1

The Museum of Modern Art Papers on Architecture

Complexity and Contradiction in Architecture

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with an introduction by Vincent Scully

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1. *Nonstraightforward Architecture: A Gentle Manifesto*

I like complexity and contradiction in architecture. I do not like the incoherence or arbitrariness of incompetent architecture nor the precious intricacies of picturesqueness or expressionism. Instead, I speak of a complex and contradictory architecture based on the richness and ambiguity of modern experience, including that experience which is inherent in art. Everywhere, except in architecture, complexity and contradiction have been acknowledged, from Gödel's proof of ultimate inconsistency in mathematics to T. S. Eliot's analysis of "difficult" poetry and Joseph Albers' definition of the paradoxical quality of painting.

But architecture is necessarily complex and contradictory in its very inclusion of the traditional Vitruvian elements of commodity, firmness, and delight. And today the wants of program, structure, mechanical equipment, and expression, even in single buildings in simple contexts, are diverse and conflicting in ways previously unimaginable. The increasing dimension and scale of architecture in urban and regional planning add to the difficulties. I welcome the problems and exploit the uncertainties. By embracing contradiction as well as complexity, I aim for vitality as well as validity.

Architects can no longer afford to be intimidated by the puritanically moral language of orthodox Modern architecture. I like elements which are hybrid rather than "pure," compromising rather than "clean," distorted rather than "straightforward," ambiguous rather than "articulated," perverse as well as impersonal, boring as well as "interesting," conventional rather than "designed," accommodating rather than excluding, redundant rather than simple, vestigial as well as innovating, inconsistent and equivocal rather than direct and clear. I am for messy vitality over obvious unity. I include the non sequitur and proclaim the duality.

I am for richness of meaning rather than clarity of meaning; for the implicit function as well as the explicit function. I prefer "both-and" to "either-or," black and white, and sometimes gray, to black or white. A valid architecture evokes many levels of meaning and combinations of focus: its space and its elements become readable and workable in several ways at once.

But an architecture of complexity and contradiction has a special obligation toward the whole: its truth must be in its totality or its implications of totality. It must embody the difficult unity of inclusion rather than the easy unity of exclusion. More is not less.

2. *Complexity and Contradiction vs. Simplification or Picturesqueness*

Orthodox Modern architects have tended to recognize complexity insufficiently or inconsistently. In their attempt to break with tradition and start all over again, they idealized the primitive and elementary at the expense of the diverse and the sophisticated. As participants in a revolutionary movement, they acclaimed the newness of modern functions, ignoring their complications. In their role as reformers, they puritanically advocated the separation and exclusion of elements, rather than the inclusion of various requirements and their juxtapositions. As a forerunner of the Modern movement, Frank Lloyd Wright, who grew up with the motto "Truth against the World," wrote: "Visions of simplicity so broad and far-reaching would open to me and such building harmonies appear that . . . would change and deepen the thinking and culture of the modern world. So I believed."[1] And Le Corbusier, co-founder of

Purism, spoke of the "great primary forms" which, he proclaimed, were "distinct . . . and without ambiguity." [13] Modern architects with few exceptions eschewed ambiguity.

But now our position is different: "At the same time that the problems increase in quantity, complexity, and difficulty they also change faster than before," [13] and require an attitude more like that described by August Heckscher: "The movement from a view of life as essentially simple and orderly to a view of life as complex and ironic is what every individual passes through in becoming mature. But certain epochs encourage this development; in them the paradoxical or dramatic outlook colors the whole intellectual scene. . . . Amid simplicity and order rationalism is born, but rationalism proves inadequate in any period of upheaval. Then equilibrium must be created out of opposites. Such inner peace as men gain must represent a tension among contradictions and uncertainties. . . . A feeling for paradox allows seemingly dissimilar things to exist side by side, their very incongruity suggesting a kind of truth." [14]

Rationalizations for simplification are still current, however, though subtler than the early arguments. They are expansions of Mies van der Rohe's magnificent paradox, "less is more." Paul Rudolph has clearly stated the implications of Mies' point of view: "All problems can never be solved. . . . Indeed it is a characteristic of the twentieth century that architects are highly selective in determining which problems they want to solve. Mies, for instance, makes wonderful buildings only because he ignores many aspects of a building. If he solved more problems, his buildings would be far less potent." [15]

The doctrine "less is more" bemoans complexity and justifies exclusion for expressive purposes. It does, indeed, permit the architect to be "highly selective in determining which problems [he wants] to solve." But if the architect must be "committed to his particular way of seeing the universe," [15] such a commitment surely means that the architect determines how problems should be solved, not that he can determine which of the problems he will solve. He can exclude important considerations only at the risk of separating architecture from the experience of life and the needs of society. If some problems prove insoluble, he can express this: in an inclusive rather than an exclusive kind of architecture there is room for the fragment, for contradiction, for improvisation, and for the tensions these produce. Mies' exquisite pavilions have had valuable implications for architecture, but their selectiveness of content and language is their limitation as well as their strength.

I question the relevance of analogies between pavilions and houses, especially analogies between Japanese pavilions and recent domestic architecture. They ignore the real complexity and contradiction inherent in the domestic program—the spatial and technological possibilities as well as the need for variety in visual experience. Forced simplicity results in oversimplification. In the Wiley House, for instance (1), in contrast to his glass house (2), Philip Johnson attempted to go beyond the simplicities of the elegant pavilion. He explicitly separated and articulated the enclosed "private functions" of living on a ground floor pedestal, thus separating them from the open social functions in the modular pavilion above. But even here the building becomes a diagram of an oversimplified program for living—an abstract theory of either-or. Where simplicity cannot work, simpleness results. Blatant simplification means bland architecture. Less is a bore.

The recognition of complexity in architecture does not negate what Louis Kahn has called "the desire for simplicity." But aesthetic simplicity which is a satisfaction to the mind derives, when valid and profound, from inner complexity. The Doric temple's simplicity to the eye is achieved through the famous subtleties and precision of its distorted geometry and the contradictions and tensions inherent in its order. The Doric temple could achieve apparent simplicity through real complexity. When complexity disappeared, as in the late temples, blandness replaced simplicity.

Nor does complexity deny the valid simplification which is part of the process of analysis, and even a method of achieving complex architecture itself. "We oversimplify a given event when we characterize it from the standpoint of a given interest." [16] But this kind of simplification is a method in the analytical process of achieving a complex art. It should not be mistaken for a goal.

An architecture of complexity and contradiction, however, does not mean picturesqueness or subjective expressionism. A false complexity has recently countered the false simplicity of an earlier Modern architecture. It promotes an architecture of symmetrical picturesqueness—which Minoru Yamasaki calls "serene"—but it represents a new formalism as unconnected with experience as the former cult of simplicity. Its intricate forms do not reflect genuinely complex programs, and its intricate ornament, though de-

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pendent on industrial techniques for execution, is dryly reminiscent of forms originally created by handicraft techniques. Gothic tracery and Rococo rocaille were not only expressively valid in relation to the whole, but came from a valid showing-off of hand skills and expressed a vitality derived from the immediacy and individuality of the method. This kind of complexity through exuberance, perhaps impossible today, is the antithesis of "serene" architecture, despite the superficial resemblance between them. But if exuberance is not characteristic of our art, it is tension, rather than "serenity" that would appear to be so.

The best twentieth-century architects have usually rejected simplification—that is, simplicity through reduction —in order to promote complexity within the whole. The works of Alvar Aalto and Le Corbusier (who often disregards his polemical writings) are examples. But the characteristics of complexity and contradiction in their work are often ignored or misunderstood. Critics of Aalto, for instance, have liked him mostly for his sensitivity to natural materials and his fine detailing, and have considered his whole composition willful picturesqueness. I do not consider Aalto's Imatra church picturesque. By repeating in the massing the genuine complexity of the triple-divided plan and the acoustical ceiling pattern (3), this church represents a justifiable expressionism different from the willful picturesqueness of the haphazard structure and spaces of Giovanni Michelucci's recent church for the Autostrada (4). Aalto's complexity is part of the program and structure of the whole rather than a device justified only by the desire for expression. Though we no longer argue over the primacy of form or function (which follows which?), we cannot ignore their interdependence.

The desire for a complex architecture, with its attendant contradictions, is not only a reaction to the banality or prettiness of current architecture. It is an attitude common in the Mannerist periods: the sixteenth century in Italy or the Hellenistic period in Classical art, and is also a continuous strain seen in such diverse architects as Michelangelo, Palladio, Borromini, Vanbrugh, Hawksmoor, Soane, Ledoux, Butterfield, some architects of the Shingle Style, Furness, Sullivan, Lutyens, and recently, Le Corbusier, Aalto, Kahn, and others.

Today this attitude is again relevant to both the medium of architecture and the program in architecture.

First, the medium of architecture must be re-examined

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if the increased scope of our architecture as well as the complexity of its goals is to be expressed. Simplified or superficially complex forms will not work. Instead, the variety inherent in the ambiguity of visual perception must once more be acknowledged and exploited.

Second, the growing complexities of our functional problems must be acknowledged. I refer, of course, to those programs, unique in our time, which are complex because of their scope, such as research laboratories, hospitals, and particularly the enormous projects at the scale of city and regional planning. But even the house, simple in scope, is complex in purpose if the ambiguities of contemporary experience are expressed. This contrast between the means and the goals of a program is significant. Although the means involved in the program of a rocket to get to the moon, for instance, are almost infinitely complex, the goal is simple and contains few contradictions; although the means involved in the program and structure of buildings are far simpler and less sophisticated technologically than almost any engineering project, the purpose is more complex and often inherently ambiguous.

3. *Ambiguity*

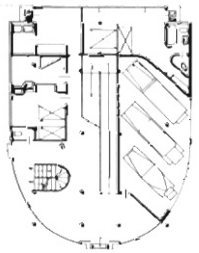
While the second classification of complexity and contradiction in architecture relates to form and content as manifestations of program and structure, the first concerns the medium and refers to a paradox inherent in perception and the very process of meaning in art: the complexity and contradiction that results from the juxtaposition of what an image is and what it seems. Joseph Albers calls "the discrepancy between physical fact and psychic effect" a contradiction which is "the origin of art." And, indeed, complex-

ity of meaning, with its resultant ambiguity and tension, has been characteristic of painting and amply recognized in art criticism. Abstract Expressionism acknowledges perceptual ambiguity, and the basis of Optical Art is shifting juxtapositions and ambiguous dualities relating to form and expression. Pop painters, too, have employed ambiguity to create paradoxical content as well as to exploit perceptual possibilities.

In literature, too, critics have been willing to accept complexity and contradiction in their medium. As in architectural criticism, they refer to a Mannerist era, but unlike most architectural critics, they also acknowledge a "mannerist" strain continuing through particular poets, and some, indeed, for a long time have emphasized the qualities of contradiction, paradox, and ambiguity as basic to the medium of poetry, just as Albers does with painting.

Eliot called the art of the Elizabethans "an impure art," [17] in which complexity and ambiguity are exploited: "in a play of Shakespeare," he said, "you get several levels of significance" [18] where, quoting Ben Jonson, "the most heterogeneous ideas are yoked together by violence." [19] And elsewhere he wrote: "The case of John Webster . . . will provide an interesting example of a very great literary and dramatic genius directed towards chaos." [20] Other critics, for example, Kenneth Burke, who refers to "plural interpretation" and "planned incongruity," have analyzed elements of paradox and ambiguity in the structure and meaning of other poetry besides that of the seventeenth century metaphysical poets and those modern poets who have been influenced by them.

Cleanth Brooks justifies the expression of complexity and contradiction by their necessity as the very essence of art: "Yet there are better reasons than that of rhetorical vainglory that have induced poet after poet to choose ambiguity and paradox rather than plain discursive simplicity. It is not enough for the poet to analyze his experience as the scientist does, breaking it up into parts, distinguishing part from part, classifying the various parts. His task is finally to unify experience. He must return to us the unity of the experience itself as man knows it in his own experience. . . . If the poet . . . must perforce dramatize the oneness of the experience, even though paying tribute to its diversity, then his use of paradox and ambiguity is seen as necessary. He is not simply trying to spice up, with a superficially exciting or mystifying rhetoric the old stale



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mockpot. . . . He is rather giving us an insight which preserves the unity of experience and which, at its higher and more serious levels, triumphs over the apparently contradictory and conflicting elements of experience by unifying them into a new pattern." [21]

And in *Seven Types of Ambiguity* William Empson "dared to treat what [had] . . . been regarded as a deficiency in poetry, imprecision of meaning, as poetry's chief virtue . . ." [22] Empson documents his theory by readings from Shakespeare, "the supreme ambiguist, not so much from the confusion of his ideas and the muddle of his text, as some scholars believe, as simply from the power and complexity of his mind and art." [23]

Ambiguity and tension are everywhere in an architecture of complexity and contradiction. Architecture is form *and* substance—abstract *and* concrete—and its meaning derives from its interior characteristics and its particular context. An architectural element is perceived as form *and* structure, texture *and* material. These oscillating relationships, complex and contradictory, are the source of the ambiguity and tension characteristic to the medium of architecture. The conjunction "or" with a question mark can usually describe ambiguous relationships. The Villa Savoye (5): is it a square plan or not? The size of Vanbrugh's fore-pavilions at Grimsthorpe (6) in relation to the back pavilions is ambiguous from a distance: are they near or far, big or small? Bernini's pilasters on the Palazzo Propaganda Fide (7): are they positive pilasters or negative panel divisions? The ornamental cove in the Casino Pio V in the Vatican (8) is perverse: is it more wall or more vault? The central dip in Lutyens' façade at Nashdom (9) facilitates skylighting: is the resultant duality resolved or not? Luigi Moretti's apartments on the Via Parioli in Rome (10): are they one building with a split or two buildings joined?

The calculated ambiguity of expression is based on the confusion of experience as reflected in the architectural program. This promotes richness of meaning over clarity of meaning. As Empson admits, there is good and bad ambiguity: ". . . {ambiguity} may be used to convict a poet of holding muddled opinions rather than to praise the complexity of the order of his mind." [24] Nevertheless, according to Stanley Edgar Hyman, Empson sees ambiguity as "collecting precisely at the points of greatest poetic effectiveness, and finds it breeding a quality he calls 'tension' which

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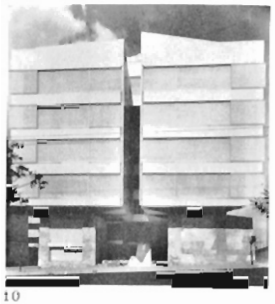

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we might phrase as the poetic impact itself." [25] These ideas apply equally well to architecture.

4. *Contradictory Levels:*

The Phenomenon of "Both-And" in Architecture

Contradictory levels of meaning and use in architecture involve the paradoxical contrast implied by the conjunctive "yet." They may be more or less ambiguous. Le Corbusier's Shodan House (11) is closed yet open—a cube, precisely closed by its corners, yet randomly opened on its surfaces; his Villa Savoye (12) is simple outside yet complex inside. The Tudor plan of Barrington Court (13) is symmetrical yet asymmetrical; Guarini's Church of the Immaculate Conception in Turin (14) is a duality in plan and yet a unity; Sir Edwin Lutyens' entrance gallery at Middleton Park (15, 16) is directional space, yet it terminates at a blank wall; Vignola's façade for the pavilion at Bomarzo (17) contains a portal, yet it is a blank portico; Kahn's buildings contain crude concrete yet polished grantite; an urban street is directional as a route yet static as a place. This series of conjunctive "yets" describes an architecture of contradiction at varying levels of program and structure. None of these ordered contradictions represents a search for beauty, but neither as paradoxes, are they caprice.

Cleanth Brooks refers to Donne's art as "having it both ways" but, he says, "most of us in this latter day, cannot. We are disciplined in the tradition either-or, and lack the mental agility—to say nothing of the maturity of attitude—which would allow us to indulge in the finer distinctions and the more subtle reservations permitted by the tradition of both-and." [26] The tradition "either-or" has

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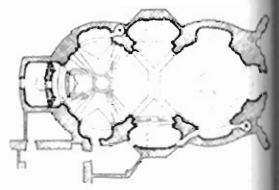

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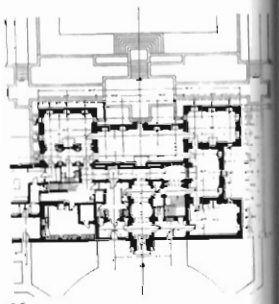

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characterized orthodox modern architecture: a sun screen is probably nothing else; a support is seldom an enclosure; a wall is not violated by window penetrations but is totally interrupted by glass; program functions are exaggeratedly articulated into wings or segregated separate pavilions. Even "flowing space" has implied being outside when inside, and inside when outside, rather than both at the same time. Such manifestations of articulation and clarity are foreign to an architecture of complexity and contradiction, which tends to include "both-and" rather than exclude "either-or."

If the source of the both-and phenomenon is contradiction, its basis is hierarchy, which yields several levels of meanings among elements with varying values. It can include elements that are both good and awkward, big and little, closed and open, continuous and articulated, round and square, structural and spatial. An architecture which includes varying levels of meaning breeds ambiguity and tension.

Most of the examples will be difficult to "read," but abstruse architecture is valid when it reflects the complexities and contradictions of content and meaning. Simultaneous perception of a multiplicity of levels involves struggles and hesitations for the observer, and makes his perception more vivid.

Examples which are both good and bad at the same time will perhaps in one way explain Kahn's enigmatic remark: "architecture must have bad spaces as well as good spaces." Apparent irrationality of a part will be justified by the resultant rationality of the whole, or characteristics of a part will be compromised for the sake of the whole. The decisions for such valid compromises are one of the chief tasks of the architect.

In Hawksmoor's St. George-in-the-East (18) the exaggerated keystones over the aisle windows are wrong in relation to the part: when seen close-up they are too big in relation to the opening they span. When seen farther back, however, in the context of the whole composition, they are expressively right in size and scale. Michelangelo's enormous rectangular openings in the attic story of the rear façade of St. Peter's (19) are wider than they are high, so that they must be spanned the long way. This is perverse in relation to the spanning limitations of masonry, which dictate in Classical architecture that big openings, such as these, be vertically proportioned. But because one usually expects vertical proportions, the longitudinal spanning ex-

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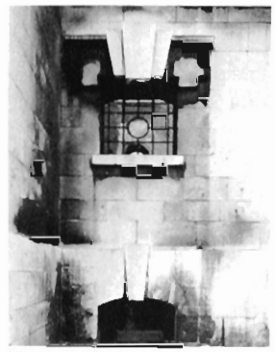

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presses validly and vividly their *relative* smallness.

The main stair in Frank Furness' Pennsylvania Academy of the Fine Arts in Philadelphia (20) is too big in relation to its immediate surroundings. It lands on a space narrower than its width, and faces an opening narrower than its width. Furthermore, the opening is bisected by a post. But this stair is ceremonial and symbolic as well as functional, and it relates to the hall immediately beyond the opening, to the whole building, and to the great scale of Broad Street outside. The outer thirds of Michelangelo's stair in the Laurentian Library vestibule (21) are abruptly chopped off and lead virtually nowhere: it is similarly wrong in the relation of its size to its space, and yet right in relation to the whole context of the spaces beyond.

Vanbrugh's end bays in the central pavilion of the entrance façade of Blenheim Palace (22) are incorrect because they are bisected by a pilaster: this fragmentation produces a duality which decreases their unity. Their very incompleteness, however, reinforces by contrast the center bay and increases the overall unity of this complex composition. The pavilions which flanked the château at Marly (23) contained a similar paradox. The compositional duality of their two-bay façades lacks unity, but reinforces the unity of the whole complex. Their own incompleteness implied the dominance of the château itself and the completeness of the whole.

The basilica, which has mono-directional space, and the central-type church, which has omnidirectional space, represent alternating traditions in Western church plans. But another tradition has accommodated churches which are both-and, in answer to spatial, structural, programmatic, and symbolic needs. The Mannerist elliptical plan of the sixteenth century is both central and directional. Its culmination is Bernini's Sant' Andrea al Quirinale (24), whose main directional axis contradictorily spans the short axis. Nikolaus Pevsner has shown how pilasters rather than open chapels bisect both ends of the transverse axis of the side walls, thereby reinforcing the short axis toward the altar. Borromini's chapel in the Propaganda Fide (25) is a directional hall in plan, but its alternating bays counteract this effect: a large bay dominates the small end; a small bay bisects the center of the long wall. The rounded corners, as well, begin to imply a continuity of enclosure and a central-type plan. (These characteristics occur in the courtyard of San Carlo alle Quattro Fontane too.) And the diagonal

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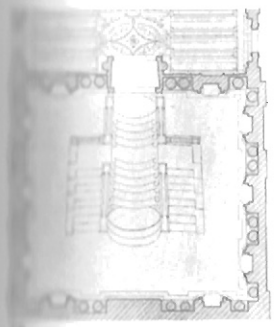

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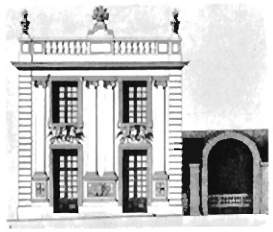

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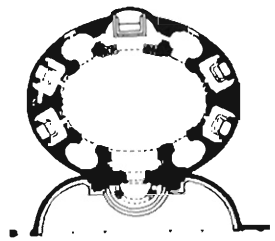

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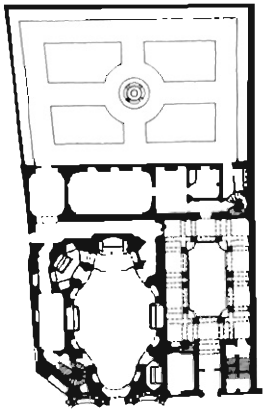

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gridlike ribs in the ceiling indicate a multidirectional structure as much like a dome as a vault. Hagia Sophia in Istanbul is equivocal in a similar way. Its central dome on the square bay with pendentives implies a central type church, but its two apses with half-domes begin to set up a longitudinal axis in the tradition of the directional basilica. The horseshoe plan of the Baroque and neo-Baroque opera house focuses on the stage and the center of the auditorium. The central focus of the elliptical plan is usually reflected in the ornamental ceiling pattern and the enormous central chandelier; the focus toward the stage in the directional distortion of the ellipse and partitions between the surrounding boxes as well as in the interruption of the stage itself, of course, and the seating in the pit. This reflects the dual focus in the program of the gala theatre: the performance and the audience.

Borromini's San Carlo alle Quattro Fontane (26) abounds in ambiguous manifestations of both-and. The almost equal treatment of the four wings implied in the plan suggests a Greek cross, but the wings are distorted toward a dominant east-west axis, thus suggesting a Latin cross, while the fluid continuity of the walls indicates a distorted circular plan. Rudolf Wittkower has analyzed similar contradictions in section. The pattern of the ceiling in the articulations of its complex mouldings suggests a dome on pendentives over the crossing of a Greek cross (27). The shape of the ceiling in its overall continuity distorts these elements into parodies of themselves, and suggests rather a dome generated from an undulating wall. These distorted elements are both continuous and articulated. At another scale, shape and pattern play similarly contradictory roles. For example, the profile of the Byzantine capital (28) makes it seem continuous, but the texture and vestigial patterns of volutes and acanthus leaves articulate the parts.

The pedimented porch of Nicholas Hawksmoor's St. George, Bloomsbury (29), and the overall shape of its plan (30) imply a dominant axis north and south. The west entrance and tower, the interior configuration of balconies, and the east apse (which contained the altar) all suggest an equally dominant counter axis. By means of contrary elements and distorted positions this church expresses both the contrasts between the back, front, and sides of the Latin cross plan and the duo-directional axes of a Greek cross plan. These contradictions, which resulted from particular


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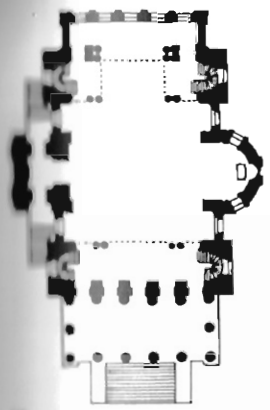
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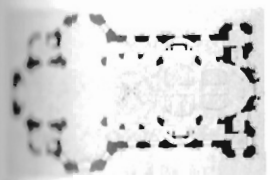
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site and orientation conditions, support a richness and tension lacking in many purer compositions.

The domed basilica of Vierzhenheiligen (31) has a central altar under a major dome in the nave. Nikolaus Pevsner has vividly contrasted its series of domes, which are distorted and superimposed on the Latin cross plan, with the conventional placing of a single dome at the crossing. This is a Latin cross church, which is also a central-type church because of the unusual position of the altar and the central dome. Other late Baroque churches juxtapose the square and the circle. Bernardo Vittone's elements—ambiguously pendentives or squinches—in the nave of S. Maria di Piazza in Turin (32) support what is both a dome and a square lantern. Hawksmoor juxtaposes mouldings in rectangular and elliptical patterns on the ceilings of some of his churches. They create contradictory expressions of both central and directional-type churches. In some rooms of the Palazzo Propaganda Fide (33) a straddling arch in the corners allows the space to be rectangular below and continuous above. This is similar to Wren's ceiling configuration in St. Stephen Walbrook (34).

In the ceilings of his secular chambers (35) Sir John Soane glories in spaces and structures both rectangular and curvilinear, and domed and vaulted. His methods include complex combinations of vestigial structural shapes resembling squinches and pendentives, oculi, and groins. Soane's Museum (36) employs a vestigial element in another dimension: the partition in the form of suspended arches, meaningless structurally yet meaningful spatially, defines rooms at once open and closed.

The façade of the cathedral at Murcia (37) employs what has been called inflection to promote largeness yet smallness. The broken pediments above the shafts are inflected toward each other to help suggest an enormous portal, appropriate spatially to the plaza below and symbolically to the region beyond. Storied orders within the shafts, however, accommodate the scale of the immediate conditions of the building itself and its setting. Bigness and smallness are expressed at once in a characteristic Shingle Style stair through distortion in width and direction. The risers and treads remain constant, of course, but the widening of the run at the bottom accommodates the spacious living-room hall below, while the narrower run at the top relates to the narrower hall above.

Precast concrete construction can be continuous yet

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fragmentary, flowing in profile yet surfaced with joints. The contours of its profiles between columns and beams can designate the continuity of the structural system, but the pattern of its grouted joints can designate the fragmented method of its erection.

The tower of Christ Church, Spitalfields (38), is a manifestation of both-and at the scale of the city. Hawksmoor's tower is both a wall and a tower. Toward the bottom the vista is terminated by the extension of its walls into kinds of buttresses (39) perpendicular to the approaching street. They are seen from only one direction. The top evolves into a spire, which is seen from all sides, spatially and symbolically dominating the skyline of the parish. In the Bruges Town Hall (40) the scale of the building relates to the immediate square, while the violently disproportionate scale of the tower above relates to the whole town. For similar reasons the big sign sits on top of the Philadelphia Savings Fund Society building, and yet it is invisible from below (41). The Arc de Triomphe also has contrasting functions. Seen diagonally from the radial approaches other than the Champs Elysées, it is a sculptural termination. Seen perpendicularly from the axis of the Champs Elysées, it is spatially and symbolically both a termination and a portal. Later I shall analyze some organized contradictions between front and back. But here I shall mention the Karlskirche in Vienna (42), whose exterior contains elements both of the basilica in its façade and of the central-type church in its body. A convex form in the back was required by the interior program; the urban space required a larger scale and a straight façade in front. The disunity that exists from the point of view of the building itself is contradicted when the building is seen in relation to the scale and the space of the neighborhood.

The double meanings inherent in the phenomenon both-and can involve metamorphosis as well as contradiction. I have described how the omni-directional spire of the tower of Christ Church, Spitalfields, evolves into a directional pavilion at its base, but a perceptual rather than a formal kind of change in meaning is possible. In equivocal relationships one contradictory meaning usually dominates another, but in complex compositions the relationship is not always constant. This is especially true as the observer moves through or around a building, and by extension through a city: at one moment one meaning can be perceived as dominant; at another moment a different meaning

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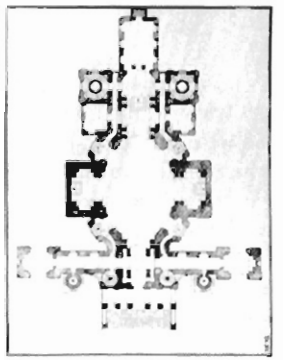

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seems paramount. In St. George, Bloomsbury (30), for instance, the contradictory axes inside become alternatingly dominant or recessive as the observer moves within them, so that the same space changes meaning. Here is another dimension of "space, time and architecture" which involves the multiple focus.

5 *Contradictory Levels Continued:*

The Double-Functioning Element

The "double-functioning"[27] element and "both-and" are related, but there is a distinction: the double-functioning element pertains more to the particulars of use and structure, while both-and refers more to the relation of the part to the whole. Both-and emphasizes double meanings over double-functions. But before I talk about the double-functioning element, I want to mention the multifunctioning building. By this term I mean the building which is complex in program and form, yet strong as a whole—the complex unity of Le Corbusier's La Tourette or the Palace of Justice at Chandigarh in contrast to the multiplicities and articulations of his Palace of the Soviets project or the Armée du Salut in Paris. The latter approach separates functions into interlocking wings or connected pavilions. It has been typical of orthodox Modern architecture. The incisive separations of the pavilions in Mies' design for the urban Illinois Institute of Technology can be understood as an extreme development of it.

Mies' and Johnson's Seagram Building excludes functions other than offices (except on the ground floor in back), and by using a similar wall pattern camouflages the fact that at the top there is a different kind of space

for mechanical equipment. Yamasaki's project for The World Trade Center in New York even more exaggeratedly simplifies the form of an enormous complex. The typical office skyscrapers of the '20's differentiate, rather than camouflage, their mechanical equipment space at the top through architecturally ornamental forms. While Lever House includes differently-functioning spaces at the bottom, it exaggeratedly separates them by a spatial shadow joint. In contrast, one exceptional Modern building, the P.S.F.S. (41), gives positive expression to the variety and complexity of its program. It integrates a shop on the first floor and a big bank on the second with offices above and special rooms at the top. These varieties of functions and scales (including the enormous advertising sign at the top) work within a compact whole. Its curving façade, which contrasts with the rectangularity of the rest of the building, is not just a cliché of the '30's, because it has an urban function. At the lower pedestrian level it directs space around the corner.

The multifunctioning building in its extreme form becomes the Ponte Vecchio or Chenonceaux or the Futurist projects of Sant' Elia. Each contains within the whole contrasting scales of movement besides complex functions. Le Corbusier's Algerian project, which is an apartment house and a highway, and Wright's late projects for Pittsburgh Point and Baghdad, correspond to Kahn's viaduct architecture and Fumihiko Maki's "collective form." All of these have complex and contradictory hierarchies of scale and movement, structure, and space within a whole. These buildings are buildings and bridges at once. At a larger scale: a dam is also a bridge, the loop in Chicago is a boundary as well as a circulation system, and Kahn's street "wants to be a building."

There are justifications for the multifunctioning room as well as the multifunctioning building. A room can have many functions at the same time or at different times. Kahn prefers the gallery because it is directional and nondirectional, a corridor and room at once. And he recognizes the changing complexities of specific functions by differentiating rooms in a general way through a hierarchy of size and quality, calling them servant and major spaces, directional and nondirectional spaces, and other designations more generic than specific. As in his project for the Trenton Community Center, these spaces end by paralleling in a more complex way the pre-eighteenth century configura-

tions of rooms en suite. The idea of corridors and rooms each with a single function for convenience originated in the eighteenth century. Is not Modern architecture's characteristic separation and specialization of program functions within the building through built-in furniture an extreme manifestation of this idea? Kahn by implication questions such rigid specialization and limited functionalism. In this context, "form evokes function."

The multifunctioning room is a possibly truer answer to the Modern architect's concern with flexibility. The room with a generic rather than a specific purpose, and with movable furniture rather than movable partitions, promotes a perceptual flexibility rather than a physical flexibility, and permits the toughness and permanence still necessary in our building. Valid ambiguity promotes useful flexibility.

The double-functioning element has been used infrequently in Modern architecture. Instead, Modern architecture has encouraged separation and specialization at all scales—in materials and structure as well as program and space. "The nature of materials" has precluded the multifunctioning material, or, inversely, the same form or surface for different materials. Wright's divergence from his master began, according to his autobiography, with Louis Sullivan's indiscriminate application of his characteristic ornament to terra cotta, iron, wood, or brick. To Wright, "appropriate designs for one material would not be appropriate for another material."[28] But the façade of Eero Saarinen's dormitory at the University of Pennsylvania includes among its materials and structure vine-covered grade, brick wall, and steel grille—yet the curving profile of its form is contiguous. Saarinen overcame the current obsession against using different materials in the same plane or the same material for two different things. In Robert Rauschenberg's painting, *Pilgrim* (43), the surface pattern continues from the stretcher canvas to the actual chair in front of it, making ambiguous the distinction between the painting and the furniture, and on another level, the work of art in a room. A contradiction between levels of function and meaning is recognized in these works, and the medium is strained.

But to the structural purist, as well as the organicist, the double-functioning structural form would be abhorrent because of the nonexact, ambiguous correspondence between form and function, and form and structure. In contrast, in the Katsura Villa (44) the bamboo rod in

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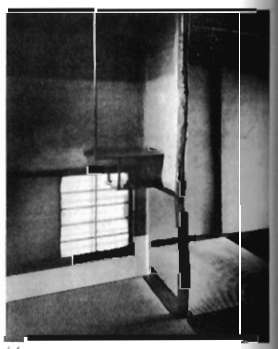

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tension and the wood post in compression are similar in form. To the Modern architect, I think, the two would seem sinisterly similar in section and size despite the current inclination toward traditional Japanese design. The Renaissance pilaster (as well as other structural elements used in a nonstructural way) can involve the phenomenon both-and at several levels. It can be at the same time physically structural or not, symbolically structural through association, and compositionally ornamental by promoting rhythm and also complexity of scale in the giant order.

Besides specializing forms in relation to materials and structure, Modern architecture separates and articulates elements. Modern architecture is never implicit. In promoting the frame and the curtain wall, it has separated structure from shelter. Even the walls of the Johnson Wax Building are enclosing but not supporting. And in detailing, Modern architecture has tended to glory in separation. Even the flush joint is articulated, and the shadow joint predominates. The versatile element which does several things at once is equally rare in Modern architecture. Significantly the column is favored over the pier. In S. Maria in Cosmedin's nave (45) the column form results from its dominant, precise function as a point support. It can direct space only incidentally in relation to other columns or elements. But the alternating piers in the same nave are intrinsically double-functioning. They enclose and direct space as much as they support structure. The Baroque piers in the chapel at Frènes (46), residual as form and redundant as structure, are extreme examples of double-functioning elements which are structural and spatial at once.

Le Corbusier's and Kahn's double-functioning elements may be rare in our architecture. The brise-soleils in the Unité d'Habitation in Marseilles are structure and porches as well as sunscreens. (Are they wall segments, piers, or columns?) Kahn's clusters of columns and his open piers "harbor" space for equipment, and can manipulate natural light as well, like the rhythmically complex columns and pilasters of Baroque architecture. Like the open beams in the Richards Medical Center (47), these elements are neither structurally pure nor elegantly minimum in section. Instead, they are structural fragments inseparable from a greater spatial whole. It is valid to sense stresses in forms which are not purely structural, and a structural member can be more than incidentally spatial. (However, the columns and the stair towers in this build-

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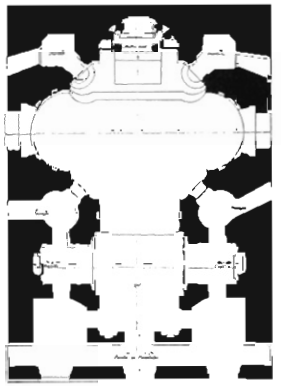

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ing are separated and articulated in an orthodox manner.)

Flat plate construction consists of concrete slabs of constant depth and varied reinforcement, with irregularly placed columns without beams or caps. To maintain a constant depth, the number of reinforcing bars changes to accommodate the more concentrated structural loads in the constant, beamless section. This permits, in apartment houses especially, a constant ceiling profile for the spaces below in order to accommodate partitions. Flat plates are structurally impure: their section is not minimum. The demands of structural forces are compromised because of the demands of architectural space. Form follows function here in a contradictory way; substance follows structural function; profile follows spatial function.

In some Mannerist and Baroque masonry construction the pier, pilaster, and relieving arch about evenly make up a façade, and the resultant structure, like that of the Palazzo Valmarana (48), is bearing wall and frame at once. The relieving arches in the Pantheon (49), in this case not originally part of the visual expression, similarly generate a wall structurally double-functioning. In this context the Roman basilica, Gaudí's Sagrada Familia (50), and Palladio's Il Redentore (51) are totally different from the Gothic basilica (52). In contrast to the segregated flying buttress, the Roman countervault spans as well as buttresses, and Gaudí's subtle invention of the tilted pier-buttress supports the weight of the vault as well as buttresses the thrust in one continuous form. Palladio's buttresses are also broken pediments on the façade. A flying buttress at S. Chiara in Assisi forms a portal for the piazza as well as a support for the building.

The double-functioning element can be a detail. Mannerist and Baroque buildings abound in drip mouldings which become sills, windows which become niches, cornice ornaments which accommodate windows, quoin strips which are also pilasters, and architraves which make arches (53). The pilasters of Michelangelo's niches in the entrance of the Laurentian Library (54) also look like brackets. Borromini's mouldings in the rear façades of the Propaganda Fide (55) are both window frames and pediments. Lutyens' chimneys at Grey Walls (56) are literally sculptural entrance markers as well, a dado at Gledstone Hall (57) is an extension of a stair riser in the same room, and the stair landing at Nashdom is also a room.

The balloon frame, which has been traced by Siegfried


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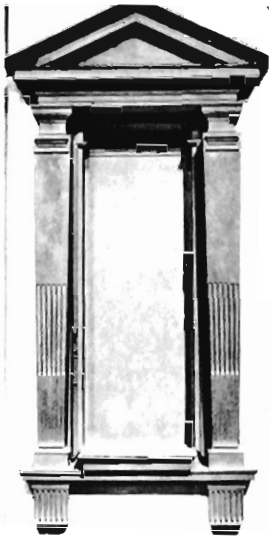
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Giedion, *becomes* on all levels. Structurally and visually it evolves from a separate frame to a skin which is both structural and sheltering: to the extent that it is made up of 2 x 4's, it is frame; to the extent that the 2 x 4's are small, close together, and braced and meshed by diagonal siding, it becomes skin. These intricate characteristics are evident in the way penetrations are made in it and in the way it is terminated. The balloon frame is another element in architecture which is several things at once. It represents a method between two pure extremes, which has evolved from each of them until it has characteristics of both.

Conventional elements in architecture represent one stage in an evolutionary development, and they contain in their changed use and expression some of their past meaning as well as their new meaning. What can be called the vestigial element parallels the double-functioning element. It is distinct from a superfluous element because it contains a double meaning. This is the result of a more or less ambiguous combination of the old meaning, called up by associations, with a new meaning created by the modified or new function, structural or programmatic, and the new context. The vestigial element discourages clarity of meaning; it promotes richness of meaning instead. It is a basis for change and growth in the city as manifest in remodeling which involves old buildings with new uses both programmatic and symbolic (like palazzi which become museums or embassies), and old street patterns with new uses and scales of movement. The paths of medieval fortification walls in European cities became boulevards in the nineteenth century; a section of Broadway is a piazza and a symbol rather than an artery to upper New York state. The ghost of Dock Street in Philadelphia's Society Hill, however, is a meaningless vestige rather than a working element resulting from a valid transition between the old and the new. I shall later refer to the vestigial element as it appears in Michelangelo's architecture and in what might be called Pop architecture.

The rhetorical element, like the double-functioning element, is infrequent in recent architecture. If the latter offends through its inherent ambiguity, rhetoric offends orthodox Modern architecture's cult of the minimum. But the rhetorical element is justified as a valid if outmoded means of expression. An element can seem rhetorical from one point of view, but if it is valid, at another level it enriches meaning by underscoring. In the project for a

gateway at Bourneville by Ledoux (58), the columns in the arch are structurally rhetorical if not redundant. Expressively, however, they underscore the abstractness of the opening as a semicircle more than an arch, and they further define the opening as a gateway. As I have said, the stairway at the Pennsylvania Academy of the Fine Arts by Furness is too big in its immediate context, but appropriate as a gesture towards the outside scale and a sense of entry. The Classical portico is a rhetorical entrance. The stairs, columns, and pediment are juxtaposed upon the other-scale, real entrance behind. Paul Rudolph's entrance in the Arts and Architecture Building at Yale is at the scale of the city; most people use the little door at the side in the stair tower.

Much of the function of ornament is rhetorical—like the use of Baroque pilasters for rhythm, and Vanbrugh's disengaged pilasters at the entrance to the kitchen court at Blenheim (59) which are an architectural fanfare. The rhetorical element which is also structural is rare in Modern architecture, although Mies has used the rhetorical I-beam with an assurance that would make Bernini envious.

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