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## FUNCTION IN MODERN DESIGN

György Kepes

THE BATTLE TO SELL modernism to the American public began shortly after World War II, led to a considerable degree by the efforts of a number of European immigrants who proclaimed the virtues of practicality, the importance of design principles, and the merits of avant-garde thinking to their students and colleagues at design schools across the United States. Trained as a painter and filmmaker in his native Hungary, György Kepes (b. 1906) emigrated to the United States in 1937, and a year later became Director of the Color and Light Department at the Chicago Bauhaus, under the direction of László Moholy-Nagy. From 1946 to 1974, Kepes taught at the Massachusetts Institute of Technology, and in 1968 founded The MIT Center for Advanced Visual Studies. As author and editor of numerous books on art and perception, he has long been interested in examining how functional design, both in theory and practice, could benefit from a fusion of art and technology. In this essay, Kepes looks critically at the relationship between the utilitarian demands of functionalism and the humanitarian goals of "honest design": it typifies the kind of analysis with which he is most often associated; a combination of creative, pragmatic, and psychological inquiry that lends itself brilliantly to the field of design scholarship.—JH

**T**oday's obsession for speed and quantity has profoundly influenced the ways in which we think and feel. Mass production and mass communication, with their characteristic standardized thoughts and vision, have overworked ideas, making of them exhausted stereotypes.

We tend to mistake the slogan for truth, the formula for the living form, repetition of habit for cultural continuity. Inertia leads us to carry this dead body of lifeless thoughts around with us. To halt the depletion of the life of the words we use, of the ideas and purposes that guide us, we must constantly overhaul our mental equipment.

Vigilance is needed not only in the spheres where we are vaguely aware of the intentional misuse and manipulation of words and ideas, as in political propaganda or the cheaper aspects of advertising. It is needed also in fields where we assume that we know what we are talking about, in our own profession. Here we must be doubly alert, for we lack the perspective that distance offers.

I have been asked to write about function in design. The words "design" and "function" are prominent in our daily vocabulary. The coupled term, "functional design," is accepted today as the core of professional activities that aim to shape man's physical environment. Has the term "functional design" escaped the fate of other repeated terms? Battles are still fought, and the last skirmishes under the banner "form follows function" are still with us; but there is reason for believing that the underlying thought has lost its living strength.

It seems, therefore, appropriate to begin by asking questions, by examining the fundamental terms that we generally assume have a clear meaning. Taking nothing for granted, let us subject our professional catchwords to strict scrutiny.

What is function in design? To answer this question logically is to answer with relevance to the purpose that initiated the question. To recognize the validity of a logic of design one must first recognize the root purpose.

What is then the purpose of man-made design? Is it sufficient to answer that the purpose of a building is shelter? the purpose of a chair to support the human body? of a book to permit its being read? Can these functions be understood only within the narrow radius of what we consider their function to be, or do we need to inquire still further until we reach a final and common root of all these purposes?

If the roots of those thoughts, which today seem self-evident and which we use frequently in a mechanical repetition, are traced back to the ideas and works of those great pioneers of the recent past who gave us these thoughts, it will become obvious that they meant more than most of us mean today. Louis Sullivan, whose work and writing became the guiding force of contemporary design thinking, was fully aware of the depth and range of the issues involved. He wrote these words about his own goal, "To make an architecture that fitted its function, a realistic architecture based on well-defined utilitarian need—that all practical demands of utility should be paramount as basis of planning and design; that no architectural dictum or tradition or superstition should stand in the way." And he wrote also, putting his own thought in a broader context, "Man perhaps and probably was the only real background that gave distinction to works appearing in the foreground as separated things."<sup>1</sup> For him and for all the great men who paved our way to a healthier thinking, it was always self-evident that design is not for design's sake, that design is for man.

Man was the root of their thought, and human function gave direction and measure to whatever they were doing. They attacked with admirable concentration new structural possibilities, but this technical mastery was only a means to an end and never the end itself. It was not the house function that they built for, but a function of man by means of a building. Not the chair, not the book, which was functioning, but again man, who through his design of the chair and the book could function better, that is, live fuller and freer. And furthermore, it was not merely one aspect of man, not just the feet, the hands, the lungs, or the eyes, but man as a whole. Everything that they conceived was considered in its implications to all the levels of existence of a human being. Although they fully recognized that straightforward thinking in physical and utilitarian terms is a necessary step in putting a design on a healthy basis, they did not forget that the elementary utilitarian functions and the honest use of materials and techniques are conditions only, not ultimate purposes.

Man was in focus; but not man only as he was then. They aimed to satisfy his needs for comfort as a means to help men grow. And we may quote Sullivan again: "The fabricating of a virile, a proud civilization, rich in its faith in man, is surely to constitute the absorbing interest of the coming generation. It will begin to take a functional form out of the resolve of choice, and the liberation of those instincts within us which are akin to the dreams of childhood, and which, continuing on through the children and the children of the children, shall be a guide evermore."

Their work had a living fiber because it was intimately connected with a living human core. For design that integrates life, functioning for man, functions in terms of the materials it uses, the structures it applies, and the form in which it is shaped. Designs which have their root in the heart of man, and not in his pocket, are

alive. Designs which grow organically with the calm dignity of honesty, not with the haste of a bad conscience, can only and do only provide the values needed for human growth. They are functional in the truest meaning of the word.

And so let us understand that the issue is not functional design as such, that it is not just the "know how," but the "know why" and the "know what." The crux of the issue is not the mere physical principle, which is as old as nature and history, but the strength and scope of application in the concrete context of genuine human needs. This means that before we proceed to design any object for a given purpose, we should question the purpose itself. The aim of the object should not simply be taken for granted. It should be evaluated in its broadest scope.

Does the so-called functional design which we are so proud of, frequently justly proud, function in this broader sense? We have learned to think honestly in the terms of the materials and tools used and to respect these materials and tools. We are sensitive to new potentialities and zealously follow new materials and new techniques. We design with a simplicity of single-minded purpose, with an economy which is the logic of design, carefully avoiding all waste. The objects we make have visual congruence between the inside and the outside and are transparent in meaning. But did we apply this honesty of thinking, the economy of the making, the alertness to the changing tools and media, to the human material which is the root and purpose, the tool and the user of our designs? Are we devoting as much care to man's need, to his intrinsic nature, as we do to building with reinforced concrete or to bending plywood into furniture?

Has not our concern for the efficiency of the detail led to the neglect of the efficiency of the most important design, the design of man as an individual and as a member of society? It is a brutal paradox of our age that by concentrating all efforts on material products the very heart of all those achievements is neglected; the producing man, the active man, man's happiness, growth, and promise. For how could we hope that all these wonderful, neat, crisp, functional designs that the best designers are creating in their best moments could truly fulfill their function when man becomes used up making the goods which should benefit him? The pleasure in making, that William Morris called "the only birthright of labour," is for most of us only a distant memory of the past. This emphasis on the finished object creates a "ready-made" attitude that rests satisfied with appearances and limited utility. Consequently, the object never seems to take its place in the broader area of total human needs. It is time now for redirection. Let us discipline our thinking by tracing all that we are doing or are intending to do to the original purpose, the human purpose. What we have learned in this recent past we must apply to a broader context. To give functional design a new living meaning we must concentrate on establishing a scale of values. And in the hierarchy of values, the human values should again regain priority. We should recognize levels of functions in which one contains another and keep in mind that the container of all values is man. We must develop a functional thinking, directed toward a design where all levels of human intentions and objects for use are organically interconnected, as only this cohesion will sanction their existence.

What are the possible concrete implications of these thoughts and hopes on designing forms of visual communication, in particular book design? What is the status of contemporary book design in relationship to other designs of today and in relationship to these reorientations that we plead for?

When other man-made objects, not hampered by tradition, went through healthy metamorphoses, when almost every product was reevaluated in terms of utili-

tarian functions, new materials and techniques, the form of the book is barely touched by the recent technological and scientific progress.

It is evident that if the book is to function on those broader terms that we hope for it must first catch up with the temper of the age, with industrial conditions, and must reach a new functional level on a realistic basis. Bookmaking must become efficient in all those means that are now affecting the design of most fabricated objects.

The first task is then to rethink the media in terms of the mechanical inventions and readjust the work to the advanced printing techniques and reproduction methods. If book design will be made with an inventive spirit, fed by the thorough knowledge of advanced production methods, it will inevitably have the stamp of honesty and clarity, the first requisite of functional design. If the designers will conceive their objects with a forward-looking thinking attitude toward their tools, their work will not be sidetracked into the costly fake trimmings of traditional styles, nor will it be necessary to use the patina of the past or the chromium-plated glitter of the present. Book designs which are done with a genuine understanding of mass production give a promise that mass production will serve as a material basis of a democratic society, giving honest service to the largest number of people.

But book design, to catch up with other design, must be efficient not only in its making, but also in its performance. The designer must rethink the book functions in their physical, optical, and psychological aspects. A book has weight, size, thickness, and tactile qualities, qualities which are handled by the hand, as its optical form is handled by the eye. The physical form of the book will be efficient in its functioning if it fits the need of the hand that uses it. The book can be conceived of in the same sense as a handle of a tool or a utensil, and must be molded so that the hand can "operate" it with perfect control.

As a visual form a book must meet the needs of the eye. The factors influencing visibility and legibility are correlated into functioning visual unity if the size of the page, the type sizes, the distribution of the type, their weight and proportion, the brightness contrast between the color of the paper and the ink, are controlled relationships. But since not an isolated eye alone but an eye with the mind behind it does the reading, the organization of the printed page should be guided by a full understanding of the most advanced knowledge of the findings of psychology. It has been disclosed that one does not perceive patterns and meaning by a piecemeal assembling of the individual parts, but by grasping total relationships. We do not read by piecemeal assembly of the individual letters but by seeing unified wholes, configurations of words or word units. Printing limited by the technical processes of making the letters or casting types and printing them in the mechanical logic of the press cannot meet the requirement of the visual organization processes. The regimentation of reading conditioned by the mechanics of printing, forcing the eye to follow the rigid compulsion of the lines, is not the optimum visual condition of comfortable reading. Eye fatigue is due to the monotony of the visual task. New possibilities of technical inventions and the findings about the laws of visual perception can be synchronized. There is a challenge for coming bookmakers, and there is a hope that printing can undergo a reformulation which will bring book design to a truly contemporary level.

A clear visual structure of the individual pages is not sufficient to make a book integrated. A book commands movement of the reading eye. As a musical composition has a melodic line that binds the tunes into a living continuity, so the book should have a continuity of movement. The dust jacket, the binding, the end papers,

the title page, the front matter, the chapter heads, and all the pages should be integrated by an orchestration of the visual sequences. And this directed movement should not be a servitude enforced on reader. A book is not music, which has only one direction. One wants some time to reread a passage or to stay longer at some part. The organization of the visual flow must be flexible enough to escape regimentation.

The linear continuity, however well organized, still cannot fulfill all demands for a unified design. The eye has to take a continuously changing span of attention in following up word, phrase, clause, sentence, paragraph, chapter, and volume. It has various tasks in reading and in looking at pictures. Reading has a changing tempo conditioned by meaning and by the visual keys to read these meanings.

There is an inherent meter and rhythm in the sequence of symbols, words, and images. Books of today very rarely meet a form that corresponds to the living pulsation of the reading eye. Severed from the rhythm of the spoken word, doubly removed from the organic rhythm of a line traced by an organic fluency of the hand, most of our books are dreary tenements of words badly in need of rhythmical accents—accents which exist in the spoken language.

To give a book unity, the graphic form of communication must match in character the ideas of which it is the vehicle. A book can have an integrated personality—its outward face can correspond to its inner content. Today the individuality of the book is only the individual graphic signature of its designer. A genuine face, that is a true unity of spirit, can only be attained by translating verbal content into its appropriate visual terms.

The laws of visual perception are conditioned by the visual habits of the time. Visual communication can be efficient only if it adapts itself to the new landscape and the new psychology of contemporary man. Book design, to be efficient, must make significant adaptations to the contemporary scene.

Machines, motorcars, airplanes, fast-racing trains, flickering light displays, shopwindows, street scenes, motion pictures, television have become common features of the contemporary scene. Together with the new richness of light effects from artificial light sources, the complex dimensions of the landscape with the skyscrapers and their intricate spatial pattern above, and the subways underneath, they give an incomparably greater speed and density to visual experience than any previous environment has ever presented. There is very little time now for perception of unessential details. The duration of the visual impressions is too short. Contemporary man's visual habit underwent a new transformation and developed idioms of simplicity, forcefulness, and structural lucidity. Our vision, to be efficient, learned to see fundamental relationships.

This tendency toward simplicity and precision is further reinforced by certain psychological needs of man living today. We do not see passively; the images we form in our minds are not simple mirrorings of what is outside. We rather see what we are looking for. Our drives, purposes, are guiding our ways of perceiving. Industrial production introduced new objects, machines, and machine-made objects. They were made with utmost precision and control dictated by clearly recognized and respected functional needs, utility, and economy. In a confusing world around and within, these things appeared as the only man-made object of perfection and logic. The mechanical functional clarity of the machine, the perfect harmony of the parts and the unmistakable clear relationships were like an oasis for men searching logic and order in life. Clarity, precision, economy are compelling values in a world suffocating in the fight of cross-purposes. It is not by chance that the most commonly appreciated aesthetic

values are in the designs of a motorcar, or airplane, or fountain pen. Visual communication forms, to be efficient in their appeal, have to utilize these qualities of straightforwardness of the visual patterns.

Fitness to function has also another implication. The logic of design is synonymous with economy of design. In the evolution of production, particularly since the industrial age, the division of labor and the functional coordination of unit performances gained increasing significance. Although at present this principle dangerously wounds the integrity of the individual, its essential sense is unquestionable. Today, when a rich range of new vehicles of communications is emerging, it is worthwhile to reconsider the meaning of the distribution of labor. It seems to be essential to understand what form of communication can best fulfill certain aspects of messages. Motion-picture photography and television become major factors in our life. For the time being, they hardly have their proper areas of effective operation. Only recently serious concerns were voiced by leaders of the book industry about the dangerous impact of television on the book industry. Creative thinkers are needed who could guide the proper problems to the proper agents and develop the appropriate distribution of function among the new and old forms of visual communication. There is also chance for a cross-fertilization of ideas, techniques, idioms. It is very possible that book design will benefit greatly from the montage technique of motion pictures as well as from the idioms of television.

Assuming that book design will meet all these and other demands of functional performance and thus will better fill its function, in truly contemporary terms, there are still some distant hopes for meeting also those deeper functions which are anchored in the deepest human needs. What are, then, those aspects of book design which go beyond the mere economy of production and efficiency in utilitarian performance?

Within an ever-increasing wealth of products, man himself became worn out, incapable of benefiting from his labors. Limited to a conveyor belt, he rarely feels the joy of creation. Unable to encompass the metamorphosis of things which take shape under the work of his hands, he forfeits the sense of accomplishment, the unity and thus the harmony in the doing, which might give him true satisfaction. Limited to the mechanical details of one or another singular movement, within the complicated cogwheels of the production machinery, he gradually loses those sensibilities which are the guarantors of his perceiving the richness of life. Drained of the nourishment which is essential to his growing to full human stature, he loses the measure and meaning of his deepest aspirations. Through mass production, which could only be achieved through mechanization, man's sensibility, emotional unity, has been killed or at least dulled and deformed. It is not accidental that in most of our free activities we don't participate with the full vigor of our total self. It is significant that in our arts, or rather in the appreciation of art—movies, the radio, television pictures, and, yes, books—we are passive men, lazy men, armchair onlookers. We perceive only a small fraction of the most vital aspects of life. We do not live any form of creative experience in a total response; we hardly ever participate with our whole sensuous being through eyes, ears, and kinesthetic pleasure. In the age of specialization we also became specialized in our experiences, and have lost the vigor that comes from the coordination of many ranges and levels.

To counteract this shallowness, to achieve a fuller man, we must do everything that helps to rescue and may redevelop man's dulled sensibilities. It is the major function of every man-made design to fit the true purpose of man and help him to

perceive life as an integrated, balanced flow of activity in which his sensuous, emotional, and ideational levels coexist harmoniously. Organic human experiences must be juxtaposed against the mechanization of man, which pushes and presses him so that he will fit into the rhythm of the machine.

We must find those feelings in which and through which man's bonds to nature and to man can again be experienced. Creative experience, man's faculty to grasp vital organic coherence, is the yeast of the potentially fuller man. Only art, the joy in creative doing and perceiving, will help to bring back the needed sensibilities which can safeguard man from being further twisted away from his better nature. Every man-made object, every element of the man-created environment, will fit to its deepest function if it is a form of art, if it has unity, proportion, rhythm, and living symmetry.

What book design ought to aim for is a rhythmical quality conditioned by appropriate technical and utilitarian limitations. The act of producing our means to survive, the search for economy of effort, led man to rhythm, and thus to art. Occupational movements articulated to perfection gave birth to something else which was broader and richer than its origin. The sweep of the sickle, the meeting of the hammer with the anvil, the play of the fingers on clay in the process of making a pot, became dance, song, and ornament. Rhythm, the coordination of individual motions into an economy of performance, became more than its origin; it became a symbol of unity between body and mind, material and tools. It became an expression of interdependence within the individual or within a team of workers. And it can help book design reach its final functional form.

There is a new challenge in contemporary thinking and vision, a challenge that springs from the need of a total reorientation of language. A transformation of vision and thinking is taking place. We are moving toward broader idioms of simultaneity, of transparency, of interpenetration. These are displacing linear perspective in thinking and seeing. Contemporary painting, architecture, design, writing, and physical science are developing powerful new methods to reach this new operational area. Transparency in painting, interpenetration of internal and external space in buildings point toward an even more dynamic visual language of simultaneity. Printed communication has its own contribution to make to this new language, its new place to take in the new world of vision.

Let there be cooperation among those whose work makes the final form of a book: the author, the book designer, the printer, the photoengraver. How can a designer shape the rhythm and personality of a book when he hardly has the chance to become acquainted with its contents? How can he synchronize his form ideas when he does not know the problems the other collaborators are facing? A collaborative team could, in a free give-and-take relationship, develop an integrated spirit, a genuine craftsmanship on a twentieth-century level. Only such cooperation can stimulate the writer to consider the book in its true terms. It can help him to think, to write with consideration of visual rhythms in the development of a new, richer, multi-dimensional literary art that affects human sensibility on every level of sensuous experience.

Designs for printing are, by sheer quantity, an important factor of our visual environment. Printed designs inevitably condition man's sensibilities, for better or worse. It is our task to be alert to what is here involved and to make our designs fit their total purposes.

If graphic forms are made to function for man's welfare in their fullest range, we may hope that we will one day fulfill our obligation and help make truth truth again and not a slogan. We can create genuine forms, rather than apply formulas. Thus we can bring back the truest meaning of tradition, which is to realize in terms of today a living continuity with the genuine values of the past.

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#### Notes

1. Louis H. Sullivan, *The Autobiography of an Idea* (New York, 1929).