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Franz Kießling

Entreprise agricole Birkeneck près de Munich (pages 378—382)

L'entreprise se trouve à 30 km au nord de Munich. Des moines y éduquent des apprentis dans différents métiers. Deux fois déjà l'entreprise a été la proie de l'incendie. Les bâtiments étant complètement détruits, les architectes reçurent l'ordre de transformer l'entreprise en une entreprise correspondant aux besoins de l'agriculture moderne: clarté et élasticité tout comme pour l'exploitation industrielle. La disposition des étables, porcheries etc. correspond d'une part à l'orientation générale et d'autre part aux besoins de transport de la mangeaille. Quelques salles sont mises à la disposition de l'enseignement. La construction du bâtiment est fort simple et ingénieuse (voir plan détachable); le montage est tout particulièrement rapide.

Gollins, Melvin et Ward

Centre administratif de l'hôpital d'Oxford (page 383)

Le bâtiment en question est en dehors d'Oxford sur un terrain réservé à l'agrandissement de l'hôpital. Plusieurs bureaux, placés auparavant à Oxford même sont maintenent installés dans le nouveau bâtiment, ainsi par exemple le service médical de la ville. Au dernier étage nous trouvons cantine, salles de repos et jardin suspendu. La construction et le plan du bâtiment sont fort intéressants.

Marvin E. Goody, Frank J. Heger

Plaques sandwich en matière plastique (pages 384—391)

Pour la construction d'une école élémentaire.

Problème

La section d'architecture du Massachusetts Institute of Technology s'occupe depuis 1954 de fabrication de matières plastiques applicables dans le bâtiment. Ces recherches sont également exécutées sous les hospices de la section d'ingénieurs de la Chemical Company Monsanto. L'idée primordiale de ces panneaux sandwich est la combinaison d'un noyau relativement poreux et de deux couches extérieures minces et dures. De tels panneaux peuvent servir d'élément porteur, possèdent un minimum de matériaux coûteux, sont donc bon marché. De plus, ces panneaux sont légers et par conséquent facilement transportables. Afin de démontrer la construction en éléments-sandwich l'on prit une école élémentaire comme exemple d'application.

Problèmes de la construction d'école et construction en général

Le programme d'étude d'une école étant presque toujours en cours de révision (voir cahier 8/1961), la préfabrication d'écoles semble être absolument justifiée. L'école semble donc être l'exemple idéal d'essai pour l'utilisation de panneaux-sandwich qui permet la production en masse.

Projet

L'exemple choisi possède un squelette et des éléments de base modulaires préfabriqués. Les éléments en question s'adaptent à n'importe quel plan et sont indépendant du squelette, ce qui permet une élasticité parfaite de disposition. L'équipe de recherche décida de prendre ce thème dans le sens d'une école future, dont le coût doit être bas et la qualité supérieure.

Les éléments de toiture

Des différents systèmes qui se présentaient l'on choisit l'hyperboloïde parabolique. L'hyperboloïde parabolique étant formé de droites, sa fabrication est simple et peu coûteuse. Les raccords d'élément à élément ou d'élément aux piliers portants sont également simples. De plus les éléments sont légers. Le parapluie formé de 4 éléments et d'un pilier forme l'élément-type de base. Un type particulier peut servir d'élément-fenêtre et être combiné aux autres. Des cables supplémentaires permettent de supprimer certains piliers.

Eléments-toit et piliers

Le poids total d'un élément-toit est de 113 kg, environ le dixième d'un élément de même grandeur en béton armé. Les plaques sont faites de deux feuilles minces de 1,5 mm (polyester-acryl) et d'un noyau poreux de 25 mm. Les profils d'acier renforçant les éléments ont une hauteur de 17 cm. Ils servent de raidissement. Les piliers tubulaires ont un diamètre de 12,5 cm seulement, et permettent le montage facile des éléments.

Montage

La fondation est faite de plaques de béton armé. Celles-ci portent les piliers auxquels sont ajoutés les éléments préfabriqués. Les plaques en question peuvent être transportées à la main par 4 à 5 hommes. Les joints sont remplis d'un mastic spécial d'étanchéité pouvant être dilaté.

Les parois

Les parois sont selon leur emploi soit sandwich soit vitrées. Les éléments-paroi ressemblent à ceux du toit mais ils sont colorés. Les plaques en question ont une épaisseur de 5 cm et sont thermiquement isolantes. La dilatation est possible sans désavantages.

Matériaux

Les matières plastiques employées pour ce genre de constructions ont de grands avantages: elles sont légères, peuvent être anti-feu, ne sont pas couteuses. Désavantage: les plaques en question sont difficiles au point de vue acoustique. Peut-être réussira-t-on à trouver une solution sans trop augmenter le coût ou le poid des éléments?

Installations mécaniques

Des "paquets mécaniques" permettent n'importe quelle installation sans toucher la construction ou la disposition. Selon les besoins l'on ajoute des registres de chauffage de conduites, etc.
Malgré certains défauts, l'exemple illustré dans ce cahier est très intéressant.

Reginald F. Malcolmson

Architecture et Education (page 392)

Le programme d'étude de l'Illinois Institute of Technology à Chicago. C'est en 1859 que William Morris fonde le mouvement «Arts and Crafts» en Grande-Bretagne. C'est dans sa célèbre maison de Bexley Heath que Morris fait connaître ses idées sur le rôle de l'artiste de l'époque industrielle. La conception négative de Morris au sujet de la révolution industrielle n'était pas sans fondements, mais toutefois romantique. Cent ans plus tard — et sans supprimer la machine — Mies van der Rohe découvre les moyens propres à la création d'une synthèse «art-industrie».

Cette synthèse mène-t-elle à l'industrialisation de l'architecture? Nous ne croyons pas qu'une telle synthèse mène à la catastrophe. Elle nous livrera sans aucun doute de nouveaux moyens qui permettront de dégager du produit industriel une architecture juste et vivante.

Mies a parfaitement su définir la portée de cette révolution industrielle lorsqu'il dit à l'Illinois Institute of Chicago — et il y a déjà 20 de cela: «L'architecture dans sa forme la plus simple est attachée au pratique en atteignant sur plusieurs degrés de valeur le domaine de l'art». Cette pensée exprime fort bien les principes de notre architecture moderne. Et c'est de ce principe que se dégage le programme d'étude de l'Illinois Institute. Mies exige tout d'abord une suite logique des études. En commençant par les aspects les plus simples l'on passe ensuite aux aspects les plus complexes de l'architecture. Un tel programme ne peut évidemment être basé que sur quelques fondements de base absolument solides, par exemple apprendre à dessiner proprement. Mais le dessin seul ne suffit pas. Il faut savoir se représenter les choses sur 3 dimensions. De plus il faut savoir se servir des moyens de construction les plus simples: brique et bois. La base constructive est de toute première importance pour l'architecture. Au principe de construction s'ajoute le principe des rapports spatiaux: couleurs, formes et rapports.

Par la suite l'étudiant apprend connaître le concept de «fonction» en traitant quelques plans simples. Que pensons-nous de l'étude de projet. En principe nous évitons le mot «projet» le plus possible. Ce mot semble exprimer certaines créations a priori, ce qu'il faut à touprix éviter. Mieux vaut montrer à l'étudiant comment «construire» de manière à atteindre les fonctions voulues. C'est pourquoi le programme des 3 premières années ne comprend aucun cours de projet dans le sens courant du terme. Ce n'est qu'après 3 ans que l'étudiant étudie les principes de «synthèse». C'est ici que se rejoignent architecture, planning régional, urbanisme et autres.

De plus, les étudiants sont évidemment obligés de poursuivre les études de statique, mathématiques, et autres branches indispensables. Le cours supérieur d'architecture ou planning (graduate programme) dure 2 ans. Souvent les étudiants fréquentent d'autres universités étrangères avant de passer l'examen final.

Récapitulons les principes fondamentaux de cet enseignement:

Nous essayons d'apprendre à penser logiquement et à cristalliser quelques principes valables. De tels principes — s'ils sont vraiment justes — peuvent mener à une base théorique propre à créer un système d'éléments interdépendants formant un ensemble de corrélations. Un tel enseignement doit donc viser l'universel, permettant de comprendre les cas particuliers. La science moderne et la technique forment le caractère de notre époque. Il faut donc savoir juger de leurs principes en toute objectivité, et ceci demande une certaine discipline. N'oublions pas toutefois que l'architecture n'est pas un domaine purement scientifique. D'autre part nous essayons de réduire au maximum le domaine des spéculations esthétiques qui offre de graves dangers. Seul le principe des éléments de base (fonctions) mène à l'ordre et à l'harmonie. Nous nous servont de l'histoire pour apprendre à connaître les principes des temps passés et non pour la copier. L'étudiant capable de comprendre la situation culturelle d'un siècle passé sera mieux à même de comprendre notre époque.

Nous pensons enfin que le programme de l'I.I.T. s'imposent non seulement pour les étudiants, mais aussi pour les professeurs et les chercheurs. Ajoutons finalement que nous ne respectons pas seulement les «faits» mais aussi les «idées».

Horst Linde, Erwin Heinle

Bâtiment parlementaire à Stuttgart (pages 393—398)

Le nouveau bâtiment parlementaire de Baden-Wurttemberg vient d'être inauguré en juin dernier. Après maintes discussions et controverses, un concours d'architecture fut organisé visant à résoudre le problème: le parlement doit oui ou non être séparé du château? La disposition en plan, la construction et les détails techniques du bâtiment sont bien résolus et mérite certainement toute notre attention.

Helmut Rhode

Bâtiment administratif central Horten à Düsseldorf (page 399—404)

Le bâtiment en question abrite la direction d'une part et les deux organisations de vente de la maison Horten d'autre part dont les sièges étaient à Düsseldorf et Nürnberg jusqu'à présent. L'administration centrale s'occupe du ravitaillement de 40 maisons différentes rattachées à la maison mère. Cela explique le rôle important de la localisation de la maison centrale (autoroutes, surface suffisante, etc.).

La surface disponible de terrain est de 55'000 m² et à proximité immédiate de l'autoroute avec accès sur celle-ci. Les entrepôts sont étalés sur une surface utile de 11'000 m² dans le sens horizontal. Alors que les fonctions administratives devaient être logées tout d'abord dans un bâtiment-tour, cette idée appuyée sur d'autres exemples du même genre (Phoenix-Rheinrohr, etc.) fut délaissée au cours des études de planning pour des raisons fonctionnelles et remplacée par la conception présente. La disposition générale ainsi que les différents plans du bâtiment en question sont fort bien étudiés dans l'ensemble et dans le détail et méritent toute notre attention. Les mouvements fonctionnels internes et externes sont remarquablement bien étudiés.

Summary

Jürgen Joedicke

1930—1960 (pages 360—373)

Introduction

The evolution of Modern Architecture after 1930 does not display that consistency and coherence that were so characteristic of the Twenties. There are stagnant periods and relapses, not occasioned by conservative reactions but appearing spontaneously within Modern Architecture itself. The nearer we get to the present the more doubtful it is whether the basic principles of Modern Architecture remain viable at all. In the USA the end of Modern Architecture is already being proclaimed.

Modern Architecture, at first limited to Central Europe, begins to spread to other countries and continents around the year 1930. This development was bound to lead to modifications, since the conditions in many of these countries are utterly different from those of Central Europe.

There is still another factor to consider. Modern Architecture was promoted in the Twenties by a select group of architects dedicated to a cause. Around 1930, when Modern Architecture began to prevail in the world at large, young architects come on the scene who are, directly or indirectly, the pupils of the first generation. The whole picture becomes rather more complex, especially in the Fifties, when still a third generation makes its appearance. Of the first generation, Le Corbusier and Mies van der Rohe are still active in the original spirit; Alvar Aalto, who already belongs to the next generation, exerts a world-wide influence, and younger architects like Saarinen, Bunshaft and Tange are at the present time going through their first creative phase.

The Situation between 1930 and 1939

The various trends of the Twenties and Thirties.

If at the outset it was maintained that the evolution of Modern Architecture in the Twenties was straightforward and reducible to common denominators, this statement may be taken with a grain of salt, for the Twenties were by no means so straightforward as was at one time the general belief. A great variety of developments were overlooked which form a part of Modern Architecture just as much as the "official" architecture based on the theories of "de Stijl", Le Corbusier and Bauhaus. The "second team", combining various tendencies, is dealt with in this Issue, but it cannot be defined with the same degree of exactness. However, this much can be said: the discipline of having to hold to simple geometric designs runs counter to the universal creativity of the artist. The new school rejects the right angle as the exclusive principle of order and bases itself on comparisons and analogies with the world of nature. Next to the "geometric" shape it sets up the "organic" or the "quasi-organic" design.

The change that occurred as against the Twenties, round about the year 1930, can be seen clearly from a comparison between the house on the Weissenhof in Stuttgart by Le Corbusier (1926) and the Mairea house in Norrmark by Aalto (1938/39). The differences emerge in the handling of space, in the choice of materials and in the relationship to the natural surroundings. The house on the Weissenhof is a pure square; this shape and the way the ground floor is treated distinguish it sharply from the natural setting. "The cube, the cone, the sphere, the cylinder or the pyramid are the great primary shapes... They strike us as clean, comprehensible and straightforward. For this reason they are beautiful shapes, the most beautiful shapes of all ... Here we have the fundamental condition of the formal arts." (Le Corbusier, Architecture of the Future, p. 16.) Aalto's plan for the Mairea house (ill. 1) is based in many respects on Le Corbusier's work, but it obviously has new elements. What is novel in it can be observed in two aspects: in the choice of material and in the relationship to the natural surroundings. Le Corbusier employs mainly "artificial" materials: steel, reinforced concrete or rendering. Aalto, on the other hand, prefers natural stone and, above all, wood. Aalto even goes so far as to cover free-standing supports in the living area with bast to achieve a uniform spatial expression. By means of the hook-shaped plan and also by the employment of natural materials, Aalto keeps the house in harmony with the surroundings, so that the artificial creation remains closely integrated with nature. The quest for differentiation of design is also evident in the handling of space. The central room is divided up into different areas by its design and by the way it is illuminated, the different areas being connected, to be sure, but also giving the effect of independent spatial quanta. The external design is likewise enriched by recessing and by the contrast between square structural elements and freely composed elements.

Aalto is not alone in his ideas, but may be regarded as the precursor of a number of architects in the same generation. With them around the year 1930 there began a new phase in the evolution of Modern Architecture, a phase which can be summed up as an expansion of formal range and an increase in formal differentiation.

The change getting under way around 1930, however, not only goes back to the endeavours of younger architects but is also the consequence of a transformation to be detected in the case of the older architects as well. It is apparent with Le Corbusier, for instance, as early as 1930. The superstructures of the Villa Savoye in Poissy are freely composed sculptural elements, which can no longer be explained in terms of Le Corbusier's geometrical norms. Here Le Corbusier stages a creative break-through, leaving behind his own self-imposed artistic rules.

The new trends are also clear in the small week-end house built by Le Corbusier in 1935 near Paris (ill. 2). The house is no longer set off from the natural setting but is integrated with it. The pure square plan is replaced by a staggered lay-out, the wings constituting the formal integration with the surroundings. There is also great differentiation in the range of materials employed. In addition to rendering and reinforced concrete, Le Corbusier employs unworked stone, raw masonry and untreated wood. Another example is the Maison aux Mathes built in 1935. We can observe the same development in Walter Gropius. The private houses erected in the USA after 1937 display the same expansion in the range of materials employed. Moreover, Gropius draws upon the regional traditions of New England in order to integrate his houses with the landscape—something that would never have occurred in the Twenties (ill. 3).

Gropius and Le Corbusier belong to the first generation, Aalto, on the other hand, is the herald of a new generation, those born between 1902 and 1905, whose precursors were born some years earlier: Alvar Aalto (1898), J. H. van den Broek (1898), Pietro Belluschi (1899), Luis Karm (1901), Marcel Breuer, Lucio Costa, Alfred Roth, Giuseppe Terragni, Junzo Sakakura, Arne Jacobsen, Egon Eiermann, Kunio Mayekawa (all born between 1902 and 1905) as well as Oscar Niemeyer (1907). Their common feature is a pronounced regional influence. In Denmark recourse was had to the native style of masonry, in Brazil a rediscovery was made of the old technique of facing a wall with azulejos (blue tiles), and in Mexico inspiration was drawn from pre-Columbian art. Alvar Aalto, the great precursor of this epoch, employs the materials used in Finland for centuries, wood and rough stone of various types. He avoids any relapse into sentimental pseudo-handicraft by means of his precise designing which is in keeping with the properties of the materials. To be sure, in his disciples there is evident a certain "local" style expressing a kind of misconceived homeliness.

The endeavour toward differentiation signifies the end of the one-sided dominance of the square and the right angle. A functional kind of designing is being striven for which is no longer pre-determined by geometrical norms in Le Corbusier's sense.

The Regional Transformations in Modern Architecture in Europe.

The work of the individual architect, however, is not only influenced by factors of personal development and by general contemporary trends but also by environmental conditions. Erik Gunnar Asplund (born 1885), the great and neglected Swedish architect, belongs in the generation of Gropius, Mies van der Rohe and Le Corbusier. In the Twenties there prevailed in Sweden as also in Denmark a studied neo-classicism, which had a determining influence on the architecture of these countries. The young Asplund first had to come to terms with these trends, and this confrontation had a decisive effect on his early work. However, the new trend is evident in the one-storey projecting annexes to the purely classicist Municipal Library (1920—28). In 1930 Asplund won international recognition with his exhibition buildings in Stockholm. Between 1934 and 1937 Asplund erected the extension to the Göteborg City Hall (ill. 7). What Asplund achieved here served as a model not only for Swedish architecture but for architects abroad. Asplund's influence on Arne Jacobsen, for example, was very considerable.

Modern Architecture got under way in Switzerland only after the first revolutionary phase was nearing its end. The Swiss mentality involves a rather cautious attitude toward the unusual. However, after the step was taken from mere vision to practical realization, Switzerland too began to open itself to new ideas. This country made a valuable contribution in the fashion in which problems were resolved, in the meticulous working out of details and in the democratic approach that is evident in Swiss buildings.

While the Twenties were dominated by the ideal of an international architecture, the present trend displays marked regional features. In Italy Giuseppe Terragni endeavours to tie in the tradition of his country with Modern Architecture. His Community Centre in Como (ill. 10) is inconceivable without Le Corbusier and Gropius. The use of loggias, the grouping of the building around a courtyard, the contrast between open mass and closed wall surface are all specifically Italian elements. In similar fashion the Japanese Junzo Sakakura and Kunio Mayekawa are concerned with a Modern Architecture adapted to the Japanese tradition.

Modern Architecture in Brazil as an Example of Influence on Non-European Countries.

The fruitfulness and the magnetic influence of Modern Architecture are evident in its impact on Brazilian building.

As in the case of European architecture during the same period, there is also evident here the clear intention to take into account the landscape and climate. What has happened in Brazil, with worldwide repercussions, is unique and can be explained only by the congruence of several favourable circumstances. One of these was the consolidation of Modern Architecture in Europe around 1930. At that time Modern Architecture had gone through its revolutionary phase and was seeking a valid mode of expression. Its methods had been tested and had proved their worth. The act of coming to terms with these ideas had already commenced in Brazil around 1922, when the "Modern Art Weeks" in Sao Paulo were held. However, it was only in the Thirties that a whole generation of young architects started working and put their enthusiasm and openness to new ideas behind the movement. The direction taken, however, by this movement is parallel to that in Europe. The difference in idiom ought not to obscure the fact that basically the same problems are being grappled with.

Richard Neutra

Richard Neutra was born in 1892. The year of his birth and his attitude to the problems of Modern Architecture mark him as an architect who stands between the generations. Neutra in a sense was born too late, but nevertheless what he says is his own and is not just second-hand. What distinguishes Neutra from his colleagues is his conception of architecture, which becomes increasingly more precise. Neutra tries to get an intimate feeling of the pattern of living of his clients when drawing up a plan, with a view to creating a home that corresponds exactly to their inner nature. Thus he has no fixed preconceptions but allows the environment and the personality of the client to effect the evolution of his plan. This approach has produced some of the very best architecture to appear.

Developments after 1945

The Influence and the Achievement of the Masters of the First Generation.

The evolution of Modern Architecture at the end of the Thirties was overshadowed and then interrupted by the imminent war. Only in a few countries—in Brazil, for instance—was important work done in this period as well. The first post-war years can be regarded as a period of preparation and stock-taking and cautious experimentation. From 1950 on, new tendencies become apparent which diverge from the previous line of development.

Le Corbusier

When Le Corbusier erected the Pilgrimage Chapel near Ronchamp, his critics believed it represented a surprising departure from his previous approach (ill. 14). The building is novel, to be sure, but it is also clear that it is located within a continuous pattern of development. Le Corbusier's work is vital in any understanding of the meaning of Modern Architecture.

Le Corbusier does not call in question his earlier approach with his latest projects, he is merely expanding it. A comparison of the Villa Savoye and the Ronchamp church will show how closely connected his earlier work is with his present buildings. In contrast to the Ronchamp church, the Villa Savoye is a geometrically exact square, but its superstructures are free compositions which can not be attributed to geometric norms. The element that was bound up within geometrical forms in the case of the Villa has at Ronchamp become liberated. With the animated shapes of Ronchamp Le Corbusier seeks to integrate the contours of the landscape.

India gave Le Corbusier the opportunity to design and build a city for 500,000 inhabitants. The Parliament building, the Governor's Palace and the Palace of Justice stand at the angles of a non-equilateral triangle. All streets and footpaths run parallel or at right angles to one another. However, there is no continuous axis. No open squares interrupt the straight lines of the streets. A person moving through the city has constantly to change his direction and thus enjoys a wealth of spatial sensations. Chandigarh is the late realization of an idea long germinating in Le Corbusier's mind: a system of axes without any one continuous straight line. By very simple means—and not by complex elaboration—Le Corbusier achieves immense architectural variety.

Mies van der Rohe

After a frustrating time in Germany, Mies van der Rohe went to Chicago as a teacher and architect, this being a fruitful and influential period that can almost be said to have launched a second Chicago School. Mies van der Rohe is of the opinion that in our age there can no longer be any specific functions, and so he constructs neutral buildings that are adaptable for any purpose, a good example of this being the Architecture School of the Illinois Institute of Technology. Mies van der Rohe is one of the great creative figures; he knows all about the dangers of academic rigidity in architecture. He says that "architecture is not an idle playing about with shapes, it aims at being an expression of given cultural forces, an expression of its age".

Walter Gropius

Walter Gropius is the moral instance of Modern Architecture, and he is also the great teacher, being the founder of Bauhaus. Even now that he is retired from active teaching at Harvard, his major concern is with the training of young architects.

He has always emphasized the danger of mere technical proficiency. For him there must always be a conception of man behind any training course. He stands for intuitive insight, the fountainhead of all true creativity.

F. L. Wright and the Concept of Organic Architecture

Wright was one of the great pioneers, and his work goes far into our own age. The quintessence of his approach is that "the inner nature of an architectural problem always bears its own solution within itself". This does not entail any given style, only a method. Organic Architecture points to a close connection with nature, it should be an architecture that grows in the same way as natural creatures grow, out of their driving inner needs, this not being interpreted to mean any kind of imitation of natural shapes.

Plans and Buildings of the Second Generation

Within the second generation and within our own period Aalto occupies a very special position. He is one of the few contemporary architects who have developed consistently from points of departure set up in the Thirties. His special love is for the natural warmth of natural materials, but he has always avoided sentimental excess.

In continuous fashion, without being distracted by the war and its aftermath, Oscar Niemeyer has striven for a plastic composition of individual structural elements. He thus finds a certain inspiration in the Baroque of the Colonial period in Brazil. He feels that we have got beyond the need for mere functionalism and that architecture should truly reflect its age.

The Contribution of the Third Generation

At the present time there is a marked preference for industrially produced materials and building elements, with a particular love for industrial precision even when natural materials are employed. The influence of the natural environment is detectable, though not so much so as in the Thirties. The tendency is to allow the specific assignment to determine the design. The architects and engineers of this generation were born around 1910. They include Gordon Bunshaft (1909), Eduardo Alfonso Reidy (1909), Ernesto Rogers (1909), Eero Saarinen (1910), Aarne Ervi (1910), Matthew Nowicki (1910), Felix Candela (1910), Hugh Stubbins (1912), Kenzo Tange (1913), Friedrich Wilhelm Krämer (1907) and J. B. Bakema (1914), who collaborates with the older J. H. van den Broek (1898).

This group is interested in an expansion of formal possibilities, but, in contrast to the Thirties, when the main stress was on natural materials. Nowadays there is a total expansion of design possibilities without any guiding orthodox principles. There is a danger of a certain quest for novelty for its own sake, leading often to imitation of bygone styles. There is an overall interest in a structural enlivening of surfaces whether functional or merely ornamental. There is a rather alarming interest in the tactile appeal of certain textures which in most cases is unjustified, even if functional reasons are sought to account for it.

Architectural Trends Today

Specific Designs for Specific Assignments and Materials.

A vital question for our time is: What can functionalism mean for us? Function is no hard and fast concept, its definition varies from time to time. Function and design are interacting factors. Functionalism is a method of design, it does not entail any fixed formal categories. Thus it is misleading to say that functionalism is dead in Modern Architecture. The function of a building, after all, grows out of the total complex of all the factors going to make up the building.

There is a widespread trend observable at the present time toward simplification of design, this simplification always being kept in line with the given project. This is paralleled by restriction in the range of building materials, both trends being reinforced by the increasing industrialization of building. This trend cuts cross the generations and can thus be regarded as a far-reaching movement in architecture. The new simplicity is sometimes confined to the individual element, while the larger composition is often rich in contrasts. This can be seen in the work of van den Broek and Bakema.

The present period also has constructional experiments to show, e. g., shell constructions, which are only now being exploited on a big scale. A further aspect of the contemporary situation is the "organic" building, in which design takes up a secondary position, this approach being represented by Hugo Häring with his farm buildings. His thesis is that the shape of a building can only be determined by the purpose for which it is built. This parallels the organic "natural" approach of Louis Sullivan and F. L. Wright.

The contemporary period has renewed its contact with the past, this of course entailing the danger of slavish eclecticism. Belluschi is a good example of one who has escaped this danger. He maintains that now that we have won the struggle against outmoded designs we can afford to be more tolerant of the human symbols of our rich past, in that they give us a sense of continuity. Philip Johnson is another important architect moving in this direction. He believes in making full use of the possibilities offered by industrial techniques. In his latest plans he is attempting to overcome the influence of Mies van der Rohe, as in the Shrine in New Harmony (Ill. 51). It has been interpreted as a continuation of the ideas of Borromini. Minoru Yamasaki is one of the most interesting but most controversial figures in contemporary architecture. He criticizes the exaggerated reliance on use and function.

Conclusion

In the work of the newest architects there is evidence that the past is not merely being aped but that Modern Architecture has within it the seeds of renewal. However, no matter what the goals may be, one thing is certain: the isolated building can no longer be the central work. From now on the individual building is to be integrated within the overall urban complex. What has up to now been attempted in the field of town-planning does not begin to come up to what has been achieved with individual buildings.

Yuncken, Freeman Brothers, Griffiths and Simpson

Music Bowl in Melbourne
(pages 374—375)

The structure in question is not a building in the general sense of the word although it possesses all the attributes of one. Its skeleton consists for the most part of cables ingeniously assembled. It is to be seen once again that shapes and values elude our attempts to experience them for lack of verbal counterparts. The area of the stage is 540 m². There is room for a hundred people in the orchestra pit. Cloakrooms, showers, store rooms, a kitchen, a cafe and a number of offices have been sited beneath the stage. The mechanical installations are in a wing of the building, as are distribution centres, the sound control rooms, a radio station and the stage lighting. Vehicles may go straight up onto the stage thanks to two ramps. The huge tent holds 2,031 seats. There is room for more than 20,000 people in the bowl.

Arne Jacobsen

Factory at Alborg (pages 376—377)

This is a factory for overhauling engines and manufacturing cylinders. The general lay-out and the construction of this building are worth very careful study.

Franz Kießling

Birckeneck Agricultural Training College near Munich (pages 378—382)

The college is 30 km. north of Munich. Monks instruct the apprentices in various trades. The college has twice been attacked by fire. As the buildings had been completely destroyed, the architects were commissioned to remodel the college so that it would meet the needs of modern agriculture: lucidity and flexibility, such as is to be found in an industrial firm. The arrangement of the sheds and sties, etc. correspond on the one hand to the general plan and, on the other, to the requirements with respect to the transport of fodder. Some rooms have been set aside for instructional purposes. The construction of the building is extremely simple and ingenious (see detachable plan), the assembly being particularly rapid.

Gollins, Melvin and Ward

Administrative Building of Oxford Hospital (page 381)

This building is sited outside Oxford itself on a plot of land set aside for a hospital extension. Several offices, hitherto located in Oxford, have been brought under the roof of the new building, thus there is the town's medical service here. On the top floor we have the canteen, lounges and a hanging garden. The construction and plan of this building are extremely interesting.

Marvin E. Goody, Frank J. Heger
Chen Y. Yang und Joseph Schiffer

Plastic Sandwich Panels

Used in the construction of an elementary school (page 384—392)

Problem

Since 1954 the department of architecture of the Massachusetts Institute of Technology has been concerned with the production of plastics suitable for constructional use. This research has been in conjunction with the engineering department of the Monsanto Chemical Company. The initial idea of these sandwich panels lies in the combination of a comparatively porous core with two thin and hard external layers. Such panels may act as bearer elements, their material cost is at a minimum and they are therefore cheap. In addition, these panels are light and are consequently easily transportable. An elementary school where they have been used has been taken as an example to show the application of these sandwich elements in construction.

Problems in school building and in construction in general

As the programme of a school is almost always in a state of revision (see No. 8/61), the prefabrication of schools appears to be justified in every respect. A school therefore would seem to be an ideal trial project for the use of sandwich panels, which allow for mass production.

Project

The example chosen has a bearing skeleton and prefabricated basic modular elements. The latter can be adapted to any plan whatsoever and are independent of the skeleton. This allows for complete elasticity in lay-out. The research team decided not to build a "school of the future" but one which was inexpensive and could be erected with means currently available.

Roof elements

From the different systems possible the hyperbolic parabola was selected. This is composed of right angles and is simple and inexpensive. The unions between element and element or element and pillar are also simple. Furthermore, they are light. An umbrella formed of four elements resting on a central support is the basic constructional element. An individual element can be used as a window element or it can be combined with others. Supplementary cables make it possible for certain pillars to be eliminated.

Roof elements and pillars

The total weight of a roof element amounts to 113 kg., that is, about one tenth that of a reinforced concrete element of the same size. The panels are made of two 1.5 mm. leaves of polyester-acryl and a porous 25 mm. core. The steel profiles reinforcing the elements are 17 cm. high. They act as bracings.
The tubular pillars are only 12.5 cm. in diameter and allow for the easy assembly of the elements.

Assembly

The foundations consist of slabs of reinforced concrete. These support the pillars, to which the prefabricated elements are attached. The panels in question can be manhandled by a team of 4—5 men. The joints are filled with a special dilatable putty.

The walls

These are either glazed or consist of sandwich panels, depending upon their function. The wall elements are similar to those used for the roof but are coloured. The panels in question are 5 cm. thick and are provided with heat insulation. Expansion is possible.

Materials

The plastic materials used for this type of construction are highly advantageous: they are light, can be fire-resistant, and are not expensive. The disadvantage is that the panels under review are difficult with respect to their acoustical properties. It may perhaps be possible to find a solution that does not involve too great an increase in expense or weight.

Mechanical installations

"Installation packages" allow for all kinds of installations to be fitted without interfering with the construction or the lay-out. Depending on needs, regulators for heat, air-conditioning, etc. can be added.
In spite of certain faults, the example illustrated in this issue is an extremely interesting one.

Reginald Malcolmson

Architectural Education (page 382)

One hundred years ago, in 1859, William Morris inaugurated the Arts and Crafts movement in England with the building, in collaboration with the architect Philip Webb, of his famous house at Bexley Heath in Kent which was to be the embodiment of his ideas concerning handicrafts and the decorative arts. The Arts and Crafts movement was later to have widespread influence throughout the Western World because Morris' penetrating vision focused attention on a basic issue—the role of the artist in an industrial society.
Morris' attitude to the Industrial Revolution and to industrial products was sound, because he fought mid-Victorian smugness and ugliness; although his solution to abolish the machine was a negative and romantic one.
One hundred years later the architecture of Mies van der Rohe demonstrates acceptance of modern industry and technology as the source of materials and methods of building so that a synthesis of art and industry has evolved which points towards a new direction.
Is that synthesis then to lead to the industrialization of architecture?—that might be a real catastrophe.
We hope rather that it will lead to a new scale of values in which industry and industrial products will be the sources from which a new and inspiring art may flourish; not as an industrial by-product, but as the summit of man's achievement as the noblest expression of modern times.
I have referred to the revolution in thought which has taken place during the last hundred years, firstly because we all tend to take it for granted, and secondly because a change so complete must find its reflection in architectural education.
When Mies outlined our curriculum 20 years ago he made a statement which still appears in our catalog and which reads as follows:
"Architecture in its simplest terms is rooted in the practical ascending through the different tiers of value into the realm of pure art." That very basic and fundamental statement is the foundation of our curriculum; it makes clear the role of the technical and aesthetic aspects of architecture and on it the framework of our curriculum has been built.
First of all, this statement implies consistency throughout the curriculum so that each subject has its logical place in the whole program and that the student progresses from simple studies to those of a more complex nature; nothing learned in the early years will be subsequently discarded and refuted, but rather it shall be incorporated and expanded into a gradually increasing body of knowledge and experience.
A curriculum intended to fulfill these aims must therefore concentrate on fundamentals, so that a sound foundation may be laid on which knowledge and experience can be built.
The student therefore learns first of all **to draw** and to draw clearly and precisely. An architect who cannot draw is, we believe, like a writer who cannot write; drawing for the architect is his language and means of communication but to draw in itself is not enough, the student must develop the ability to visualize points and lines in space and to present solutions to three dimensional problems in a way which is not only clear to the observer but is also an aesthetically valid presentation in itself.
Then the student must learn **to build** simple structures in brick, wood and stone and to understand the properties and correct uses of these materials.
We place a great deal of emphasis on construction because we believe that a real architecture can only be developed from a sound knowledge of construction.
The student must also **understand proportion** and space relations as well as textures, form and color, his eyes must be trained to see significant relationships.
Next, he will gain a **knowledge of Function** by the study first of all of simple rooms in which furniture and equipment determine the plan according to use; and so by a combination of rooms, buildings are developed by the analysis of each part on a functional basis.
What about architectural design? we try to avoid as much as possible the use of this word because of its connotation that a concept of a building can be formed on a purely a priori basis; we prefer to show the student how he can develop a building from his knowledge of how to build, how to determine proportions and how to analyze its functions; and of course, not least of all, how to draw it.
That is why we do not attempt to teach architectural design in the first three years, so that in the fourth and fifth year, a synthesis of the knowledge and skills gained in the earlier years can be formed.
In the last two years the student also learns the elements of City and Regional Planning, and although we are at present developing an independent Department of City and Regional Planning. Mr. Hilberseimer who introduced the City Planning courses into our curriculum 20 years ago, considers it very important that the students of architecture should have some knowledge of city planning, as many large offices no longer deal with the individual building as an end in itself, but often with a complex of many buildings which demand a knowledge of planning if a valid solution is to be reached.
I must assume of course that it is understood we have the required courses in Mathematics, Strength of Materials, Civil Engineering and other technical subjects as well as Liberal studies requirements, all very competently taught by their respective departments on our campus.
The Graduate program in Architecture or in Planning covers two years and since the students have varied backgrounds, coming as they do from different areas in the United States as well as abroad, the first year of their work is devoted to problems of an advanced nature so that they can come to some common understanding, with the second year devoted to the thesis.
Now I would like to examine some of the ideas that are implicit in our curriculum.
We try as far as possible to encourage the student to think clearly and logically and to that end we aim at a clear grasp of principles.
In the world of antiquity the Greek mind was the first to formulate knowledge in terms of principles, and since then this ability has been one of the unique qualities of Western civilization.
This has been very clearly stated by Kant in the 18th Century in the following: "Nobody may call himself practical in his science if he despises theory. He is ignorant who believes guess-work is a substitute for principles and thinks he would achieve better things without the aid of principles.
Principles lead to a theory which if worked out methodically becomes a system, a group of entities, which are related to one another by interaction or interdependence."
A study of principles, of course, must lead us to a study of universal, rather than special solutions; but the proper understanding of such universals, places the student in a much stronger position to deal with special cases than if he were to approach all problems from the particular.
Modern science and technology dominate and form the character of our age.
If our architecture is to be as all great architectures have been expressive of the age, then we must accept the disciplined thought and objectivity that are characteristic products of the scientific method. Our curriculum therefore imposes a strong discipline on both students and teachers; we regard that as a positive asset for it gives order, method and clarity to the work.
We do not believe in discipline as an end in itself, but as a means whereby a student can learn to get the best out of himself.
Architecture is, of course, not a wholly rational study, if it were so we could very readily classify it as a science, to the intense relief of those who love classification, but to the detriment of art. How then can intuitive perception be taught? The answer is that it cannot be taught, but it can be developed, and intensified with patience. Partly by demonstration and example, and partly by developing awareness of visual qualities and relationships.
Several painters in modern times, most notably Paul Klee, have used a method we often employ in our class-work. Klee often painted several variations of a theme for a period of two or three weeks, each picture or sketch showed some variation so that from a comparative study of possibilities a painting could be made.
We make use of this comparative method in our work because it is not only a valid methodology in itself for the study of aesthetic problems but also because it sharpens the powers of observation as well as intensifying the problem. In fact we like, in as far as it is possible, to reduce the area of aesthetic speculation.
We make use of this comparative method on all levels in our work, because we regard it not only as a valuable method-

ology but also because by means of it the work passes through various stages of probability to an acceptable result. In fact, we like, insofar as that is possible, to reduce the area of aesthetic speculation in any given problem not because we want to avoid intuitive judgement, but for quite the opposite reason that we know such judgements have much greater force and meaning when the elements involved are reduced to their simplest terms. Then and only then will a visual order and harmony be clearly revealed. There is a commonly accepted illusion that the new architecture is a-historical that it tends to neglect history, if not go against it. Nothing could be further from the truth in our case, for not only do we have formal courses in the history of architecture but we continually make reference to, and studies of, historical types in the course of our work. Who can understand the architectural and structural possibilities of domes? who is ignorant of the Pantheon and Hagia Sophia? who understands vaulting problems? who is ignorant of Gothic work? and who knows the possibilities of long span construction in steel? who has never heard of the great Galerie des Machines of 1889 in Paris?
We study history to understand the principles involved in different buildings in the past, to learn what were the architectural expressions of past cultures; in short, to understand the history of architecture not to imitate it.
We believe that if the cultural situations in the past are understood, the student will be in a better position to interpret the present.
A curriculum such as ours at I.I.T. based on fundamentals is, we believe, not only good for the students, but also for the teachers. As they are obliged whether they are engaged in practice, in research, or as consultants or if they are writing and developing their own ideas outside the classroom, to return to basic principles and think out once again with their students the foundations on which their own work rests. I am told that the late Enrico Fermi occasionally taught freshman physics at the University of Chicago and I have no doubt for much the same reason, for the effort to state clearly and concisely, the fundamentals in art or science is one that we can all derive benefit from in our thoughts and in our work.
In conclusion let me say that while we respect the facts, a true education cannot be based solely on facts, but must, in the last analysis, be founded on ideas.

Horst Linde, Erwin Heinle

Parliament Building in Stuttgart
(pages 393—398)

The new parliament building of Baden-Wurttemberg was inaugurated last June. After a number of discussions and controversies an architectural competition was organized with the intention of solving the problem whether Parliament was to be separated or not from the castle. The plan, the construction and the technical details of the building have been handled well and deserve careful study on our part.

Helmut Rhode

Horten Main Administration Building in Düsseldorf (pages 399—408)

The building in question houses the management on the one hand and the two sales organizations of the Horten firm on the other hand. These have up to now been located in Düsseldorf and Nuremberg. The central administration is concerned with the supplying of 40 different houses attached to the parent firm. This explains the important role of the parent house as it is sited (superhighways, sufficient surface, etc.).
The disposable area of the site is 55,000 sq. meters and is in immediate proximity to the superhighway with access to it. The warehouses are distributed over a utility surface of 11,000 sq. meters in the horizontal direction. Whereas the management functions were originally to have been accommodated in a point-house, this idea, based as it was on other examples of the same kind (Phoenix-Rheinrohr, etc.), was set aside during planning studies and that for functional reasons, and replaced by the present conception. The general lay-out, as well as the different plans of the building in question, is very carefully worked out both in general and in detail and merits our serious attention. The internal and external functional lines of flow are remarkably well conceived.

Biographische Notizen

Mitarbeiter in der Architekturfirma Yuncken, Freeman Brothers, Griffiths & Simpson:

John R. Freeman

Geboren 1899 in Geelong, Australien. Studium am Gordon Institute of Technology, Geelong.

Thomas D. Freeman

Geboren 1903. Studium am Gordon Institute of Technology und an der Universität Melbourne.

W. Balcombe Griffiths

Geboren 1907 in Melbourne. Studium an der Universität Melbourne. Mitglied des Royal Institute of British Architects 1961.

Roy M. Simpson

Geboren 1914. Studium am Technical College und an der Universität Melbourne. Mitglied des Royal Australian Institute of Architects.

Angel W. Dimitroff

Geboren 1922 in Sofia. Studium an der Technischen Hochschule München 1945. Mitglied des Royal Australian Institute of Architects 1956.

John D. Gates

Geboren 1924. Studium an der Universität Melbourne.

Percy A. Jenkin

Geboren 1896 in Melbourne. Studium an der Universität Melbourne. Mitglied des Royal Victorian Institute of Architects und des Royal Australian Institute of Architects.

Barry B. Patten

Geboren 1927 in Melbourne. Studium an der Universität Melbourne und am Royal Melbourne Technical College.

Franz Kießling

Geboren 1925 in Regensburg. Studium an der Technischen Hochschule München 1946—49. Assistent an der Technischen Hochschule München. Eigenes Büro seit 1951 in München.

Wichtigste Bauten:
Kindergarten in München, 1957
Wohnsiedlung in Neuburg (Donau), 1960—61
Jugendwohnheim Zellhof bei Salzburg, im Bau.

Marvin E. Goody

Geboren 1929 in New York City. Studium an der Universität Pennsylvania, am Massachusetts Institute of Technology, Cambridge (USA), und an der Universität Yale. Vorlesungen über Stadtbau an der Universität Yale. Dozent für Entwurfslehre am M. I. T. seit 1953. Teilhaber der Architekturfirma Hamilton, Goody & Clancy. Mit Hamilton und Clancy arbeitet er an Experimentierprojekten für die Vorfabrikation von Wohnbauten: Bau des Kunststoffhauses der Zukunft für das Disneyland im Auftrag der Monsanto Chemical Company (siehe Heft 7/1959). Seit 1955 ist Goody am M. I. T. mit Entwicklungsarbeiten für die Verwendung von Kunststoff im Bauen beschäftigt.

Frank J. Heger

Geboren 1927 in Cambridge (USA). Studium und anschließend Dozent für Statik am Massachusetts Institute of Technology. Teilhaber der Ingenieurfirma Simpson, Gumpertz & Heger.

Chen Y. Yang

Geboren 1930 in Tientsin, China. Studium an der Taiwan-Universität, Formosa, an der Universität Purdue, Indiana, und am M. I. T., Cambridge. Forschungsassistent der Ingenieurabteilung des M. I. T. in Cambridge. Mitglied des American Concrete Institute.

Joseph J. Schiffer

Geboren 1931 in Boston. Studium am M. I. T., Cambridge, und am Boston Architectural Center. Seit 1959 Dozent für Architekturgeschichte am M. I. T. und am Wellesley College. Mitarbeiter der Forschungsabteilung des M. I. T. für das Projekt einer Schule aus Kunststoff.

Horst Linde

Geboren 1912 in Heidelberg. Studium an der Technischen Hochschule Karlsruhe, Schüler von Otto Ernst Schweizer. Planungen für den Auf- und Ausbau der Universität Freiburg und ihrer Kliniken 1947—50. Baudirektor des Landes Südbaden: Planungen von Universitätskliniken und Bauten von Kirchen, Heilbädern, Verwaltungsbauten, städtebauliche Aufgaben 1950—57. Leiter der Bauabteilung des Finanzministeriums Baden-Württemberg: städtebauliche Planungen in Stuttgart, Ulm, Tübingen, Heidelberg, Karlsruhe usw. 1957—60. Doktor h. c. der Universität Freiburg 1957. Seit 1961 ordentlicher Professor der Technischen Hochschule Stuttgart.

Erwin Heinle

Geboren 1917. Studium an der Technischen Hochschule Stuttgart. Assistent und Mitarbeiter von Professor Günter Wilhelm an der Technischen Hochschule Stuttgart 1950—54.

Wichtigste Bauten:
Krebsforschungszentrum Heidelberg, seit 1961 in Planung
Als freier Mitarbeiter tätig beim Süddeutschen Rundfunk (Oberbauleitung Fernsehturm Stuttgart 1954—55) sowie bei Prof. Gutbier, Siegel und Wilhelm (Kollegiengebäude I der Technischen Hochschule Stuttgart 1956—58).

Helmut Rhode

Geboren 1915 in Berlin. Studium an der Technischen Hochschule Berlin. Eigenes Büro seit 1950 in Düsseldorf.

Wichtigste Bauten:
Verwaltungsbau ARAG in Düsseldorf, 1954
Wohnbau in Düsseldorf, 1955
Phoenix-Rheinrohr in Hannover, 1956
Tiefgarage in Dortmund, 1960

Inhaltsverzeichnis