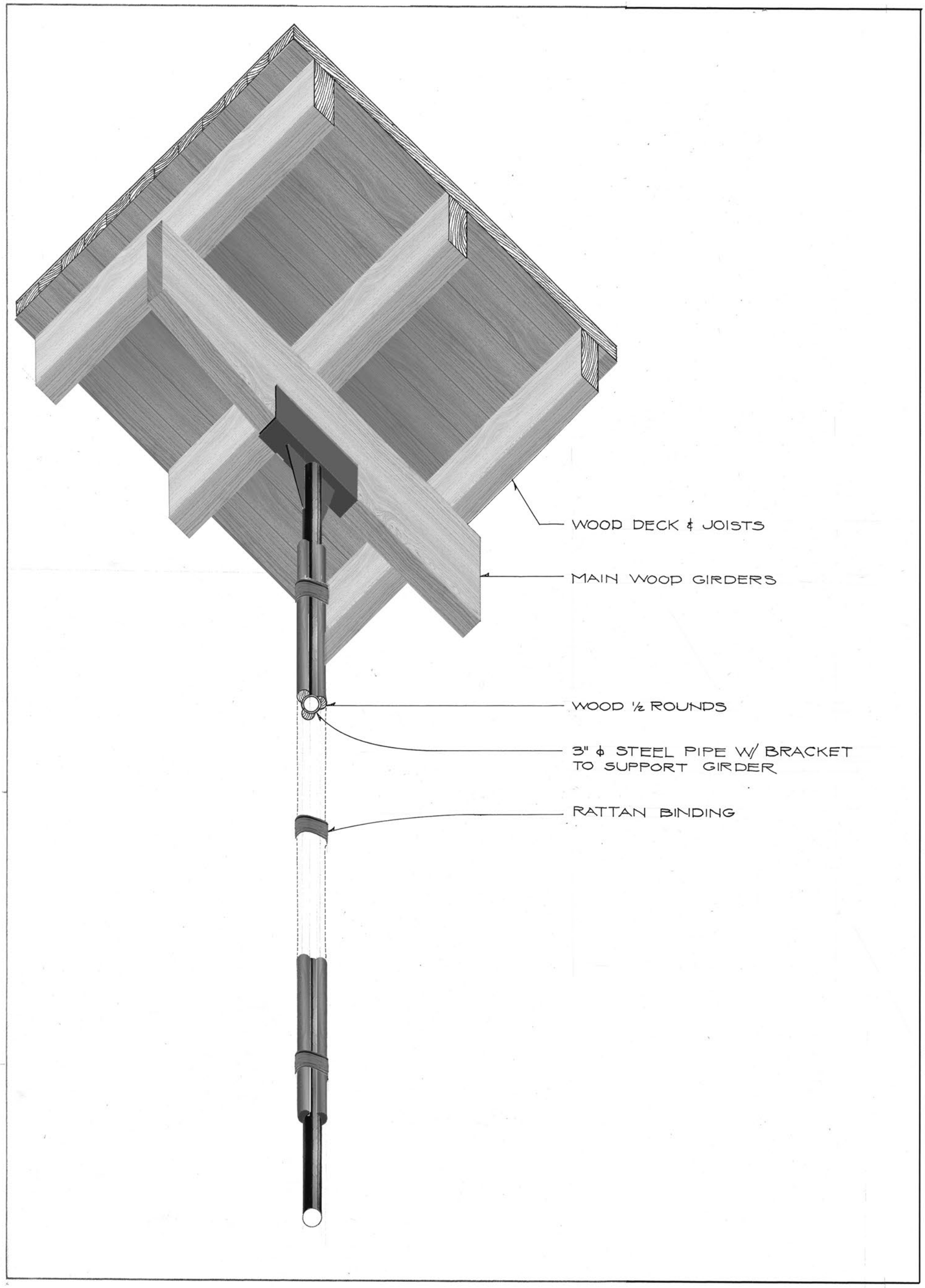


fig. 16

Column, Bus Station for the Sunila Pulp Mill, Alvar Aalto,
Kotka, Finland, 1937

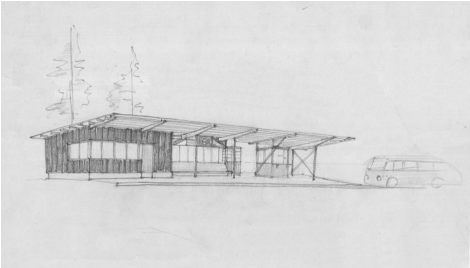


fig. 17

Bus Station for the Sunila Pulp Mill, Alvar Aalto,
Kotka, Finland, 1937

fig. 18

Column, First Unitarian Church, A. C. Schweinfurth,
Berkeley, California, 1898

Aalto's Finnish Pavilion for the Paris Exhibition (1937) contains a more complex progression of its constructional history, beginning with the most primitive tree trunk columns; then progressing through a level of intermediate craft in the clustered and wrapped wood columns; and finally, the double-tapering wood columns with fins that resemble airplane pylons. All are isolated moments reminding us that the structure is wood in the abstract context of a building in which the structural frame is concealed.

Aalto's clustered columns are an example of another type of autonomous detail with a long history that winds its way through modernism. In Aalto's work, this history is complete, moving from a literal archaic folk technology to a literal representation of it over the course of his career. As initially proposed in his Bus Station for the Sunila Pulp Mill in Finland (1937), the clustered column can be more precisely descriptive of the structural forces at work than a solid column. *figs.* 17–18 Additional column shafts can be added or subtracted as loads increase or decrease. By the time that they were used at the Villa Mairea (1939), however, they had become vestigial and symbolic. The wrappings of the wood sauna columns are unnecessary, for example, while those of the interior steel columns are there for tactile—not structural—reasons. At the same time, the caning of the living room columns recalls the more archaic wrapping of the sauna columns that are structural, at least in appearance. The real role of both column groups is to represent archaic technology rather than to structurally support. They appear in stone in later Aalto works such as the Wolfsburg Cultural Center in Germany (1962). These details act to alter the level of representation. They are handicraft elements in technologically sophisticated buildings, but they are also representative, e.g., historical, elements in abstract buildings.

The front porch of Koolhaas' Kunsthal in Rotterdam (1992) has a similar sequence of three columns—one concrete, one castellated steel, and one round steel tube. *figs.* 19–20 In the present arrangement, a sculpture including a tree trunk is also set in the opening between the castellated and round steel column. Cecil Balmond, the building's structural engineer, wrote:

> Before you enter the Kunsthal from the street you notice three columns in close proximity. They are of different shape and material, one in concrete, two in steel. The concrete column is square in section and the steel columns have different profiles. One has the appearance of a normal 'I' beam section, the other is castellated. These profiles are found regularly in many building but what makes this instance unusual is that the columns are close together, their separateness being quite distinct. They somehow 'disturb' the air. Their personalities clash. The configuration arises due to separate roof loads being supported directly and not ironed out in hidden transfer structures to give a single point of support. The ad-hoc solution gives an energy to the idea of entry, and the three distinct natures mix and interface to offer 'threshold' as an improvisation.[11]

The detail as a series of historical transformations forms another type with a pedigree that predates modernism. The overgrown trellis of Karl

fig. 19

Kunsthal, Rem Koolhaas,
Rotterdam, Netherlands, 1992

fig. 20

Columns at Entry Porch, Kunsthal, Rem Koolhaas,
Rotterdam, Netherlands, 1992

Friedrich Schinkel's Gardener's Cottage at Charlottenhof Palace in Germany (1831) has a variety of forms of support: the trunk of the vine, Hermes, simple round columns, simple square columns, and small Corinthian columns. Other sequences appear as literal historic development in literary works such as Ribart de Chamoust's *L'Ordre Francois trouvé dans la nature* in 1776, which showed the hypothetical development of the Corinthian order quite literally out of trees. On the frontispiece of Johannes Kepler's *Tabulae Rudolphinae*, the history of astronomy is portrayed as a series of columns, each column an astronomer. *fig.* 21 The oldest is a primitive wood shaft representing an anonymous ancient observer. The latest, a refined marble Corinthian column, is Tycho Brahe, and the columns between portray Hipparchus, Ptolemy, and Nicolaus Copernicus, in progressively refined types of construction. In a 1982 article, German architect O. M. Ungers wrote of this process of transformation:

> The principle of transformation can be a formative one that puts the designer in a position to link up divergent and apparently

fig. 21

Frontispiece from *Tabulae Rudolphinae* ("Rudolphine Tables"), by Johannes Kepler, 1627

irreconcilable contrasts reciprocally. This presupposes in the first place a recognition of the fact that objective and natural things of the spirit can assume not just one single state, but present themselves in different forms. Just as water can dissolve into the vaporous state of solidify in the form of ice, a spatial structure can be transformed from a definitive situation into one without precise limits.... This concept can also be clarified by referring to architecture, for instance to a supporting element: this can be a pole, beam, pillar, bar, strut, post, pier or column, according to the situation in which it is found.[12]

These transformations, like many others, replicate at a small scale the hypothetical development of orders discussed in chapter 4, and the detail sequences of Aalto and Koolhaas can be understood as historical recapitulations

fig. 22

Column, Williams Natatorium, Cranbrook School,
William Tsien,
Bloomfield Hills, Michigan, 1999

of the development of their own orders. In their more extreme versions, these transformations form a type of autonomous detail as historical reference—a literal one, a history of style. Williams and Tsien's Cranbrook Natatorium in Bloomfield Hills, Michigan (1999), does not show a particularly strong Aalto influence, but the clustered column reappears at the entry canopy. It is Aalto's wood column built in metal. *fig.* 22 The paired steel columns of Scarpa's Venezuelan Pavilion at the Venice Biennale (1956) have multiple ancestors, including Aalto and the tied stone columns of the Northern Italian Gothic. *figs.* 23–24 Despite the motific character of the Scarpa building, these details take on an autonomous character. They are autonomous narratives of construction in buildings otherwise unconcerned with construction.

There are, in the buildings described above, three types of historic narrative or progression: raw-to-processed material, handcrafted to

fig. 23

Column, Venezuelan Pavilion at the Venice Biennale,
Carlo Scarpa,
Venice, Italy, 1956

industrialized, or simply archaic to modern. Some are reminders of constructional realities that contradict the larger, less structurally expressive, themes of the building. Why are they there at all? Probably it is because they are deliberate juxtapositions of two contradictory ways of understanding a building. It is not that the buildings would have no meaning without them, but that they would have a different meaning.

If the detail as joint can be an autonomous detail, it must then have negative/abstract equivalent detail. The most obvious example of this would be the absence of a joint where it is expected or required, as in UN Studio's Mobius House or Ando's Modern Art Museum of Fort Worth, but a more significant negative/abstract joint is the fragmented joint—the joint that implies disassembly rather than assembly.

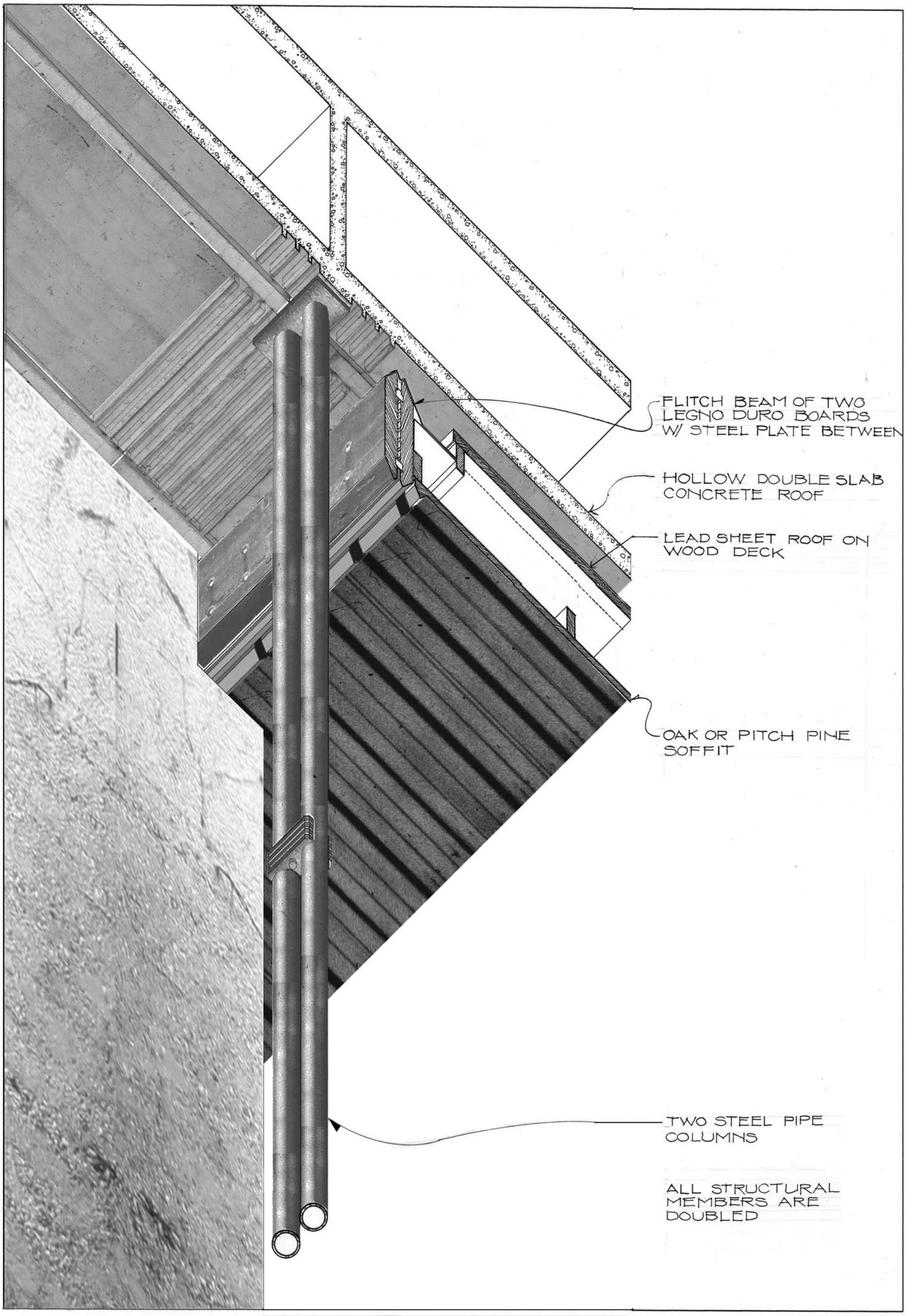


fig. 24

Columns, Venezuelan Pavilion at the Venice Biennale, Carlo Scarpa, Venice, Italy, 1956

fig. 25

Palazzo dei Congressi at the EUR, Adalberto Libera, Rome, Italy, 1942

fig. 26

Palazzo dei Congressi at the EUR, Adalberto Libera, Rome, Italy, 1942

Structure—a change in our awareness of the forces acting within a building, particularly weight

The regular column grid of the Mortensrud Church is, at one point, interrupted by the substitution of an upside-down V for a column, allowing the structure to straddle an existing rock that penetrates the church floor. This is an alteration in the mode of structural expression, the standard structural element that suddenly acquires an atypical character. This type of autonomous detail as structural element is a circumstantial one, a specific condition that requires a specific, non-conforming detail. But there are autonomous details of a structural nature that cannot be explained by circumstance. If architecture is indeed about structure, and structure is about weight, then as the expression of structure is changed so is the expression of weight, and so is the expression of architecture.

Adalberto Libera's Palazzo dei Congressi at the EUR in Rome (1942) is an abstract, monumental, oversized frame, defined by walls and a tightly spaced marble clad colonnade with little structural character. *fig.* 25 If it communicates anything about structure, it does so in a subtle, minimal way. This is not true of the support of the glass curtain wall behind the columns. A tapering catenary-shaped truss allowed to rotate at its ends, it is a very precise diagram of the magnitude of the forces of wind it resists—large at the middle where the stresses are greatest, small at the ends where they are the least. *fig.* 26 In terms of the elements of the building that resist external forces, this is not a primary one, but it is the only one so meticulously articulated. This is another type of autonomous detail, the articulation of constructional forces in a building that otherwise denies or simplifies them.

One could argue that this is simply functional accommodation. The opaque mullion is minimized to maximize transparency, but the selection of a radically different architectural vocabulary is rarely mandated by function alone, and it has broader implications than function. It is an assertion of structure that becomes an assertion of scale. We become aware of the size of the window, while the building remains an abstraction of indeterminate size.

This detail type, the isolated catenary mullion, probably originates in Howe and Lescaze's PSFS Building in Philadelphia (1932) or Aalto's Viipuri Library (1935), and like most autonomous details, it reappears periodically, in Eero Saarinen's TWA Terminal in New York (1962) and, more recently, in the atria of Norman Foster's Commerzbank Tower in Frankfurt (1997). These buildings are not devoid of structural expression. What makes the detail autonomous is that the expression of structure in the window mullion in each case is so precisely articulated. The minimum of material is used to solve the problem. In the remainder of the buildings, excess is born out of their geometric simplicities. While all of these details are, to a degree, autonomous in the context of the buildings that hold them, none are as powerful as the EUR. The quite real movement of the elements in some of these details is explicit, and while we may understand them in a technical way, we also perceive them as animations—quite literal mechanical ones, and this type of animation is a component in a variety of types of autonomous details.

Less easily explained are structural frames that, while structurally explicit, are configured in ways that are indirect, illogical, disjointed, and irregular for no apparent functional reason. This type of detail often involves an indirect structural support, taking on the qualities of the human body. The support for a *Madonna and Child* from Scarpa's Castelvecchio literally reaches around the edge of the display panel like an abstracted human hand and as a result animates

fig. 27

Sculpture Support, Castelvecchio Museum, Carlo Scarpa,
Verona, Italy, 1967

the structure, implying an inner force. *fig.* 27 The object is supported from the side rather than the bottom. It has the same effect of making the structural load to seem non-existent or inconsequential. This would be a structurally illogical solution if used at a scale of any consequence. Like similar Scarpa details, it provides the sculpture with a backdrop, but the background does not provide support. Its primary effect and purpose is the same as any picture frame or sculptural base, to separate the work of art from the world around it. But there is another factor present in this kind of structural animation, which asks a very basic question: how do we understand structure?

An expressive structure can follow one of two modes. One is mathematical: the way we see and understand a truss, a bridge, or a vault as a diagram of the forces at work. It is an understanding that is intellectual rather than intuitive; one that is largely acquired. The second type of experience—one that is at least partially intuitive—is sculptural: the perception of an animation of an inert mass, such as the bulging and expanding of the Ionic order at the frieze, capital, and torus that suggests that internal forces are at work. These ornaments, in their own way, are no less expressive of structure than a bridge by Robert Maillart. The building is suddenly animated by structurally expressive elements. But the structurally autonomous details are regardless of type, foreign elements in the work in which they occur. They create a difference in expression, and the fewer the instances of their use, the more powerful the message that they deliver. Both types are animations of their inner materials. One is engineered, mechanical, and real; the other is sculptural and often symbolic.

In addition to the distinction between a mathematical and sculptural understanding of structure, there is another polarity of our structural understanding: whether a building is understood as monumental or empathetic. A monumental expression communicates stability and permanence, usually on a literally massive scale. One reacts to the Baths of Caracalla (216 CE) or the British Museum (1753) in this way. The architecture of institutions is often, regardless of style, the architecture of weight, mass, and solidity. In a simple way, it is communicating to the world that the building is a manifestation of an institution that is equally solid, stable, and permanent. How we react to a building that speaks to us of mass, permanence, and stability is largely be determined by who is doing the speaking and why. Such a building to a Julien Guadet, the Beaux-Arts theoretician, may mean the stability of society of an institution. To a Peter Rice it may mean the repression and dominance of an individual by a society.[13]

In addition to the monumental, there is as second type of structural understanding: the empathetic. Our understanding and consciousness of a building's internal forces will vary depending on the perceived magnitude of the force, e.g., there will be a different understanding at different scales, and when they are at a scale that approximates the scale of forces in our own body, a very different reaction takes place. In classical architecture, these take the form of well-known ornaments—the torus, the capital, and effects such as entasis. There are examples of this phenomenon in modernism that are quite literally anthropomorphic, such as the caryatids supporting the canopy at Berthold Lubetkin's Highpoint One Apartments in London (1935). These columns create a sense that they can support less than the modern columns that surround them. They thus act to deny the expression of structural forces in the buildings that contain them. Types that are this literal are far less common than the more subtle, suggestive ones. They take the form of more literally animated joints, as in those of Berlage, Jacobsen, Piano, Rice, or Jourda & Perraudin.

Heinrich Wölfflin was one of many historians to explore the process of empathy:

> Physical forms possess a character only because we ourselves possess a body.... We read our own image into all phenomenon.... Our own bodily organization is the form through which we apprehend everything physical.[14]

There are examples of this that are not classical, Gothic portals in particular. Meyer Schapiro writes of the portal of the west facade of the Church of St. Lazare in Avallon that contains four adjacent columns—one a fluted square, one a human figure, one twisted, and one cylindrical:

> Just as the human figure loses its organic character in becoming a column, the column acquires organic character and properties of movement; it acquires more degrees of freedom than the mere architectural, inert stone object has. There has been a sort of exchange between the human and the inorganic here.
>
> That power of investing the human with its opposite, and the inhuman with the human, is part of this conception.... The column is a frequent metaphor or simile in the literature of the eleventh and twelfth centuries. A king or a bishop or a laymen who possesses to the highest degree qualities of stability and reliability, firmness, is praised as being a column.... This sense of the column, then, as having a human potentiality, and of the human as having columnar qualities, these are realized through such images.[15]

The structurally autonomous detail may affirm permanence or authority in a building where it is otherwise absent, but it is more likely, as in the above cases, to subvert it by the introduction of an empathetic, smaller scale of expression. In either case, our attitude toward the building, our distance from it, is altered at that point. But which of these types of expression occur in any building is far less important than the presence or absence of any of them. Obviously an alternative perception, or inversion of the mode of expression in a building, will alter the way we respond to it at that point, and if that type of detail is one that deals with weight, it will produce an alteration of more than just constructional interpretation. We interpret architecture in contradictory ways because we look to it for contradictory things, whether it is a building's solidity—suggesting stability or intimidation—or its similarity to ourselves (an empathetic understanding).

Program—a change in our awareness of our own functional engagement with a building

The four organically shaped handrails discussed at the beginning of this chapter are obviously the product of more than mere functional accommodation, but are rather an alternative mode of expression. What is that mode? Again it is animation, of the same order, but at a smaller scale than the structural examples above.

In his 1832 *Dictionnaire historique d'architecture*, Antoine-Chrysostôme Quatremère de Quincy wrote of the fundamental differences between the Doric, Ionic, and Corinthian orders, which he saw as based on sculpture:

> The Doric order, which expresses strength and solidity, did not demand from sculpture the elegance and the luxury that suit the other orders.... The profiles of the capital and the entablature were left smooth, and there were hardly any exceptions to this rule in antiquity. Contrawise, the Ionic order owed the elegance of its capital, and the varied details of its freeze, its mutules, its tori without base, and all the moldings of its entablature to sculpture. Sculpture, in all the energy of its means, was also utilized to endow Corinthian with the highest character of richness.... It is obvious that the art of

fig. 28

Drinking Fountain Handle, Stockholm Public Library,
Erik Gunnar Asplund,
Stockholm, Sweden, 1928

> sculpting is, in reality, a necessary part of architecture, endowing her with the most energetic means of her language by strongly manifesting her ideas, rendering them intelligible, and reinforcing their impressions.[16]

The Ionic order is an early example of a common phenomenon in Western architecture, sculptural intrusion into an architectural totality. At certain points in a structure a material alters the way it represents itself to us, changing from static to fluid, rigid to supple. It usually suggests properties that the material itself does not possess and, in some cases, represents another object altogether. This is another form of animation. If the EUR mullion represents a literal, mechanical, and structural animation, this is an animation that, while sculptural rather than structural, has a similar effect.

An early-twentieth-century manifestation of this, a very literal one, is the details of Erik Gunnar Asplund's Stockholm Public Library (1928), in which these intrusions pop up at odd locations, particularly in the door handles.

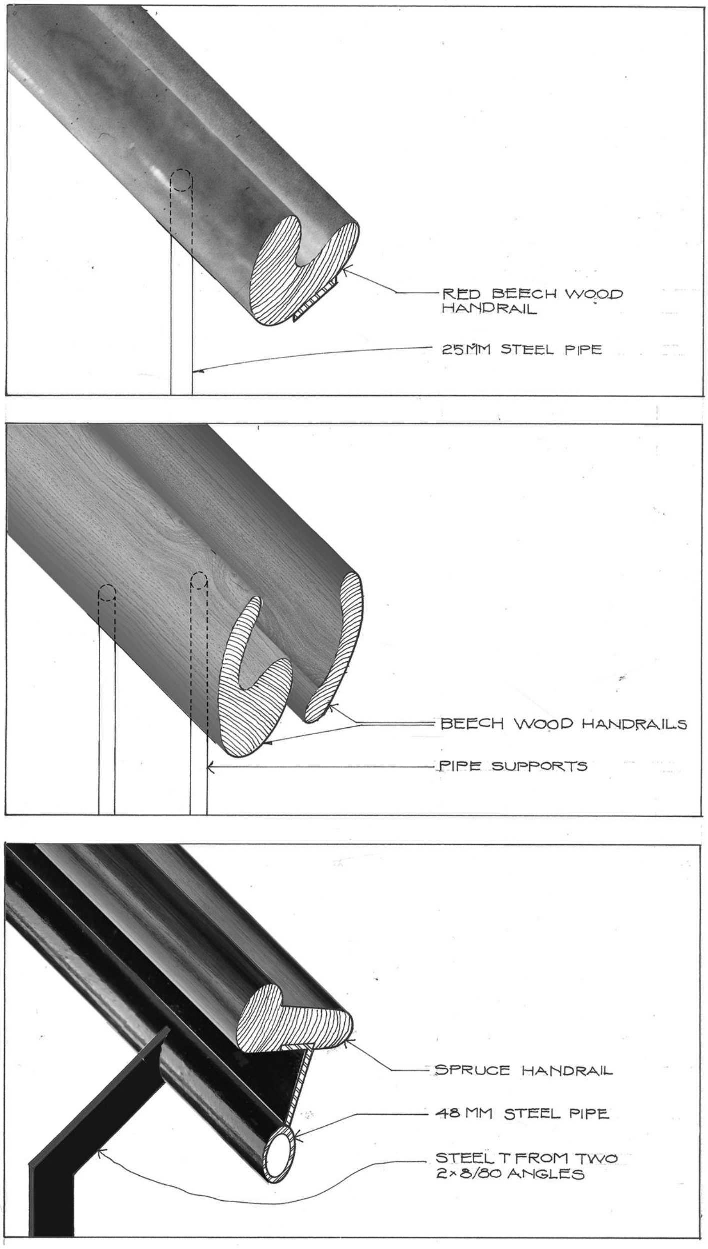


fig. 29

Top
Handrail, Bredenberg's Department Store, Erik Gunnar Asplund,
Stockholm, Sweden, 1935
Middle
Handrail, Viipuri Library, Alvar Aalto,
Vyborg, Russia, 1935
Bottom
Handrail, Canadian Clay and Glass Gallery, Patkau Architects,
Waterloo, Ontario, 1992

At the front door, we find Adam and Eve; at the drinking fountain, a rotating Mercury. *fig.* 28 The building is the most sculptural where it is the most tactile. The decade that followed saw Asplund's great modernist works, but the sculptural intrusions did not disappear; they simply became less representational. The organic wood handrails of the Bredenberg Department Store in Stockholm (1935) and Gothenburg Law Courts (1937) introduce soft, surreal elements into buildings that are more geometric, structural, and abstract in their expression. *fig.* 29 And once again, these details occur at the point of tactile contact.

Aalto's rails and door handles have a similar quality. Again, the intrusions occur at points of contact with the hand, and Aalto argued that they are thus more "humanistic." This is debatable; they may be more the expression of need, rather than the accommodation of need. The fact that they are suggestive of the body does not necessarily mean that they are accommodating to it. It is more useful to think of these as sculptural intrusions within an architectural context. They may evoke other materials, be suggestive of very different qualities of their actual materials, or resemble the human body quite literally, giving them both sculptural and anthropomorphic qualities. These details are not just intrusions, but animations, suggesting different forces at work, or forces working in a different way.

Regardless of their functionality, these forms are probably more the result of Surrealist influence than practical analysis. It is thus valuable to hear Aalto's friend and Surrealist artist Jean Arp's view of this type of animation. *fig.* 30 Arp described the process of concretion, a kind of petrification of organic forms:

> Concretion signifies the natural process of condensation, hardening, coagulating, thickening, growing together.... Concretion designates solidification the mass of the stone, the plant, the animal, the man. Concretion is something that has grown.[17]

English poet Herbert Read wrote extensively on the subject of vitalism, particularly in the work of artists of the 1930s such as Henry Moore and Arp. Read was influenced by art historian Wilhelm Worringer and, like Worringer, saw an artistic division between the naturalistic and geometric,

fig. 30

Relief Sculpture, Jean Arp, Jean (Hans) Relief, 1938–39,
after a relief of 1934–35

fig. 31

Door Handles

From Top:
Villa Mairea, Alvar Aalto,
Noormarkku, Finland, 1939

National Pensions Building, Alvar Aalto,
Helsinki, Finland, 1952

St. Catherine's College, Arne Jacobsen,
Oxford, United Kingdom, 1960

Chapel of St. Ignatius, Seattle University, Steven Holl,
Seattle, Washington, 1997

the organic and conventional, the vitalistic and formalistic, or the realistic and abstract. Read wrote:

> Modern civilized man regards that faculty which attributes spiritual or vital qualities to inanimate objects as the mark of a primitive stage in human development; and it would be a mistake to identify modern art with any revival of such 'animism.' But modern man at his most 'civilized' (the modern scientist) has restored a degree of animation to matter, which a short time ago was regarded as merely inert.[18]

The tactile, sculptural, animated intrusion into the rigid, abstract, and geometric building is the most well-known type of autonomous detail and has the longest architectural history. It occurs in a variety of conditions, always at odds with its containing building: as a handrail in Jacobsen's Aarhus Town Hall; as a door handle in Jacobsen's St. Catherine's College and in Steven Holl's Simmons Hall Dormitory at MIT (2002); as railings in Patkau Architects' Canadian Clay and Glass Gallery, Williams and Tsien's Cranbrook Natatorium (1999) and Neurosciences Institute (1995); and as handrails at Kahn's Kimbell Art Museum, Herzog and de Meuron's Tate Modern, and Koolhaas's Dutch Embassy. *fig.* 31 Koolhaas used tree trunks as handrails in the Educatorium in Utrecht and as both columns and rails at the Kunsthal. One might think of these details as humanizing in the same way as the organic handrails of Aalto, but the archaic, sculptural, and over-designed technology of Koolhaas' details is more intimidating than accommodating. *fig.* 32

A common occasion for the intrusion of organic vitalism is built-in furniture, and a common characteristic of the nineteenth-century inglenook, such as those of H. H Richardson's Paine House in Waltham, Massachusetts (1886). Elements such as the arms of the benches are organic sculptural intrusions, curvilinear, anthropomorphic, soft, body-like serpentine forms that grow out of the abstract totality. The material of the building is transformed into a seating element, taking on the contours of the body, and seemingly transforming the rules of design in the process. This is common in modernism as well. A ceramic tile bench plays a conspicuous role in the bath at the Villa Savoye, where it becomes a petrified version of Le Corbusier's Chaise Longue.

fig. 32

Handrail, Educatorium, University of Utrecht,
Rem Koolhaas,
Utrecht, Netherlands, 1997

fig. 33

Bench, Exeter Library, Louis Kahn,
Exeter, New Hampshire, 1972

fig. 34

Left
Bench, Woodland Crematorium, Erik Gunnar Asplund,
Stockholm, Sweden, 1940
Middle
Bench, University of Minnesota College of Architecture,
Steven Holl,
Minneapolis, Minnesota, 2002
Right
Bench, Cranbrook Institute of Science, Steven Holl,
Bloomfield Hills, Michigan, 1998

fig. 35

Pier Table, Holkham Hall, William Kent,
Norfolk, begun 1734

fig. 36

Table at Terrace, Villa Savoye, Le Corbusier,
Poissy, France, 1929

fig. 37

Table at Ramp, Villa Savoye, Le Corbusier,
Poissy, France, 1929

In Asplund's Woodland Crematorium (1940), the plywood paneling of the wall peels loose to form a continuous bench along the wall with the aid of an iron support. The travertine facing of the stair rail in Kahn's Exeter Library (1972) takes on the organic form of a seat, a shape almost unknown in Kahn's other work, and in a more subtle way, the mankato stone facing of Holl's bench at the entry of the Cranbrook Institute of Science (1998) does the same. *fig.* 33 In Holl's University of Minnesota College of Architecture (2002), the Asplund plywood bench is even replicated down to the profile. *fig.* 34 Each of these examples demonstrates a change in architectural rules, an intrusion of an attitude based on furniture into the existing fabric of a building based on architecture. All have in common the use of the body, quite literally imposed upon the architecture, transforming materials and forms in the process.

There is a similar history of these intrusions, albeit a more subtle one, in the built-in table. Early examples are the pier tables of William Kent, in which an ornate piece of furniture is built into a pier, losing its rear legs that are thus made redundant. *fig.* 35 There is something absurd about this arrangement. A piece of furniture designed to be light and mobile has been fixed to the wall and become stationary, and being structurally incomplete, is dependent on the wall for support. These tables, while part of the architecture, are not themselves architectural. We cannot conceive of them at a scale much larger than they are. Despite the somewhat surreal nature of this device, it has a long history, being particularly prevalent during the Queen Anne Revival, a period rich with a variety of furniture/architecture hybrids, but there are modern equivalents. Kent's table has a zoomorphic character; the vitalism of its progeny is more subtle. A table or chair made of square, uncurved, and unmolded members can be just as suggestive of the human body, purely by the specificity of its size and its marked difference from is architectural surroundings.

The engaged table that is fragmented—apparently mobile, but in reality engaged—is found in many of Le Corbusier's early works. As one ascends the ramp of the Villa Savoye, one encounters at least four similar tables, all missing two of their standard four legs and half supported instead by columns of the building—at the entry, the terrace, and terminating the sequence, and at the end of the ramp in the roof garden. *figs.* 36–37 It is curious to note that

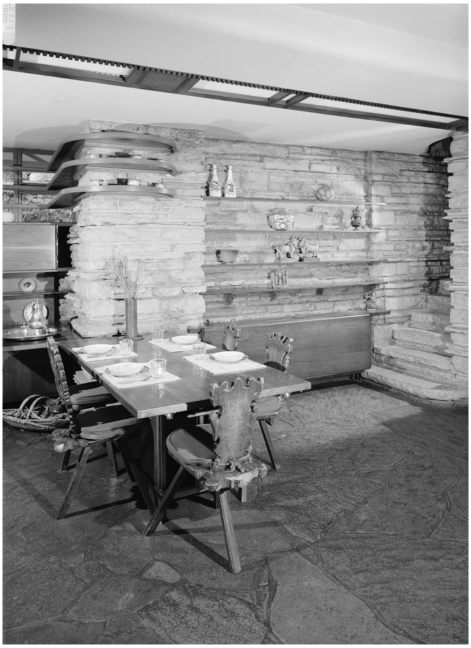


fig. 38

Dining Table, Edgar J. Kaufmann House, "Fallingwater,"
Frank Lloyd Wright,
Bear Run, Pennsylvania, 1935

fig. 39

Dining Table, Stanley Rosenbaum House, Frank Lloyd Wright,
Florence, Alabama, 1939

fig. 40

Window, Fisher House, Louis Kahn,
Hatboro, Pennsylvania, 1967

this occurs in a building that contains no dining room. It is not so much that the architecture is built using furniture, as that it is built of furniture that is incomplete without the architecture, and while these tables are not anthropomorphic because of their sculptural quality, they are because of their scale.

Engaged furniture seems an odd element for Le Corbusier and Wright to share, but the engaged table or desk is an almost universal fixture of

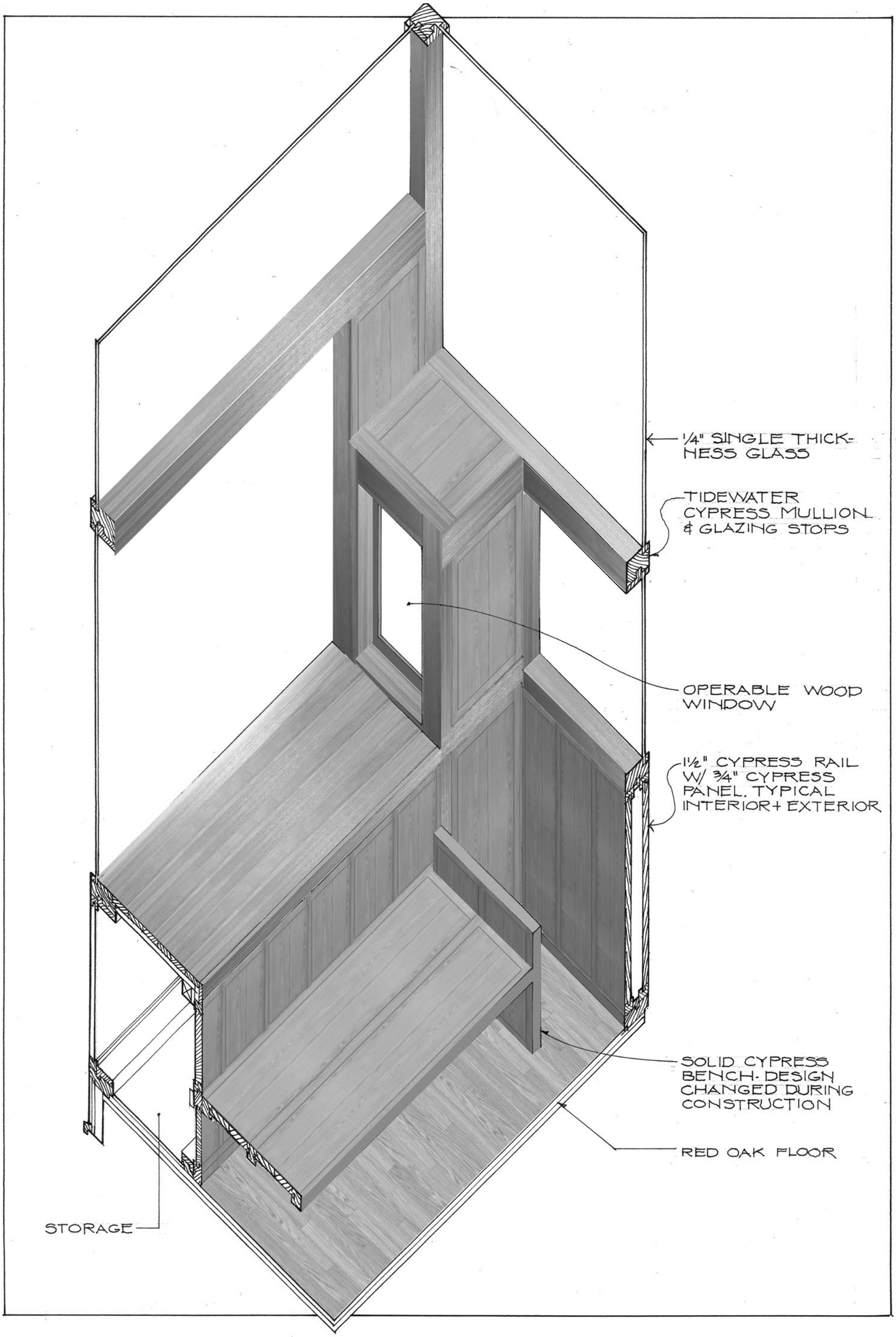


fig. 41

Wall Section, Fisher House, Louis Kahn,
Hatboro, Pennsylvania, 1967

the Usonian houses of the 1930s and 1940s. Although Wright uses it in a less dissonant way, the engaged table can be found in Usonian houses such as the Baird House in Amherst, Massachusetts (1940), the Goetsch-Winkler House in Okemos, Michigan (1939), the Lloyd Lewis House in Libertyville, Illinois, and the Kaufmann House (1939). *fig.* 38 'The dining spaces of these houses are loosely planned in relation to the formal, symmetrical, and centralized dining rooms of Wright's Prairie houses, but their ambiguous nature, both spatially and structurally, is what gives them their appeal. The table is typically supported at one end by a brick pier with freestanding chairs on one side and built-in seating on the other that usually extends beyond the table to form a banquette. Frequently, the table can be extended by a matching but detached section. The secondary supports of these tables are subdued or suppressed in comparison to the Corbusian examples, but as with Le Corbusier, their mobility is often implied. Wright's built-in tables, such as that of the Rosenbaum House in Florence, Alabama (1939), are aligned to the tight sixteen-and-twenty-four inch modules of the building that contains them, yet their dimensions and eccentricity make them anthropomorphic assertions in abstract compositions. *fig.* 39 Despite the absence of organic form—they are not curved or molded in any anthropomorphic way—they are assertions of scale within abstractions of indeterminate size. Few recent architects have used the engaged table as profusely as Le Corbusier or Wright, but it is present, often directly engaged with fenestration, as in Kahn's Fisher House near Philadelphia (1967). *figs.* 40–41

These are examples of the introduction of the particular and eccentric into the geometric and standardized, and it is no accident that the intentions of the furniture resist the standardized order of the rest of the buildings, giving the space a specificity of function that would otherwise be lacking. They are figural elements, introduced into compositions that are otherwise abstract. Many, like Le Corbusier's tables, are also fragmentary, dependent elements within architectural forms that are self-sufficient. They offer scale and require engagement, creating a correspondence between occupant and building.

Like any autonomous detail this type can be reversed into a negative/abstract detail; rather than the sculptural element in an abstract building, we have an abstract element in the sculptural one. The De Stijl casework of Peter Bohlin's Ledge House, despite its historical allusions, remains an assembly of abstract forms in a literal context. Both Bohlin's and Aalto's details have the effect of engaging us at a smaller scale, but through opposite means: Aalto by making us more aware of the material's inner life; Bohlin by denying the same quality through abstraction.

Performance—a change in our awareness of the forces acting on a building

Not all animations are of the structural or sculptural kind. There are external animations as well, dealing with the building as shelter, particularly with regards to water.

Traditional architecture tended to have discrete parts that were the solutions to certain issues of building performance—how water is kept out, or how a material is supported. Thus there were copings and sills to stop and shed water, and lintels to support masonry. Modernist detailing tends to minimize or eliminate these elements while still solving the problem, but a theme of

fig. 42

Gutters, Clare College Hostel, Ralph Erskine, Cambridge, United Kingdom, 1969 much traditional architecture, and some modern architecture, is the exaggerated expression of performance by the exaggerated design of these elements.

The Victorian master of this type of detail was Frank Furness, and his tools were the oversized, over-designed lintel and sill, but the most common of the oversized but isolated performance detail is the enlarged gutter, one that saw great popularity among Brutalist architects. The oversized gutter, which was not confined to concrete, also has a long, autonomous history, although its chain of details is less formally consistent. The roof and balcony drains of Ralph Erskine's Clare Hall Hostel in Cambridge (1969) seem designed for a deluge of biblical proportions. They are literally monumental, comprised of large timber downspouts, concrete scuppers, and open drains cut into the ground to create a vastly over-designed drainage network that winds its way between the buildings down to the River Cam. *fig.* 42 It forms a striking contrast to a typical Wright Prairie house, in which the rainwater drops from a small short pipe through the air for a distance of over fifteen feet to a sunken basin below. Wright does not quite make the detail invisible, but he minimizes it. Erskine, by contrast, enlarges it to the scale of the building and beyond.

fig. 43

Foundress Court, Eric Parry, Pembroke College, Cambridge, United Kingdom, 1998

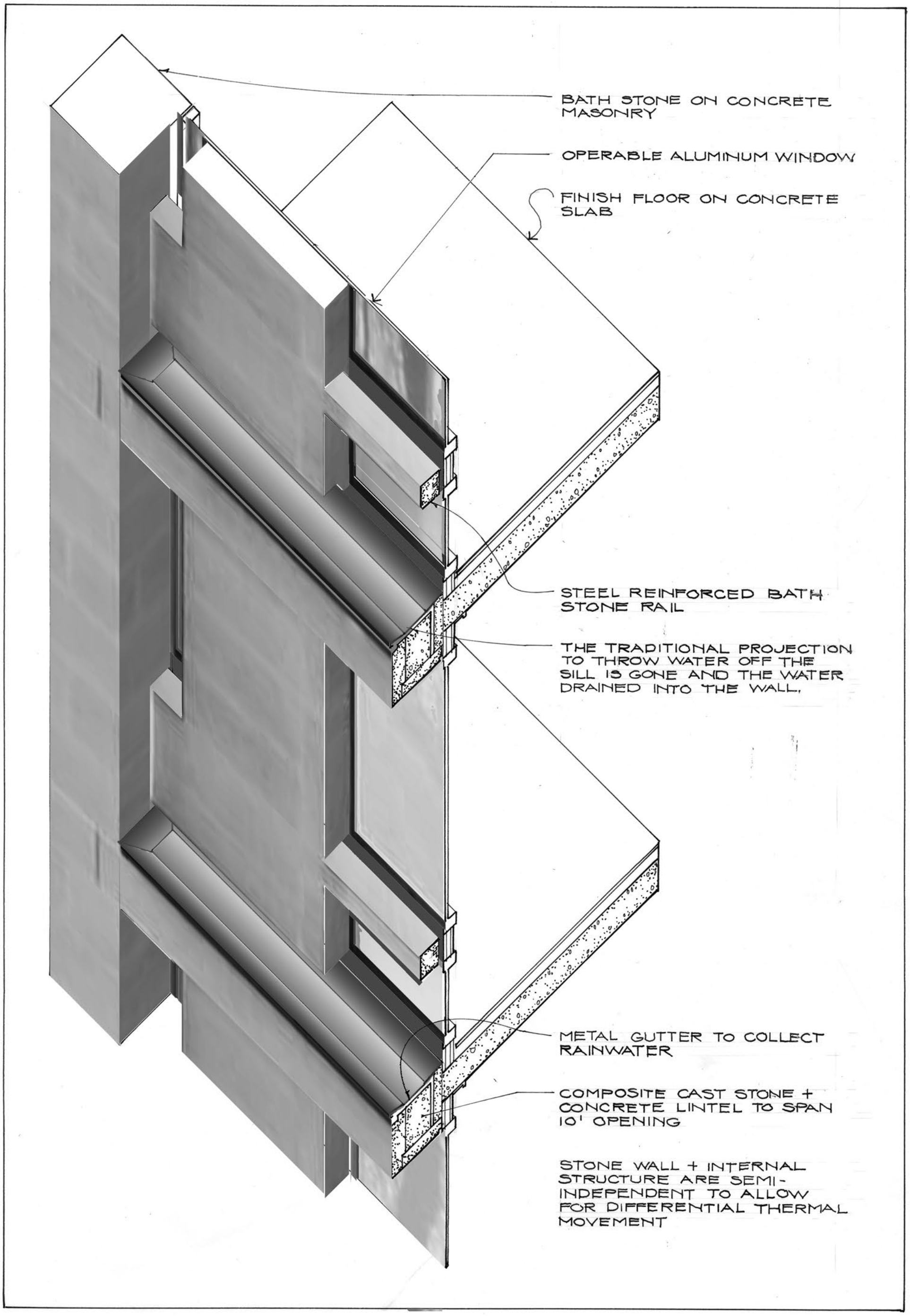


fig. 44

Wall Section, Foundress Court, Eric Parry, Pembroke College, Cambridge, United Kingdom, 1998

Although autonomous, Erskine's details dominate the remainder of the building. They constitute a monumental system of drainage, and the effect of the vastly over-designed drain is the same as a vastly over-designed structure. It produces a kind of awe at the implication that there are great forces at work in a building that is otherwise indifferent to these forces.

A similar detail occurs in the gutters of Scogin and Elam's Carol Cobb Turner Library (1991), and Scogin sees this type of detail to be just as much an animation as an Aalto door handle. A passage from a 1985 article:

> "We use the word 'energy' a lot," observes Scogin. "It's a word closely related to every aspect of present-day society, which has to do with the cultivation and expression of energy, whether television, movies, computers or just the hustle and bustle of most of our cities....
>
> In general there are many design strategies by which to invest a building with 'energy.'...One should 'rise' not 'descend' to a door, and the door itself should be unexpected, outfitted perhaps with a special hand rail or push bar—inviting the hand to touch the door unusual way heightens expectations.[19]

As with any autonomous detail, there is a reverse autonomous detail, one that is negative/abstract, the absence of an expression of performance in the articulated building. In Eric Parry's Foundress Court at Pembroke College in Cambridge (1998), the windowsills are missing. *fig.* 43 Omitting this detail required a great deal of hidden "plumbing," or hidden pipes, to actually get rid of the water, which is drained back into the building, then expelled at the base. The sill is thus eliminated, and with it the consciousness of natural forces that the oversized sill and coping would assert. *fig.* 44 The negative/abstract detail, the gutter that is not there, is found often in residences of Venturi, Scott Brown that have a trimless, knife-edged eave. This has the effect of denying the scale of the building, turning it less into an abstraction than into an icon, or even a cartoon. In some of their larger buildings, hidden gutters are provided where the quantity of water or location is problematic.

The details of the positive/literal type—the over-designed gutters, sills, and copings—are isolated reminders of the elements, in this case water. The effect is very much the same as an isolated reminder of structure. The building ceases to be a weightless, amaterial, scaleless abstraction and becomes a reality. The sudden absence of an expected element in a building that emphasizes its qualities that demonstrate a protection from the elements moves it toward abstraction. The effect of the negative/abstract type—the missing gutter, sill, or coping—has the opposite effect, toward abstraction. In a quite literal way, they alter a building's apparent consciousness of the natural world and with it, our own. The negative/abstract detail detaches rather than connects the building from its context, denies the elements rather than confirming them, and thus creates a certain distance between the building and the observer. They might have gone unnoticed if they had been abstract elements occurring in an abstract building, but the specificity of the context in which they occur—the missing sill and gutter—makes their absence conspicuous.

Distance

Of course these four divisions of autonomous detail types are, to a degree, subjective, as many of these details, perhaps most, have more than one manifestation in each of the divisions. The awareness of joining, for example, is at times a clear product of the awareness of structural forces, and many or perhaps all animations have structural implications, but the ultimate effect of any animatiion is to alter the perception of a building at an isolated point toward empathy and away from abstraction, to use Worringer's terms. While Worringer's theory and empathy in general are problematic, it is useful to recognize that a detail can work to establish a kind of distance between ourselves and a building.

Peter Zumthor speaks of what he calls "levels of intimacy" relating to "distance and proximity, with distance from me, distance between me and a building":

> It all has to do with proximity and distance. The classical architect would call it scale. But that sounds too academic—I mean something more bodily than scales and dimensions. It refers to the

various aspects—size, dimension, scale, the building's mass by contrast with my own. The fact that it is bigger than me, far bigger than me. Or that things in the building are smaller than me. Latches, hinges, all the connecting bits, doors.... What I'm talking about is size and mass and gravity of things.... There are things bigger than me that can intimidate me—the representative state edifice, the nineteenth-century bank, columns, that kind of thing.[20]

Failures

There are a number of objections to this entire analysis, primarily that this type of detail can lead to contradiction, which is undesirable, as easily as it can to ambiguity, which is. It can also be argued that there are buildings with radical shifts in language of detail that are in no way beneficial. The inconsistent detail is just as likely to end in incoherence as it is to end in dissonance, and there are many autonomous details that occur in buildings that would be better off without them—the misplaced gutter, the glazed curtain wall that appears opaque, the unwanted control or expansion joint, and all the other unplanned absences of resolution of a typical modern building, but there are failures of intention as well. In recognizing the importance of the autonomous detail, it is equally important to realize when it fails. The inconsistent detail may destroy the abstraction rather than enhance it, and the subversive element may lead only to confusion.

Confusion is perhaps not the best word to describe the excesses of postmodernism. Postmodern details, such as the greatly enlarged keystone, have the qualities of many autonomous details—oversized, displaced, over-abstracted, and over-transformed, such as Michael Graves's Plocek House in Warren, New Jersey (1982). Most fail ultimately because they have no context in which to occur and because the role of the element before transformation is purely an ornamental one.

It is equally important to recognize what are not autonomous details. There are buildings of multiple languages of detail that are perfectly consistent in their own framework. There is nothing autonomous, dissonant, or subversive about the two languages of detail that make up Kahn's Salk Institute—the wood, windowed flat slabbed study spaces and the steel, glazed, long-span prestressed laboratories. Although they are opposite in character, they are of equal quantity and value; in some cases, there is a fine line between the building with autonomous details and the building with multiple languages of detail. This is not true of the handrails of the Kimbell, which are isolated, dissonant, and at odds with their containers, neither integrated nor collaged into their environments.

Conclusion

It is clear that the autonomous detail, if not the most common type of detail, is the most significant; it is less clear why this is so.

The first explanation is functional necessity. Detailing requires the articulation or non-articulation of the necessities of construction—structure, program, and performance—and in a unified system of design, there is an inevitable suppression of functional needs that must, at some point, emerge. In any building, it is necessary to deal with situations that are programmatically, structurally, or constructionally unique. In this view, autonomous and subversive details are not so much desirable as they are necessary; all buildings of any complexity must use them. This is an unconvincing argument, given that many of the details described above could have been accommodated through negative or unarticulated details and many have been given rather unconvincing functional explanations. Clearly there is an intent beyond necessity.

A second, similar explanation is that consistency of detail, even if functionally possible, is aesthetically undesirable. Thus no explanation for the autonomous detail is needed; it is rather those buildings that exhibit absolute consistency, the motific buildings of Wright and others, that require justification because of their rigid and often functionally unresponsive stylization. This goes to the somewhat uncomfortable question, for a modernist, of what constitutes a style and to what degree it must be uniform. Schapiro, among others, argued that a rigid uniformity of style is undesirable:

> There are styles in which large parts of a work are conceived and executed differently, without destroying the harmony of the whole. In African sculpture an exceedingly naturalistic, smoothly carved head rises from a rough, almost shapeless body. A normative aesthetic might regard this as an imperfect work, but it would be hard to justify this view.... It is possible to see the opposed parts as contributing elements in a whole that owes its character to the interplay and balance of contrasted qualities. But the notion of style has lost in that case the crystalline uniformity and simple correspondence of part to whole with which we began. This integration may be of a looser, more complex kind, operating with unlike parts.[21]

This is, at least, a partially plausible explanation: that style requires imperfection. Rigidly unified detail must include exceptions. Otherwise we are left with the motific and superficially stylized, whether in the mode of Scarpa or Hadid.

Since many autonomous details are inversions of the expected—the heavy made light, the geometric made organic—a third explanation is the concept of otherness. In order to express one thing, we must demonstrate the opposite. Souto de Moura said in an interview:

> My obsession with finding a rule, finding order, finding the rational, is a theoretical premise so that I can work. But it has no final objective. When I manage to achieve a certain order, a rule for construction, or a basic module, everything seems to be going great guns; if they fail to materialize then invent them. In the Salzburg Hotel the 'overkill' with regard to finding a rule implied a leap in the opposite direction, which reinforces the actual interpretation of the rule, since it sets an anti-rule next to it. A building is all the more rational when compared to its opposite.[22]

But this explanation is still overly simple. Autonomous details have an importance beyond inconsistency or subversion, and at their best they constitute an independent narrative. This is the fourth and most all-encompassing explanation, that the autonomous and subversive detail offers an alternative understanding of the building.

We may understand a building in a number of ways. The first is familiarity—it is an image we know—this is recognition. Of the autonomous details examined above, many are representational, even symbolic. Details of this type are historical or figural representations within abstractions, such as the constructional narratives in the columns of Aalto, or in the many "quotations" of Aalto in the work of other architects. But the mass of autonomous details do not fall into this category but rather the articulated or abstract type.

On another level, we may perceive a building as abstract forms or geometric shapes—proportioned, composed, perhaps transformed or displaced—imperfectly represented by the materials of which it is constructed. The details associated with this type are abstract and require the suppression of information, and with that comes, a degree of unreality. This type of engagement with a work of architecture involves a disconnection from the world. Insofar as we see the building as an abstracted, inert, weightless, ideal form of no particular material, free from the constraints of gravity and constructional necessity, with no consciousness of it having been assembled, not subject to external force, of no particular size, we are disconnected from it in a direct way but connected to it in an idealized one. This is reading the building, as if it were a text.

Thirdly, we may see a building as a configuration that resists and balances forces, formed from a distinct arrangement of parts, clearly defined and clearly assembled, a system that is at equilibrium, a piece of equipment that serves our needs and provides shelter in the broadest sense. We might call this feeling the building. We understand it in an empathetic way.

This type of engagement with a work of architecture involves a heightened connection to the world. It reminds us of where we are, what is around us, and how we are situated, through an awareness of connections, forces, assemblies, and materials.

Insofar as we are aware that a building is affected by gravity and its consequences, subject to natural forces, animated by internal stresses, insofar as we realize that a building is a constructed assembly of parts made of certain materials, and insofar as we are directly physically engaged with a building, we are connected to it. This set of details is characterized by animations, elements that manifest what seem to be internal forces, through the apparent effects of weight, the perception of construction, natural forces, and natural materials.

This group may involve empathetic association within a building that is otherwise devoid of this characteristic. Each of these animations has a magnitude comparable with the forces at work in the human body, and there is thus the potential for an empathetic response. It may be a simple tactile response, as in the organic door handles; it may be of a more abstract order, as in the Scarpa sculpture mount. At the same time animation may be of a magnitude greater than ourselves, as in the structural joints of Berlage or Jacobsen, in which case our response is perhaps the opposite of empathy.

The above examples suggest two opposing, and not easily reconcilable, ways of looking at buildings, indicating that we respond to a work of architecture in multiple, contradictory ways. The polar opposites of the articulation or non-articulation of program, construction, structure, and performance can be seen in the polar opposites of two types of expression—the vital and the abstract.

We may perceive a single building as abstract or animated, but rarely in equal quantities. The autonomous detail is the manifestation of one of these sensibilities in the context of another—the vital in the inert, the naturalistic in the abstract. The expression of both sensibilities is an essential condition for a true architectural understanding.

It is the role of a detail not to resolve this contradiction, but to articulate it.

Epigraph. Wölfflin, *Principles of Art History*, 184-185; Nesbitt, *Theorizing a New Agenda for Architecture*, 496; Xavier Güell, "Interview with Eduardo Souto de Moura," *2G* (No. 5, 1998), 123; Eric Owen Moss, *gnostic architecture* (New York: Monacelli, 1999), 1, 5.

1 Nina Rappaport, "Power Station" *Architecture* 89, (May 2000), 153.

2 Semper, *Style*, 645.

3 Frampton, *Studies In Tectonic Culture*, 299.

4 Jencks, ed., *Theories and Manifestos*, 110.

5 Moss, *gnostic architecture*, 1, 5.

6 Eric Owen Moss, *Buildings and Projects* (New York: Rizzoli, 1991), 12.

7 Ibid., 15.

8 Letter from Enric Miralles to Barbara Doig, May 30,1999. Holyrood Inquiry Document No. OA-1-091

9 Sverre Fehn, *The Skin, the Cut & the Bandage: The Pietro Belluschi Lectures* (Cambridge: MIT Press, 1997), 7.

10 Ursula Opitz, "The Tree in the Japanese House: Reflections on the *Toko-bashira*," *Daidalos* 23 (March 1987), 30ff.

11 Cecil Balmond, *Informal*, (London: Prestel, 2002), 88–89.

12 Oswald Mathias Ungers, *Lotus Document: Architecture as Theme* (Milan: Rizzoli, 1980), 15.

13 For Guadet see Ford, *The Details of Modern Architecture, Vol. 1,* 5; Rice, *An Engineer Imagines*, 30.

14 Harry Mallgrave and Eleftherios Ikonomou, *Empathy, Form and Space* (Santa Monica: Getty Publications, 1994), 151, 152, 157–58.

15 Meyer Schapiro, *Romanesque Architectural Sculpture* (Chicago: University of Chicago Press, 2006), 89.

16 Antoine-Chrysostome Quatremère de Quincy, *The True, The Fictive, and the Real: The Historical Dictionary of Architecture of Quatremère De Quincy* ed. Samir Younes (London: Andreas Papadakis, 1999), 227–28.

17 Herbert Read, *The Art of Jean Arp* (New York: H. N. Abrams, 1968), 93.

18 Herbert Read, *The Philosophy of Modern Art* (New York: Fawcett, [1953] 1967), 212.

19 Mack Scogin, "[Scogin Elam and Bray]. "*A+U: Architecture and Urbanism* 11 (November 1989), 47–48.

20 Peter Zumthor, *Atmospheres* (Boston: Birkhauser, 2006), 49–53.

21 Schapiro, *Theory and Philosophy of Art*, 61–62.

22 Luiz Trigueiro et al., *Eduardo Souto de Moura* (Lisbon: Blau, 1996), 310.

7

What Is Detailing?

It is always a shock to see a section through the Medici Chapel and realize that Michelangelo's set piece is less than half the height of the space, that you are only looking at half the building. *fig.* 1 The drawing is, oddly, a completely different way of experiencing the building than the reality. *fig.* 2 The chapel is described in contrasting, often contradictory, ways as well. Some use the words proportion, pattern, ratio, linearity, scale, or rhythm. Some use words like weight, force, plasticity, vigor, tension, excavation, structure, and material. Some describe a process of imaginary geometric transformation—enlargement, extension, compression, or proportional alteration of an ideal prototype, while others describe an equally fictive process of animation and inner life, using

fig. 1

Tomb of Lorenzo de' Medici, Michelangelo Buonarroti, Florence, Italy, 1534

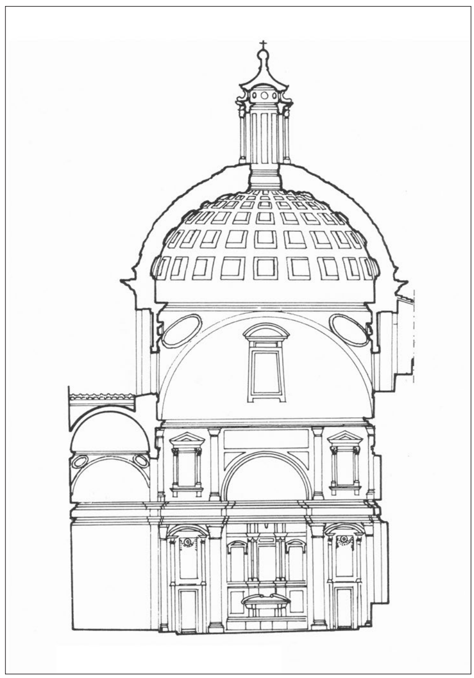


fig. 2

Section, Medici Chapel, Michelangelo Buonarroti, Florence, Italy, 1534 phrases such as "life infused into inert matter" or the classic "a wall transformed from an inert plane to a vital, multilayered epidermis." It is the difference, in Read's words, between an art of physics and an art of optics. While the descriptions given above are by two different architectural historians, Colin Rowe and James Ackerman, they do not represent two men looking at the building in two different ways. My divisions mix up the descriptions of the two; both of the authors saw the building as both abstract and animated.[1]

This might be one more manifestation of the age-old dichotomy between organic forms and geometric ones, but it is part of a much larger question. It is about two ways of experiencing a building or any work of art: as an abstraction or as a natural phenomenon; or put another way, abstraction and animation. These are not merely two modes of expression, but two types of experience. Abstraction is a necessary distancing mechanism in any art—a formal arrangement, a plot device, or an idealized shape—to make the fragments of the world, physical or otherwise, into art. Philosopher José Ortega y Gasset called it distance:

> The inevitable dullness of this analysis will, I hope, be excused if it now enables us to speak in a clear and precise way of a scale of emotional distances between ourselves and reality. In this scale, the degree of closeness is equivalent to the degree of feeling participation; the degree of remoteness, on the other hand, marks the degree to which we have freed ourselves from the real event, thus objectifying it and turning it into a theme of pure observation. At one end of the scale the world—persons, things, situations—is given to us in the aspect of 'lived' reality; at the other end we see everything in the aspect of 'observed' reality.[2]

Abstraction's architectural tools are easily recognized—the expression of geometry, rhythm, and proportion; the apparent absence of weight, material, and external force.

Animation—abstraction's opposite—is no less necessary, and if abstraction is about understanding a building, animation is about feeling it. If abstraction is about external observation, animation is about inner life and the perception of internal forces. To philosopher Theodor Lipps, writing in 1903, this was empathy:

> The specific characteristic of esthetic pleasure has now been defined. It consists in this: that it is the enjoyment of an object, which however, so far as it is an object of enjoyment, is not an object but myself. Or, it is the enjoyment of the ego, which however, so far as it is esthetically enjoyed, is not myself but an objective.[3]

Animation's tools are also easily recognized—the presence of weight, the consciousness of material, and the perception of an external surface formed by internal forces.

Wilhelm Worringer described this polarity as abstraction and empathy, and argued that these poles represent not just a means of understanding art, but the means by which art connects or disconnects us to the world. Empathy engages us with reality. Abstraction takes us aesthetically elsewhere. Worringer's analysis was applied to much of the art, particularly the abstract art that followed his 1908 work *Abstraction and Empathy*. Nevertheless, many, if not most, of the artists who produced that art would dispute his description of abstraction; not its existence, but that it constituted an escape from the world rather than an engagement with the world. But even if abstraction and animation do not describe two types of engagement with reality, they describe two types of architectural expression that are, to a degree, mutually exclusive.

Does this bring us any closer to an understanding of what a detail is? According to Worringer, this is what detailing is about:

> The tectonic of the Greeks consists in the animation of stone, i.e. an organic life is substituted for stone.... In the Ionic temple and the architectural development ensuing upon it the purely constructional skeleton, which is based solely on the laws of matter, that is to say, upon the relationship between load and carrying power, etc., was guided over into the more friendly and agreeable life of the organic, and purely mechanical functions became organic in their effect.[4]

This aspect of Worringer's analysis, that the detail is a sort of isolated point of animation within an abstraction, is an idea no less applicable to the Pompidou Center than to the Erechtheum, and these two counterpoles—abstraction and animation—are a point of departure to provide useful answers to the fundamental questions about detail asked in chapter 1.

Is detailing simply the act of elimination?

One of the less appealing visions of an afterlife is Tintoretto's *Paradise* (1590), in the Council Chamber of the Doge's Palace in Venice, a painting that measures twenty-five by eighty-one feet. The life of the world to come is apparently an eternity spent standing in concentric Dantesque circles of weightless people. Our souls, according to Tintoretto, look just like ourselves; they are simply weightless and immaterial. Painter and theoretician Kasimir Malevich agreed with this assessment:

> God, feeling the weight in himself, dispersed it in his system, and the weight became light and relived him. . . . Adam transgressed the limits of the system and its weight collapsed onto him. As a result the whole of humanity is laboring in sweat and sufferings to free itself from the weight of the collapsed system, is striving to distribute the weight in systems, wishing to repair the mistake—hence his culture consists of distributing weight in systems of weightlessness.[5]

As does sculptor Richard Serra:

> Everything we chose in life for its lightness soon reveals its unbearable weight. We face the fear of unbearable weight: the weight of repression, the weight of constriction, the weight of government, the weight of tolerance, the weight of resolution, the weight of responsibility, the weight of destruction, the weight of suicide, the weight of history which dissolves weight and erodes meaning to a calculated construction of palatable lightness.[6]

This is true abstraction. It is not abstraction in the sense of geometric form, or abstraction in the case of something that does not represent a recognizable object. It is architectural abstraction—the removal of the expression of weight, the denial of material, the absence of scale; and for Tintoretto and Malevich, it is transcendent—a disconnection from this world and a connection to another.

Much of architectural detailing is elimination of both the necessary and unnecessary small-scale elements of a building, and in a well-detailed building, they are done with a purpose, for the act of elimination is essentially the act of abstraction. If one removes the evidence that a building resists weight, is assembled of parts, resists the weather, and accommodates the needs of its inhabitants, one pushes the form toward a weightless, immaterial, and often geometrically simple abstraction.

According to Worringer, abstraction is an escape from the world; naturalism is an engagement with it. Naturalism characterized the art of the Renaissance and classical Greece. Abstraction was the art of the Dark Ages, and in his lectures, Norris K. Smith often implied that the abstraction of Kandinsky, Mondrian, Pollack, and Rothko were the modern counterparts of the abstract design of twelfth-century manuscript illuminations, the harbingers of a new dark age we were about to enter.

Is abstraction an escape from the world? Worringer and Smith thought so, and so evidently did Tintoretto and Malevich. To Robert Smithson, however, they have it completely wrong:

> Esthetics have been suffering from an acute case of empathy. . . . Abstract art is not self-projection, it is indifferent to the self. . . .
>
> Geometry strikes me as a 'rendering' of inanimate matter. What are the lattices and grids of pure abstraction, if not renderings and representations of a reduced order of nature? Abstraction is a rendering of nature devoid of 'realism' based on mental or conceptual reduction. There is no escaping nature through abstract representation; abstraction brings one closer to physical structures within nature itself.[7]

Wright certainly did not think of abstraction as an escape from the world. It was the world. The geometry of his work was to him the underlying geometry of nature, as it was for Emerson, Thoreau, and Sullivan. It was not an otherworldly geometry, as it was for Malevich, but the inner life of the world. But the polarities of abstraction and animation, and with them the concept of detailing, is nevertheless essential to architecture. Worringer's error was equating abstraction with geometry. Geometry, although one of abstraction's principal tools, is not its only one, and it is a tool that can be used for other purposes.

A less melodramatic interpretation of abstraction than Worringer's or Smith's is that while abstraction can be an escape, it is more accurately about distance. Regardless of whether abstraction is inherently transcendental, it is about an establishment of aesthetic order and perspective distance that the creation of art requires. The mechanism may be the plot of a novel, the composition of a painting; it might be created with something as simple as a picture frame or a pedestal. Architecturally it might be as simple as a geometric form. It is the action of placing the subject matter in a condition in which it is perceived in an aesthetic way; it is the inevitable reorganization and editing of reality that art requires. Modern art has done much to erode and make ambiguous this process, but it has not altogether eliminated it. It is perhaps most essential and most difficult in architecture in which the everyday must be elevated and refined into a defined aesthetic experience, and without the frame of the painting, the pedestal of the sculpture, and the proscenium of the theater. Abstraction is the primary mechanism for making a work of construction into a work of architecture. But abstraction alone is insufficient; art requires abstraction's opposite, as author Walker Percy called it, abstraction and reentry.[8]

Each material of Juha Leiviskä's Mannisto church in Kuopio (1994) is readily identifiable, yet it has the quality of being immaterial or, rather, of materials—rough painted wood, fabric, and plaster—at the point of dematerialization. *fig. 3* It is an abstract arrangement of planes with an ill-defined environmental boundary, all accomplished with a highly limited constructional and structural expression—a scarcity of information that, when it occurred, made the presence of this expression all the more emphatic. There is nothing

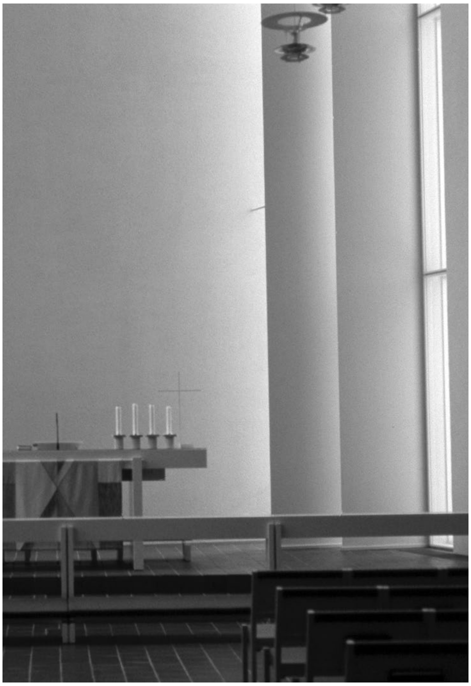


fig. 3

Mannisto Church, Juha Leiviskä,
Kuopio, Finland, 1994

fig. 4

Church of St. Peters, Sigurd Lewerentz,
Klippan, Sweden, 1966

structurally deceptive or dishonest about Mannisto, but it is hardly constructionally descriptive. One can respond to Sigurd Lewerentz's Church of St. Peter in Klippan (1966) in a spiritual way, but one never forgets for a moment that it is a brick building. *fig.* 4 Mannisto and Klippan exemplify two attitudes toward our relation to a building—one of emphatic connection, one of abstract distancing.

Thus if abstraction, and with it distancing, is a necessary condition of architecture, then much of detailing is elimination, and the art of detailing is far more likely to involve a conscious effort to hide rather than express something. But the process is never complete.

Detailing is the act of deciding not to conceal.

Is there an activity, detailing, distinct from architectural design?

One way, perhaps the best way, to understand the facade of Frank Furness' Pennsylvania Academy of Fine Arts in Philadelphia (1876) is as the structural expression of the behavior of masonry in a wall. *fig.* 5 The window openings are arched to carry the weight of the bricks above to the adjacent piers. At the base, where the loads are greatest, the wall becomes thicker, and the small, smooth bricks become larger rusticated stones. Its other ornaments can be understood, at least in part, as functional—drip molds to keep water away from the window at the top, sloping sills to push it away at the base. If you walk around to the back of the building, you will find all this ornamentation ends abruptly at the rear corner. The back, facing a narrow alley, is a simple flat brick wall. Does this indicate that the complex configuration of the front and sides is not functional? No, it just means that it is functionally exaggerated.

fig. 5

Pennsylvania Academy of Fine Arts, Frank Furness, Philadelphia, Pennsylvania, 1876

The ornamentation of Furness' facade is a narrative. Certain details are hidden or minimized; others are exposed and exaggerated. The act of detailing involves the suppression of much information and the presentation of other information, but rarely in an arbitrary way. Each detail establishes or strengthens a certain reading. In the course of this study, we have seen a variety of such narratives—narratives of joinery that animate some connections while suppressing others; narratives of structure that vary the size, form, and material of elements to establish hierarchies, to create a reading of skin and bones or body and clothes, or to deny there is any structure or weight at all.

Most of these narratives are simplifications of reality. Many are exaggerations, and some completely contradict the structural or constructional reality of the building—the superimposed, useless columns of Roman vaulted architecture, the superimposed classical orders on Robert A. M. Stern's steel-framed buildings, the suppression of all joints in the Möbius House. The authors of these works did not intend for them to be read in a structural way, but that does not preclude us from doing so. They all illustrate that while the exact correspondence of constructional narrative to constructional reality is rarely possible, or desirable, the value of the narrative is reduced as the distance increases between itself and the reality of the building that it covers.

Of the types of narrative examined in the text, the most successful share two factors—an element that is at some point not just expressive, but animated—and the most successful of these animated conditions are autonomous. This is because, as in the Medici Chapel, while a building must be at many points abstract, it needs also to be animated.

The vast majority of details that are articulated, visible, and positive—and that contribute to the buildings that contain them—are isolated points of animation in buildings that are otherwise inert and static: Berlage's steel pivot, the torus of the Ionic order, Miralles' truss joint in Edinburgh, Aalto's handrails, Asplund's bench, or Erskine's gutter. There are a smaller number of significant details that are the opposite, isolated moments of abstraction within buildings that are largely animated. The reason for this is the twofold nature of the way we experience a building, abstraction and animation.

Thus detailing is the small-scale animation of static abstractions by the displaying of function, by the exaggerating of function, by the representing of function, or by the reverse.

Detailing is selective animation or in some cases selective abstraction.

Is there a difference between an ornament and a detail?

The torus at the base of an Ionic column is, according to Palladio, "crushed by the weight of the column above." According to theorist Gherardo Spini, the torus is the "nervous muscle" of the column.[9] This is one of the oldest, most basic forms of animation—the expression of the apparent effects of weight on a stone mass. The dormitories of Louis Kahn's Indian Institute of Management(1974) are simple brick volumes, with the exception of two sets of elements—the flared buttresses at the base and the combination of jack arches and precast concrete ties over each porch opening.*fig.* 6 The torus of the Ionic order is unnecessary but expressive as a structural element, but Kahn's

fig. 6

Indian Institute of Management, Louis Kahn,
Amenabad, India, 1974

buttresses and arches are not as purely functional as we might assume. They are at least partially necessary, but the precast ties are needed only at the ends. At the typical condition, the lateral thrust of one arch counteracts the other.

This is animation by weight. There is a great deal of ornament that has little to do with weight, animation or even joints—the ornament of Wright, for example—but there is a great deal of ornament that, while non-functional, is expressive of weight, as in the torus. There are also a great number of functional devices—Kahn's buttresses—which, while functional, are exaggerated and articulated to take on the same role, and there are a large number of these devices that, despite having functional origins, are functionally unnecessary, as in Kahn's internal arch ties. The line between these last two is an ambiguous one.

According to Coventry Patmore, weight is the sole subject matter of the art of architecture. Many felt likewise; Arthur Schopenhauer said, "[Architecture's] sole and constant theme is *support and load,*" and Heinrich Wölfflin wrote, *"The opposition between matter and force of form,* which sets the entire organic world in motion, is the principal theme of architecture."[10] There is a great deal of traditional architecture, most of it masonry, to confirm this. However there is also a great deal of architecture, particularly modern architecture—and especially International Style architecture—that is mostly about the absence of weight. Nevertheless, this arguably is still about weight. Abstraction is about the denial of material, and it is about the absence of weight, but it does not eliminate our consciousness of it. In fact, it requires it. Arguably our understanding of a building, whether an abstract or a symbolic understanding, is based on our understanding of it as a form that transcends reality, or at least expresses another reality that is ethereal, geometric, and abstract. There are moments of animation within these buildings that contradict this understanding, that remind us of the real material, that articulate the accommodation of significant weight and internal forces—the ribs and moldings of the Amiens Cathedral, the bulging curves of the moldings of the Ionic order—these are the details as well as the ornaments of these buildings, moments of isolated animation in static, geometric abstractions. Weight is the most common and most important means of animating a detail, but it is not the only one.

Construction

While the volutes at the top of the Ionic column are, according to Kahn, representative of the loads moving from entablature to column. To John Onians, they are representative of something else, a knot or a pulley of a Greek ship. He writes, "What did the Ionic brain see in such forms to get a positive feeling from them? The answer is probably pulleys and ropes."[11] The base of the rigid steel frame of Peter Behrens' AEG Turbine Factory (1910) is a steel pivot. *figs.* 7–8 It represents movement by moving; this is animation by construction. Both joints are eccentric conditions within the buildings that hold them. Thus in the Ionic volute or torus, marble becomes soft, pliable, and moving. Behrens' joint is literally moving, but the building itself, with its massive corners and brick gable, could not be more static. Both joints articulate connection, both joints articulate transfer of load, and, if one believes Onians, both articulate movement. But more importantly, they are reminders that the buildings are constructed, that they are made of parts assembled into a stabile, albeit moving, arrangement. Of the countless joints of any building, a small number of these are articulated and a smaller number of these are animated. The less common the animated joint, the more effective its presence. But it is not the quantity of these details that gives them importance; it is their subversiveness, that they contradict the very building that they help to create. We do not normally think of a building in motion. It is easier and preferable to think of it as permanent, stable, and unchanging. These details, like most animations, convey a different message than the building as a whole. They illustrate again the different, and seemingly mutually exclusive, ways we understand a building. Beyond the obvious polarity of the timeless, unchanging abstraction versus the transient assembly of parts in equilibrium, the animated connection is more than just an isolated incident of vitality in a static assembly. It is a reminder of something transient in a work of art that is about permanence.

fig. 7

AEG Turbine Factory, Peter Behrens, Berlin, Germany, 1910

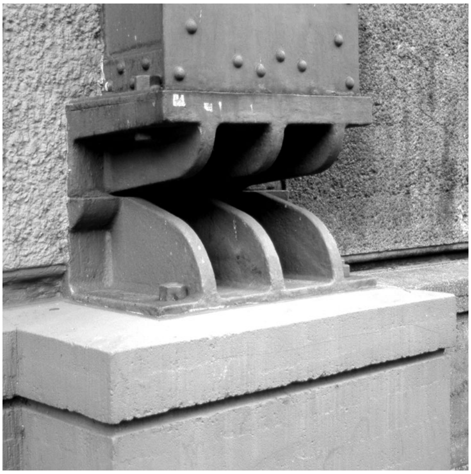


fig. 8

Column Base, AEG Turbine Factory, Peter Behrens, Berlin, Germany, 1910

Shelter

At each corner of the Parthenon, just below where the long vanished acroteria were placed, are four lion's heads, each with an open mouth out of which, apparently, flows rainwater from the gutter behind. *fig.* 9 They are in fact false gutters, but the animal as scupper is a Western tradition with a long history. All of the water from the Ronchamp Chapel's roof finds its way along a valley to a scupper at the rear, where it falls into an open cistern. *fig.* 10 The scupper is not literally an animal, but almost everyone seems to find one in it—typically the snout or nostrils of a monster of indeterminate definition. This is animation by the elements, and it occurs at the Parthenon as an isolated phenomenon. There is not much information about water and its accommodation in the rest of these buildings, which again is why these elements are so effective. Still, one cannot say that either building is not expressive of shelter. These details are exaggerations, not exceptions to the rest of the detailing. Nevertheless, like the joints described above, they are reminders of the everyday within images that are anything but.

fig. 9

Lion's Head False Gutter, Parthenon,
Athens, Greece, 438 BCE

fig. 10

Downspout, Chapel of Notre Dame du Haut, Le Corbusier,
Ronchamp, France, 1955

Program

A different type of animation is found in the central stair of H. H. Richardson's Paine House (1886). *fig.* 11 Despite differences in form, certain parts of it have much in common with the Ionic volute and torus, the handrails and baluster, for example. Both are alterations of expression from the architectural to the sculptural in which a material suggests qualities that are different—even opposite— from those it actually possesses. The handrail in Asplund's Bredenberg Department Store is also a sculptural element in a building in which this type of expression is otherwise missing. The first detail is in the tradition of Richard Norman Shaw and Stanford White. The second is in the tradition of Arp and Aalto, and these two detailing traditions, which are almost identical, occur in two architectural traditions that otherwise have little in common.

This is animation by program, but these details also have much in common with—in fact are arguably identical to—the sculptural animations discussed previously. What separates them is obviously the absence of substantial weight, whether real or implied. While the expression, even the motifs, of these two sculptural traditions are at points identical, our reaction to them is not, and weight is the reason.

All of the above types of animation can occur at the large scale and the small. All of the above examples, however, are at the small, and in all four cases, the small-scale animations of a fundamentally different order because of the size of the forces at work in relation to those of our bodies. And the size of the forces and the scale of the animation are at the scale of the detail. Detailing, at its best, is selective animation and, sometimes, selective de-animation.

In the examples of animation presented here, classical details are coupled with modern details and as a result, the representative with the real. There are a great many ornaments that have nothing to do with construction or animation, but there are a significant number of ornaments that originate in, or have acquired an association with, one of these types of selective animation. There are a number of modern details that do the same in a literal way.

fig. 11

Inglenook, Paine House, H. H. Richardson, Waltham, Massachusetts, 1886

There are, however, no rigid boundaries between the expressive but functionally useless ornament; the functionally exaggerated condition; and the purely functional detail. Each of these three is present in both modern and traditional architecture.

Therefore some ornaments are details and some details are ornaments.

The fundamental difference between a large-scale and a small-scale animation leads to the answer to the simplest, and perhaps most important, of these questions about details: how does scale matter? A large part of the answer is the quantity of weight that the architecture must accommodate, that which we perceive the building to possess—the quantity of force and the capacity to resist force that we perceive our own bodies to possess.

How does scale matter?

We perceive the effects of pressure and weight in a building in two ways—one that is institutional, a force greater than ourselves; and one that is empathetic, something like ourselves, not in shape, but in the quantity of load. We can understand the structure of a building in two ways. One is based on mathematics and knowledge of statics, and another is based on aesthetic, sculptural, perhaps intuitive, even structurally inaccurate impressions. On the level of aesthetic effect, this difference is not so great.

When these animations take place at the small-scale level of the detail, they are of an empathetic and not an institutional character, they are at the scale of the forces within our bodies. The neat and tidy conclusion to this is to say that detailing is about the process of empathy at the small scale, not abstraction at the large, and it is certain that a large number of autonomous details, if not all the details discussed here, are of this type. We have already seen there are a great many modernists who reject Worringer's thought, including many of those—Kandinsky, Mondrian, and Wright—to whom it is often applied. The question is thus: is this empathy, or rather, what is empathy?

The idea of empathy has had a long life since it appeared in the late 1800s. An early explanation for empathy was pantheism. Philosopher Robert Vischer wrote in 1873:

> The way in which the phenomenon is constructed also becomes an analogy for my own structure. I wrap myself within its contours as a garment.
>
> We thus have the wonderful ability to project and incorporate our own physical form into an objective form.... What can that form be other than the form of a content identical with it? It is therefore our own personality that we project into it.
>
> This symbolizing activity can be based on nothing other than the pantheistic urge for union with the world, which can by no means be limited to our more easily understood kinship with the human species but must... be directed toward the universe.[12]

For those who find this explanation overly mystical, there are more scientific ones. In this mode, empathy is kinesthetic sympathy with an object. Wölfflin wrote, "Physical forms possess a character only because we ourselves possess a body.... We read our own image in all phenomenon," but he felt that projection of ourselves into an object was not required: "Instead of an inexplicable 'self projection,' we might perhaps imagine that the optic nerve impulse directly stimulates the motor nerves, which causes specific muscles to contract." Nevertheless, at times, he sounds no less pantheistic than Vischer. Wölfflin wrote, "In everything there is a will that struggles to become form."[13]

Despite this pantheistic urge, those art historians who were advocates of empathy largely felt that it is a process of projecting ourselves into an object. As with abstraction, artists and theologians see things somewhat differently than art historians: in this case, as rather the reverse, that the object is projecting something into us. Furniture maker George Nakashima wrote in his book *The Soul of a Tree*:

> In Japanese, *kodama*, 'the spirit of a tree,' refers to an experience known to almost all people in this island nation. It involves a feeling of special kinship with the heart of a tree. It is our deepest respect for the tree which impels us to master the difficult art of joinery, so that we may offer the tree a second life of dignity and strength.[14]

Religious philosophers see this as part of a longer tradition. Mircea Eliade made similar observations on the origins of stone figures, "undressed stone indicated the divine presence far more effectively to the primitive religious mind than did any statue."[15] Philosopher Ananda Coomaraswamy wrote of a quality found in Indian art, *Sadrsya*, something like similitude:

> Sadrsya, 'visual correspondence' has nevertheless been commonly misinterpreted as having to do with two appearances, the work of art and that of the model. It refers, actually, to a quality wholly self-contained within the work of art itself, a correspondence of mental and sensational factors in the work. This correspondence is indeed analogous to the correspondence of person and substance in the thing to be 'imitated'; but the object and the work of art are independently determined, each to its own good.

A similar concept in Chinese art is *hsing-ssu:*

> It is not the outward appearance as such, but rather the idea…in the mind of the artist, or the immanent divine spirit, or the breath of life…that is to be revealed by the right use of natural forms.

To Coomaraswamy, this was imagist or mystical art, as opposed to the symbolic and iconographic art of the Western tradition:

> In this kind of art no distinction is felt between what a thing 'is' and what it 'signifies.'…Its ultimate theme is that single and undivided principle which reveals itself in every form of life whenever the light of the mind so shines on anything that the secret of its inner life is realized.[16]

This discussion places us on the border between the aesthetic and the spiritual, and for the architect, it may not matter a great deal, at least in practice, in which realm the argument is located, for the great difficulty of this issue is the problem of how a form is technologically realized. Naturalism, or at least organic form, can be just as much an escape from the world as a geometric pattern, perhaps not in our inability to see in it a form that we recognize, but in our perception of the reality of its fabrication and material behavior.

Much of the art that might be called organic or natural is anything but: the cliffs of Antoni Gaudí's Casa Milà, the organic forms of sculptor Henry Moore, and the concretions of Arp are all carved with chisels; the forms are imported from without and do not come from within. Aalto and Asplund's handrails are made the same way as a wood molding is made, with a milling machine. At best, one can argue that they are an interaction of the character of the tool with the resistance of the material, not an expression of the material per se. This is certainly the case with Asplund and Holl's plywood benches, and especially the case with the recent glut of digital fabrication, particularly the glut of modeled ceilings and wall panels. Each owes more to the tool than to the character of the material itself. The rectilinear parts of the buildings in which these forms occur are no less natural, organic, or expressive of their inner character; perhaps even more so.

While these cases establish that many modern details that seem to be an expression of the literal construction contain a great deal of traditional representation, there is a question of the accuracy of that representation. There are, in the preceding chapters, details that are animated, autonomous, and subversive in the context of static abstractions that are more literal and less representational: the moving joints of Berlage and Rice, the steel connectors of Souto de Moura, the base of the concrete trees at the S. C. Johnson Building. And if it is the true role of these details to counteract the abstract image of the building as a whole, whether it is historical or non-objective, these details, more literal and less representational, will be far more convincing.

This is not an argument that modern details are superior to traditional ones but rather the contrary. It is a plea to return traditional details to the animated spirit of their origins, even if those origins are mythical. There is, for Worringer or Nakashima, a point of departure for a detail that is an animation of the inner life of an object. Over time, these evolve into symbols and often lose their character in the process. The intention is to escape the symbolism of the torus and volute and return these ornaments, if not to their sixth-century BCE origins, at least to the time when they were expressions of force, and not characteristics of a style.

Less important than the opposition of geometric and organic shapes is a sense of ideal form as opposed to a sense of material reality. Forms, whether prisms or blobs, do not preclude the expression of either ideal form or material reality. It is very much a question of aesthetic distance, but it is not determined solely by shape. Thus the act of detailing is a question not just of part to whole, of construction to ornament, of style to reality, but of the relationship of ourselves to a work of architecture.

Scale matters because there is a point at which the forces at work in a building, real or perceived, are on the order of forces at work inside ourselves; and this is where empathy occurs.

What is the relation of the architectural part to the architectural whole?

There are a number of ways to unify architectural part and architectural whole: by using the same technical device for every purpose and at every scale, by repeating the same decorative motif for every purpose and at every scale, by formally manipulating each part into stylistic unity. Each will succeed, but only in the service of one goal, visual unity. If one wants to feel the presence of scale, to understand the nature of material, to show the internal forces at work in a building, these methodologies are a hindrance. In order to do this, the relation of part to whole must recognize and express differences of size, material, the conditions of shelter, structure, and program; and the articulation of joints.

The future of the joint does not appear particularly bright at present. We are told with increasing frequency that, due to digital fabrication, we are on the edge of an era of jointless buildings with zero tolerance. This statement is usually delivered with no explanation as to why this is desirable, on the assumption that anything digital or anything perfect is inherently good. It is my hope at some point in the near future to hear how digital fabrication will make it easier to articulate joints.

The joints of a building are not the small parts, but the parts between the parts. Many of our most basic understandings of architecture, in any period or style, are dependent not just on the perception of parts, but on the perception that loads are being transferred between them, that they are securely connected, and that they are in equilibrium. It seems inevitable that we use analogy to understand this arrangement of parts as something more than what it is. Evidently, we project a great deal more than our own bodies into a building. But not only the perception of parts, but the perception of load is critical. Our reaction to these assemblies will change as the perception of the weight changes.

The critical factor in the relation of part to whole is the joint to establish a sense of connection, the presence of load, and the process of construction, or the absence of any of these.

Is an understanding of the functional aspects of building—structure, construction, shelter, and program—essential to an architectural understanding of a building?

In February 2003, the proposed designs for the World Trade Center site had been narrowed to two: one by Daniel Libeskind, the other by the THINK Team. In a *New York Times* editorial, architectural historian and critic Marvin Trachtenberg called Libeskind's proposal "a miracle of creativity" and wrote, "It is in a class by itself in its deeply creative, organic relationship to the specificity of ground zero and its environment." He had no good words for the THINK proposal, which he saw as a continuation of modernism's worst aspects:

> In the early twentieth century, mainstream Modernism formulated a program from which it has never really retreated: the repression of history, memory, place and identity; the exaltation of functionalism, technology and the machine.... What would happen if the underlying macho-techno paradigm of the Towers was combined with its antithesis, an architecture of commemoration and revivification? Although such a hybrid is perhaps theoretically possible, the likely product of this Modernism-meets-living-memorial scenario would be an architectural Frankenstein monster like the World Cultural Center proposed by the Think team.[17]

It is Trachtenberg's assumption that architecture must choose between the expression of technology and the expression of "history, memory, place and identity" and that modernism, if it responds to "functionalism, technology and the machine," cannot thus respond to place, particularly the city. Whatever the merits of the THINK proposal—and it should be noted I am one of many who found it to be the superior scheme—more disturbing was Trachtenberg's underlying reasoning, that technology, whatever that might mean, is a library of symbols to which we assign meanings.

It is extremely difficult, if not impossible, to escape a symbolic or analogous interpretation of architecture. We may interpret technological images as technological optimism or as technological nostalgia. Yet both are superficial readings that, over time, will have no more validity than the idea that Southern neoclassicism is somehow representative of slavery. Southern neoclassicism is simply associated with slavery, not emblematic of it, and to associate modern technological images, whether the Norris Dam (1936) or the Clinton Library (2004), with the horrors or the achievements of the modern era is to understand both in a glib, transient, superficial, and ultimately non-architectural way.

The articulation of construction is not an alternative that excludes an architecture that evokes "history, memory, place and identity." It is the mechanism for doing so. Architecture's most spiritual buildings—the Pantheon, Amiens Cathedral, the Ise Shrine, or the Kimbell Art Museum—are not so in spite of their constructional rigor, but because of their constructional rigor. It may be difficult to escape a symbolic or analogous interpretation of architecture, but it is equally difficult to avoid a constructional understanding of a building altogether. It is equally true that we cannot avoid an abstract understanding of a building; we simply place less value on it.

How are we to define the relation of part to whole, except as a consequence of the building being assembled, however fictive that interpretation might be? How are we to understand the difference between the large and the small, except as an expression of the effect and intensity of weight? How are we to omit the evidence that the technical problems of a building have been solved? The virtue of the Pantheon, Amiens Cathedral, the Ise Shrine, and the Kimbell Art Museum is that they can be understood as abstractions or as constructions; and animation and abstraction are a part of this process at the large scale as well. It is absurd to explain the Pantheon or Amiens as purely the result of structural rationalism, but it is impossible to understand them or appreciate them without a structural understanding. Detailing is a part of this process of understanding, but more correctly, it is a small-scale understanding that parallels a large-scale understanding.

The appreciation of detail is the process of escaping, however momentarily, the symbolic and associative qualities of a building, and understanding its essence. A similar process is essential in our understanding of technology as a whole: a need to understand a mechanism not for its historical or social associations, not as a bit of nostalgia or local color, but rather to appreciate the order of its own internal organization without consideration of whether the technology is antiquated or advanced.

The question as to whether an understanding of structure, construction, program, and shelter is critical to a building is irrelevant because it cannot be avoided; it is at some point inevitable, just as is its absence, not because of any particular building, but because of ourselves.

What is a Detail?

Having answered the smaller questions we are left with the larger one as to what a detail is, and at this point, I ought to, as promised, offer a general, all encompassing definition that includes all the qualified ones already given, but I will not. Any comprehensive definition that could be provided would be so imprecise in its boundaries, so vague in its descriptions, so over-generalized in its broad terms, and over-qualified in its specific ones, that it would easily prove useless to the practitioner and satisfy only the pedantic theoretician. But if the detail as a class of objects cannot be usefully described with any degree of useful specificity, detailing as an activity can. Detailing is the act of varying the distance. Architecture requires both engagement and its opposite, and the detail is the mechanism for doing either.

In the open letter from the architecture faculty to the University of Virginia community that I helped write in 2005, we asked what was then posed as a rhetorical question, "Is architecture simply a question of style, of applied motifs with historical associations? Is the architect's only task to apply columns, pediments, and ornaments to a symmetrical block of an unimaginative floor plan, or is it an exploration of the essence of a building, the needs of its occupants, and the nature of its site?"[18] The answer is that while this application of motifs is not architecture's only task, it is, at least in its intention, one of its major tasks.

The ornaments of Jefferson's Lawn are not a superficial historical residue or a vestigial decoration. Stripped of its tori, scotias, capitals, volutes, and abacuses, it would be a lifeless abstraction, but it is the sculptural qualities of the elements that are of ultimate value, not their historical associations. The architects of the recent neoclassical buildings at the university feel that having built something that is reminiscent of Jefferson or that resembles Jeffersonian buildings, they have respected his achievements; that the symbol is all that matters. This is not architectural understanding, or even architectural appreciation; it is simply architectural recognition. It is a process that requires these elements to be deprived of a deeper meaning in order to realize a superficial one.

If you walk along the colonnade on the southwest side of Jefferson's lawn, looking at the bases of the columns and not lifting your eyes above the horizon, you will see the following: seventy-nine small columns, each with a single torus at the base. These are interrupted by five pavilions, two faced with the small columns of the colonnade and three faced with groups of larger columns. The first and second group of larger columns sit on a torus, then a scotia, then a larger torus. The two groups of smaller columns fronting the third and fourth pavilions are the same size as the small intermediate columns, and also have a single torus. The fifth group consists of four Doric columns without bases. Three of the smaller columns toward the end of the walk have been restored to their original condition, with unfinished plaster and cleaner, crisper molding profiles than those of the paint-encrusted older columns. *fig.* 12 I have mixed feelings about this type of restoration. They form an instructive juxtaposition. The older columns have the patina of age and a historical authenticity. On the other hand, the moldings of the restored columns have an animation and life that the somewhat poorly made and paint-thickened older moldings lack. It presents two realities: an authentic one with the patina of a real history; and one that, while less authentic, is truer to the principle of the molding. They illustrate that

fig. 12

Column Bases on the Southwest Side of the Lawn, University of Virginia, Thomas Jefferson, Charlottesville, Virginia, begun 1817 in order to understand the molding, one must go both below its surface and back to its origins. That meaning might be harder to discern, but it will be far less transitional and glib—one that is an articulation of parts in equilibrium; a static form that has been animated; an abstract form that has been given weight, that creates a distance between an abstraction and a reality.

These are details, and they are not the part from which the whole is generated, not the representation of what is hidden, certainly not the result of the application of certain concepts consistently throughout the building. They are details at their most autonomous and subversive. Beyond the accommodation of function, besides the determination of composition, after the delineation of the significant form, lies another task. A building needs to be informed with another quality altogether, the quality of animation, ambiguous representation, and contradictory manifestations of the nature of material that the capitals represent. If they do not illustrate, for the modern mind, what architecture is about, they do represent what detailing is about. The ornaments of the Lawn, like all details, are a reminder that architectural design requires the expression of forces that are contradictory, inconsistent, and at times irreconcilable; and that the architect's task is neither to repress these nor to ameliorate their differences, but rather to detail, to allow, on a selective basis, these conflicts to become manifest.

Details are not a class of objects, a library of symbols, or a collection of clever devices. They are the evidence of a necessary mediation between the way in which we see a building and the way we feel a building, between abstraction and animation, between material reality and idealized form, an impossible to quantify informing of one set of attitudes with the other. At its best, the detail is the result of the conscious act of creating the inconsistent, imperfect, or exceptional part, and while often done with an eye toward reconciling the conflicting perceptual demands we make of buildings, it is more likely to be the act of making these differences readily apparent. Detailing that is stylized, perfect, invisible, or accomplished with motifs will succeed only where it is inconsistent, imperfect, exaggerated, and contains non-conforming parts. The good detail is not consistent, but non-conforming; not typical, but exceptional; not doctrinaire, but heretical; not the continuation of an idea, but its termination, and the beginning of another.

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9 Payne, *The Architectural Treatise in the Italian Renaissance,* 178, 164.

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14 Nakashima, *The Soul of a Tree* (New York: Harper & Row, 1988), 132.

15 Mircea Eliade, *Patterns in Comparative Religion* (Lincoln: Nebraska, 1958), 235.

16 Ananda Coomaraswamy, *The Transformation of Nature in Art* (New York: Dover, [1934] 1956), 13, 14, 38. A New Vision for Ground Zero Beyond Mainstream Modernism

17 Marvin Trachtenberg, "A New Vision for Ground Zero Beyond Mainstream Modernism" *New York Times*, February 23, 2003.

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fig. 6:
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fig. 7:
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fig. 20:
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Chapter 7

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