

THE INTERNATIONAL STYLE

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W · W · NORTON & COMPANY

New York · London

IV. A FIRST PRINCIPLE: ARCHITECTURE AS VOLUME

CONTEMPORARY methods of construction provide a cage or skeleton of supports. This skeleton as it appears before the building is enclosed is familiar to everyone. Whether the supports are of metal or of reinforced concrete, the effect from a distance is of a grille of verticals and horizontals. For protection against the weather it is necessary that this skeleton should be in some way enclosed by walls. In traditional masonry construction the walls were themselves the supports. Now the walls are merely subordinate elements fitted like screens between the supports or carried like a shell outside of them. Thus the building is like a boat or an umbrella with strong internal support and a continuous outside covering. In the buildings of the past, support and protection were both provided by the same masonry wall. It is true that supporting wall sections are still sometimes used in combination with skeleton construction. (Pages 124 and 213.) Isolated supports, piers of metal or reinforced concrete, are, however, normal and typical.

Plans may be worked out with far greater freedom than in the past. The piers of modern construction are so slight in section that they create no serious obstruction. If in given cases they might interfere, occasional supports may be omitted and their burden carried by cantilevering. Entire façades are frequently cantilevered and the screen walls set some distance outside the supports. (Pages 109 and 163.) Symbolically the indication of modern plans is reduced to points representing support and lines representing separation and protection from the weather. No longer do we find the solid blocks of bearing walls and piers of masonry. The plan can be composed almost entirely in terms of the needs it must provide for, with only minimal concessions to the inescapable needs of sound construction.

The effect of mass, of static solidity, hitherto the prime quality of architecture, has all but disappeared; in its place there is an effect of volume, or more accurately, of plane surfaces bounding a volume. The prime architectural symbol is no longer the dense brick but the open box. Indeed, the great majority of buildings are in reality, as well as in effect, mere planes surrounding a volume. With skeleton construction enveloped only by a protective screen, the architect can hardly avoid achieving this effect of surface of volume unless, in deference to traditional design in terms of mass, he goes out of his way to obtain the contrary effect.

The European functionalists conform unconsciously to this principle of the international style without accepting its validity as an æsthetic discipline. The American functionalists, however, often load their surfaces, thus obscuring with an effect of solidity and weight the non-supporting character of their

wall screens. If they design at all—and except in factories the client usually demands some sort of applied design—they design still in mass. A striking contrast is familiar to everyone as it appears in buildings under construction: the strong light cage of steel, and the heavy solid-appearing walls with which it is gradually covered. The greater simplicity of the newer skyscrapers, the increase in the window area and the growing awareness of the international style are reducing little by little this superficial heaviness. But thus far the more expensive the building, the more surely is there a conflict between its true character as an enclosed steel cage and the apparent mass of its vertical buttressing and its pyramidal composition.

Of course this pyramidal composition is required in high buildings by the zoning laws. Present American zoning laws are at best pseudo-functional. They attempt merely to ameliorate the sociological and technical difficulties inherent in crowding tall buildings together on narrow streets. Proper zoning laws would require the spacing of skyscrapers far enough apart so that they might rise straight to the top without setbacks. Setbacks complicate the structure and provide relatively little terrace space, nor do they adequately protect the light and air of neighboring buildings. The criticism that accepts the present zoning laws as beneficent is mistaken. If that criticism is æsthetic, it rests on the false assumption that skyscrapers are mere enlargements of the masonry towers of the past. If the criticism is functional, it has failed to go to the root of the urban problem. Skyscrapers have their proper place in the modern city, but they must be so widely spaced that they relieve congestion rather than aggravate it.

The McGraw-Hill Building (Page 157) comes nearest to achieving æsthetically the expression of the enclosed steel cage, but it is still partially distorted into the old silhouette of the massive tower. The setbacks are, of course, required by the zoning law, but they are arranged without subtlety. The unnecessary pyramidal feature which crowns the structure is inexcusably heavy. Yet the architect, Raymond Hood, in the Daily News Building of the previous year, which is in other ways less pure in expression, handled the setbacks so that they did not suggest steps and brought his building to a clear stop without decorative or terminal features. This has also been justly criticised by those functionalists whose ideology is more European. For the water-tanks and elevator machinery which have to find a place on top of a large building are there, hidden within the shell of the main structure.

These various objections, which place both of these buildings as something less than distinguished architecture, are implicit in American conditions. Only the acceptance of a thoroughgoing æsthetic discipline by our architects would make it possible for our skyscrapers to be finer than our factories. For our factories, unless the client has called for embellishment, are like the constructions of the European functionalists. They exist clearly and effectively as the surfaces of volumes, even though the architect has never accepted the æsthetic principle that they should do so.

In the past the great styles became something more than a certain sort of construction, or a certain repertory of ornament. Post and lintel construction was used in Egyptian architecture as well as Greek. Romanesque churches achieved nearly as great

a science and elaboration of vaulting as did the later ones of the Gothic age. The Gothic architects emphasized the impression of height and of orderly multiplicity of organically related parts; the Greek architects so adjusted their design as to give their buildings the plastic somatic character of their sculpture. Style is character, style is expression; but even character must be displayed and expression may be conscious and clear, or muddled and deceptive. The architect who builds in the international style seeks to display the true character of his construction and to express clearly his provision for function. He prefers such an organization of his general composition, such a use of available surface materials, and such a handling of detail as will increase rather than contradict the prime effect of surface of volume.

In giving this effect the flat roofs normal with modern methods of construction have an essential æsthetic significance. Roofs with a single slant, however, have occasionally been used with success. For they are less massive and simpler than the gabled roofs usual on the buildings of the past. Flat roofs are so much more useful that slanting or rounded roofs are only exceptionally justified.

The clarity of the impression of volume is diminished by any sort of complication. Volume is felt as immaterial and weightless, a geometrically bounded space. Subsidiary projecting parts of a building are likely to appear solid. Hence a compact and unified solution of a complex problem will be best æsthetically as well as economically. The massiveness of the architecture of the past was felt as gravitational, with surface and content one. Being heavy, massive architecture demanded the appearance of support such as could be given by a piling up of the parts. This

sort of stability, like that of a wood pile, our tenuous cage construction does not give. The sense of internal support is, on the other hand, increased by the avoidance of subsidiary parts and by the achievement as far as possible of the effect of a single volume with continuous surfaces.

Thus as a corollary of the principle of surface of volume there is the further requirement that the surfaces shall be unbroken in effect, like a skin tightly stretched over the supporting skeleton. The apparent tensions of a masonry wall are directly gravitational, although they are actually modified more or less by the use of lintels and arches. The apparent tensions of screen walls are not thus polarized in a vertical direction, but are felt to exist in all directions, as in a stretched textile. Hence the breaking of the wall surface by placing windows at the inner instead of at the outer edge of the wall is a serious fault of design. (Pages 153 and 229.) For the glass of the windows is now an integral part of the enclosing screen rather than a hole in the wall as it was in masonry construction.

Where the roof is supported on sections of wall rather than on isolated posts, only the non-supporting sections are really screens. Yet the discipline of the general style is better served if the contrast between the supporting wall surfaces and the non-supporting surfaces is not over-emphasized. Such construction with a reinforced concrete roof slab is still more like the normal modern cage construction than like traditional masonry construction. (Page 125.) This is a special case which demands on the part of the designer unusual tact and sense of the style. Such exceptions must always be borne in mind by the critic. Their successful incorporation in the style according to the

spirit, if not the letter, of the fundamental disciplines makes the existence of a contemporary style difficult to dispute.

The ordering of the openings in the wall surface is quite as important as the avoidance of apparent reveals in the preservation of the integrity of the wall plane. But questions of order fall more logically in a later section of this discussion. Needless to say, the more consistently a surface is arranged, the more conspicuous will be its character as a surface. Contemporary buildings often have entire walls of transparent glass constituting one enormous window. The frames of the panes in such walls must be light enough to be distinguished from true supports. (Pages 141 and 187.) Otherwise these subordinate divisions will so break up the surface into panels that its continuous character is confused. Even though the independent supporting skeleton is perfectly clearly seen behind, such a panelled treatment appears to have weight if not mass. Such altogether transparent walls are not by any means the easiest for the architect to handle effectively. They no longer appear the extreme toward which the development of the contemporary style inevitably leads. Indeed, as the Crystal Palace of the last century and the steel and glass department stores of 1900 suggest, such maximal fenestration was a preparation for the development of a more general principle of modern design: that of emphasizing the surfaces whether they are opaque or transparent.

Windows constitute a more important element in modern architecture than they have in any architecture since that of the Gothic cathedrals. They are the most conspicuous features of modern exterior design. Their handling is therefore an æsthetic problem of the greatest importance. The very effect of volume

that is sought in choosing surfacing materials can easily be diluted or contradicted by bad fenestration.

Window frames unavoidably break the general wall surface and if they are heavy tend to make the window a mere hole in the wall quite as much as do reveals. (Pages 133 and 175.) Light simple frames, preferably of durable non-corroding metal in standardized units, are to be desired as much æsthetically as practically. (Pages 149 and 167.) Non-corroding metals are still rather expensive. Moreover standardized metal frames have not yet come into use everywhere. But the general development in this direction is undeniable and one of happy augury for the contemporary style.

Wooden window frames are becoming a makeshift. Yet many architects have been able to make them appear hardly heavier than metal ones. Some of the finest examples of fenestration in modern architecture are executed in wood. (Pages 103 and 119.) Of course the elegance which is obtained by light frames and muntins goes for nothing if the windows are badly subdivided and badly placed in the general design.

The spirit of the principle of surface covers many exceptions to its letter. The type of construction represented by Miës van der Rohe's Barcelona pavilion, (Page 183), as well as that represented in Le Corbusier's house at Le Pradet, (Page 124), leads to a treatment of surfaces sensibly different from that which has been primarily stressed here. These works, nevertheless, testify that their designers are extending the possibilities of the contemporary style. In each of these buildings the surfaces are emphasized and their continuity made evident although their

relation to the supporting construction is less simple than in most buildings.

In the Barcelona pavilion the walls are screens but they do not define a fixed volume. The volume beneath the post-supported slab roof is in a sense bounded by imaginary planes. The walls are independent screens set up within this total volume, having each a separate existence and creating subordinate volumes. The design is unified by the slab roof on its regular supports, not by the usual continuous exterior screen wall.

In the Le Pradet house by Le Corbusier sections of rubble masonry wall provide the main support and isolated piers are used only subordinately. These supporting sections are unbroken by windows and widely separated by wall areas entirely of glass. As in the Barcelona pavilion the enclosing volume is defined by the continuous slab roof. The exterior surfaces are not continuous because they are of two sorts, unbroken masonry walls and intervening glass screens. But the two sorts of surfaces are both treated in a way to emphasize their specific characters. The supporting walls are rough and solid in appearance; the intermediate screens, light, smooth and transparent. The two sorts are carefully related in proportion. The use of a special type of construction suited to the particular problem of a Riviera country house has led to a special type of design. The expression is related to the general principle of surface of volume but not restricted by it. Thus the prime principles of the great styles of the past were applied in exceptional cases. This special type of design has its place in the general contemporary style as much as astylar buildings in Greek architecture or unvaulted construction in the Gothic.

The principle of surface of volume intelligently un-

derstood will always lead to special applications where the construction is not the typical cage or skeleton of supports surrounded by a protecting screen. The apparent exception may not prove the validity of the general principle, but it undoubtedly indicates its elasticity. Rigid rules of design are easily broken once and for all; elastic principles of architecture grow and flourish. Forgetting neither the origins in a certain type of construction nor the possibilities which lie always ahead, architects should find in such principles as that of surface of volume a sure and continuing guidance as the international style develops.

V. SURFACING MATERIAL

THE CHARACTER of surface of volume is not expressed merely by the general design of a modern building; the actual materials of the surface itself are of the utmost importance. The ubiquitous stucco, which still serves as the hall-mark of the contemporary style, has the æsthetic advantage of forming a continuous even covering. But if the stucco is rough, the sharpness of the design, which facilitates apprehension of the building's volume, is blunted. (Page 149.) Rough stucco, because of its texture and because it recalls the stucco-covered buildings of the past, is likely to suggest mass. All stucco, rough or smooth, is subject to cracking and streaking; if painted, it is even less likely to preserve its original surface and color. Stucco, like exposed concrete, must be considered inferior to more solid sheathing except where the large scale of the construction makes the flaws that come with time relatively inconspicuous. A material like stucco but elastic and with a wide color range, which could be laid over various bases, would be ideal.

Wooden sheathing is admirable in the special case of

modern construction in wood. It is not as durable as stone or brick, yet as we are aware in America, it can well outlast a century if it is kept painted. Smooth matchboarding is desirable because overlapping or stripped joints mar the surface, particularly in small-scale construction. (Page 223.) In interiors and on temporary buildings, plywood panels are excellent since they are large in area and smooth. (Page 111.) They may be painted or left to show the grain. Any enframement suggesting panelling seriously breaks the continuity of surface and should be avoided.

As in the architecture of the past, the finest materials for wall surfacing are stones, granites and marbles. (Pages 129 and 183 f.) Unless they are large in area, however, the separate units are likely to appear like the faces of blocks of masonry, suggesting weight and mass. As in Byzantine architecture it is possible to use plates so that their true character as sheathing is evident. Rich natural materials are expensive and hence more suitable in construction of a monumental or luxurious character than in ordinary buildings. Artificial plaques of various sorts and metal plates exposed or painted have similar advantages and will doubtless be increasingly used. (Pages 103 and 163.) In any sort of plate covering it is important that the plates be so joined that the surface is as little broken as possible. Graining, moreover, should be so disposed as to emphasize the continuity of the whole wall and not, as in the past, to produce symmetrical patterns. It is also important that the surface remain a plane without convexities and concavities. Otherwise the effect becomes picturesque and the sense of equal tension in all directions is destroyed.

Plate sheathing has the distinct advantage of similarity in texture and scale to the glass panes of the windows. The mas-

siveness of the walls of the past was emphasized by the contrast between the wall surfaces and the windows. The walls appeared the more solid for being visibly penetrated by infrequent holes. Today the general consistency of the design and the sense of continuous surface is emphasized by reducing the contrast between the transparent and the opaque sections of the bounding walls. Windows should be independent in character but not a breach in the general coherence of the surface.

Burned clay products are more frequently used than plate sheathing. Brick is from the practical point of view the most satisfactory inexpensive surfacing material in general use. It may be equally well used for screen walls and for sections of supporting wall where they supplement skeleton construction. Yet from an æsthetic point of view, brick is undoubtedly less satisfactory than other materials, including stucco. Indeed, brick is often covered with stucco even by architects who claim to be uninfluenced by æsthetic considerations. (Page 215.) This concession to the principle of achieving a smooth continuous surface is an important instance of the exaggeration of the functionalists' anti-æsthetic claims.

Brick, when laid conventionally, suggests a solid supporting wall even where that does not exist. Even a screen wall of brick appears to retain something of the mass and the dead weight of the architecture of the past. The use of brick tends to give a picturesqueness which is at variance with the fundamental character of the modern style. Bricks are more or less rough in texture, often irregular in color, and quite unrelated in scale to the panes of the windows. (Page 213.)

Nevertheless, much can be done to emphasize continuity

of surface. If the color of the mortar be near that of the brick, and the bricks relatively even in value and texture, the bonding pattern need not be strikingly evident. The actual material of a wall surface of considerable area is then relatively inconspicuous. (Pages 161 and 179.) On the whole, the cheapest, the most common types of brick and the most straightforward method of laying have fortunately proved best. Since brick is permanent in color and not subject to cracking and streaking, it is in the long run actually superior æsthetically to stucco for large-scale constructions. (Pages 185 and 145.)

A different shape of brick and a different method of laying might be developed which would be more satisfactory æsthetically as well as practically than present types and methods. Increase in size would be only a disadvantage since it would make the individual unit more conspicuous. Indeed, the finest surfaces from the point of view of the contemporary style are those attained in eighteenth century Holland with very small smooth bricks and thin joints.

Ordinary terra cotta blocks or concrete blocks of the cheapest sort are less satisfactory in appearance and more suggestive of traditional masonry than even the commonest brickwork. Concrete slabs even though they may attain the scale of plate sheathing are also too irregular in texture and variable in color to be acceptable except at the economic minimum.

In the range of constructions of medium cost and medium size glazed tile laid with continuous vertical as well as horizontal joints provides a material that vies in æsthetic effectiveness with plate sheathing. (Page 171.) The shape of the

units may be such that all suggestion of the traditional masonry block is lost. The texture is smooth and permanent; the color possibilities are wide. The small scale of the individual tiles is less harmonious with the panes of the windows than are large plaques, but the individual tiles are less independently assertive. An adjustment of the minor rhythm of the individual tiles to the rhythm of the windows and the structural elements is a possible refinement. Tiles properly laid give even more surely than bricks a continuous surface pattern like the texture of a fabric. They also quite avoid the suggestion of a supporting masonry wall. Their pattern is more regular than the graining of natural materials used in sheathing plates. Marble or granite plates are certainly richer; tile, however, fulfills better the rigid letter of the principle of surface.

Glass bricks and translucent glass plates are types of surfacing materials which may occasionally take the place of true windows. (Pages 166 and 189.) In certain buildings various panes of transparent, translucent, and opaque glass have been combined together for entire walls. The effect is rich and harmonious but perhaps too fragile for permanent architecture. Glass bricks provide a means of carrying light through the wall without a window frame. When they are of the same or related scale they combine best aesthetically with other unitary coverings such as brick and tile. (Page 140.)

In the choice of surfacing materials the architect is far from free. Factories will hardly have marble sheathing; yet because they have very large wall areas, the surfacing material itself is less noticeable. Brick appears the best material for large and inexpensive construction, tile in the middle range and plate

sheathing for exceptional buildings. In the last the architect has the opportunity to seek to the full the possibilities of richness and individual distinction which the contemporary style affords quite as much as the styles of the past.

VI. A SECOND PRINCIPLE: CONCERNING REGULARITY

THE PATTERNS of Gothic fenestration were ordered according to definite conceptions of design derived from structure and leading more and more to arbitrary decoration. Today the patterns of windows, the composition of the parts of contemporary architecture, must also be ordered according to an æsthetic principle if a contemporary style exist. The functionalists claim that they order their designs according to practical considerations alone. Yet even they, because of the economic force of standardization, accept a discipline of design not dissimilar to that found in the work of contemporary architects who grant the importance of æsthetic considerations. Beside the principle of surface of volume already discussed there is a second controlling principle, evident in the productions of the international style including the work of the European functionalists.

This second principle of contemporary style in architecture has to do with regularity. The supports in skeleton construction are normally and typically spaced at equal distances

in order that strains may be equalized. (Pages 109 and 142.) Thus most buildings have an underlying regular rhythm which is clearly seen before the outside surfaces are applied. Moreover, economic considerations favor the use of standardized parts throughout. Good modern architecture expresses in its design this characteristic orderliness of structure and this similarity of parts by an æsthetic ordering which emphasizes the underlying regularity. Bad modern design contradicts this regularity. Regularity is, however, relative and not absolute in architecture.

The varied purposes which most buildings serve cannot be completely regularized. A loft building in a city may be, and often is, regular throughout except for the entrances and the elevators. (Page 156.) The many purposes which each floor serves are so nearly alike that the same plan and elevation may be used throughout. Few buildings, however, are so simple. In most cases, within a structure as regular as possible and using similar parts the architect must provide for many varying functions related in various different ways to one another. In a hotel, for example, although the suites considered as units repeat themselves, the lobbies, dining rooms and kitchens serve the whole building and are on an entirely different scale. Within an individual dwelling house it is obvious that there are relatively fewer interchangeable elements. The functional requirements of the different rooms are even more varied. The bathroom, for example, makes far more elaborate specific demands than the living room, but it is possible to take care of them in much less space. Thus technically the prime architectural problem of distribution is to adjust the irregular and unequal demands of function to regular construction and the use of standardized parts.

Just as the æsthetic principle of surface of volume has been derived from the fact that architecture no longer has solid supporting walls, the second principle, that of regularity, depends on the regularity typical of the underlying skeleton of modern construction. This second principle is expressed in an ordering of design more consistent than would result merely from the æsthetically unconscious use of regular structure and standardized parts for varying and complicated functions. Thus the expression receives a visible regularity and consistency. This is the symbol of the underlying technics, which in the completed building are known rather than seen. (Pages 143 and 155.)

It must be remembered that the nearer approaches to absolute regularity are also approaches to monotony, as the earlier reference to the loft building will have suggested. The principle of regularity refers to a means of organization, a way of giving definite form to an architectural design, rather than to an end which is sought for itself. As an end, regularity is modified by the equal necessity, understood in all æsthetic organization, of achieving a proper degree of interest. What constitutes a proper degree of interest is hardly to be determined in theory.

Many critics, more familiar with the architecture of the past than with that of the present, claim that the international style seldom if ever achieves a proper degree of interest. They miss the interest arising from the normally irregular construction of much of the architecture of the past. They fail to comprehend the new and possibly more subtle sorts of interest which derive from the principle of surface of volume or which lie in the positive application of the principle of regularity itself. The same critics,

preferring the picturesqueness of less rigorous styles, are equally likely to find an insufficient amount of interest in Greek architecture and in the work of those architects who attempted to revive the Greek style a hundred years ago. It is undoubtedly true that much minor architecture of the Greek Revival was monotonous and it is equally true of much of the building in the contemporary style. Even this monotony, arising from the too rigid application of the principle of regularity may, however, be preferred to the confused vagaries of the intervening period, when the principle of regularity was largely abjured. Within the field of a given style, however, what constitutes a proper degree of interest is in practice sufficiently clear: the Parthenon would not be improved by being as complicated as the Propylæa or the Erechtheum. The great modern architects have known how to achieve interest in their compositions while exercising a truly classic restraint.

In the various styles of the past a principle of axial symmetry controlled design rather than a principle of regularity as that is understood here. The Greek meaning of symmetry, "a due proportion of the several parts," was nearly equivalent to this special meaning of regularity. But Greek symmetry was usually bilateral as well as regular. Axial symmetry has generally been used to achieve the ordering of irregularity, as in Baroque architecture, dominating and relating the confusion of independent features and elaborate detail. Modern standardization gives automatically a high degree of consistency in the parts. Hence modern architects have no need of the discipline of bilateral or axial symmetry to achieve æsthetic order. Asymmetrical schemes of design are actually preferable æsthetically

as well as technically. For asymmetry certainly heightens the general interest of the composition. (Pages 171 and 203.) Function in most types of contemporary building is more directly expressed in asymmetrical form.

Sometimes asymmetry will be strong and positive, marked by emphasis on a real axis well off the center. (Page 145.) In other cases the general effect may suggest symmetry, but there will be no stronger emphasis at the center than at some other point. (Page 135.) But in any case the avoidance of symmetry should not be arbitrary or distorted.

The mark of the bad modern architect is the positive cultivation of asymmetry for decorative reasons. For that can only be done in the majority of cases at the expense of common consistency and common sense. The mark of the good modern architect, on the other hand, is that the regularity of his designs approaches bilateral symmetry. (Page 119.) Occasionally, indeed, he even reaches it. (Pages 196 and 211.) Bilateral or axial symmetry is, however, more usually the mark of the architect newly converted to the contemporary style. Such men tend to retain it as an irrevocable traditional discipline, failing to apprehend the full implication of the new discipline of regularity which has replaced it.

Structure today is usually highly regular for economic reasons which either did not apply to masonry structure or were given less emphasis in the architecture of the past. Most functions are not regular in the sense of being similar to one another. Hence the natural expression of the various functions grouped in one building is not symmetrical. The difficulties inherent in fitting the various functions of the modern dwelling house into an

eighteenth century shell, which is both relatively regular and rigidly symmetrical, make this clearly evident. The international style does not attempt to force irregular functions into a symmetrical shell. It does aim to adjust rationally the provision for irregular functions to regular structure and to express this adjustment in a clear and consistent design. Fortunately, economic considerations offer the advantage to regularity over irregularity in the arrangement of the parts and in detail quite as much as in the general structure. (Pages 157 and 179.) The functionalists often seem to follow here exactly the same principle of regularity as those who are conscious of a formal æsthetic discipline. (Page 215.)

Complete provision for function might seem to demand, for example, that each function receive unique treatment: that every window be of different shape and size, placed without formal geometrical relation to the others. Working on the principle of regularity, the ingenious architect is able to provide for all the varied functions which windows serve by means of windows of the same size, or at least built up of related units. (Page 208.) In placing them he achieves a pattern, adapted to the regularity of the underlying structure, which is both ordered and expressive. Only seldom can this pattern be absolutely regular without interfering with the provision for function. But always it may be relatively regular and composed according to a definite scheme.

Analogous to, but separate from, the hidden structural skeleton, a scheme of proportions integrates and informs a thoroughly designed modern building. A geometrical web of imaginary lines on plan and in elevation composes the diverse parts and harmonizes the various elements into a single whole.

(Pages 117 and 125.) Proportions, which according to the theories of the extreme functionalists are but a relic of the nineteenth century, are still the æsthetic touchstone of the best modern design.

It is in the field of proportions and in the applications of the principle of regularity that modern architects differ most from one another. Some strive to arrange all the elements of their design within a single bounding shape, thus emphasizing to the utmost the unity of volume of the given building. (Page 119.) Others prefer a more extended articulation with more emphasis on the organic relation between the parts. (Page 143.) Architects differ greatly also in their handling of those parts of a building where, as in a wind shelter on a roof, the needs of function are very easily satisfied. Often such features are entirely unconnected with the general structure of the building and have only themselves to support. The principle of regularity does not lead to an exact solution of such a problem in adjusting function to structure, since both are too readily adaptable. For the architect who seeks only to follow the rules, or for the functionalist who has no positive interest in æsthetic creation, it is safest to do that which will be least startling. But for the great architect there is the opportunity for personal lyric expression.

At times, indeed, for the architect who is quite sure of himself and who is instinctively permeated with the spirit of the æsthetic disciplines of the contemporary style, this individual lyricism may go further. It may modify, as a positive force, the restricting discipline of regularity, composing and adjusting the necessities of function and structure without breaking with the spirit of the principle. It is the condition of the existence of a

true style, the price of an architecture generally high in level, that æsthetic disciplines should be rigid, but it is the privilege of genius to interpret these disciplines, even here and there to discard them altogether. The functionalists cannot admit such a conception. Their disciplines are not in intention æsthetic and they protest most vehemently against just this sort of lyricism and personal expression. Up to a certain point they are right. Sound buildings of dull design are better than monuments of architecture whose apparent brilliance of design is paid for by inadequate provision for function and by distortion of structure. But if architecture is still to be an art, great architects must be free to go forth upon new paths of design.

It is in relation to regularity that architects are exploring the elasticity of the current disciplines. The critic may not determine in advance how far, or even in what direction, the creative interpretation of the architect may go. He may, however, judge of the results and distinguish after the fact what liberties have been those of real and what of spurious genius. He can also determine what breaches of the principle of regularity are merely irrational and careless faults. The work of some architects merely fails to achieve common consistency. The work of the best functionalists is never thus slipshod; but it seldom passes beyond the attainment of common consistency. The great architects, who still consciously practice architecture as an art, add a more interesting and usually a more personal expression to the simplification and unity of design, which even the functionalists achieve.

This development of the æsthetic possibilities of the contemporary style is well illustrated in the use of oblique and rounded forms in plan and elevation. (Pages 168 and 195 ff.)

Such exceptions to general rectangularity are only occasionally demanded by function and they may introduce complications in the regular skeleton of the structure. They are, of course, a definite breach of rigid regularity. Yet sometimes as in stair wells and water-tanks, function is not best served by rectangular shapes. Curved and oblique interior partitions, moreover, often make possible the more complete adjustment of available space to function, without interfering with the regular spacing of the isolated supports. (Pages 116 and 186.)

Non-rectangular shapes, particularly if they occur infrequently, introduce an æsthetic element of the highest positive interest. To them the architect of courage turns from time to time, realizing that he must employ them chiefly with the sanctions of genius and in definite opposition to the discipline of regularity. They need seldom occur in ordinary building, but in monuments where the architect feels justified in seeking for a strongly personal expression, curves will be among the elements which give most surely extreme positive or negative æsthetic value. Curved and oblique forms seldom find a place in the cheapest solution of a given problem. But if they can be afforded, they succeed, as they fail, on æsthetic grounds alone.

The functionalists, and those who are too timid to break with rigid regularity, fall rather into the æsthetic danger of repeating the commonplaces of the style. Ranges of equal-sized windows, set in an unbroken pattern, façades where ribbon of glass alternates with ribbon of stucco, broken only by an occasional stair window, are already frequent enough in Europe to have lost the interest of mere novelty. The most determined defender of the international style must admit that the too rigid

application of the principle of regularity, the unimaginative repetition of the most obvious schemes of composition, has produced much very dull building. But such work is nevertheless preferable to the building of the careless modern architects who have failed even to apprehend the existence of a principle of regularity. Those who try to follow the new style without understanding it produce work which is not only dull but irritating. They abuse corner windows; they fail to avoid the visibly gabled roof; they pile up blocks as if they were still dealing with the massive architecture of the past. In designing façades they dispose the elements with an obvious and gratuitous asymmetry and they arrange their fenestration according to no discoverable principle of order, æsthetic or technical. For them the new style that they parody is merely the architecture of the half-moderns with the decoration omitted, a makeshift product of apologetic individualism.

The American functionalists are of this order although they are less given to parodying the surface of the new style. Where they do not hide their dullness under cheap cosmetics in deference to the æsthetic desires of the client, they prefer rather to group their windows in vertical bands. This gives a traditional buttress effect quite without relation to modern methods of steel cage construction. The resultant verticality of design is still admired in America, chiefly because it recalls the aspiring quality of the Gothic towers of the past. Even in buildings with predominantly horizontal window arrangement, groups of buttresses in the center or at the corners of the building are added as a concession to the client. For horizontality, which is the most conspicuous characteristic of the international style as judged

in terms of effect, is still unacceptable æsthetically to the average American client.

Yet its logic is unescapable. Storeyed construction naturally produces horizontality. Most functions, moreover, require extended development in the horizontal plane—in plan, that is, rather than in elevation. Rooms are usually broader than they are high, and are most evenly illuminated by windows of the same proportion. Structural and functional horizontality is naturally expressed in façade design by architects who seek to obtain consistency to the principle of regularity. It appears quite as clearly in the work of the European functionalists who apply no æsthetic criteria, for it is the obvious and the most straightforward result of striving to provide for function with the means of modern construction. (Page 215.)

The verticality of the skyscrapers of the American functionalists is obtained by reducing the window area and increasing the weight of the screen wall. It also contradicts the storeyed character of the construction and destroys the human scale of the design. In the early evening, when the lights come on, the solid towerlike quality of the skyscraper disappears. Then, at least, it is seen as one volume divided up into horizontal storeys. Only on rear elevations, or on façades where the architect has been severely restricted by economy, is the underlying horizontality of the American commercial building visible in the daytime.

This artificial impression of solidity, this applied verticality, undoubtedly increases the visual congestion of the modern city. The continual appeal of vertical lines tires the eyes. Even the most commercial buildings of the nineteenth century provided the reposeing horizontal of an approximately even cornice line.

The verticality of the skyscraper is meaningless and anarchical. Yet because the skyscraper is an American development and the international style has developed in Europe, some nationalist critics would protect our functionalist architects from the invasion of a horizontal æsthetic. If our builders might be engineers only, protected from all æsthetics, the skyscraper would necessarily be horizontal in design. For its verticality is merely an imitative garment of pseudo-style.

Horizontality is not in itself, however, a principle of the international style. Where function demands a vertical element, that also receives expression. (Pages 153 and 234.) The principle of regularity tends to increase the effect of general horizontality at the expense of the vertical elements which play but a subordinate part in most buildings. It is only the weak and imitative architect who seeks horizontality for its own sake. One of the chief vices of contemporary architecture, which has superseded in Europe the emulation of the verticality of the American skyscraper, is what may be called "fake banding," a purely decorative scheme of tying windows together in a horizontal row. Exceptionally, where the distance between separate windows is very slight, the space between may be treated as an exposed pier by rounding it or sheathing it with the material of the window frame. (Pages 157 and 203.) But ordinarily what is not window is wall and should receive the same treatment as the rest of the wall of which it is a part. (Pages 155 and 181.)

Only great artists are capable of achieving brilliant effects with the limited means. Architects are no exception. But it is the privilege of great architects to interpret the æsthetic discipline of the style according to the spirit rather than the letter.

Anyone who follows the rules, who accepts the implications of an architecture that is not mass but volume, and who conforms to the principle of regularity can produce buildings which are at least æsthetically sound. (Page 161.) If these principles seem more negative than positive, it is because architecture has suffered chiefly in the last century and a half from the extension of the sanctions of genius to all who have called themselves architects.

It were better that the world build only according to the rigid anti-æsthetic theories of the extreme European functionalists than that nineteenth century debauchery of design should continue. The individualists of the early twentieth century reacted against that debauchery with its extravagance of applied ornament. But their reaction created no fixed standards. They were neither consistent in their aims nor critical enough of the results. The ornament of the half-moderns has failed to stand the test of time even as well as that of the more cultured revivalists. The continuance of this superficially novel decoration which the half-moderns originated most effectually distinguishes the mass of American modern architecture from that of Europe.

VII. A THIRD PRINCIPLE: THE AVOIDANCE OF APPLIED DECORATION

ABSENCE OF ornament serves as much as regular horizontality to differentiate superficially the current style from the styles of the past and from the various manners of the last century and a half. Applied ornament may not have been significant or important in the architecture of the past, but it certainly existed. It is easier to defend the claim that the finest buildings built since 1800 were those least ornamented. The failure of revivalism probably lay quite as much in the inability to recreate the conditions of craftsmanship which once made applied ornament æsthetically valid, as in the impossibility of adapting the spirit of old styles to new methods of construction.

It would be ridiculous to state categorically that there will never be successful applied ornament in architecture again. It is nevertheless clear that conditions are today even less propitious for the production of ornament than they were during the last century. Since the middle of the eighteenth century the

quality of the execution of ornament has steadily declined. Even the renaissance of craftsmanship sponsored by the Mediævalists failed to turn the tide. On the whole each generation of traditionalists has been worse served in this respect than its predecessor.

Architecture, however, has never been without other elements of decoration. For decoration may be considered to include not only applied ornament, but all the incidental features of design which give interest and variety to the whole. Architectural detail, which is required as much by modern structure as by the structure of the past, provides the decoration of contemporary architecture. Indeed, detail actually required by structure or symbolic of the underlying structure provided most of the decoration of the purer styles of the past.

The fact that there is so little detail today increases the decorative effect of what there is. Its ordering is one of the chief means by which consistency is achieved in the parts of a design. As has already been suggested in discussing window frames, the quality of the detail has very considerable importance in supporting the effect of surface of volume. It is not in contemporary architecture alone that the details of fenestration are thus important. In any simple architecture where the windows are conspicuous these decorative elements are vital to the total effect. It is easy to recall innumerable buildings of the seventeenth and eighteenth centuries of which the scale and harmony of the design has been destroyed by the introduction of large panes of glass and thin muntins at some later date. One of the surest signs of the real existence of a style of architecture is the creation of a fixed type of window detail.

The development of simple forms of standardized detail suitable to mechanical production is thus an æsthetic as well as an economic desideratum. The absence of contemporary style in inexpensive American house building is as much due to the standardization of modern window frames after eighteenth century models as to any more positive vices of design. The comparative excellence of American factory building is largely that of its metal sashes.

Important as windows have come to be in contemporary design, there are other elements of architectural detail besides. Many of these elements do not, like windows, lend themselves to complete standardization. Of these the capping of walls is of major importance. Those who employ roof projections in normal construction indicate a definite lack of feeling for contemporary style; such relics of the cornice are required only in exceptional cases. Where such projections constitute merely an unnecessary complication of the wall surface their effect is positively bad. (Page 149.) On the other hand, where more of the roof plane is visible than merely the band projecting beyond the wall, as in various types of pavilion construction, there is no such objection. Instead, the roof plane exists, like the ceiling of an interior, as the bounding surface of a volume. (Pages 183 f. and 235.) Such capping as ordinary walls require for protection against the weather is best made as inconspicuous as possible and patently no more than a seal to the wall itself. (Pages 203 and 223.)

The handling of isolated supports like the handling of wall capping is incidental rather than fundamental. The best architects, however, have shown in this a finesse equal to that of the Greek and Gothic builders. Where isolated supports pass

up into a closed construction most architects indicate the coherence of the posts with the skeleton of the construction above and not with its covering surfaces. (Pages 115 and 163.) In ferroconcrete construction rounded forms are aesthetically, and usually technically, superior since they remain visually quite separate from the wall surface. The rounded form in interiors interferes less with vision and circulation than a square or oblong pier. Where fire laws do not require more complete insulation, the actual metal pier is exceedingly light and elegant. (Page 190.) In this way significance and independence can be given again to visible supports. This they had in the great styles of the past and lost only when they came to serve as a sort of applied ornament. In some cases columns may require something corresponding to the capitals of the past. In most types of construction such bracing will disappear in the supported slab. (Page 184.) In any case such subsidiary detail should follow as directly as possible the actual stresses of the construction, avoiding the symmetrical cushion shape of traditional capitals. (Page 97.)

Parapets and railings have an importance in contemporary architecture as great as that of balustrades in the architecture of the seventeenth and eighteenth centuries. In many cases the parapet is properly treated as a continuation of the wall surface, since it encloses the roof terrace just as the wall encloses the interior room space below. (Page 135.) Where open railings are used, it is important that they should be in scale not merely with the terrace they enclose, but with the structure as a whole. Moreover, the relation of the uprights and the horizontals, forming like the muntins of the windows a grille pattern, requires careful handling. A careful adjustment of the open patterned

surface to the solid unpatterned surface of the walls is a mark of distinguished design. (Pages 120 and 139.)

The best architects give particular thought to matters of detail. Although they are incidentals, they require more than incidental attention. Fine details decorate a modern design just as did the functional columns and mouldings of Greek and Gothic architecture. If there truly be a contemporary style of architecture, it must control these as well as larger matters. Careless architects leave details to chance, thus marring creditable work. Those who claim that architecture is merely science are usually conscientious enough technologists to handle with competence, if not with brilliance, such matters of detail.

Besides architectural detail, related subordinate works of sculpture and painting have on occasion been successfully used to decorate contemporary buildings without degenerating into mere applied ornament. Mural painting should not break the wall surface unnecessarily. Yet it should remain an independent entity without the addition of borders or panelling to fuse it with the architecture. Baumeister and Ozenfant, among others, have done work of this order. But there is no reason why painting less abstract should not find its place quite as satisfactorily on the walls of contemporary buildings. It is most important that mural painting should be intrinsically excellent; otherwise a plain wall is better. It need not be related, except in scale and shape, to the wall on which it is placed. Contemporary architecture cannot expect to dictate the evolution of contemporary painting, but it offers fields more considerable than the framed canvas panel.

Sculpture also ought not to be combined or merged with architecture. It should retain its own character quite separate

from that of its background. This was true of the best Greek sculpture and often of that of other periods. It is particularly important today that sculpture should be isolated; for if it is actually applied, its suggestion of solid mass is carried over to the wall surface it decorates. Thus far contemporary architecture has served rather as an admirable background for wholly separate units of painting and sculpture not designed for their specific location. (Page 184.) But there is an opportunity here for collaboration which may well in the future lead to brilliant results.

Whether from these two different forms of decoration—architectural detail and related works of painting and sculpture—the contemporary style will in time develop an ornament of its own as did the styles of the past, no one can say. The supposedly novel ornament from which architecture is now freeing itself has put us on our guard against innovations which are merely decorative. The force of all self-conscious theory tends to deny the necessity for ornament as such. Some critics would even explain all the ornament on the fine architecture of the past as but an extension of free sculpture or as a continuance of inherited detail which originally had structural meaning.

Lettering is the nearest approach to arbitrary ornament used by the architects of the international style. It has, of course, a real functional purpose in advertising and in indicating the use of different parts of a large building. Clear unseriffed letter forms are most legible at a good scale and conform most harmoniously to the geometrical character of contemporary design. Letters set forward from the wall surface or in silhouette above a roof decorate a building without breaking up the wall surfaces. (Pages 111 and 211.)

In the choice of letter forms, in the spacing of letters and words, in the use of color and lighting and handsome materials, and above all in the relation of the scale of the inscription to the scale of the building there are immense possibilities for subtlety. The principle of regularity must be respected. In architectural lettering, as in printing, legibility is a prime consideration. Script forms and fantastic placing may be justified for their effectiveness in advertising, but they are on the whole unarchitectural and best avoided. (Page 167.) Like other sorts of decoration in contemporary architecture, lettering can easily be abused.

The current style sets a high but not impossible standard for decoration: better none at all unless it be good. The principle is aristocratic rather than puritanical. It aims as much at making monstrosities impossible, at which the nineteenth century so signally failed, as at assuring masterpieces, at which the nineteenth century had no very extraordinary success.

Also in the use of color the general rule is restraint. In the earliest days of the contemporary style white stucco was ubiquitous. Little thought was given to color at a time when architects were preoccupied with more essential matters. Then followed a period when the use of color began to receive considerable attention. In Holland and Germany small areas of bright elementary colors were used; in France, large areas of more neutral color. The two practices were in large part due to the influence of two different schools of abstract painting, as represented on the one hand by Mondriaan and on the other by Ozenfant. In both cases colors were artificially applied and the majority of wall surfaces remained white. (Page 115.)

At present applied color is used less. The color of natural

surfacing materials and the natural metal color of detail is definitely preferred. (Page 131.) Where the metal is painted, a dark neutral tone minimizes the apparent weight of the window frame (Pages 165 and 171.) In surfaces of stucco, white or off-white, even where it is obtained with paint, is felt to constitute the natural color. The earlier use of bright color had value in attracting attention to the new style, but it could not long remain pleasing. It ceased to startle and began to bore; its mechanical sharpness and freshness became rapidly tawdry. If architecture is not to resemble billboards, color should be both technically and psychologically permanent.

Patently artificial color, moreover, makes too sharp a contrast with natural surroundings. Light and neutral tones not unduly conflicting with those of nature are more satisfactory. (Page 133.) In cities, however, small areas of brilliant color may be effectively contrasted with large areas of more or neutral color. (Page 171.)

In the use of different colors on different walls much ingenuity has been expended. Structure, function and regularity provide little excuse in principle for this use of color. It is perhaps better avoided, although it has occasionally been the means of eminent success. It emphasizes strongly the effect of surface, but it breaks up the unity of volume. This way of painting interior walls to aid reflection and light distribution has been particularly abused. The use of natural materials and of such contrasts between different walls as structure and function easily provide is more satisfactory. There is no better decoration for a room than a wall of book-filled shelves. (Page 191.)

Trees and vines are a further decoration for modern

architecture. Natural surroundings are at once a contrast and a background emphasizing the artificial values created by architects. Choice of site, and the arrangement of buildings upon the site: these are the prime problems of the international style in relation to natural surroundings. As far as possible the original beauties of the site should be preserved. Mere open spaces are not enough for repose; something of the ease and grace of untouched nature is needed as well.

Terraces may extend the house outside its own boundaries, but beyond the terraces the reign of nature should clearly begin. The elaborate formal garden has no place in connection with the international style. An æsthetic of right angles derived from architecture cannot be generally applied to landscape design without diminishing the reposeful contrast of the natural background. Additional planting needed for protection or shelter, however, should usually keep to straight lines and avoid the imitation of natural irregularity. Roads and paths should be laid out for efficient communication, not with picturesque curves. The function of grounds for games and of plots for vegetables and flowers usually requires a simple geometric plan.

Furthermore, small gardens in cities, or directly attached to individual houses, may often be treated as part of the architecture. (Pages 129 and 185.) Pergolas and protective walls or hedges transform these gardens into outdoor living rooms. Of such outdoor living rooms, roof terraces are the most conspicuous examples. (Pages 115 and 120.)