

LOUIS I. KAHN

Writings, Lectures, Interviews

Introduced and edited by Alessandra Latour

1955

Order Is

Order is

Design is form-making in order

Form emerges out of a system of construction

Growth is a construction

In order is creative force

In design is the means—where with what on when with how much

The nature of space reflects what it wants to be

Is the auditorium a Stradavarius

or is it an ear

Is the auditorium a creative instrument

keyed to Bach or Bartok

played by the conductor

or is it a convention hall

In the nature of space is the spirit and the will to exist a certain way

Design must closely follow that will

Therefore a stripe painted horse is not a zebra.

Before a railroad station is a building

it wants to be a street

it grows out of the needs of street

out of the order of movement

A meeting of contours englazed.

Thru the nature—why

ORDER IS

Thru the order—what

Thru design—how

A Form emerges from the structural elements inherent in the form.

A dome is not conceived when questions arise how to build it.

Nervi grows an arch

Fuller grows a dome

Mozart's compositions are designs

They are exercises of order—intuitive

Design encourages more designs

Designs derive their imagery from order

Imagery is the memory—the Form

Style is an adopted order

The same order created the elephant and created man

They are different designs

Begun from different aspirations

Shaped from different circumstances

Order does not imply Beauty

The same order created the dwarf and Adonis

Design is not making Beauty

Beauty emerges from selection

affinities

integration

love

Art is a form making life in order—psychic

Order is intangible

It is a level of creative consciousness

forever becoming higher in level

The higher the order the more diversity in design

Order supports integration

From what the space wants to be the unfamiliar may be revealed to the architect.

From order he will derive creative force and power of self criticism to give form to this unfamiliar.

Beauty will evolve

"Order Is," reprinted from *Perspecta 3: The Yale Architectural Journal*, 1955, p. 59.

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On Form and Design

Speech at the 46th meeting of the Association of Collegiate Schools of Architecture held at the University of California at Berkeley, Berkeley, California, April 22-23, 1960

As you know, I am a teacher which means really I am teaching myself and whatever rubs off, the student gets. When questions are brought before you by students I feel

ON FORM AND DESIGN

that the answers to these questions cannot be given offhand. I have always felt rather humble in the presence of a student.

During the time when I was thinking about form and design and making distinctions between the two I thought that the unmeasurable aspects of our existence are the ones that are the most important. Such things as thought, feeling, realization are all unmeasurable. It seems that this is also the concern of scientists.

I am concerned with realization because I believe from realization do we really design. Realization stems from the transcendence of our own feeling into the feeling of ourselves as others, and it actually represents the fact of feeling itself. The transcendence of thought is philosophy. We live by our own feelings and our own thoughts but when we come to realizations we transcend our own feelings and our own thoughts. Realization, I feel, stems from the fact of thought and the fact of feeling.

Now I say all this because I believe one can understand a form much better if one understands realization. You might say that realization is the sense of harmony of systems and belong to that which wants to exist and it is a sense of the order of things.

Design, when we come to it, is what we call on to put into being that which we realize.

During a seminar which was held at one of the universities, we gave ourselves the problem of trying to discover the nature of schools, not a school, not a program of a school, but simply school itself. The recognition of the singularity that you are different from another person gave rise to the idea that a man speaking to two people is not the same man talking to ten or the same man talking to a thousand.

One could speak to a thousand when speaking of a formula. When you are discussing knowledge, when you are discussing thought and feeling, we know we are a different person speaking to two or four or eight, and that you are very much attuned to your own singularity and to the singularity of others. From this you come to the realization that school is not a series of rules as you would get from a school board, but rather a realm of spaces wherein it is good to learn.

* The architect when confronted with a problem of building a school has to start all over again and derive his source of design from where school began. Form is really inner image, something which does not have shape or dimension, but something which has the reflection of the order of things which makes the realm of spaces for the activity of school particular and not like other spaces.

When you reflect on the spaces of a city hall it is a space where you pay fees and taxes, the courts are there, but the participation is not there any more. The various organizations that feel responsible toward our way of life politically do not have any place in a city hall. It has lost its sense of participation.

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Kahn constructed his theory not so much by crafting finished statements but by a process of successive reiteration and refinement, returning to a theme again and again in lectures to students and in publication, so that the same ideas appear in various forms. For example, the discussion of "Form and Design," prepared by Kahn for the Voice of America *Forum Lectures* in 1960, first appeared in *Architectural Design* (31 [April 1961], pages 145-54), is reprinted in modified form in *The Notebooks and Drawings of Louis I. Kahn* (edited by R. S. Wurman and E. Feldman [Cambridge, Massachusetts, 1973]), and was published in V. Scully, *Louis I. Kahn* (New York, 1962), which version is given here. The sections perforce deleted concern the early studies for the First Unitarian Church of Rochester, the Richards Medical Center, and the Salk Institute. Included here are the adaptation of Kahn's booklet, "A City Tower . . .," published by the Universal Atlas Cement Company in 1957, and passages from Kahn's notebooks as reprinted in the Wurman and Feldman anthology.

FORM AND DESIGN

A young architect came to ask a question. "I dream of spaces full of wonder. Spaces that rise and envelop flowingly without beginning, without end, of a jointless material white and gold." "When I place the first line on paper to capture the dream, the dream becomes less."

This is a good question. I once learned that a good question is greater than the most brilliant answer.

This is a question of the unmeasurable and the measurable. Nature, physical nature, is measurable.

Feeling and dream has no measure, has no language, and everyone's dream is singular.

Everything that is made however obeys the laws of nature. The man is always greater than his works because he can never fully express his aspirations. For to express oneself in music or architecture is by the measurable means of composition or design. The first line on paper is already a measure of what cannot be expressed fully. The first line on paper is less.

"Then," said the young architect, "what should be the discipline, what should be the ritual that brings one closer to the psyche. For in this aura of no material and no language, I feel man truly is."

Turn to Feeling and away from Thought. In Feeling is the Psyche. Thought is Feeling and presence of Order. Order, the maker of all existence, has No Existence Will. I choose the word Order instead of knowledge because personal knowledge is too little to express Thought abstractly. This Will is in the Psyche.

All that we desire to create has its beginning in feeling alone. This is true for the scientist. It is true for the artist. But I warned that to remain in Feeling away from Thought means to make nothing.

Said the young architect: "To live and make nothing is intolerable. The dream has in it already the *will to be* and the desire to express this *will*. Thought is inseparable from Feeling. In what way then can Thought enter creation so that this psychic will can be more closely expressed? This is my next question."

When personal feeling transcends into Religion (not a religion but the essence religion) and Thought leads to Philosophy, the mind opens to realizations. Realization of what may be the *existence will* of, let us say, particular architectural spaces. Realization is the merging of Thought and Feeling at the closest rapport of the mind with the Psyche, the source of *what a thing wants to be*.

It is the beginning of Form. Form encompasses a harmony of systems, a sense of Order and that which characterizes one existence from another. Form has no shape or dimension. For example, in the differentiation of a spoon from spoon, spoon characterizes a form having two inseparable parts, the handle and the bowl. A spoon implies a specific design made of silver or wood, big or little, shallow or deep. Form is "what." Design is "how." Form is impersonal. Design belongs to the designer. Design is a circumstantial act, how much money there is available, the site, the client, the extent of knowledge. Form has nothing to do with circumstantial conditions. In architecture, it characterizes a harmony of spaces good for a certain activity of man.

Reflect then on what characterizes abstractly House, a house, home. House is the abstract characteristic of spaces good to live in. House is the form, in the mind of wonder it should be there without shape or dimension. A house is a conditional interpretation of these spaces. This is design. In my opinion the greatness of the architect depends on his powers of realization of that which is House, rather than his design of a house which is a circumstantial act. Home is the house and the occupants. Home becomes different with each occupant.

The client for whom a house is designed states the areas he needs. The architect creates spaces out of those required areas. It may also be said that this house created for the particular family must have the character of being good for another. The design in this way reflects its trueness to Form.

I think of school as an environment of spaces where it is good to learn. Schools began with a man under a tree who did not know he was a teacher discussing his realization with a few who did not know they were students. The students reflected on what was exchanged and how good it was to be in the presence of this man. They aspired that their sons also listen to such a man. Soon spaces were erected and the first schools became. The establishment of school was inevitable because it was part of the desires of man. Our vast systems of education, now vested in Institutions, stem from these little schools but the spirit of their beginning is now forgotten. The rooms required by our institutions of learning are stereotype and uninspiring. The Institute's required uniform classrooms, the locker-lined corridors and other so-called functional areas and devices, are certainly arranged in neat packages by the architect who follows closely the areas and budgetary limits as required by the school authorities. The schools are good to look at but are

* From Vincent Scully, *Louis I. Kahn* (New York, 1962), pp. 114-21; and Richard S. Wurman and E. Feldman, ed., *The Notebooks and Drawings of Louis I. Kahn*, 2nd. ed. (Cambridge, Mass., 1972), *passim*.

shallow in architecture because they do not reflect the spirit of the man under the tree. The entire system of schools that followed from the beginning would not have been possible if the beginning were not in harmony with the nature of man. It can also be said that the existence will of school was there even before the circumstances of the man under a tree.

That is why it is good for the mind to go back to the beginning because the beginning of any established activity of man is its most wonderful moment. For in it lies all its spirit and resourcefulness, from which we must constantly draw our inspirations of present needs. We can make our institutions great by giving them our sense of this inspiration in the architecture we offer them.

Reflect then on the meaning of school, a school, institution. The institution is the authority from whom we get their requirements of areas. A School or a specific design is what the institution expects of us. But School, the spirit school, the essence of the existence will, is what the architect should convey in his design. And I say he must, even if the design does not correspond to the budget. Thus the architect is distinguished from the mere designer. In school as a realm of spaces where it is good to learn, the lobby measured by the institute as so many square feet per student would become a generous Pantheon-like space where it is good to enter. The corridors would be transferred into classrooms belonging to the students themselves by making them much wider and provided with alcoves overlooking the gardens. They would become the places where boy meets girl, where the student discusses the work of the professor with his fellow-student. By allowing classroom time to these spaces instead of passage time from class to class, it would become a meeting connection and not merely a corridor, which means a place of possibilities in self-learning. It becomes the classroom belonging to the students. The classrooms should evoke their use by their space variety and not follow the usual soldier-like dimensional similarity, because one of the most wonderful spirits of this man under the tree is his recognition of the singularity of every man. A teacher or a student is not the same when he is with a few in an intimate room with a fireplace as in a large high room with many others. And must the cafeteria be in the basement, even though its use in time is little? Is not the relaxing moment of the meal also a part of learning? . . .

The realization of what particularizes the domain of spaces good for school would lead an institution of learning to challenge the architect to awareness of what School *wants to be* which is the same as saying what is the form, School. . . .

I want to talk about the difference between form and design, about realization, about the measurable and the unmeasurable aspects of our work and about the limits of our work.

Giotto was a great painter because he painted the skies black for the daytime and he painted birds that couldn't fly and dogs that couldn't run and he made men bigger than doorways because he was a painter. A painter has this prerogative. He doesn't have to answer to the problems of gravity, nor to the images as we know them in real life. As a painter he expresses a reaction to nature and he teaches us through his eyes and his reactions to the nature of man. A sculptor is one who modifies space with the objects expressive again of his reactions to nature. He does not create space. He modifies space. An architect creates space.

Architecture has limits.

When we touch the invisible walls of its limits then we know more about what is contained in them. A painter can paint square wheels on a cannon to express the futility of war. A sculptor can carve the same square wheels. But an architect must use round wheels. Though painting and sculpture play a beautiful role in the realm of architecture as architecture plays a beautiful role in the realms of painting and sculpture, one does not have the same discipline as the other.

One may say that architecture is the thoughtful making of spaces. It is, note, the filling of areas prescribed by the client. It is the creating of spaces that evoke a feeling of appropriate use.

To the musician a sheet of music is seeing from what he hears. A plan of a building should read like a harmony of spaces in light.

Even a space intended to be dark should have just enough light from some mysterious opening to tell us how dark it really is. Each space must be defined by its structure and the character of its natural light. Of course I am not speaking about minor areas which serve the major spaces. An architectural space must reveal the evidence of its making by the space itself. It cannot be a space when carved out of a greater structure meant for a greater space because the choice of a structure is synonymous with the light and which gives image to that space. Artificial light is a single tiny static moment in light and is the light of night and never can equal the nuances of mood created by the time of day and the wonder of the seasons.

A great building, in my opinion, must begin with the unmeasurable, must go through measurable means when it is being designed and in the end must be unmeasurable. The design, the making of things is a measurable act. In fact at that point, you are like physical nature itself because in physical nature everything is measurable, even that which is yet unmeasured, like the most distant stars which we can assume will be eventually measured.

But what is unmeasurable is the psychic spirit. The psyche is expressed by feeling and also thought and I believe will always be unmeasurable. I sense that the psychic Existence Will calls on nature to make what it wants to be. I think a rose wants to be a rose. Existence Will, *man*, becomes existence, through nature's law and evolution. The results are always less than the spirit of existence.

In the same way a building has to start in the unmeasurable aura and go through the measurable to be accomplished. It is the only way you can build, the only way you can get it into being is through the measurable. You must follow the laws but in the end when the building becomes part of living it evokes unmeasurable qualities. The design involving quantities of brick, method of construction, engineering is over and the spirit of its existence takes over.

Take the beautiful tower made of bronze that was erected in New York.¹ It is a bronze lady, incomparable in beauty, but you know she has corsets for fifteen stories because the wind bracing is not seen. That which makes it an object against the wind which can be beautifully expressed, just like nature expresses the difference between the moss and the reed. The base

¹Seagram Building, New York, built in 1954-58, by Mies van der Rohe with Philip Johnson.—Ed.

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I Love Beginnings

Speech given at the International Design Conference, Aspen, Colorado, 1972

I love beginnings. I marvel at beginnings. I think it is beginning that confirms continuation. If it did not—nothing could be or would be. I revere learning because it is a fundamental inspiration. It isn't just something which has to do with duty; it is born into us. The will to learn, the desire to learn, is one of the greatest of inspirations. I am not that impressed by education. Learning, yes; education is something which is always on trial because no system can ever capture the real meaning of learning.

In my own search for beginnings a thought has recurred—generated by many influences—out of the realization that material is spent light. I likened the emergence of light to a manifestation of two brothers, knowing quite well that there are no two

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brothers, nor even One. But I saw that one is the embodiment of the desire *to be to express*; and one (not saying "the other") is *to be to be*. The latter is nonluminous; and "One" (prevailing) is luminous, and this prevailing luminous source can be visualized as becoming a wild dance of flame which settles and spends itself into material. Material, I believe, is spent light. The mountains, the earth, the streams, the air, and we ourselves are spent light. This is the center of our desires. The desire *to be to express* is the real motivation for living. I believe there is no other.

I began by putting up a diagram calling the desire *to be to express* silence; the other, light. And the movement of silence to light, light to silence, has many thresholds; many, many, many thresholds; and each threshold is actually a singularity. Each one of us has a threshold at which the meeting of light and silence lodges. And this threshold, this point of meeting, is the position (or the aura) of inspirations. Inspiration is where the desire *to be to express* meets the possible. It is the maker of presences. Here also is the sanctuary of art, the center of the expressive urges and the means to expression.

When I first made this diagram, I made it to be read from left to right; and here it is in mirror-writing (to mystify and to evoke an even greater source than itself) and so as to put nothing in front of you that is really thoroughly readable; by this means you can strive to find something that even goes beyond this realization. Again, I am always looking for a source, a beginning. I know it's in my character to want to discover beginnings. I like English history, I have volumes of it, but I never read anything but the first volume, and even at that, only the first three or four chapters. And of course my only real purpose is to read Volume 0 (zero), you see, which has yet not been written. And it's a strange kind of mind that causes one to look for this kind of thing. I would say that such an image suggests the emergence of a mind. Your first feeling is that of beauty—(not the beautiful nor the very beautiful) just beauty itself. It is the moment, or you might say the aura, of perfect harmony. And from this aura of beauty—on its heels—comes wonder. The sense of wonder is so very important to us because it precedes knowing. It precedes knowledge. When the astronauts went into space and the earth appeared as a marble, blue and rose, I felt nothing was less important than knowing. Maybe knowledge was still important, but knowing certainly was not. Yet strangely enough Paris or Rome—the wonderful works of men, all of which came from circumstantial conditions—somehow diminish the importance of the mind as compared to the sense of wonder that seems to have prevailed at that time. I do think, however, that a toccata and fugue remained, because of the distance from measure that was kept. The immeasurable was the one thing that captivated the mind; the measurable makes very little difference. When we talk about pollution the worst part about it is that when you see a gentle stream polluted your sense of wonder about the stream leaves

you. If you go to a stream where the water is still clear, you feel something ominous about being near a stream that will soon fall from its position of wonder. Never must that leave our minds and no substitutions, nothing operational, should be admitted; except matter, which should be there to help us look back and to wonder again. This relationship, to be of any worth at all, must remain constant and not be just an accumulation of so much knowing.

Let us consider the inspiration to learn. If you stop to think of other inspirations, it's pretty hard to find any. For instance, I mentioned that all city planners must be part of the inspiration to meet. But then when you think of school, it is also part of the inspiration to meet. There's another inspiration which is somehow on trial—as I prefer to express it—and that is, the inspiration to well-being. And well-being includes such things as ecology. Yet it mustn't be considered a subject like ecology, or anything else. It must be realized as something catastrophic tainting our sense of wonder, our instinct to meet to learn. You can see why the original inspirations surrounding architecture, when it first became something apparent, were unclassifiable except as a kind of inspired moment which later acquired a title. But its beginning didn't have a title. It just had an undeniable urge to be brought into being. And up to then, and I think it will always be that way, there was no such thing as Architecture; there was the spirit but no presence whatsoever. What does have presence is a *work* of architecture, which at best must be considered as an offering to Architecture itself if only because of the wonder of its beginning. So when people talk about architecture being in one niche and urban planning being in another, with "city" planning in a third, and environmental design in still another, these to me are purely marketplace divisions. And I feel it's very destructive if a man on his stationery says that he practices all these things. In the marketplace this constitutes a very great advantage. Yet a man who feels Architecture as a spirit, cannot title himself this way because he would consider it pure dissipation of his original inspirations. An architect can build a house and build a city in the same breath only if he thinks about both as part of a marvellous, expressive, and inspired realm. From the first feelings of beauty, or the first sense of it, and the wonder that follows comes realization. Realization stems from the way we were made because we had to employ all the laws of the universe in order to be. We hold within us the record of the decisions that make us particularly human. There is the psychic record; and there is the physical record together with the choices we made to satisfy this desire to be, which in turn directed itself to what we now are. I believe that this nucleus is in the leaf and in the microbe. It is in every living thing. There is consciousness, I feel, in all living things. How wonderful it would be—in order to really understand ourselves—if only we could capture what must be the consciousness of the rose. That must, perforce, have such beautiful simplicity that we would then

be able, I think, to solve our problems in a kind of offertory glow as we cannot now do.

From this understanding of the process of realization comes *form*. Form is not shape. Shape is a design affair, but form is a realization of inseparable components. Design calls into being what realization—form—tells us. You could also say that form can be detected as the nature of something and design strives at a precise moment to employ the laws of nature in putting that into being, by allowing light to come into play. This resource of material that is to *make*, to call into being; this maker of presences is the element that puts the measurable into what you're doing. Until it is brought into play, everything is fundamentally and consistently unmeasurable. Whatever you leave then has both in it. At the moment a painting is made, and at that time only, can you say, "I don't like red," or "I like small canvases." Only then is existence revealed to be what thought "would be" or could give you. And thought, in turn, is revealed as having existence but no presence.

Design demands that one understand the *order*. When you are dealing, or designing in brick, you must ask brick what it wants, or what it can do. And if you ask brick what it wants, it will say, "Well, I like an arch." And then you say "But, uh, arches are difficult to make. They cost more money. I think you can use concrete across your opening equally as well." But the brick says, "Oh, I know, I know you're right, but you know, if you ask me what I like, I like an arch." And one says, "Well now, why be so stubborn, you know?" And the arch says, "May I just make one little remark? Do you realize that you are talking about a being, and a being in brick is an arch?" That's knowing the order. It's knowing its nature. It's knowing what it can do. Respect that tremendously. If you're dealing with brick, don't use it as just a secondary choice, or because it's cheaper. No, you have got to put it into absolute glory, and that is the only position that it deserves. If you're dealing with concrete, you must know the order of nature, you must know the nature of concrete, what concrete really strives to be. Concrete really wants to be granite but can't quite manage. Reinforcing rods are the play of a marvellous secret worker that makes this so-called molten stone appear wonderfully capable—a product of the mind. Steel wants to tell you that it can be an insect in strength and the stone bridge that it is built like an elephant; but you know the beauty of both, harmony due to the extension of the material to its fullest capability. If you just cover a wall with stone, you feel that you've done something inferior, though that can be said for the very best of us. To get things right in your mind and then to act in the purest manner can isolate you very much. However, it is terribly important to make the move downward; it's made cautiously and in full knowledge that you're doing it.

And while we are on the subject of "natures" . . . I am building a theater in Fort Wayne, Indiana, and having therefore observed theaters, I came to the conclusion that one must regard the auditorium and the stage as a violin, a sensitive instrument where one should be able to hear, even a whisper, without any amplification. The lobbies and all other adjunct spaces may be compared to the violin case. The violin and its case are completely different. Then going backstage, in many theaters I found nothing more than the inside of a wastebasket. As the actor emerges from this wastebasket, he seems pretty calm, as though nothing had happened, but behind stage the mop is right next to him. That is just hell. I decided then to think of it all as the actor's house and to design his house half a mile away from the theater, regarding the "Green Room" as the living room with its fireplace, the practice rooms, the dressing rooms, as if it were all a function of that house . . . I even installed a little chapel where a man could

think of his lines alone without being prodded. Then outside this house I built a porch which faced the street, then wheeled that backstage and presented the porch of the house as what you see when the curtains open.

I was trying to discover the "nature" around which design was possible. This can also be thought of as what one does in building a house when one considers the bedroom as being in a field, with no roof so you can see the stars. The windows may be limited because the window is really above you. Then you discover that the room isn't just a sleeping room, but becomes a sick room; and when you need a cup of tea you long for the kitchen. Slowly, stealthily, the bedroom creeps to the kitchen, maybe even begs for forgiveness. The living room does the same, despite its freedom; so does the kitchen. But the house recombines in a loving way, an understanding way. Somehow it gathers strength not by looking into how things are made now, but how they could be made. The city must also be considered in the light of how it could be made, not in how to correct what is already there.

I think the most inspirational point from which we might try to understand architecture is to regard the room, the simple room, as the beginning of architecture. You know, when you enter your room, how you know it like no one else knows it. Maybe it is the windows of the room that are the most marvelous thing. Wallace Stevens, the American poet, said something for architects. (He aspired to be a one.) He asked, "What slice of the sun enters your room?" As if to say that the sun never knew how great it was until it struck the side of a building. Can you put that in a Univac machine?

I think that a plan is a society of rooms. A real plan is one in which rooms have talked to each other. In another sense, the plan may be said to be the "structure of the spaces in their light." If you consider that structure is the maker of light, because structure releases the spaces between and that is light giving. It could be a matter of an entrance or a window or even a little building with windows in it, because the distances between columns are so resourceful that you cannot cope with the generosity of such a construction using concrete (which has such tremendous power and need have very little material). The disciplines of the column provide an endless study. Its elements are, as we said before, in the sense of form that a building has. The form of a school could have something to do with the conversation of the various rooms, their nature, and how they complement each other and enrich the environment with the feeling of a "good place to learn." Consider elements in a house, for instance, in which the living room contains a bay window where a boy admonished can sit and feel that he is away or in his own little room. Or consider a stairway that goes from one level to another as being in a sense "measured" by the agility of a boy with all his coordinating faculties who wants to run up the four flights in no time flat. In such a case, when an

architect draws a plan that involves a stairway, he cannot exert enough accuracy. Where he can draw the walls with a certain abandon, the stair must be drawn as if he were making a ruler or a measuring stick. Such is the sense of importance that must be felt. And the stair must have a landing—well—a number of landings. And the landing must want to be a room really. The landing is quite a wonderful thing because the stair, the same stair, is used by a child, a young man, and an old man. And when the old man ascends the stair with the young boy and reaches the landing there must be there a window, possibly a window seat, and maybe a bookcase. So as he ascends he says to the boy, "You know, I always wanted to read this book."

The roof, the floor, the ceiling, are really all elements and they deserve, of course, to be dealt with as such. But there is a great tendency to resort, you know, to *Graphic Standards*, where you find out everything you have to know. It'll tell you everything. It'll tell you what kind of stair is all right, but it'll never tell it as you (as an architect) must feel it.

1957

47-54 It is instructive to compare the following writing by Louis Kahn to his essay on monumentality of thirteen years earlier. The theme of structural expressiveness remains his central preoccupation, but it is now transformed from a generalized enthusiasm for the aesthetic potential of contemporary engineering to a more personal and poetic statement drawn from his own experience and sensibility.

By the late 1950s Kahn had arrived at a mature design philosophy. Along with numerous smaller commissions, he had completed the Yale University Art Gallery and the Trenton Bathhouse and undertaken several major urban design projects for downtown Philadelphia. In 1957 he began work on the Richards Medical Building at the University of Pennsylvania, a first major statement of his seminal thesis of servant and served space. His early sketches already show the defining presence of "hollow stones"—a system of brick-clad volumetric shafts. Initially intended to provide the building's structural support, they ultimately served to separate stairs, elevators, animal quarters, air ducts, and other mechanical equipment from the major space of the work areas. "I do not like ducts. I do not like pipes. I hate them really thoroughly, but because I hate them so thoroughly I feel they have to be given their place," he explained. Kahn's concept of the functional utilization of the inner space of structural members seems to have been inspired by the lightweight technology of the tubular space frame—in line with the ideas of Buckminster Fuller and his engineer colleague Robert Le Roques, and explored in his own Philadelphia City Tower project of 1954 (with Anne Tyng)—but now, significantly, returned to a more archaic idiom. He thus embodied the modern "space order concept" of hollowness in terms of load-bearing solidity. In search of a new architecture of massiveness, monumentality, and closure, he reinterpreted formed concrete, rolled steel, and prefabricated joints in the context of Greco-Gothic construction.

In a more fully articulated statement of his philosophy, ultimately entitled "Form and Design" (first presented at CIAM's Otterlo meeting in 1959, later rewritten and widely circulated), Kahn defined his notion of the "form" or "preform" as a conceptual idea ordering all human institutions—"what a thing wants to be." Mediating this was "design"—the "how" of the building, its contingent circumstances. At Richards, despite the powerful symbolism of the volumetric assembly, the servant-served concept overrode its own functionality; inadequate control of light and ad hoc utilization of the laboratoriousness doubt on which was really the major and which the minor element of the part. Form, in Kahn's own terms, had overpowered design. Kahn was to achieve a much fuller integration of his dialectical theses of servant-served and form-design in the Salk Institute Laboratories, a masterwork in La Jolla, California, of 1965.

Kahn's hierarchical distinction between functional and honorific spaces and his concept of revealed process had immediate impact in the early 1960s on architects like Team 10 and the Japanese Metabolists. Slightly later, in the developing climate of postmodernism, especially in Italy, it was his recourse to history, to the mythos of collective memory and a typological interpretation of institutions, that guided his reception and "rediscovery." New scholarship on his career is contained in the recent exhibition catalogue by David Brownlee and David De Long, *Louis Kahn: In the Realm of Architecture* (1991). His insightful (and often awkward) verbalizations on architecture are collected in full in Alessandra Latour, ed., *Louis I. Kahn: Writings, Lectures, Interviews* (1991).

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Architecture Is the Thoughtful Making of Spaces Louis Kahn

Reflect on the great event in architecture when the walls parted and columns became.

It was an event so delightful and so thought wonderful that from it almost all our life in architecture stems.

The arch, the vault and the dome mark equally evocative times when they knew what to do from how to do it and how to do it from what to do.

Today these form and space phenomena are as good as they were yesterday and will always be good because they proved to be true to order and in time revealed their inherent beauty.

In the architecture of stone the single stone became greater than the quarry. Stone and architectural order were one.

A column when it is used should be still regarded as a great event in the making of space. Too often it appears as but a post or prop.

What a column is in steel or concrete is not yet felt as a part of us.

It must be different from stone.

Stone we know and feel its beauty.

Material we now use in architecture we know only for its superior strength but not for its meaningful form. Concrete and steel must become greater than the engineer.

The expected wonders in concrete and steel confront us. We know from the spirit of architecture that their characteristics must be in harmony with the spaces that want to be and evoke what spaces can be.

Forms and spaces today have not found their position in order though the ways of making things are new and resourceful.

A space in architecture shows how it is made.

The column or wall defines its length and breadth; the beam or vault its height.

Nothing must intrude to blur the statement of how a space is made.

The forms characterizing the great eras of architecture present themselves and tempt us to adapt them to concrete and steel. The solid stones become thinner and eye deceiving devices are found to hide the unwanted but inevitable services. Columns and beams homogenized with the partitions and ceiling tile concealing hangers, conduits, pipes and ducts deform the image of how space is made or served and

therefore presents no reflection of order and meaningful form.

We are still imitating the architecture of solid stones.

Building elements of solids and voids are inherent in steel and concrete. These voids are in time with the service needs of spaces. This characteristic combined with space needs suggest new forms.

One quality of a space is measured by its temperature by its light and by its ring.

The intrusion of mechanical space needs can push forward and obscure form in structure.

Integration is the way of nature. We can learn from nature.

How a space is served with light air and quiet must be embodied in the space order concept which provides for the harboring of these services.

The nature of spaces is further characterized by the minor spaces that serve it. Storage-rooms, service-rooms and cubicals must not be partitioned areas of a single space structure, they must be given their own structure.

The space order concept must extend beyond the harboring of the mechanical services and include the "servant spaces" adjoining the spaces served.

This will give meaningful form to the hierarchy of spaces.

Long ago they built with solid stones.

Today we must build with "hollow stones."