WALTER GROPIUS
SCOPE OF TOTAL ARCHITECTURE

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CREATION AND love of beauty are elemental for the experience of happiness. A time which does not recognize this basic truth does not become articulate in the visual sense; its image remains blurred, its manifestations fail to delight.

Since my early youth I have been acutely aware of the chaotic ugliness of our modern man-made environment when compared to the unity and beauty of old, preindustrial towns. In the course of my life I became more and more convinced that the usual practice of architects to relieve the dominating disjointed pattern here and there by a beautiful building is most inadequate and that we must find, instead, a new set of values, based on such constituent factors as would generate an integrated expression of the thought and feeling of our time.

How such a unity might be attained to become the visible pattern for a true democracy—that is the topic of this book. It is based, essentially, on articles and lectures written—with a few exceptions—during my years in Harvard University as chairman of the Department of Architecture (1937—1952).*

WALTER GROPIUS

* Acknowledgment: The idea to publish this book originated with my wife, Ise, née Frank, who undertook to edit and select the material from my manuscripts.
Introduction *

Entering a new chapter of my life that—contrary to the normal expectation of life after seventy—looks to me just as turbulent and perilous as the period preceding it, I realize that I am a figure covered with labels, maybe to the point of obscurity. Names like “Bauhaus Style,” “International Style,” “Functional Style” have almost succeeded in hiding the human core behind it all, and I am eager, therefore, to put a few cracks into this dummy that busy people have slipped around me.

When, as a young man, I received the first public attention I was rather put out to find my mother depressed and disapproving of the fact that my name had begun to appear in newspapers. Today I understand her apprehension all too well, because I have experienced that, in our era of fast printing and categorizing, publicity is likely to be tied around an individual like a label around a bottle. Every so often I feel a strong urge to shake off this growing crust so that the man behind the tag and the label may become visible again.

I have been told that a tree which is supposed to bear my name is to be planted in Chicago on the campus of the Michael Reese Hospital, for which I have been architectural consultant for the last eight years. I want this to be a tree in which birds of many colors and shapes can sit and feel sustained. I do not wish to restrict it to species with square tail-ends or streamlined contours or international features or Bauhaus garb. In short, I wish it to be a hospitable tree from which many songs should be heard, except the fake sounds of the bird imitators.

When I was a small boy somebody asked me what my favorite color was. For years my family poked fun at me for saying, after some hesitation, “Bunt ist meine Lieblingsfarbe,” meaning: “Multicolored is my favorite color.” The strong desire to include every vital component of life instead of excluding part of them for the sake of too narrow and dogmatic an approach has characterized my whole life. It is, therefore, with on invitation of the Illinois Institute of Technology, Chicago, May, 1953.
considerable disgust that I have watched the confusing battle of words that has arisen around the representatives of the various schools of modern design. These esthetic battles are usually not stirred up by the architects themselves, but by those well-meaning or ill-meaning, self-appointed critics who, in the attempt to buttress their own esthetic or political theories, wreak havoc with the work of creative people by capturing and abusing some of their statements without comprehending the background and context they sprang from.

I have found throughout my life that words and, particularly, theories not tested by experience, can be much more harmful than deeds. When I came to the U.S.A. in 1937 I enjoyed the tendency among Americans to go straight to the practical test of every newborn idea, instead of snipping off every new shoot by excessive and premature debate over its possible value, a bad habit that frustrates so many efforts in Europe. This great quality should not get lost in favor of biased theorizing and fruitless, garrulous controversy at a moment when we need to muster all our strength and originality in trying to keep creative impulses active and effective against the deadening effect of mechanization and overorganization that is threatening our society.

Of course, the relative position which a searching mind has to take when going off the beaten path exposes it to attacks from all directions. In my time I have been accused by the Nazis of being a Red, by the Communists of being a typical exponent of the capitalistic society, and by some Americans of being a “foreigner,” unacquainted with the democratic way of life. All these labels, applied to the same person, show the confusion that is caused in our time by an individual who just insisted on forming his own conviction. I look upon these temporary tempests in my personal life with the detachment that comes from experience. I know that the strong currents of our times might have cast my boat on the rocks many times unless I could have trusted my own compass.

But the thing I do not want to seem detached about is our common plight of losing control over the vehicle of progress that our time has created and that is beginning to ride roughshod over our lives. I mean that the misuse of the machine is creating a soul-flattening mass mind, which levels off individual diversity and independence of thought and action. Diversity is, after all, the very source of true democracy. But factors of expediency like high-pressure salesmanship, organizational oversimplification and moneymaking as an end in itself have surely impaired the individual's capacity to seek and understand the deeper potentialities of life.

Democracy is based on the interplay of two contrasting manifestations. On the one hand it needs diversity of minds, resulting from intensive, individual performance; on the other it needs a common denominator of regional expression, springing from the cumulative experience of successive generations who gradually weed out the merely arbitrary from the essential and typical. As irreconcilable as these two manifestations may seem to be, I believe that their fusion can and must be brought about or we shall end up as robots.

One of the U.S. Supreme Court Justices once discussed the substance of democratic procedure and I was highly interested to hear him define it as “essentially a matter of degree.” He did not base his decisions on abstract principles of right and wrong, but wanted to consider every case in its particular circumstances and relative proportion, because he felt that it was the soundness of the whole social structure that mattered and that what might contribute to its detriment today might be inconsequential tomorrow under changing conditions, and vice versa.

To sharpen this sense of balance and feeling for equipoise is something we all have to accomplish individually in our lives. For instance, when we accuse technology and science of having deranged our previous concepts of beauty and the “good life,” we would do well to remember that it is not the bewildering profusion of technical mass-production machinery that is dictating the course of events, but the inertia or the alertness of our brain that gives or neglects to give direction to this development. For example, our generation has been guilty of producing horrors of repetitious housing developments, all done on a handicraft basis, which can easily compete in deadly uniformity with those ill-advised prefabrication systems which multiply the whole house instead of only its component parts. It is not the tool, it is our mind that is at fault. The art of accurately knowing the degree to which our individual instincts are to be curbed or encouraged or our common policies enforced or resisted is
apparently the privilege of few wise people, and we are desperately in need of them. No other generation has had to face so vast a panorama of conflicting tendencies and our heritage of overspecialization does not equip us too well to cope with them. The architecture we produce will inevitably reveal the degree to which we have been able to show respect for the developing social pattern which we are part of, without devitalizing our individual contribution to it.

I want to rip off at least one of the misleading labels that I and others have been decorated with. There is no such thing as an "International Style," unless you want to speak of certain universal technical achievements in our period which belong to the intellectual equipment of every civilized nation, or unless you want to speak of those pale examples of what I call "applied archaeology," which you find among the public buildings from Moscow to Madrid to Washington. Steel or concrete skeletons, ribbon windows, slabs cantilevered or wings hovering on stilts are but impersonal contemporary means—the raw stuff, so to speak—with which regionally different architectural manifestations can be created. The constructive achievements of the Gothic period—its vaults, arches, buttresses and pinnacles—similarly became a common international experience. Yet, what a great regional variety of architectural expression has resulted from it in the different countries!

As to my practice, when I built my first house in the U.S.A.—which was my own—I made it a point to absorb into my own conception those features of the New England architectural tradition that I found still alive and adequate. This fusion of the regional spirit with a contemporary approach to design produced a house that I would never have built in Europe with its entirely different climatic, technical and psychological background.

I tried to face the problem in much the same way as the early builders of the region had faced it when, with the best technical means at their disposal, they built unostentatious, clearly defined buildings that were able to withstand the rigors of the climate and that expressed the social attitude of their inhabitants.

Our present responsibility seems to be to determine which features of our vast industrial civilization represent the best and lasting values and should therefore be cultivated to form the nucleus for a new tradition. Proper distinction of cultural values can, of course, develop only through steadily improved education. One of the major jobs falling to us architects in the field of cultural education would be to point up and make precise the new values and sift them from the welter of ascending and fading fashions and a mass production process that has yet to discover that change, as such, does not necessarily bring improvement. Amidst a vast production and an almost limitless choice of goods and types of all description, we need to remember that cultural standards result from a selective process of seeking out the essential and typical. This voluntary limitation, far from producing dull uniformity, should give many individuals a chance to contribute their own individual variation of a common theme and so help to evolve again the integrated pattern for living that we abandoned with the advent of the machine age. The two opposites—individual variety and a common denominator for all—will then once more be reconciled to each other.
Chapter 1

Approach*

MY intention is not to introduce a, so to speak, cut and dried "Modern Style" from Europe, but rather to introduce a method of approach which allows one to tackle a problem according to its peculiar conditions. I want a young architect to be able to find his way in whatever circumstances; I want him independently to create true, genuine forms out of the technical, economic and social conditions in which he finds himself instead of imposing a learned formula onto surroundings which may call for an entirely different solution. It is not so much a ready-made dogma that I want to teach, but an attitude toward the problems of our generation which is unbiased, original and elastic. It would be an absolute horror for me if my appointment would result in the multiplication of a fixed idea of "Gropius architecture." What I do want is to make young people realize how inexhaustible the means of creation are if they make use of the innumerable modern products of our age, and to encourage these young people in finding their own solutions.

I have sometimes felt a certain disappointment at being asked only for the facts and tricks in my work when my interest was in handing on my basic experiences and underlying methods. In learning the facts and tricks, some can obtain sure results in a comparatively short time, of course; but these results are superficial and unsatisfactory because they still leave the student helpless if he is faced with a new and unexpected situation. If he has not been trained to get an insight into organic development no skillful addition of modern motives, however elaborate, will enable him to do creative work.

My ideas have often been interpreted as the peak of rational-

* From a statement, made for The Architectural Record, at the start of my teaching career as Professor of Architecture at Harvard University, May, 1937.
ization and mechanization. This gives quite a wrong picture of my endeavors. I have always emphasized that the other aspect, the satisfaction of the human soul, is just as important as the material, and that the achievement of a new spatial vision means more than structural economy and functional perfection. The slogan “fitness for purpose equals beauty” is only half true. When do we call a human face beautiful? Every face is fit for purpose in its parts, but only perfect proportions and colors in a well-balanced harmony deserve that title of honor: beautiful. Just the same is true in architecture. Only perfect harmony in its technical functions as well as in its proportions can result in beauty. That makes our task so manifold and complex.

More than ever before is it in the hands of us architects to help our contemporaries to lead a natural and sensible life instead of paying a heavy tribute to the false gods of make-believe. We can respond to this demand only if we are not afraid to approach our work from the broadest possible angle. Good architecture should be a projection of life itself and that implies an intimate knowledge of biological, social, technical and artistic problems. But then—even that is not enough. To make a unity out of all these different branches of human activity, a strong character is required and that is where the means of education partly come to an end. Still, it should be our highest aim to produce this type of men who are able to visualize an entity rather than let themselves get absorbed too early into the narrow channels of specialization. Our century has produced the expert type in millions; let us make way now for the men of vision.

Chapter 2

My Conception of the Bauhaus Idea*

AIM. After I had already found my own ground in architecture before the First World War, as is evidenced in the Fagus Building of 1911 and in the Cologne Werkbund Exhibition in 1914 (Germany), the full consciousness of my responsibility as an architect, based on my own reflections, came to me as a result of the First World War, during which my theoretical premises first took shape.

After that violent eruption, every thinking man felt the necessity for an intellectual change of front. Each in his own particular sphere of activity aspired to help in bridging the disastrous gulf between reality and idealism. It was then that the immensity of the mission of the architect of my own generation first dawned on me. I saw that, first of all, a new scope for architecture had to be outlined, which I could not hope to realize, however, by my own architectural contributions alone, but which would have to be achieved by training and preparing a new generation of architects in close contact with modern means of production in a pilot school which must succeed in acquiring authoritative significance.

I saw also that to make this possible would require a whole staff of collaborators and assistants, men who would work, not as an orchestra obeying the conductor’s baton, but independently, although in close co-operation to further a common cause. Consequently I tried to put the emphasis of my work on integration and co-ordination, inclusiveness, not exclusiveness, for I felt that the art of building is contingent upon the co-ordinated teamwork of a band of active collaborators whose co-operation symbolizes the co-operative organism of what we call society.

Thus the Bauhaus was inaugurated in 1919 with the specific object of realizing a modern architectonic art, which like human

nature was meant to be all-embracing in its scope. It deliberately concentrated primarily on what has now become a work of imperative urgency—averting mankind's enslavement by the machine by saving the mass-product and the home from mechanical anarchy and by restoring them to purpose, sense and life. This means evolving goods and buildings specifically designed for industrial production. Our object was to eliminate the drawbacks of the machine without sacrificing any one of its real advantages. We aimed at realizing standards of excellence, not creating transient novelties. Experiment once more became the center of architecture, and that demands a broad, co-ordinating mind, not the narrow specialist.

What the Bauhaus preached in practice was the common citizenship of all forms of creative work, and their logical interdependence on one another in the modern world. Our guiding principle was that design is neither an intellectual nor a material affair, but simply an integral part of the stuff of life, necessary for everyone in a civilized society. Our ambition was to rouse the creative artist from his other-worldliness and to reintegrate him into the workaday world of realities and, at the same time, to broaden and humanize the rigid, almost exclusively material mind of the businessman. Our conception of the basic unity of all design in relation to life was in diametric opposition to that of "art for art's sake" and the much more dangerous philosophy it sprang from, which I had called it into being to combat. Our endeavors were to find a new approach which would promote a creative state of mind in those taking part and which would finally lead to a new attitude toward life. To my knowledge, the Bauhaus was the first institution in the world to dare to embody this principle in a definite curriculum. The conception of this curriculum was preceded by an analysis of the conditions of our industrial period and its compelling trends.

Arts and Craft Schools. When, in the last century, the machine-made products seemed to sweep the world, leaving the craftsmen and artists in a bad plight, a natural reaction gradually set in against the abandonment of form and the submersion of quality. Ruskin and Morris were the first to set their faces against the tide, but their opposition against the machine could not stem the waters. It was only much later that the perplexed mind of those interested in the development of form realized that art and production can be reunited only by accepting the machine and subjugating it to the mind. "The Arts and Crafts" schools for "applied art" arose mainly in Germany, but most of them met the demand only halfway, as their training was too superficial and technically amateurish to bring about a real advance. The manufactories still continued to turn out masses of ill-shaped goods while the artist struggled in vain to supply platonic designs. The trouble was that neither of them succeeded in penetrating far enough into the realm of the other to accomplish an effective fusion of both their endeavors.

The craftsman, on the other hand, with the passing of time began to show only a faint resemblance to the vigorous and independent representative of medieval culture who had been in full command of the whole production of his time and who had been a technician, an artist and a merchant combined. His workshop turned into a shop, the working process slipped out of his hand and the craftsman became a merchant. The complete individual, bereaved of the creative part of his work, thus degenerated into a partial being. His ability to train and
instruct his disciples began to vanish and the young apprentices gradually moved into factories. There they found themselves surrounded by meaningless mechanization which blunted their creative instincts, and their pleasure in their own work; their inclination to learn disappeared rapidly.

DIFFERENCE BETWEEN HANDICRAFTS AND MACHINE WORK. What is the reason for this devitalizing process? What is the difference between handicraft and machine work? The difference between industry and handicraft is due far less to the different nature of the tools employed in each, than to subdivision of labor in the one and undivided control by a single workman in the other. This compulsory restriction of personal initiative is the threatening cultural danger of the present-day form of industry. The only remedy is a completely changed attitude toward work which, though based on the sensible realization that the development of technique has shown how a collective form of labor can lead humanity to greater total efficiency than the autocratic labor of the isolated individual, should not detract from the power and importance of personal effort. On the contrary, by giving it the possibility of taking its proper place in the work of the whole it will even enhance its practical effect. This attitude no longer perceives in the machine merely an economic means for dispensing with as many manual workers as possible and of depriving them of their livelihood, nor yet a means of imitating handwork; but, rather, an instrument which is to relieve man of the most oppressive physical labor and serve to strengthen his hand so as to enable him to give form to his creative impulse. The fact that we have not yet mastered the new means of production and, in consequence, still have to suffer from them, is not a valid argument against their necessity. The main problem will be to discover the most effective way of distributing the creative energies in the organization as a whole. The intelligent craftsman of the past will in future become responsible for the speculative preliminary work in the production of industrial goods. Instead of being forced into mechanical machine work, his abilities must be used for laboratory and tool-making work and fused with the industry into a new working unit. At present the young artisan is, for economic reasons, forced either to descend to the level of a factory hand in industry or to become an organ for carrying into effect the

platonic ideas of others; i.e., of the artist-designer. In no case does he any longer solve a problem of his own. With the help of the artist he produces goods with merely decorative nuances of new taste which, although associated with a sense of quality, lack any deep-rooted progress in the structural development, born of a knowledge of the new means of production.

What, then, must we do to give the rising generation a more promising approach to their future profession as designers, craftsmen or architects? What training establishments must we create in order to be able to sift out the artistically gifted person and fit him by extensive manual and mental training for independent creative work within the industrial production? Only in very isolated cases have training schools been established with the aim of turning out this new type of worker who is able to combine the qualities of an artist, a technician and a businessman. One of the attempts to regain contact with production and to train young students both for handwork and for machine work, and as designers at the same time, was made by the Bauhaus.

BAUHAUS TRAINING: PRELIMINARY COURSE. The Bauhaus aimed at the training of people possessing artistic talents as designers in industry and handicrafts, as sculptors, painters and architects. A complete co-ordinated training of all handicrafts, in technique and in form, with the object of teamwork in building, served as the basis. The fact that the man of today, from the outset, left too much to traditional specialized training—which merely imparts to him a specialized knowledge, but does not make clear to him the meaning and purport of his work, nor the relationship in which he stands to the world at large—was counteracted at the Bauhaus by putting at the beginning of its training not the “trade” but the “human being” in his natural readiness to grasp life as a whole. The basis of its training was a preliminary course, introducing the pupil to the experience of proportion and scale, rhythm, light, shade and color, and allowing him at the same time to pass through every stage of primitive experience with materials and tools of all kinds, in order to enable him to find a place where, within the limits of his natural gifts, he could obtain a secure footing. This training, which occupied six months, was intended to develop and ripen intelligence, feeling and ideas, with the general object of evolving
the “complete being” who, from his biological center, could approach all things of life with instinctive certainty and would no longer be taken unawares by the rush and convulsion of our “Mechanical Age.” The objection that, in this world of industrial economy, such a general training implies extravagance or a loss of time does not, to my mind and experience, hold good. On the contrary, I have been able to observe that it not only gave the pupil greater confidence, but also considerably enhanced the productiveness and speed of his subsequent specialized training. Only when an understanding of the interrelationship of the phenomena of the world around him is awakened at an early age will he be able to incorporate his own personal share in the creative work of his time.

As both the future craftsman and the future artist were subject to the same fundamental training at the Bauhaus, it had to be sufficiently broad to enable each talent to find its own way. The concentric structure of the whole training embodied all the essential components of design and technique right from the beginning, in order to give the pupil an immediate insight into the whole field of his future activities. The further training merely gave breadth and depth; it differed from the elementary “preliminary training” only in degree and thoroughness, but not in the essence. Simultaneously with the first exercises in materials and tools, the training in design commenced.

**Language of Vision.** In addition to technical and handicraft training, the designer must also learn a special language of shape in order to be able to give visible expression to his ideas. He has to absorb a scientific knowledge of objectively valid optical facts, a theory which guides the shaping hand and provides a general basis on which a multitude of individuals can work together harmoniously. This theory is naturally not a recipe for works of art, but it is the most important objective means for collective work in design. It can best be explained with an example from the musical world: the theory of counterpoint which, though in the course of time it may have undergone certain changes, is, nevertheless, still a supraindividualistic system for regulating the world of tones. Its mastery is required lest the musical idea should remain lost in chaos; for creative freedom does not reside in the infinitude of the means of expression and formation, but in free movement within its strictly legal bounds. The academy, whose task it had been from its beginning—when it was still a vital force—to tend and develop this theory for the optical arts, had failed because it lost touch with reality. Intensive studies were therefore made at the Bauhaus to rediscover this grammar of design in order to furnish the student with an objective knowledge of optical facts—such as proportion, optical illusions and colors. Careful cultivation and further investigation of these natural laws would do more to further true tradition than any instruction in the imitation of old forms and styles.

**Workshop Training.** In the course of his training, each student of the Bauhaus had to enter a workshop of his own choice, after having completed the preliminary course. There he studied simultaneously under two masters—one a handicraft master, and the other a master of design. This idea of starting with two different groups of teachers was a necessity, because neither artists possessing sufficient technical knowledge nor craftsmen endowed with sufficient imagination for artistic problems, who could have been made the leaders of the working departments, were to be found. A new generation capable of combining both these attributes had first to be trained. In later years, the Bauhaus succeeded in placing as masters in charge of the workshops former students who were then equipped with such equivalent technical and artistic experience that the separation of the staff into masters of form and masters of technique was found to be superfluous.

The training in handwork given in the Bauhaus workshops must not be taken as an end in itself, but as an irreplaceable means of education. The aim of this training was to produce designers who were able, by their intimate knowledge of materials and working processes, to influence the industrial production of our time. An attempt was made, therefore, to produce models for the industry which were not only designed but actually made in the workshops of the Bauhaus. The creation of standard types for the articles of daily use was their main concern. These workshops were essentially laboratories in which the models for such products were carefully evolved and constantly improved. Even though these models were made by hand, the model designers had to be fully acquainted with the methods of production on an industrial scale and so, during
practical commissions for the Bauhaus, in which both masters and students could put their work to a test. In particular, the erection of our own institute buildings, in which the whole Bauhaus and its workshops co-operated, represented an ideal task. The demonstration of all kinds of new models made in our workshops, which we were able to show in practical use in the building, so thoroughly convinced manufacturers that they entered into royalty contracts with the Bauhaus which, as the turnover increased, proved a valuable source of revenue to the latter. The institution of obligatory practical work simultaneously afforded the possibility of paying students—even during their three years of training—for salable articles and models which they had worked out. This provided many a capable student with some means of existence.

After a three-year training in handwork and design, the student had to submit to an examination both by the masters of the Bauhaus and by the "Chamber of Handicrafts" in order to obtain the Journeyman's Certificate. The third stage for those who wanted to proceed was the building training. Co-operation on practical building sites, practical experiments with new building materials, studies in craftsmanship and engineering in addition to design led to the Master Certificate of the Bauhaus. The students then became either practical architects or collaborators in the industry, or teachers—according to their special gifts. The thorough manual training in the workshops served as a very valuable equipment for those students who found it impossible to penetrate into the more comprehensive and complex task of the architect's profession. The gradual and manifold instruction of the Bauhaus enabled him to concentrate on precisely that kind of work which best suited his capabilities.

The most essential factor of the Bauhaus work was the fact that, with the passing of time, a certain homogeneity was evolved in all products: this came about as the result of the consciously developed spirit of collaborative work, and also in spite of the co-operation of the most divergent personalities and individualities. It was not based on external stylistic features, but rather on the effort to design things simply and truthfully in accordance with their intrinsic laws. The shapes which its products have assumed are therefore not a new fashion, but the result of clear reflection and innumerable processes of thought and work in
a technical, economic and form-giving direction. The individual alone cannot attain this goal; only the collaboration of many can succeed in finding solutions which transcend the individual aspect—which will retain their validity for many years to come.

The Creative Teacher. The success of any idea depends upon the personal attributes of those responsible for carrying it out. The selection of the right teacher is the decisive factor in the results obtained by a training institute. Their personal attributes as men play an even more decisive part than their technical knowledge and ability, for it is upon the personal characteristics of the master that the success of fruitful collaboration with youth primarily depends. If men of outstanding artistic ability are to be won for an institute, they must from the outset be afforded wide possibilities for their own further development by giving them time and space for private work. The mere fact that such men continue to develop their own work in the institute produces that creative atmosphere which is so essential for a school of design and in which youthful talents can develop. This is the most important supposition, to which all other questions affecting the organization must be subordinated. There is nothing more deadening to the vitality of a design school than when its teachers are compelled, year in and year out, to devote the whole of their time to classes. Even the best of them tire of this unending circle and must in time grow hardened. Art, in fact, is not a branch of science which can be learned step by step from a book. Innate artistic ability can only be intensified by influencing the whole being, by the example of the design master and his work. Whereas the technical and scientific subjects can be learned by progressive courses of lectures, the training in design must, to be successful, be conducted as freely as possible, at the personal discretion of the artist. The lessons which are intended to give direction and artistic incentive to the work of the individuals and groups need by no means be very frequent, but they must provide essentials which stimulate the student. The ability to draw is all too frequently confused with the ability to produce creative design. Like dexterity in handicrafts, it is, however, no more than a skill, a valuable means of expressing spatial ideas. Virtuosity in drawing and handicrafts is not art. The artistic training must provide food for the imagination and the creative powers. An intensive “atmosphere” is the most valuable thing a student can receive. Such a “fluidum” can only grow when a number of personalities are working together to a common end; it cannot be created by organization, nor can it be defined in terms of time.

When I tried to find out for myself why the seeds of the Bauhaus venture have not come up faster, I saw that the demand on the flexibility of human nature during the last generation have been indeed all too sweeping. With that rapid torrent of constant changes in all fields of activities—material as well as spiritual—natural human inertia could not keep pace.

Ideas of cultural import cannot spread and develop faster than the new society itself which they seek to serve. However, I think it is not an overstatement when I maintain that the community of the Bauhaus, through the wholeness of its approach, has helped to restore architecture and design of today as a social art.
Chapter 3

Is There a Science of Design? *

FOR MANY years I have systematically collected facts about the phenomenon of our human sight and its relation to the other senses, and about our psychological experiences with form, space and color. These are as real as any material problems of structure and economy which I shall disregard here. I consider the psychological problems, in fact, as basic and primary, whereas the technical components of design are our intellectual auxiliaries to realize the intangible through the tangible.

The term “design” broadly embraces the whole orbit of man-made, visible surroundings, from simple everyday goods to the complex pattern of a whole town.

If we can establish a common basis for the understanding of design—a denominator reached through objective findings rather than through personal interpretation—it should apply to any type of design; for the process of designing a great building or a simple chair differs only in degree, not in principle.

An individual of the species man has certain characteristics in common with others of his kind in the way he perceives and experiences his physical world. Most important is the fact that sensation comes from us, not from the object which we see. If we can understand the nature of what we see and the way we perceive it, then we will know more about the potential influence of man-made design on human feeling and thinking.

Many years ago I saw a movie called The Street. It started with an unforgettable scene acquainting the audience in a flash with the tangled web of a matrimonial drama. First the wife, then the husband looks down from the window into the street. She sees the gray, trivial, everyday life as it is; but he projects his imagination into the scene, transforming it into a sensational picture giving brilliance, intensity and meaning to the pattern of life before his eyes.

REALITY AND ILLUSION. I remembered this experience when I read a study by Earl C. Kelley of Wayne University about “education for what is real,” as verified by recent experiments in sensation, made in co-operation with the Dartmouth Eye Institute in Hanover, New Hampshire. One of the basic statements of this remarkable study is:

We do not get our sensations from things around us but the sensations come from us. Since they do not come from the immediate environment (the present) and obviously cannot come from the future, they come from the past. If they come from the past they must be based on experience.

The demonstration is as follows: You are presented with three peepholes about the size of the pupil of the eye. You are asked to look through these holes in turn. The material back of the holes is well lighted. In each case you see a cube, with its three dimensions and its square sides. In general, the three cubes look substantially the same. All appear to be about the same distance away [Fig. 1].

Then you are permitted to look back of the boards through which the peepholes run. When you do this, you see that one of the holes indeed has a wire cube back of it. Another, however, has a drawing on a plane, with scarcely any of the lines running parallel. The third is a number of strings stretched between wires running away from the eye.

Neither of the latter two look anything at all like a cube when viewed from behind the scenes. And yet the sensation in each case was a cube ...

Widely different materials caused the same pattern on the retina of our eye and resulted in the same sensation. The sensation could not come from the material, since in two cases it was not a cube. It could not come from the pattern on the retina since that pattern was not a cube. The cube does not exist except as we call it a cube; and that sensation did not come from the material in our environment, but from us. It came from prior experience.

Similarly a baby in the cradle, seeing the moon for the first time in his life, tries to catch it; what is at first a mere reflected image on the retina assumes, in later life, symbolic meaning by experience. But we need not go back to the undeveloped mind of the baby.

SUBCONSCIOUS REACTIONS. For instance when you drive in a car on a slushy road and a passing car coming in the opposite direction hurls slush at your windshield you blink and dodge. The subconscious reactions are automatic; though our intellect

tells us that the windshield protects us, the reaction to ward off possible danger for our eye reoccurs every time. Our eye obviously does not take any chances.

Imagine sitting on a balcony twenty stories high above the ground, the balcony having an open railing made of vertical bars. Though the railing gives you physical protection, you will have a sensation of giddiness if you look down. Giddiness, however, stops immediately if the railing is covered with cardboard or paper, for this enclosure then gives support to the eye. Our equilibrium is re-established through the illusion of safety although nothing has been added in fact for greater physical safety. The eye does not know, it reacts automatically.

The equivalent phenomenon in horizontal direction is the so-called agoraphobia, i.e., the dread of open spaces which seizes sensitive persons crossing a large open square (Fig. 2). They feel lost in a space the size of which is not in keeping with the human scale. But if some vertical planes were erected on that open space like wings on a stage, such as shrubs or fences or walls, the illusion of safety would be reinstated, and the dread would disappear; for the eyes of the person groping in space now find a frame of reference to support them; when they hit a solid in the field of vision they register its outline just as radar does.

These examples show that there is a split between physical perception on the one hand and our intellectual knowledge on the other. The subconscious stratum of our human nature obviously reacts unswervingly like a ship’s compass; it is uninfluenced by any gambol of the intellect, but it is subject to illusions.

**DESIGN EDUCATION.** *My thesis is that artistic creation draws its life from the mutual tension between the subconscious and the conscious faculties of our existence, that it fluctuates between reality and illusion.* The subconscious or intuitive powers of an individual are uniquely his therefore. It is futile for an educator in design to project his own subjective sensations into the student’s mind. All he can do successfully is to develop his teaching on the basis of realities, of objective facts common to all of us. But the study of what is reality, what is illusion, requires a fresh mind, unaffected by the accumulated debris of intellectual knowledge. Thomas Aquinas has said, “I must empty my soul that God may enter.” Such unprejudiced emptiness is the state of mind for creative conception. But our present intellectual emphasis on book education does not promote such mental climate. The initial task of a design teacher should be to free the student from his intellectual frustration by encouraging him to trust his own subconscious reactions, and to try to restore the unprejudiced receptivity of his childhood. He then must guide him in the process of eradication of tenacious prejudices and relapses into imitative action by helping him to find a common denominator of expression developed from his own observation and experience.

If design is to be a specific language of communication for the expression of subconscious sensations, then it must have its own elementary codes of scale, form and color. It needs its own grammar of composition to integrate these elementary codes into messages which, expressed through the senses, link man to man even closer than do words. The more this visual language of communication is spread, the better will be the common understanding. This is the task of education: to teach what influences the psyche of man in terms of light, scale, space, form and color. Vague phrases like “the atmosphere of a building” or “the coziness of a room” should be defined precisely in specific terms. The designer must learn to see; he must know the effect of optical illusions, the psychological influence of shapes, colors and textures, the effects of contrast, direction, tension and repose; and he must learn to grasp the significance of the human scale. Let me illustrate:

**Some Biological Facts about Our Way of Seeing.** As we have already seen, man perceives his physical environment by sensory experience. Our sense of vision and our tactile sense supplement each other in this highly complicated physiological act of seeing. Our retinas supply us with flat images only as the lens of a camera projects a flat picture on a sensitive film. The experience of distance in space has to be acquired by each individual personally, supported by his tactile sense. Remember the baby reaching for the moon (Fig. 3).

(Fig. 4) * The human eye is built very similar to a photographic camera.

* Figs. 4-11 from *Der Mensch* by Dr. Fritz Kahn, Alb. Müller Verlag, Zürich, 1939.
(Fig. 5) The most common delusion. The human eye actually sees the environment as an inverted mirror image. By means of a psychological correction which is acquired in practice from a very early age, we turn the image around bringing it into correspondence with reality.

(Fig. 6) Diagrammatic section through the human eye showing the cornea lens and retina.

(Fig. 7) Looking into a human eye: (a) the accommodation muscle which turns and releases the ligaments of the lens (b); (c) the longitudinal fibers of the iris which dilate the pupil when they contract; (d) the circular fibers which decrease the size of the pupil when they contract. Beneath the iris is the lens, above it is the dome of the cornea.

(Fig. 8) The iris diaphragm of the camera compared to that of the human eye. At the left the diaphragm is contracted, at the right it is released just as in a photographic camera the contracted diaphragm sharpens the image.

(Fig. 9) This picture shows the adjustment of the human eye—not only of the diaphragm, but also of the lens. In the upper picture you see that the flattening out of the lens brings the sharp adjustment of the image, whereas the lower is blurred because of wrong adjustment. Technology uses the same method for reproducing and printing pictures as nature does in our eye, using a sieve or screen.

In the eye the image projected upon the retina by the lens is likewise broken up into dots by the rods and cones of the retina since each cell sees only one dot no larger than itself. Strongly stimulated cells report to the brain "light," weakly stimulated cells "dark." If a retinal image were to be magnified several hundred times, we would see that it consists of points or dots just like an enlarged piece of a halftone engraving.

(Fig. 10) This is the television apparatus of the human eye which like that of a broadcasting station transforms optical images into electrical currents (a, b, c), the supporting framework (g, h), the photosensitive cells (f), the connecting cells (e), the large transmitting cells (d), the nerve cable (i, k), the protecting base.

(Fig. 11) The human eye is a combination camera for day and night photography. The retinal cones on the left are daylight apparatus. They require much light, producing sharply defined panchromatic pictures. The rods in our eye shown on the right side are twilight apparatus. They are strongly photosensitive but produce indistinct achromatic pictures.

The curvature of the retina as well as of our eye lens is the source of certain distortions of images. This complicates further the necessary association of our space-perceiving senses and is the common cause of a wealth of optical illusions. The knowledge of these illusions appears to be indispensable for a designer.

OPTICAL ILLUSIONS. The plainly recognizable concavities of a moon landscape (Fig. 12) will appear convex if we turn the picture upside down (Fig. 13). Note that the stream running through a valley in the original picture now runs over a crest. Our eyesight is unable to adjust this illusionary phenomenon of reciprocation to the reality of the original view now reversed. Modern abstract painters have made use of the intriguing interplay of form elements which can be read as being either convex or concave, thus giving an illusion of motion.

An accurate square, striped by parallel lines running either horizontally or vertically, appears to be elongated in the opposite direction from that of the parallel lines (Fig. 14). This is an important fact to know for architectural and fashion design. In addition, the width of the stripes has to be carefully chosen to be in keeping with the size of the figure. The girl in the bathing suit (Fig. 15) looks more slender in horizontal than vertical stripes. In the same way the columns of the cathedral of Siena, Italy, (Fig. 16) would appear heavier if the stripes were vertical.

Another optical phenomenon is that called "irradiation." A bright figure on dark background appears to be larger than a black figure on a bright background (Fig. 17). This illusion is caused by the light spilling over the dark edges of a silhouette projected on our retina. Silhouettes of sculptured figures standing against the bright sky appear to be reduced by irradiation. The volume of such sculpture has to be exaggerated in order to give the intended effect of truthfulness (Fig. 18). The light nibbles at the contours.

PSYCHOLOGICAL INFLUENCE OF SHAPES AND COLORS. El Greco's "Grand Inquisitor" is more than the portrait of a
man. It depicts the state of mind this man evoked in the beholder and in the artist. The explosive stroke of the brush and the shapes chosen suggest horror and dread of a terrifying menace—the Inquisition (Fig. 19).

Shapes can be exciting or soothing. In addition, their colors—shrill or soft—can increase the intended effect. Color and texture of surfaces have an effective existence of their own, sending out physical energies which can be measured. Such effect can be warm or cold, advancing or receding, bright or dark, light or heavy, in tension or in suspension, or even attractive or repulsive (Fig. 20). A New York designer who calls himself a color engineer reports that he is sure that violet induces melancholy; that yellow is an energizing color, conducive to conviviality, increased brain activity and a sense of well being, and that classrooms painted yellow are good for retarded children, while nurseries painted yellow are likely to inhibit naps; that blue induces not the “blues” but relaxation, and that old people often become “blue-thirsty,” that the psychological reactions to red are stimulating to brain, pulse and appetite and that if you stand twenty feet away from a red chair and a blue chair the red chair will appear a foot closer; that green makes people feel cold and that stenographers working in green offices are prey to psychosomatic chills, which they readily shed, along with thirst; that greens and grays are placed on their chairs or orange curtains are hung at their windows; that a charity appeal mailed in a light-blue-green envelope will command a surer philanthropic response than one sent in a white envelope; that a twenty-pound box painted dark blue will look heavier, and seem harder to carry, than the same box painted light yellow; that a telephone bell ringing in a white booth will seem louder than the same bell ringing in a purple booth, and that a peach consumed in the dark will appear to have less flavor than one whose color is visible.*

**Relativity.** We can hardly believe that the gray dot in all five cases of this picture (Fig. 21) is of the same darkness. It shows the relativity of values. The same factual value of the gray disks appears to change with its brighter or darker background. Human nature seems to depend more than we realize on the contrast of opposites which keep us alert and alive, since they create an alternating tension or repose. Colors can be active or passive; planes or walls can be made to advance or recede by color treatment. The dimensions of a room thus appear to be different from what the actual measurement tells us. In fact the designer—if he masters these means—can create illusions which seem to belie the facts of measurement and construction.

**What Is the Human Scale?** The size of our body (of which we are always conscious) serves as a yardstick when we perceive our surroundings (Fig. 22). Our body is the scale unit which enables us to establish a finite framework of relationships within the infinite space. Unusual scale may have a ridiculous or a repulsive effect. One’s emotional interest in an object may be altered merely by a change of its size, deviating from the expected norm.

Or emotional interest can be greatly intensified just by close-up enlargement. I remember the intense physical horror I experienced once when seeing on the screen the enlarged picture of a scorpion and a mantis, appearing as huge monsters tearing each other to pieces in a gruesome life and death struggle. Merely through an enlargement of the optical scale, causing a closer emotional relation, strong physical and psychological sensations sprang up which would not have occurred had I seen the fight in its original small scale.

All this must bring us to the conclusion that it lies within the grasp of the designer to organize the psychological effects of his creation at will by increasing or decreasing its scale or that of its parts which changes the relationship with us.

When the Aztecs or the Egyptians built a pyramid their intention was to create awe and fear of God. The designer strove for an expression of the supernatural through large-scale (Fig. 23). The Pharaohs and Caesars, playing God and intending to subjugate their subjects by fear, expressed their power by megalomaniac axes of superhuman scale. Hitler and Mussolini both received in rooms of colossal size, seated at the opposite end of the entrance; the approaching visitor was made to feel uneasy and humble.

Westminster Cathedral in London is an example of an out-of-scale building; overburdened with decorations and striped all over on top, it leaves an impression of pettiness and con-
fusion in spite of its huge physical size. Its design has missed the right relationship to the human scale (Fig. 24).

**DISTANCE, TIME AND SPACE RELATIONS.** But it is not only the absolute size relation between our own body and the objects we see which has to be considered by a designer; he also must anticipate the varying distances from which the beholder may view his work. The effect of a building will be intense only when all requirements for human scale have been fulfilled for any potential distance or direction of view.

From far away its silhouette should be simple so that it can be grasped at a glance like a symbol even by an ever so primitive spectator as well as by a man passing in an automobile (Fig. 25). When we come closer we distinguish protruding and receding parts of the building, and their shadows serve as scale regulators for the new distance. And finally, standing close by, no longer able to see the whole edifice, the eye should be attracted by a new surprise in the form of refined surface treatment (Fig. 26).

Is it the result of instinctive sureness if the designer has applied the proper human scale, or that of knowledge, or does a balance of both account for it?

We know that the Indian architects first had to learn several crafts; then, in their forties, before they were permitted to build a temple, priests gave them secret training in mathematics. I wonder whether they had a science of vision. They certainly did not shrink from complicated working processes in order to achieve a desired optical effect. For instance, the miter lines of their richly molded cornices do not simply run parallel, as in Western architecture, but they meet in a distant vanishing point. This tapering off creates an optical illusion of greater depth and more impressive scale (Fig. 27).

For the same reasons, Iktinos, the designer of the Parthenon, which represents the culmination of perfection and subtlety in Western design, inclined its columns slightly toward the center axis of the building and delicately curved all its horizontal lines to compensate for the optical illusion of concavity; for a long, straight and horizontal line appears to cave in at its center because of the curvature of our retina. This distorts and weakens the effect. In order to counteract this illusion, the plinth of the Parthenon was raised four inches higher at its center than at its ends (Fig. 28). It is evident that the base was purposely built this way, for it stands on solid rock and its vertical joints are still very tight today, no settling could have displaced its original lines. Here intuition and intellect joined to triumph over the natural deficiencies of human vision. Here is true architecture.

These selected examples characterize the elements which form the language of design. What do we know about the relations of these elements in "space"? Every one of us has once in his life attempted to understand the infinite space by lying on his back, looking into the stars, thinking and trying to envisage the endlessness of the heavens, only to recognize that we are denied cognition of the infinite. The mathematician has invented the infinitely small and the infinitely large quantity. He has certain signs for them. But each is an abstraction we cannot understand. We comprehend space and scale only within a frame of reference which is finite. Confined space—open or enclosed—is the medium of architecture. The right relation between the building masses and the voids which they enclose is essential in architecture. This may appear obvious, but I have found that many people are not at all conscious of this relation, and that there are even trained architects who design only in terms of the buildings themselves, ignorant of the fact that the open spaces between them are just as important a part of the architectural composition.

Many of us still live innocently in a static three-dimensional world of Newtonian conception which has long since collapsed. Philosophers and scientists have replaced that static conception by a dynamic picture of relativity. In today's design terminology this profound change has been acknowledged by what we call "space-time" relations. Science has discovered the relativity of all human values and that they are in constant flux. There is no such thing as finality or eternal truth according to science. Transformation is the essence of life. I would like to quote a report about the Princeton Bicentennial meeting, "Planning Man's Physical Environment."

The Physical Environment which the architects were invited to consider had changed at a terrorizing velocity within their working lifetime. The expanding universe had become the exploding universe, and time, the new Fourth Dimension, had
become more ponderable than any of the other three. Man had changed, too, but not enough. The architects showed that their buildings had felt the now decisive effect of Time and its mirror, Motion—but Man emerged under their inquiring stare as a creature bent by the relentless past, confused by his vestigial emotions, and so handicapped by defective vision that he literally can see only what he wants to see.

Accordingly, the element of time, introduced as a new fourth dimension, begins to penetrate human thought and creation. **The Need for Change.** This shift in the basic concept of our world from static space to continuously changing relations engages our mental and emotional faculties of perception. Now we understand the endeavors of Futurists and Cubists who first tried to seize the magic of the fourth dimension of time by depicting motion in space (Fig. 29). In a picture by Picasso the profile and front of a face are depicted; a sequence of aspects is shown simultaneously (Fig. 30). Why? This element of time, apparent in modern art and design, evidently increases the intensity of the spectator's reactions. The designer and the artist seek to create new and stimulating sensations which will make us more receptive and more active. This statement corresponds with Sigmund Freud's findings that irritants generate life. Primitive cells kept in a solution, perfect in temperature and nourishment, slowly die in contentment; but if an irritating agent is added to the liquid they become active and multiply.

The English historian Toynbee tells a story of a ship's captain who won reputation by always bringing in the freshest herring. On his deathbed he gave away his secret, namely, that he had always put a catfish into the boat's fish tank. The catfish killed a few, frightened them all and thereby kept them in splendid condition. Similarly human beings receive new stimulation from irritants. **Art must satisfy this perpetual urge to swing from contrast to contrast; the spark, generated by tension of opposites, creates the peculiar vitality of a work of art.** For it is a fact that a human being needs frequently changing impressions in order to keep his receptive abilities alert. Unchanging conditions, perfect as they may be, have a dulling and lulling effect. To give a trivial example: A whole day's traveling in an air-conditioned Pullman car of evenly adjusted temperature, air velocity and humidity makes us uneasy. Even...

if it is a very hot day we like to step out at a station, seeking the contrast of less comfortable conditions, for this will enable us to enjoy again the comfortable air-conditioning back in the car. Our functions of adaptation have called for a contrast.

This need for change becomes very evident when we compare the psychological effects of daylight with those of artificial light. Recently I came across this statement in the Illuminating Engineering Society's *Report of the Committee on Art Gallery Lighting*: "Today any interior (museum) gallery can be artificially lighted to better effect than is possible by daylight; and, in addition, it can always reveal each item in its best aspect, which is only a fleeting occurrence under natural lighting." A fleeting occurrence! Here, I believe, is the fallacy; for the best available artificial light trying to bring out all the advantages of an exhibit is, nevertheless, static. It does not change. Natural light, as it changes continuously, is alive and dynamic. The "fleeting occurrence" caused by the change of light is just what we need, for every object seen in the contrast of changing daylight gives a different impression each time.

For instance, imagine the surprise and animation experienced when a sunbeam, shining through the stained glass window in a cathedral, wanders slowly through the twilight of the nave and suddenly hits the altarpiece (Fig. 31). What a stimulus for the spectator, though experiencing only a "fleeting occurrence." I remember a vivid experience I once had in the Pergamon Museum in Berlin. To me the light on the temple walls, coming from skylights, seemed to be too diffused and uniform. But one night I happened to drop in when a photographer with a large spotlight was at work. I was electrified by the effect of the strong direct illumination which brought the reliefs to life all of a sudden and helped me discover a new beauty of the sculptures which I had never observed before.

One day we may have at our disposal man-made moving sunlight to be used at will, varying in quantity, intensity and color. However, as long as artificial light cannot yet fully comply with our requirements, I believe that we should not exclude the dynamic qualities of daylight as supplement to artificial lighting wherever it is feasible because it satisfies our need for change. To give you an example of the psychological means at our disposal to keep our senses alert and responsive I shall try...
to analyze what could be done to make a visit to a museum into a stimulating instead of an exhausting experience. As we know, the capacity of a visitor to receive the messages of many masterpieces, crowded together, will dwindle rapidly unless we are able to refresh him frequently. His mind must be neutralized after each impression before a new impression can sink in. We cannot keep him in a high pitch of ecstasy for hours while he is wandering through a gallery, but the acuity of his interest can be kept awake by skillful design offering him ever varying space and light effects and an arrangement of display that is rich in contrasts. Only if he is thus compelled to use his natural functions of adaptation from tension to repose will he remain an untired and active participant. The arrangement of the exhibition spaces themselves and the distribution of exhibits in them should create a sequence of arresting surprises which must be well timed and properly scaled to fit the visitor's susceptibility. With this demand we enter the realm of architectural creation.

It is evident that motion in space, or the illusion of motion in space produced by the artist's magic, is becoming an increasingly powerful stimulant in contemporary works of architecture, sculpture, painting and design. In architecture today there is a preference for transparency, achieved through large areas of glass and through undercutting and opening parts of the building. This transparency aims at producing the illusion of a floating continuity of space. The buildings seem to hover, space seems to move in and out (Fig. 32). Sections of the infinite outdoor space become part of an architectural space composition which does not stop at the enclosing walls, as in past periods, but is carried beyond the building into its surroundings. Space seems to be in motion (Fig. 33).

COMMON DENOMINATOR FOR DESIGN. Educators in design have started to bring new order into the findings of philosophy and science. A basic philosophy of design needs first of all a denominator common to all. Some of the initial groundwork in the formulation of a language of design has been done by the Bauhaus, by Le Corbusier and Ozenfant in L'Espirit nouveau, by Moholy-Nagy in his The New Vision and Vision in Motion, by the teachings of Josef Albers, by Kepes's Language of Vision, by Herbert Read's Education Through Art and particularly by Le Corbusier's Modulor (Fig. 34) and by others in these and related fields.

Will we succeed in establishing an optical "key," used and understood by all, as an objective common denominator of design? This can, of course, never become a recipe or a substitute for art. Intellectual art is sterile, and no work of art can be greater than its creator. The intuitive directness, the short cut of the brilliant mind, is ever needed to create profound art. But an optical key would provide the impersonal basis as a prerequisite for general understanding and would serve as the controlling agent within the creative act.
Chapter 4
Blueprint of an Architect's Education *

A. General Educational Background

I BELIEVE that every healthy human being is capable of conceiving form. The problem seems to me not at all one of existence of creative ability but more of finding the key to release it.

This problem is not America's problem alone; but it is perhaps more acute in this country because Americans, in their great enthusiasm for learning, are likely even to outdo Europeans in their efforts to cultivate their receptive and reproductive abilities to such a degree that creative instincts sometimes become submerged. This is not true with respect to the creative and inventive spirit in the technical field. Here the living generation seems to have no difficulty at all in encouraging bold pioneering and proud disregard of standards set by the past. But people behave altogether differently in their attitude toward the arts. Our great heritage seems to have left us stunned and bereft of original impulse and, from being participators and creators, we have changed into connoisseurs and scholars. If we investigate the vague feelings of the average man toward the arts, we find that he is timid and that he has developed a humble belief that art is something which has been invented centuries ago in countries like Greece or Italy and that all we can do about it is to study it carefully and apply it. There is no natural, eager response to the works of modern artists who try to solve contemporary problems in a contemporary way, but, rather, a great uneasiness and a strong disbelief that they can turn out something worthy of the great works of their forefathers.

This surprising sterility is in my opinion due not so much to inborn lack of ability or interest, but is a result of the fact that we are today separated into two groups of beings—the "public" and the "expert." Each person feels that he is an "expert" in one or two fields and just the "public" in all the others. But you know, probably, from experience that no one is able really to appreciate any display of ability in any field if he, himself, has not to a certain degree taken part in its problems and difficulties at some time. But the way art and design are taught today to the average youngster often does not give him any clue toward contemporary problems and contemporary tasks. He emerges from school and college filled to the brim with knowledge, but he has rarely been engaged in the task of meeting himself. I think we have been exceedingly successful so far in working out ways of acquainting our children with the achievements of the past, but I do not think we are as successful in stimulating them to come forth with their own ideas. We have made them study art history so hard that they have found no time to express their own ideas. By the time they have grown up they have developed such fixed ideas of what art is that they have ceased to think of it as of something to be freely approached and recreated by themselves. They have lost the joyful, playful urge of their early youth to shape things into new forms and have become, instead, self-conscious onlookers. This, however, is not the fault of the individual but seems to have been caused by the social changes in life.

The Origin of Abstract Art. When, in the great art periods of former times—say, in the Middle Ages—an artist painted a Madonna, he was immediately understood by everybody on account of the common, established social and religious background of his contemporaries. Today we are living between two civilizations: the old one went to pieces, the new one is just in the making. An artist of today can be understood only by a clique, not yet by the whole community, as the spiritual content of our civilization is not yet so firmly settled that it may be clearly symbolized by the artist. This may give us also a clue to what brought about the so-called "abstract art" of today whose discoveries have so deeply influenced architecture. The community, being deprived of the old standards of social and religious ideals, confined the artist to isolation. He lost touch with the life of the community. His way out of this dilemma was his attempt to concentrate on the very medium of his art, observing and discovering new phenomena in space and color,
and abstaining from any literary content in his work. Naturally, art became severed from the life of the people. That is what we have to face today.

**Balance Between Experience and Book Knowledge.** I am convinced, though, that in every human being there are artistic faculties; the deeper values of life, however, are being impaired today by putting the emphasis of our existence on secondary considerations; business as an end in itself and this or that practical occupation. The “trade-mentality,” so to speak, has superseded the desire for a balanced life as it informed former periods. Our whole system of education is directed to fit the man as soon as possible for specialized work. As soon as the happy playtime of the child is over he becomes confined to only one sector of life, losing more and more his innate connection with the totality of life. Discrepancy between occupation and vocation is seriously increasing. The courage to venture into other fields of human experience has vanished in our specialized system of production with its almost exclusively material aims. No doubt education has suffered considerably from our overestimation of material aspects and of a one-sided intellectual approach. Good education, aiming at preparing the individual for a creative attitude and for equipoise in life, must certainly lead him beyond mere fact information and book knowledge into direct personal experience and action. We must give our young people more opportunity to acquire such personal experience during their educational training, for only if we make them “find” facts by themselves can knowledge turn into wisdom.

It is characteristic of the current trend that most influential educational plans published in recent years treat the visual arts rather casually, not at all as a discipline belonging to the central core of education. We seem to have forgotten that, since time immemorial, creative esthetic disciplines in the arts have always generated ethic qualities. We are too overconfident of the benefits from intellectual training. Art, being the product of human desire and inspiration, transcends the realms of logic and reason. It is a field of interest common to all, as beauty is a basic requirement for civilized life.

The true aim of all education—too often forgotten, however—is to stimulate enthusiasm toward greater effort. I am convinced that “safety first” is a foul slogan for a young man. The idea of personal security, being in itself an illusion, breeds irresponsibility and egoism. It is a mere materialistic conception. No durable result in any trend of education can be expected without a dominating ideal, the human or social component of which has to direct the professional one—not vice versa. Although such an aim may appear self-evident, it has become extremely rare in today's educational practice. Surely a student must be fitted for practical life, but the opposite danger of educating dreamers, secluded from the world, is hardly imminent today. The overemphasis on fact-knowledge, on intellectual reasoning has obviously carried our generation astray. It has lost touch with the totality of life and with its social implications. Intuitive quality—eternal source of all creative action—is being underrated. We see our youth mistrusting their own instincts and denying everything which cannot be conclusively reasoned. In my opinion they should, instead, be encouraged to be heedful of their emotions, learning to control rather than to subdue them. They need spiritual guidance beyond professional practicalities to develop their own creative substance, not only their intellect. The greater the spiritual aims, the better youth will conquer material difficulties. When intuition has found food, skill develops most rapidly while routine alone can never supersede creative vision. Highest reality can be given shape only by a being who has comprehended sublimest unreality.

**B. Curriculum**

**Creative Design.** In all great creative periods, architecture in its highest embodiment has been the dominating mother of all arts, has been a social art. I therefore believe that the architecture of the future is destined to dominate a far more comprehensive sphere than it does today. Today our architectural education is far too timid, overemphasizing scholarly discipline and almost solely directed toward the so-called “Fine Arts” and toward the past. An esthetic conception, so to speak, has fatally displaced a creative conception of art. Creative art and history of art should no longer be confused. “Creating new order” is the artist's task; that of the historian, to rediscover and explain orders of the past. Both are equally indispensable,
but they have entirely different aims. Successful teaching of creative design cannot therefore be handled by historians but only by a creative artist who is a “born teacher.”

The architect of the future should create through his work an original, constructive expression of the spiritual and material needs of human life, thus renewing the human spirit instead of rehearsing thought and action of former times. He should act as a co-ordinating organizer of broadest experience who, starting from social conceptions of life, succeeds in integrating thought and feeling, bringing purpose and form to harmony.

If we expect the future architect to be as many-sided as that, what must his preparation be?

ART IN THE NURSERY. If we start from the conviction that each healthy individual is originally capable of producing form, the optical sense should be developed already in early childhood. We must remember that the child’s urge to play leads to experiment and invention, source of all sciences and of all arts. Training must be started therefore in nurseries and kindergartens, giving the children abundant opportunity to build, model, draw and paint in a very free form, as in play, which is intended to attract the child and to stimulate his imagination.

ART IN SCHOOL. Creativeness in the growing child must be awakened through actual working with all kinds of materials in conjunction with training in free design. Throughout the whole duration of the school manual skill and form perception are to be trained simultaneously by “building” (with actual materials), assembling, modeling, painting, free-hand and geometrical drawing. But this is important; no copying, no elimination of the urge to play, i.e., no artistic tutelage! The whole task of the teacher is constantly to stimulate the child’s imagination and his desire to build and draw. The child’s drawings and models must not even be corrected, for his power of imagination is too easily irritated by grownups if we impose our own wider knowledge too much upon him. Knowledge of facts is indispensable, of course, but it must be taught with sufficient respect toward the younger being’s specific imagination, which differs from our own and which tends to find new expression. Imperceptibly guiding the child during the very difficult transition from play to work, the teacher—besides giving it the scientific

facts and technical advice—must encourage him again and again by trying to stimulate his indigenous inspiration.

PROFESSIONAL TRAINING IN DESIGN. Upon leaving school, the young student—planning to become an architect or designer—has arrived at that crossroads where a decision is due: either to follow the long way of higher education or to go directly into professional training. Here he urgently needs most thoughtful and careful advice. Is his character, his talent, his vision, his perseverance so strong, so promising that he should aim at becoming an independent architect or should he train himself rather to be a skilled draftsman? In order to diminish the number of false decisions made in this respect a sort of qualification test should be passed by all—a test of creativeness and power of imagination. All those students, who, possessing artistic talent, have passed the qualification test at the beginning of their training—also those who started first in a technical school—should then be offered a higher training in universities and schools of design.

METHOD OF TEACHING. For this part of his training consistency of approach in his studies is imperative. Overwhelmed by the profusion of contradictory opinions about the world at large as they are offered by institutions of higher learning he is in danger of becoming apathetic or cynical unless his educators present him with a definite and, as it were, unilateral curriculum which should not change its direction until a certain maturity is reached and a conviction has been formed. The objection that such a consistent method would be too one-sided is not valid, for only he who has understood really well one way of thinking will be able later to compare it to other ways of thinking and to select elements from them intelligently for his own creative attempts.

The teaching of a method of approach is more important than the teaching of skills. It should be a continuing process which must grow concentrically like the annual rings of a tree. In all its stages the scope should be all-embracing instead of sectional, increasing slowly in intensity and detail in all fields of discipline simultaneously. The integration of the whole range of knowledge and experience is of the greatest importance right from the start; only then will the totality of aspect make sense in the student’s mind. He will easily absorb all further
Such an educational approach would start the student off into a creative effort toward integrating simultaneously design, construction and economy of any given task with its social ends. Obvious as this demand appears to be from an intellectual point of view, educational experience has shown that it takes years to bring the student into the habit of simultaneously conceiving all three—design, construction and economy—as an inseparable and interdependent entity. The reason for the widespread sectional approach in architectural education seems to be the overemphasis on intellectual academic training and the resulting lack of opportunity for experience in field and workshop. I cannot see why knowledge alone should be made the primary object of education, when direct experience is just as indispensable as a basis for subsequent training. Paper has become too exclusive a medium of exchange. The book and the drafting board cannot give that invaluable experience gained by trial and error in the workshop and on the building site. Such experience should therefore be interwoven into the training right from the start, not added on later, after the academic part of learning has been already completed. For practical experience is the best means of guaranteeing a synthesis of all the emotional and intellectual factors in the student's mind; it prevents him from rushing off into "precocious" design, not sufficiently weighted down by the know-how of the building process. No doubt the fatal separation between craftsmanship and academic learning during the development of the machine age has split architecture from building. The problem of how to co-ordinate both—scientific knowledge and field experience—is crucial in our educational system. I will try to outline, therefore, a plan which might help to correct these present deficiencies, starting off first with a suggestion for a more scientific approach in design.

The general indolence of people toward the arts and architecture and the prevalent methods of education in design seem to be interdependent. Through improved education people should be encouraged to believe again in the basic importance of art and architecture for their daily lives. But so long as we consider the problems involved to be a matter of individual feelings which cannot be objectively defined as to standards of value, we cannot expect them to be recognized as basic for educational progress. The spiritual implications of art in society are to be redefined and, with the help of the scientists and using their methods of precision, the social and psychological components of art—not only the technical ones—are to be determined by a distinct order of values and meanings.

Common Denominator of Design. Basic order in design needs first of all a denominator common to all, derived from facts. A common language of visual communication will give the designer a foundation of solidarity for his spontaneous expression in art; it will free him from the sad isolation from which he is suffering at present since, in a socially disrupted world, we have lost the common key for understanding the visual arts.

In music a composer still uses a musical key to make his composition understood. Within the framework of only twelve notes the greatest music has been created. Limitation obviously makes the creative mind inventive.

In architecture the "golden means," the "modules" of the Greeks, the "triangulation" of the Gothic builders give evidence that in the past also optical keys have existed, serving as common denominators for the working teams of early builders. For a long period, however, no common denominator has guided our expression in the visual arts. But today, after a long, chaotic period of "l'art pour l'art," a new language of vision is slowly replacing individualistic terms like "taste" or "feeling" with terms of objective validity. Based on biological facts—both physical and psychological—it seeks to represent the impersonal cumulative experience of successive generations. Here roots true tradition.

Language of Vision. In modern architecture and design there is a reawakening toward a language of vision. We are able today to feed the creative instinct of a designer with richer knowledge of visual facts, such as the phenomena of optical illusion, of the relation of solids and voids in space, of light and shade, of color and of scale; objective facts instead of arbitrary, subjective interpretation or formulas long since stale.

Order of course can never become a recipe for making art. The artist's inspirational spark transcends logic and reason.
But a language derived from old and new discoveries in science controls his creative act. It provides simultaneously the common key for understanding the artist's message and transforms its paradoxical content into visible terms of expression.

Yet before it can become common to all, it must be made valid through general education. This goal cannot be reached by theoretical knowledge alone; it must be combined with continuous practical experience.

Emphasis on Practical Experience. Emotional faculties cannot be trained by analytical methods but only by creative disciplines as in music, poetry and the visual arts. Making is certainly not a mere auxiliary to thinking. It is a basic experience indispensable for the unity of purpose within the creative act. It is the only educational means which interrelates our perceptive and inventive faculties.

If we compare teaching the arts of design in the past with our present methods of training, the discrepancy becomes apparent at a glance. In the past, design was developed from apprenticeship in workshops—today, from the platonic drafting board. What used to be an auxiliary only for the maker of things—paper design—has become the central discipline of the designer. This shift of emphasis from learning by doing to intellectual discipline is typical of the present educational methods in design. But can an architect become a master of his craft without previous experience with tools and materials, without the know-how of an illuminating experience in building and making? Should architectural education then be separated from its present academic framework? Many architects would agree with a decisive turn toward greater emphasis on practical experience. I, personally, have grave doubts as to whether the present bookish climate of universities can offer at all a healthy breeding ground for architects. The impact of industrialization on our professions has been so decisive that the young generation of designers should be trained in close touch with the building industries and with their laboratories. As such a desirable change develops slowly, however, I shall attempt here to outline a transitional curriculum which, making use of existing academic facilities, aims at balancing academic learning by direct experiences in the workshop and on the building site.

Experimental Workshop and Preliminary Design Course. A continuous training of basic manual skill in experimental workshops combined with disciplines in the fundamentals of surface, volume and space, and of composition—derived from objective findings—must be developed on all levels of general and professional education. Both the reinstatement of workshop practice and the introduction of scientific courses leading to a common language of visual communication are basic requirements for successful teaching of the arts of design and especially of architecture.

This training should start with a general preliminary course aimed at co-ordinating the elements of handwork and design. As the beginner does not yet know the relationship in which he stands to the world at large, it would be wrong to put the "trade" idea or any specialization at the beginning of his training. In his natural readiness to grasp life as a whole a student should first get a comprehensive view of the vast field of possibilities for expression lying before him. The customary training in mere drawing is not sufficient as a preparation. Drawing and painting are certainly most valuable means of self-expression, but paper, pencil, brush and water color are not enough to develop the sense of space so necessary to freedom of expression. The student should be introduced first, therefore, to three-dimensional experiments; that is, to the elements of "building," i.e., composition in space with all sorts of experiments in materials. For example, observing the contrast between rough and smooth, hard and soft, tension and repose, will help the student to discover for himself by exercise of his hands the peculiarities of materials, their structure and textures. Working with materials, the student begins simultaneously to understand surface, volume, space and color. In addition to technical skill, he develops his own form language in order to be able to give visible expression to his ideas. After he has absorbed the elementary studies, he should then be ready to attempt compositions of his own invention.

The aim of such design work is to widen the personality rather than to provide professional skill. Its success will depend greatly on the qualities of the teacher who, by encouraging and stimulating, must release the student's own imagination, must oppose with objectivity any reproduction or imitation.
of other people's conceptions, including his own. The student will then experience his own ability for making creative short cuts which go beyond his preceding intellectual research.

Such a training will give confidence and independence and will thus enhance the productiveness and speed of any subsequent professional training.

Professional Training. After such preliminary experience the professional designer can then start his specialized curriculum from solid ground. Still he will need the workshop and the building site all along, to relate his design to the realities of materials and techniques. It is then that he will realize that his knowledge of the language of vision, his skill in construction, in draftsmanship and representation are all indispensable implements for expressing the all-important social end of his creative effort.

Field Practice. In educational practice, the best means of preserving the unity of the entire training on all levels is to relate it to as many realistic experiences as possible. The problems given should be built up on real conditions, suggesting an actual site and calling in a "client." The more the collaboration between teachers and students resembles office practice, the better. Visiting buildings under construction, manufacturing plants, research institutes will stimulate the student's imagination and strengthen his understanding of making and building. But most important, he should work as an apprentice on a building under construction or as an assistant to its clerk-of-the-works, in order to learn to cope with the elements of the building process, the assembly of building parts and the potential frictions between the various subcontractors. How can a student understand flashing and roofing via the drafting board, or the economic and technical problems involved in the sequence of the building process merely from drawings? In practice only, closely observing the procedure of executing a building from drawings, will he gather experience which will make sense to him. Knowledge collected by others and handed out to him theoretically remains a contention without proof in his mind; he can learn by experience only and not by authority. Every student, before applying for a professional degree, should therefore see a building being constructed from start to finish; such experience should be made obligatory.

In addition to such field practice, graduate schools should run a laboratory workshop in connection with a sample collection. Here, experiments should be made by teachers and students together for the finish of interior and exterior parts of buildings—textures and colors—and of their relations in space. As the practical part of the architect's profession is highly technical, he should be given opportunities for experimenting and testing similar to those given to students of medicine, biology and chemistry in their laboratories.

History of Art and Architecture. Studies in the history of art and architecture, intellectual and analytical in character, make the student familiar with the conditions and reasons which have brought about the visual expression of the different periods: i.e., the changes in philosophy, in politics and in means of production caused by new inventions. Such studies can verify principles found by the student through his own previous exercises in surface, volume, space and color; they cannot by themselves, however, develop a code of principles to be valid for present creation in design. Principles have to be established for each period from new creative work. History studies are therefore best offered to older students who have already found self-expression. When the innocent beginner is introduced to the great achievements of the past, he may be too easily discouraged from trying to create for himself. As soon as he has found his bearings, however, through self-expression in workshop and studio, history studies are a welcome means of refining his thinking without luring him into an imitative attitude. These studies should be started in the third year, instead of in the first year of training.

I sum up my conclusions for a transitional approach in architectural education:

1. The architect is to be a co-ordinator—a man of vision and professional competence—whose business it is to unify the many social, technical, economic and artistic problems which arise in connection with building.

   The architect has to recognize the impact of industrialization and should explore the new relationships dictated by the social and scientific progress.

2. In an age of specialization, method is more important than information. The training of an architect should be con-
centric rather than sectional. In essence it should be all-inclusive throughout its duration, gaining in certainty of approach—that is, in clearness of thought and in the know-how of its realization. It should aim at teaching the student that it is through a creative attitude and independence of conception that he will arrive at basic convictions, not by accepting ready-made formulas.

Most essential is the unity of educational purpose. Man is to be the focus; his spiritual and material needs in relation to the life of the community should determine all stages of the student's training.

2a. The approach toward any kind of design—of a chair, a building, a whole town or a regional plan—should be essentially identical not only in respect to their relationship in space but to social aspects as well. The common ideal to which all are addressed should be emphasized above their material and technical means of realization; for all products of design are to be part of the organic whole, part of our man-made environment in town and country.

3. Three-dimensional conception is the basic architectural discipline. Methods of stimulating interest in visual expression in all fields of the plastic arts must train the student first to see, to perceive distance, and to grasp the human scale. Such disciplines are indispensable for acquiring the instinctive sureness to organize three-dimensional space and to conceive it simultaneously in terms of structural efficiency, economy of means and harmony of appearance.

4. Knowledge will come to life only by individual experience. Therefore, designing and building—the drafting board and the job—should be closely related on all levels. Field practice should not be added on as a separate experience, after an academic training of several years' duration has been completed. It should be an integral part of the curriculum itself.

5. In the first year, basic design-and-workshop practice combined should introduce to the students the elements of construction and of "building" by developing three-dimensional exercises to be carried out with materials and tools. At the same time a design course, incorporating actual problems, should focus all activities of the group on the social aim of improving the life of the community. Elements of planning are to be included in these comprehensive initial studies.

6. In the second and third year, the design-and-construction studio, supplemented by field experience during the summer vacations and by activities in a laboratory, will correlate further experience with the broadening knowledge. The term "field experience" does not refer to work in an office, but to practice directly in the field, as an assistant to the foreman or the supervisor. This field experience—not less than six months—should be made obligatory for any professional degree in architecture. It should include also acquaintance with the building industry.

7. Construction should be taught as part and parcel of design, for both are directly interdependent. Equal emphasis must be put on both; no student should be promoted so long as he is deficient in either one. Design and construction problems should be related to actual conditions regarding the site and the requirements for the use of the building. They should be approached as inseparable from the problems of the community which include the all-important factors of economy.

8. The students should be trained to work in teams—also with students of related techniques—in order to learn methods of collaboration with others. This will prepare them for their vital task of becoming co-ordinators of the many individuals involved in the conception and execution of planning and building projects. The nature of teamwork will lead the students to good well-co-ordinated architecture rather than to flashy "stunt" design.

9. History studies should be started in the third year rather than in the first, to avoid intimidation and imitation. They should help the maturer students to analyze the origin of masterworks of the past and to show him how the architectural conception of a past period, as evident from the remaining examples, resulted from its religion, its social setup and its means of production.

10. Teachers should be appointed only after sufficient practical experience of their own, both in design and building. The trend to engage young men as teachers who have just completed an academic training is harmful. For only teachers with broad experience can muster the desirable resourcefulness so necessary to stimulate the student consistently all along. The best education can offer is stimulation, for it makes the student eager
to use his own initiative. Every teacher in architecture and engineering should have the right to private practice, for this alone can replenish his resourcefulness. Without such opportunity, he is bound to dry out rapidly and then withdraw to an "authoritative" platform.

11. Schools of architecture of smaller size—say, with an enrollment of 100 or 150 students—are more efficient than large ones. The most valuable intangible of a school, an intensive "atmosphere," results from mutual participation of faculty and students in all activities; this is easily lost in oversized schools so adverse to intimate group effort.

12. The efficiency of teaching performance depends on the number of students per teacher. An architect's training calls for individual coaching in order to help the student on terms adapted to his own personal talent and state of development. An overburdened teacher will be lost to all of his students. The desirable number of students per teacher should be twelve to sixteen at the most.

The emphasis in all my arguments is on the creative factor. That is, that a program of search rather than research makes the creative architect. Such a program, I believe, will lead our potential architects from observation to discovery to invention and finally to an intuitive shaping of our contemporary scene.

PART TWO
THE CONTEMPORARY ARCHITECT

Chapter 5

Appraisal of the Development of Modern Architecture

Today we are in a position to prove conclusively that the outward forms of modern architecture are not the whim of a few architects hungry for innovation, but the inevitable consequential product of the intellectual, social and technical conditions of our age. It has taken a quarter of a century of earnest and pregnant struggle to bring these forms into being—forms which evince so many fundamental structural changes when compared with those of the past. I think the present situation can be summed up as follows: a breach has been made with the past which enables us to envisage a new aspect of architecture corresponding to the technical civilization of the age we live in; the morphology of dead styles has been destroyed and we are returning to honesty of thought and feeling; the general public, which was formerly indifferent to everything to do with building, has been shaken out of its torpor; personal interest in architecture as something that concerns every one of us in our daily lives has been aroused in wide circles; and the lines of future development have become clearly manifest throughout Europe.

But this development has encountered obstacles: confusing theories, dogmas and personal manifestoes; technical difficulties and finally the dangers arising from formalistic will-o'-the-wisps. The worst of all of these was that modern architecture became fashionable in several countries! Imitation, snobbery and mediocrity have distorted the fundamentals of truth and simplicity on which this renaissance was based. Spu-

rious phrases like “functionalism” and “fitness for purpose equals beauty” have deflected appreciation of the new architecture into minor and purely external channels. This one-sided characterization is reflected in that frequent ignorance of the true motives of its founders, and a fatal obsession which impels superficial people to try to relegate this phenomenon to one isolated province instead of perceiving that it is a bridge which unites opposite poles of thought.

The idea of rationalization, which many people aver is the outstanding characteristic of the new architecture, is only its purifying role. The other aspect, the satisfaction of the human soul, is just as important as the material. Both find their counterpart in that unity which is life itself. The liberation of architecture from the mass of ornament, the emphasis on the functions of its structural members and the quest for concise and economical solutions, only represent the material side of that formalizing process on which the practical value of the new architecture depends. **What is far more important than this structural economy and its functional emphasis is the intellectual achievement which has made possible a new spatial vision—for whereas the practical side of building is a matter of construction and materials, the very nature of architecture makes it dependent on the mastery of space.**

The transformation from manual to machine production so preoccupied humanity for a century that instead of pressing forward to tackle the real problems of design, men were long content with borrowed styles and formalistic decorations.

This state of affairs is over at last. A new conception of building, based on realities, has developed; and with it has come a new and changed perception of space. The very different appearance of the numerous good examples of the new architecture which already exist exemplify these changes and the new technical means we now use to express them.

How far has the struggle progressed in the meantime, and what parts have the various nations played in it? I will begin with the precursors of the prewar era, and confine myself to contrasting the actual founders of the new architecture up to 1914: Berlage, Behrens, myself, Poelzig, Loos, Perret, Sullivan and St. Elia; and drawing up a brief balance of their joint achievement. The governing factors in my choice will be, not
Headquarters in Vienna at the turn of the century, Wagner dared to expose plain surfaces entirely free of decoration and moldings. Today, it is almost impossible for us to imagine what a revolution such a step implied. Simultaneously Adolph Loos, another Viennese, began writing those articles and books in which he set forth the fundamentals of the new architecture, and building that large shop in the Michaelplatz, immediately opposite the Hofburg in Vienna, which so inflamed the passions of a population accustomed to Baroque forms.

In 1913 Futurism was launched in Italy, of which St. Elia, who unfortunately died in the war, was one of the leading adherents. At the 1933 Triennial Exhibition in Milan his memory was invoked by Marinetti, the founder of Futurism, as one of the great originators of the new architecture. St. Elia wrote astonishingly accurate anticipations of the ideology of the coming architecture, but he never had a chance to carry out any practical work. His project for a skyscraper on a four-tiered street remained a paper design.

In Holland development was slower. Berlage, De Bazel and Lauweriks, who based their work on anthropological premises, had reanimated the use of geometrical systems in design, and had also, in emulation of those important English pioneers, Ruskin and Morris, inspired a revival of handicrafts. A romantic mystical school continued in Holland until well into the postwar decade. It was in 1917, three years after the Cologne Exhibition, that the group known as “Stijl” was formed, of which Oud and Van Doesburg became the leaders. In 1914 the most advanced buildings in Holland were Berlage’s office buildings and De Klerk’s housing blocks.

In the United States the revival of architecture had begun as far back as the eighties, simultaneously with the development of a new constructional technique.

Root built a brick skyscraper in Chicago in 1883. About the end of the century Sullivan—Frank Lloyd Wright’s far too little recognized master—constructed buildings of this type which are epoch-making, and also formulated architectural principles which contain the pith of the functional doctrines of today. We must not forget that it was Sullivan who wrote, “Form should follow function.” Intellectually speaking, he was more articulate in his ideas than Frank Lloyd Wright, who was later to inspire so many European architects in both a spatial and a structural sense. Later on, and more particularly in the postwar period, Frank Lloyd Wright began to manifest a growing attachment to romanticism in his lectures and articles that was in sharp contradiction to the European development of the new architecture. At the present moment the Americans have the most fully developed constructional technique of any nation in the world—as I had an opportunity of seeing for myself in the course of my investigations in the United States. But in spite of Sullivan and Frank Lloyd Wright and a very highly developed technical organization, their artistic evolution has remained in abeyance. The intellectual and cultural background necessary for its preparation does not as yet exist.

This outlines the most important development in the period prior to the war. The war intervened, but at its close the new architecture blossomed forth simultaneously in several centers. The most organic and continuous progress was made in Germany, where the leaders of the movement were all moving spirits in the Deutscher Werkbund, and a wide circle of supporters was soon found to share their views. In 1919 the Bauhaus was founded at Weimar, and later on its practical influence on housing developments in the cities with its marked social effect became apparent. Thereafter the movement began to be welcomed by public authorities at large.

In Holland the “Stijl” movement began to take root; Oud, Rietveld, and Van Loghem built their first buildings, and the City of Amsterdam its extensive housing estates. The “Stijl” movement had a marked effect as propaganda, but it over-emphasized formalistic tendencies, and so provided the impulse that made “cubic” forms fashionable. The structural concepts of the new architecture are now beginning to oust the theories which inspired the Dutch Modernists.

About the same time, the French-Swiss Corbusier, who had studied for a time under Peter Behrens, began to work in France. In 1916 he was still using pilasters and cornices, but shortly afterward he started to edit L’Esprit Nouveau, and to produce architectural and literary work of an astonishingly wide scope which made a profound impression on the young generation in every country. But in contrast to Germany, where a whole following had sprung up in and around the Bauhaus,
the movement in France developed only as the purely personal concern of a few individuals; and people in general remained indifferent, with the result that no new school arose as a logical result of their activities.

Switzerland produced a number of capable architects after the war who considerably influenced the movement, more particularly in regard to town planning.

The Stockholm Exhibition of 1930 was an important success for the new architecture in the Scandinavian countries.

England's contribution has been confined to housing and town planning; but Sir Raymond Unwin's ideas and the English garden cities have influenced the whole European housing movement.

Bourgeois accomplished useful pioneering work in Belgium, and has taken a successful part in the replanning of Brussels.

Vigorous young groups have been formed in Czechoslovakia, Poland, Spain and England; while a very active Japanese group exists at Osaka.

In the United States, the Austrian Neutra and the Dane Lönborg-Holm, who have made their home there, and who are both men of outstanding initiative and energy, are carrying on the movement. The younger generation of Americans, some of whom studied at the Bauhaus, are slowly beginning to find their bearings and evolve their own formal components.

The appearance of co-operative working groups, to which I have just drawn attention, is characteristic of the latest development of the new architecture. In countries which might be supposed to have least in common with one another similar free organizations of young architects have been formed, roughly speaking, on the Bauhaus model, who collaborate in practical and experimental work. I consider this co-operative principle particularly promising, and very appropriate to the spirit of our age; especially when these groups include engineers and economists. Such groups—when led by men who possess the right qualifications for holding their members together and inspiring the team spirit—are a guarantee for the thoroughness and many-sidedness of the work produced, as each member inspires his fellow. But groups of this kind must be founded on a voluntary basis. It is impossible to run them within the usual frame of rules and regulations.
An international organization based on the same principles called “Les Congrès Internationaux d’Architecture Moderne” (CIAM) was formed in Switzerland; to which twenty-seven national groups have since adhered. The objects of the congress are to pool the experience of the different countries, and to co-ordinate the results so as to provide practical data and sound directives for town planning and to insure their recognition and adoption in the various countries. This orientation of the congress work is not, of course, accidental, but represents a direct continuation of the original principles of the new architecture applied to the larger unit of the town. The conception which the new kind of architect has of his calling, as that of a co-ordinating organizer, whose business it is to resolve all formal, technical, sociological and commercial problems and combine them in a comprehensive unity, has inevitably extended his researches beyond the house to the street, from the street to the more complete organism which is the city itself; and ultimately into the wider field of regional and national planning. I believe that the future development of the new architecture is bound to embrace these wider spheres, and concern itself with all their congruent details; and that it must inevitably progress toward an ever fuller conception of the province of design and construction as one vast indivisible whole whose roots are embedded in life itself.

In the face of these proofs of the genuineness of the movement no one who takes the trouble to investigate its sources can possibly still maintain that it is based on an antitraditional obsession for technique qua technique which blindly seeks to destroy deeper loyalties and is doomed to lead to the deification of pure materialism. The order by which it seeks to restrict arbitrary caprice is the result of a most thorough social, technical and artistic investigation. I believe that our conception of the new architecture is nowhere in opposition to that of tradition; since respect for tradition does not imply an esthetic preoccupation with bygone forms of art, but is, and always has been, a struggle for essentials—that is to say, a struggle to get at what is at the back of all technique, which is forever seeking visible expression with its help.
Chapter 6

Archeology or Architecture for Contemporary Buildings? *

Architecture is said to be a true mirror of the life and social behavior of a period. If that is true, we should be able to read from its present features the driving forces of our own time. There is conflicting evidence, however. If we compare current public buildings—for example, the "classical" character of the National Gallery in Washington—with the contemporary character of the new group of buildings for the United Nations, a deep-seated controversy becomes apparent.

We will find an even more puzzling discrepancy if we observe the current state of collegiate architecture, which is bound, of course, to influence the next generation growing up in and around it.

Should it follow the Gothic tradition or the Georgian tradition or should it fulfill the requirements of new college buildings by using "modern" means of expression unprejudiced by any period design? And, if this last trend seems to have become more prevalent in recent years, why is that so? What is happening to tradition? What stand will finally be taken by responsible educators? These questions seem to touch the very roots of our civilization, laying open both its weaknesses and its virtues.

Good original architecture depends just as much on an understanding public as on its creators.

Vasari tells the revealing story of Brunelleschi's cathedral in Florence and how the entire population participated in its development. People get the kind of architecture they are ready for, and tendencies in education which foster either creative habits or imitative habits are decisive in forming their attitude.

One of the consequences of our purely analytical and intellectual approach to education has been the habit of teaching the visual arts by historical and critical methods of appreciation and information instead of by participation in the processes and techniques of making things. Esthetic connoisseurship has generally displaced a creative conception of art.

Here, then, we find the very reason for the timid attitude so often shown when the architectural character of new college buildings has to be decided upon. We seem to have forgotten that there is an opportunity to make architectural history for ourselves and to have buildings designed in unmistakable terms of our own period.

What we need is a new code of visual values. So long as we flounder about in a limitless welter of borrowed artistic expression, we shall not succeed in giving form and substance to our own culture, for this implies selective choice of those artistic means which best express the ideas and spiritual directions of our time.

The impact of environment on a young man during his college years is certainly decisive. If the college is to be the cultural breeding ground for the coming generation, its attitude should be creative, not imitative. Stimulating environment is just as important to free the student’s creative talent as rigorous teaching.

Accordingly, the student needs the real thing, not buildings in disguise. So long as we do not ask him to go about in period clothes, it seems absurd to build college buildings in pseudo-period design. How can we expect our students to become bold and fearless in thought and action if we encase them timidly in sentimental shrines, feigning a culture which has long since disappeared?

The physical and spiritual functions determining the design of a building are interdependent. They are both part of our present life. It is an anachronism to express the physical functions with the newest technical means but to express the spiritual functions by borrowing a historical shell from the past. Such an attempt confuses the art of architecture with applied archeology. Genuine architecture of organic growth implies continuous renewal.

As history shows, the conception of “beauty” has changed along with progress in thought and technique. Whenever man imagined he had found “eternal beauty,” he fell back into imitation and stagnation. True tradition is the result of constant

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* This article, published in the New York Times Magazine of October 23, 1949, under the title “Not Gothic But Modern for Our Colleges,” received the Howard Myers Memorial Prize in 1951.
growth; its quality must be dynamic, not static, to serve as an inexhaustible stimulus to man.

If, from this vantage point, I now look at my own immediate problem in hand—the design of the new Graduate Center for Harvard University—and contemplate the way in which these structures can be made into a vital link between the historic mission of a great educational institution and the restless, inquisitive minds of the young men and women of today, I know that it cannot be done without enlisting the student's wholehearted emotional response as well as by paying due respect to the specific architectural tradition of Harvard University.

What now is this tradition? Harvard's "Yard," so familiar to many sons of this country, shows a sound basic theme of architectural design which has been reverently kept throughout the centuries by almost all the architects who have contributed individual buildings; a composition of quadrangles, varying in size and confined by individually different buildings, offers a sequence of arresting surprises in space.

This spatial theme fulfills an ancient requirement of the art of architecture—namely, to balance artfully the building masses and open spaces in conformity with the human capacity to experience and sense harmonious space and scale.

The buildings themselves, however, though each is an integral part of the whole, do not "match." Harvard's most famous architectural bequests, built during three centuries, could hardly differ more strikingly in their enriching contrasts of forms and colors. Yet they all conform to the noble spatial pattern of the Harvard Yard.

Careful study of this existing pattern of open spaces and structures has therefore become the starting point for the design of the new Harvard Graduate Center. For here lies the inherent tradition of the Yard; its timeless pattern may well be interpreted again today in new terms of architecture, valid for present-day life.

There is no need to emulate the "atmosphere" of this or that period. New buildings must be invented, not copied. The great periods of architecture in the past have never imitated the periods of their forefathers. In one and the same famous build-
must move on or die. Its new life must come from the tremendous changes in the social and technical fields during the last two generations.

Neither medievalism nor colonialism can express the life of the twentieth-century man. There is no finality in architecture—only continuous change.

Chapter 7

The Architect Within Our Industrial Society *

Background Analysis. In my analysis I anticipate that architecture as an art starts beyond the demands of construction and economy on the psychological plane of human existence. The satisfaction of the human psyche resulting from beauty is just as important for a full, civilized life, or even more so, than the fulfillment of our material comfort requirements. The emotional blocks which bar the development of more organically balanced living must be met at the psychological level, just as our practical problems are met at the technical level.

Is the maker of the rose or the tulip an artist or a technician? Both, for in nature utility and beauty are constitutional qualities, mutually and truthfully interdependent. The organic form process in nature is the perpetual model for every human creation, whether it results from the mental strife of the inventive scientist or from the intuition of the artist.

We all still have before our mind that unity of environment and spirit that prevailed in the horse and buggy time. We sense that our own period has lost that unity, that the sickness of our present chaotic environment, its often pitiful ugliness and disorder have resulted from our failure to put basic human needs above economical and industrial requirements. Overwhelmed by the miraculous potentialities of the machine human greed has obviously interfered with the biological cycle of human companionship which keeps a community healthy. At the lower level of society the human being has been degraded by being used as an industrial tool. This is the real cause for the fight between capital and labor and for the deterioration of community relations. We now face the difficult task to rebalance the life of the community and to humanize the impact of the machine. It dawns on us that the social component weighs heavier than all the technical, economic and esthetic problems.

The key for a successful rebuilding of our environment—which is the architect's great task—will be our determination to let the human element be the dominant factor.

But in spite of the effort of quite a few of us, we obviously did not yet find the spiritual bond to hold us together for a concerted effort at establishing a cultural denominator strong enough to becalm our fears and to grow into a common standard of expression.

The artists among us must grow impatient for such a synthesis, which would make whole what is now still unhappily disconnected.

We cannot deny that art and architecture had become an aesthetic end in themselves, because they had lost touch with the community and the people during the industrial revolution. The external embellishments of a building were designed mainly to outdo those of the neighboring building instead of being developed as a type fit to be used repeatedly as a unit in an organic neighborhood pattern. The emphasis on being different instead of searching for a common denominator characterized our last generation of architects who dreaded the antihuman influence of the machine. The new philosophy in architecture recognizes the predominance of human and social requirements and it accepts the machine as the modern vehicle of form to fulfill these very requirements.

If we look backward into the past we discover the curious fact that a combination of both, a common denominator of form expression and individual variety was in evidence. The desire to repeat a good standard form seems to be a function of society, and that was true long before the impact of industrialization. The designation “standard” as such has nothing to do with the means of producing it—the hand tool or the machine. Our future houses will not necessarily be regimented because of standardization and prefabrication; natural competition on the free market will take care of individual variety of the component parts of buildings, just as we experience today a rich diversity of types for machine-made everyday goods on the market. Men did not hesitate to accept widely repeated, standard forms in the premachine periods of civilization. Such standards resulted from their means of production and from their way of living. They represented a combination of the very best

many individuals have contributed to the solution of a problem. The standard forms of architecture of the past express a happy blend of technique and imagination, or rather a complete coincidence of both. This spirit—though by no means its dated forms—should be revived to create our own environment, with our new means of production, the machine.

But if they are not constantly checked and renewed, standards become stagnant. We know now that it is a futile attempt to try to match standards of the past, that our recent obsession with the idea that new buildings must always match existing ones betrayed a terrible weakness of our time, a silent admission of spiritual bankruptcy, for which there is no other example in the past. After the revolution in our own ranks, which has brought clarification, we seem to be set for a new creative effort. So it might be appropriate to investigate how far our professional framework fits the condition of our time, which I have tried to outline. Let’s see whether the gigantic shift in the methods of production has been sufficiently recognized by us. For we have to see our case in the light of technological history and as we are not living in a period of sweet contemplation and security, we should reconsider our basic principles, for there are certainly some disturbing facts we cannot disregard any longer.

In the great periods of the past the architect was the “master of the crafts” or “master builder” who played a very prominent role within the whole production process of his time. But with the shift from crafts to industry he is no longer in this governing position.

Today the architect is not the “master of the building industry.” Deserted by the best craftsmen (who have gone into industry, toolmaking, testing and researching), he has continued thinking in terms of the old craft methods, pathetically unaware of the colossal impact of industrialization. The architect is in a very real danger of losing his grip in competition with the engineer, the scientist and the builder unless he adjusts his attitude and aims to meet the new situation.

Separation of Design and Execution. Complete separation of design and execution of buildings, as it is in force today, seems to be altogether artificial if we compare it to the process of building in the great periods of the past. We have withdrawn
much too far from that original and natural approach, when conception and realization of a building were one indivisible process and when architect and builder were one and the same person. The architect of the future—if he wants to rise to the top again—will be forced by the trend of events to draw closer once more to the building production. If he will build up a closely co-operating team together with the engineer, the scientist and the builder, then design, construction and economy may again become an entity—a fusion of art, science and business.

I will be more specific and reveal my target: The American Institute of Architects at its 1949 convention added to the mandatory rules of the Institute a new paragraph which reads: “An architect may not engage directly or indirectly in building contracting.”

I have very great doubts about the wisdom of this rule which would perpetuate the separation of design and construction. Instead we should try to find an organic reunification which would return to us the mastery of the know-how in building. Of course, the intention of this mandatory paragraph has been a good one, namely to block unfair competition. But I am afraid that it represents merely a negative veto and does not try to solve our dilemma constructively.

Let us not deceive ourselves as to the strength of our present position in the eyes of our clients. The average private client seems to consider us as members of a luxury profession whom he can call in if there is some extra money available for “beautification.” He does not seem to consider us as essential for the building effort as the builder and the engineer.

If you think I exaggerate, look at the facts in the U.S.A.: More than 80 per cent of all U.S. buildings are being built without an architect.

Average income of the architect is less than a bricklayer makes in the East.

People generally do not understand the complicated task of the architect as we define it, and we have not been able sufficiently to clarify the issue.

When a client is in the building mood, he wants to buy the complete building for a fixed price and at a definite time of delivery. He is not at all interested in the question of the division of labor between architect, engineer and contractor. Since he senses subconsciously that it is rather artificial to keep design and building so wide apart, he usually concludes that the architect may be the unknown “X” in his calculations, in terms of money as well as time.

And what else can we expect? Are we not in an almost impossible position, having to meet a set price, though we have to start almost every commission with a kind of research and laboratory approach? Compare that with the long process in industry from paper design to test model to final product. In our field of design we have to absorb all the cost of research ourselves, for with us the model and the end product are one and the same. Has this not become an almost unsolvable task, particularly because it is subject to changes caused either by the client or by public agencies?

We often question the soundness of the business angle of our activities when we realize that the greater the ingenuity and the harder the work we devote to reducing costs, the more we are penalized by lesser payment. The client on the other hand assumes that it must be in the material interest of the architect to increase the building cost deliberately, since this would also increase the architect's percentage fee. So he often tries to settle for a lump sum fee. Of course we have to oppose that tendency of the client, as it is quite unfair to us, but that does not solve the ticklish problem in either direction. Here indeed is our greatest ethical dilemma. It often causes distrust on the part of the client, because of its inherent injustice to both parties; it even keeps many clients from seeking our service altogether.

**Example of Industrial Designer.** This does not happen to the designer of industrial products, who is usually paid for his initial service to develop the model, plus royalties from multiplication of the product. He benefits from the success of his work not only financially, but also in stature as a legitimate member of the team to which he belongs, along with the scientist, the engineer and the businessman. This process, developing more and more in industry, is carrying the previously isolated artist-designer back into the fold of society.

I am convinced that a similarly co-ordinated teamwork will also become the trend within the building industry. This should
give the future architect, who is by vocation co-ordinator of the many activities concerned with building, once more the opportunity to become the master builder—if we are only willing to make the necessary changes in attitude and training. Of course, whether he shall be able, personally, to reach the high historical aim of his profession to integrate through his work all social, technical and esthetic components into a comprehensive, humanly appealing whole, that will depend on his creative vision. I say his "aim" for whether he actually is the master depends of course on his performance within the collaborating team. He cannot claim leadership as such, for the best man in a team should lead. But the historical mission of the architect has always been to achieve the complete co-ordination of all efforts in building up man’s physical surroundings. If he wants to be faithful to this high mission, he must train the rising generation in conformity with the new means of industrial production instead of confining them to a training at the platonic drafting board, isolated from making and building.

**Industrialization and Prefabrication.** The machine certainly has not stopped at the threshold of building. The industrialization process of building seems only to take longer to complete than it took in other fields of production, since building is so much more complex. One component part of building after another is being taken out of the hands of the craftsman and given to the machine. We have only to look at manufacturers’ catalogues to become convinced that already an infinite variety of industrialized component building parts exists at our disposal. In a gradual evolutionary procedure, the hand-building process of old is being transformed into an assembly process of ready-made industrial parts sent from the factory to the site. Furthermore, the proportionate percentage of mechanical equipment in our buildings is steadily increasing. Prefabrication has penetrated much further into the building of skyscrapers than into residential building.

But, to be honest with ourselves, we must admit that only relatively few of us architects have directly taken part in influencing and performing this great change, or in designing those component parts which we all use in building. It is the engineer and the scientist who have been instrumental in this development. That is why we have to speed up to regain lost ground by training our young generation of architects for their twofold task: (1) to join the building industry and to take active part in developing and forming all those component parts for building, and (2) to learn how to compose beautiful buildings from these industrialized parts. This presupposes, in my opinion, much more direct participation and experience in the workshop and in the field in contact with industry and builders than our usual training provides.

The coming generation of architects must bridge that fatal gap between design and building.

To begin with, let’s stop squabbling about styles; every architect owes it to himself to defend the integrity of his design effort. What matters to the profession as a whole is to close ranks, to do some hard thinking together, and then to come up to constructive decisions as to how we may reopen the gate leading into the field of building production for the benefit of the younger generation of architects. They are beginning to lose confidence in the trusteeship character of our professional setup and in its logical result: the self-appointed prima donna architect. Architects in the future will refuse to be restrained from a natural urge to take actual part in a team effort with the industry to produce buildings and their parts. The emphasis, I believe, will be more and more on the team.

**Teamwork.** For years I have been personally concerned, through my activities as an educator, with the plight of young architects as they leave school and enter into practice. I have seen them make valiant attempts to establish themselves independently, and I have seen them more often resign themselves to work indefinitely as draftsmen in large offices which offer little or no chance of exercising individual initiative. It is sad to see so much youthful energy and talent dry up by the slow attrition of our more and more centralized working system. Democratic concepts cannot easily survive the assaults of our increasing mechanization and superorganization, unless an antidote is used which may protect the individual in his struggle against the leveling effect of the mass mind.

I have tried to find such an antidote by introducing my students in Harvard, besides their individual training, to the experience of working in teams. This has become a valuable
stimulant to students as well as to teachers who were all equally unacquainted with the advantages and difficulties of collaborating in groups. Now they had to learn to collaborate without losing their identity. This is to me an urgent task lying before the new generation, not only in the field of architecture but in all our endeavors to create an integrated society.

In our particular field there is no book of rules for such collaboration, unless we go back as far as the Middle Ages to study the working teams of the great cathedral builders. Most striking within the organization of those building guilds was the fact that until late in the eighteenth century every craftsman on the job was not an executing hand only, but was permitted to put his own design into his part of the work as long as he abided by the master's guiding key of design, which was the secret, geometrical auxiliary of the building guilds, similar to the keys in musical composition. Preconceived paper design hardly existed at all; the group lived together, discussed the task and built their ideas.

Compare this with our present conditions. We are expected to put all our design ideas, unto the last screw, into drawings and specifications. Then an army of workmen has to execute our design. We are hardly permitted to make any changes though there is no genius who could have sufficient foresight or imagination properly to judge the effect of every detail of his preconceived design; even less so the more he stays aloof from the practical process of building and making. Nor has the workman of today any chance to contribute to the design of a building. Since the time of the building guilds, collaboration among men, which would release the creative instincts of the individual instead of smothering them, has not been practiced much and we find very little knowledge about the basic requirements which made such teamwork possible. It is so unknown today in our profession that it is apt to be even viewed with apprehension, because the ideology of the past century has taught us to see the individual genius the only embodiment of true and pure art. It is true that the creative spark originates always with the individual, but by working in close collaboration with others toward a common aim, he will attain greater heights of achievement through the stimulation and challenging critique of his teammates, than by living in an ivory tower. Of course, the creative mind asserts itself usually under any circumstance, even against heavy odds, but if we want to raise the average performance, teamwork becomes essential to sharpen and improve the individual contribution.

The condition sine qua non of true teamwork is voluntariness; it cannot be established by command. It calls for an unprejudiced state of mind and for the firm belief that togetherness of thought and action is a prerequisite for the growth of human culture. Individual talent will assert itself quickly in such a group and will profit for its part from the cross-fertilization of minds in the give and take of daily contact. True leadership can emerge when all members have a chance to become leaders by performance, not by appointment. Leadership does not depend on innate talent only, but very much on one's intensity of conviction and devotion to serve. Serving and leading seem to be interdependent.

Our time is probably as rich as any in original talent, but too often this is doomed to spend itself in isolated accidental bursts of creativity because its message is lost for lack of a comprehensive response. If we could reclaim the individual genius for his natural task, i.e., to work as a primus inter pares—first among equals—instead of in exalted isolation, a much broader basis for understanding and response could be formed.

Certainly good intention alone is not sufficient for building up a team. We have to relearn methods of collaboration. It takes considerable time to acquire certain habits which seem indispensable for fruitful teamwork. I discovered that it was first of all imperative that every participant of the team must tell the other members right from the start what he is thinking and doing in a continuous mutual exchange. But even if everyone has the best intention to proceed that way in the beginning, it takes quite a while to train oneself to this end. Then this exchange becomes indispensable, as it places the different individuals in the right place within the collaborating team and, of course, everyone likes to do what he is particularly fitted for. Research then grows quickly, and a variety of opinions develops into a challenge for the team to come to final terms. In the flood of so many objective problems that have to be solved, the natural vanity of the individual is slowly drowned. The
task grows gradually above the individual, who finally hardly remembers who initiated this or that part of the idea, as all their thoughts resulted from mutual stimulation. The stature of the individual grows under this voluntary collective effort of the team. As democracy obviously hinges on our ability to co-operate, I want the architect, as a co-ordinator by vocation, to lead the way toward developing the new technique of collaboration in teams. The essence of such technique should be to emphasize individual freedom of initiative, instead of authoritative direction by a boss. Experimenting with teamwork keeps one resilient and flexible and its methods are probably more adaptable to the rapid changes of our time than the boss-employee relationship. Synchronizing all individual efforts the team can raise its integrated work to higher potentials than is represented by the sum of the work of just so many individuals.

I should like to leave no doubt however that the type of team which will be effective for future building must certainly reach into the field of production. Increasing specialization needs ever growing co-ordination.

To accomplish the first of the twofold tasks of the future—the development of the component building parts—the architect needs to build up a team with the scientist and the manufacturer. His second task—the design of finished buildings from such component parts, and their actual assembly on the site—should be solved in a closely integrated collaboration between him, the engineer and the builder in direct contact with industrial methods and research.* It is quite obvious that we as individual architects have no facilities to test new materials and new technological methods, and even less to control our wealth of new technical potentialities the way the master builder of old controlled the crafts. In order to become more effective again for the whole process of building, we need the team and the production tools of industry. But we should not assume that our self-determined privilege to act as leader of the team will be accepted per se. As latecomers in industry we have to take the risk to join the team as equals and then to show by way of our own performance whether we shall be able to act as first among equals and so finally to change that rank order of public esteem in the architect's favor.

The essential difference of our industrialized society compared to a society of handcraftsmen rests upon the distribution of labor, not upon the tools used. A complicated textile machine represents only a refinement of the early hand loom. But it marks a change of principal importance if the entity of a working process is handled by one and the same craftsman, or if it is subdivided into many fragments, each of which is being put into the hands of another worker, as at the assembly line. It is this atomizing effect of the subdivision of labor which has exploded the coherence of the premachine society, not the machine itself. I confidently hope that organically built-up teamwork will gradually give us back that essential connectedness which is indispensable for a unity of effort.

I have merely tried to throw some light on the crossroad to which our profession has come. One of the two roads appears rough but wide and full of venture and hope. The other narrow one may lead into a dead end.

I have made my personal choice where to go, but being along in years, all I can do is to urge those who represent the next generation to search for a constructive solution how to correlate again design and execution in their future practice by direct participation in industrial and building production. For I cannot convince myself that it shows a lack of integrity when a young architect and a young builder decide to join hands in order to build up a complete modern service—both design and building execution. We should instead actively encourage such a natural combination.

I have been asked whether it would not leave the client high and dry when he is deprived of the trustee control of his architect. My reply is that we do not need trustees for buying our everyday goods; we select them on account of the good reputation of the make or of the manufacturer. I do not see any difference as to buildings and their component parts. Of course, I know that the task of reconciling design and execution—which should be inseparable—will still meet a great many difficulties which can only be slowly solved in practice. But

* With this type of collaboration I do not refer to the so-called “package deal” corporations, as they treat architectural design more or less as a minor appendix only to the all-important business transaction. In the team which I have in mind the designer must have as much power of decision as the businessman and the builder. He must be a legitimate partner.
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it is always a change of attitude first which precedes any implementa-
tion of a new course of direction.

This proposal I certainly do not think of as a cure-all for the ills that beset our profession. Nobody knows yet which measures will have to be taken to protect it against unfair competition, while at the same time giving the green light to those who want to take creative part also in the production itself of buildings and building parts. All I propose to do in today’s state of fluidity is to keep the door open to a new set of problems, and knotty ones at that, which are the result of the impact of industrialization and must be solved by the new generation of architects.

Chapter 8

Architect—Servant or Leader? *

MODERN architecture is not a few branches of an old tree—It is new growth coming right from the roots. This does not mean, however, that we are witness to the sudden advent of a “new style.” What we see and experience is a movement in flux which has created a fundamentally different outlook on architecture. Its underlying philosophy knits well with the big trends in today’s science and art, steadying it against those forces which try to block its advance and to retard the growing power of its ideas.

What constitutes a “Style”? The irrepressible urge of critics to classify contemporary movements which are still in flux by putting each neatly in a coffin with a style label on it has increased the widespread confusion in understanding the dynamic forces of the new movement in architecture and planning. What we looked for was a new approach not a new style. A style is a successive repetition of an expression which has become settled already as a common denominator for a whole period. But the attempt to classify and thereby to freeze living art and architecture, while it is still in the formative stage, into a “style” or “ism” is more likely to stifle than to stimulate creative activity. We live in a period of reshuffling our entire life; the old society went to pieces under the impact of the machine, the new one is still in the making. The flow of continuous growth, the change in expression in accordance with the changes of our life is what matters in our design work, not the hunt after formalistic “style” features.

And how deceiving a precipitate terminology can be! Let us analyze, for instance, that most unfortunate designation, “The International Style.” It is not a style because it is still in flux, nor is it international because its tendency is the opposite—namely, to find regional, indigenous expression derived from

the environment, the climate, the landscape, the habits of the people.

Styles in my opinion should be named and outlined by the historian only for past periods. In the present we lack the dispassionate attitude necessary for impersonal judgment of what is going on. As humans we are vain and jealous and that distorts objective vision. Why don’t we leave it, then, to the future historians to settle the history of today’s growth in architecture and go to work and let it grow? I’d like to suggest that in a period when the leading spirits of mankind try to see the human problems on earth as interdependent, as one world, any chauvinistic national prejudice regarding the shares claimed in the development of modern architecture must result in narrowing limitation. Why split hairs about who influenced whom when all that really matters is whether the results achieved improved our life? I dare say that we are all much more influenced by each other today than architects of former centuries because of the rapid development of interchange and intercommunication. This should be welcome as it enriches us and promotes a common denominator of understanding so badly needed. (I tried to encourage my students to let themselves be influenced by ideas of others, as long as they feel able to absorb and digest them and to give them new life in a context that represents their own approach to design.)

SEARCH FOR COMMON DENOMINATOR VERSUS EGO CULT. If we look back to see what has been achieved during the last thirty or forty years we find that the artistic gentleman-architect who turned out charming Tudor mansions with all modern conveniences has almost vanished. This type of applied astrology is disappearing fast. It is melting in the fire of our conviction that the architect should conceive buildings not as monuments but as receptacles for the flow of life which they have to serve, and that his conception must be flexible enough to create a background fit to absorb the dynamic features of our modern life. We know that a period piece of architecture could never satisfy such a demand, but it is just as easy to create a modern straitjacket as a Tudor one—particularly if the architect approaches his task solely with the intention of creating a memorial to his own genius. This arrogant misapprehension of what a good architect should be often prevailed, even after the revolution against eclecticism had already set in. Designers who were searching for new expression in design would even outdo the eclecticist by striving to be “different,” to seek the unique, the unheard of, the stunt.

This cult of the ego has delayed the general acceptance of the sound trends in modern architecture. Remnants of this mentality must be eliminated before the true spirit of the architectural revolution can take root among the people everywhere and produce a common form expression of our time after almost half a century of trial and error. This will presuppose a determined attitude of the new architect to direct his efforts toward finding the type, the best common denominator instead of toward the provocative stunt. Preconceived ideas of form, whether the outcome of personal whims or fashionable styles, tend to force the stream of life in a building into rigid channels and to hamper the natural activities of the people therein.

The pioneers of the new movement in architecture developed methodically a new approach to the whole problem of “design for living.” Interested in relating their work to the life of the people, they tried to see the individual unit as part of a greater whole. This social idea contrasts strongly with the work of the egocentric prima donna architect who forces his personal fancy on an intimidated client, creating solitary monuments of individual esthetic significance.

THE CLIENT. By this statement I do not mean that we architects should docilely accept the client’s views. We have to lead him into a conception which we must form to fit his needs. If he calls on us to fulfill some whims and fancies of his which do not make sense, we have to find out what real need may be behind these vague dreams of his and try to lead him in a consistent, over-all approach. We must spare no effort on our part to convince him conclusively and without conceit. We have to make the diagnosis of what the client needs on the strength of our competence. When a man is ill he certainly wouldn’t insist on telling his physician how to treat him, but, if we expect such trust from our client, we learn that architects are rarely treated with the respect accorded to the medical profession. If we have not been competent enough to deserve being trusted, we had better make sure that we are in the future—in design, in construction and in economy, as well as in the social con-
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cept, which embraces the three other components of our work. If we neglect to make ourselves highly competent in all these fields, or if we shun responsibility in leading the way, we resign ourselves to the level of minor technicians.

Architecture needs conviction and leadership. It cannot be decided upon by clients or by Gallup Polls, which would most often only reveal a wish to continue what everybody knows best.

Machine and Science in Service of Human Life. There is another argument going on which, distorting the aims of modern architecture, needs clarification. We hear: “The modern accent is on living, not on the machine,” and Le Corbusier’s slogan, “The house is a machine for living,” is old hat. With it goes a portrait of the early pioneers of the modern movement as men of rigid, mechanistic conceptions, addicted to the glorification of the machine and quite indifferent to intimate human values. Being one of these monsters myself, I wonder how we managed to survive on such meager fare.

The truth is that the problem of how to humanize the machine was in the foreground of our early discussions and that a new way of living was the focus of our thoughts.

To devise new means to serve human ends, the Bauhaus, for instance, made an intense attempt to live what it preached and to find the balance in the struggle for utilitarian, esthetic and psychological demands. Functionalism was not considered a rationalistic process merely. It embraced the psychological problems as well. The idea was that our design should function both physically and psychologically. We realized that emotional needs are just as imperative as any utilitarian ones and demand to be satisfied. The machine and the new potentialities of science were of greatest interest to us, but the emphasis was not so much on the machine itself as on better use of the machine and science in the service of human life.

Looking back, I find that our period has dealt too little with the machine, not too much.

What is Regional Expression? Another confusing factor in the development of modern architecture is the appearance now and then of deserters from our cause who fall back on nineteenth-century eclecticism for lack of strength to go consistently through with a rejuvenation from the roots up. Design-
conviction to a society still pretty ignorant of the new ideas in architecture and planning.

My answer is this:

Making a living cannot be the only aim of a young man who should want above all to realize his own creative ideas. Your problem is, therefore, how to keep the integrity of your conviction intact, how to live what you preach, and still find your pay. You may not succeed in finding a position with an architect who shares your approach in design and who could give you further guidance. Then I would suggest you take a paying job wherever you can sell your skill, but keep your interests alive by a consistent effort carried on in leisure hours. Try to build up a working team with one or two friends in your neighborhood, choose a vital topic within your community, and try to solve it, step by step, in group work. Put ceaseless effort into it, then someday you will be able to offer the public, together with your group, a well-substantiated solution for this problem, for which you have become an expert. Meanwhile, publish it, exhibit it and you may succeed in becoming an adviser to your community authorities. Create strategic centers where people are confronted with a new reality and then try to weather the inevitable stage of violent criticism until people have learned to redevelop their atrophied physical and mental capacities to make the proper use of the proffered new setup. We have to discern between the vital, real needs of the people and the pattern of inertia and habit that is so often advanced as “the will of the people.”

The stark and frightening realities of our world will not be softened by dressing them up with the “new look” and it will be equally futile to try to humanize our mechanized civilization by adding sentimental fripperies to our homes. But if the human factor is becoming more and more dominant in our work, architecture will reveal the emotional qualities of the designer in the very bones of the buildings, not in the trimmings only; it will be the result of both good service and good leadership.