Type as Social Agreement

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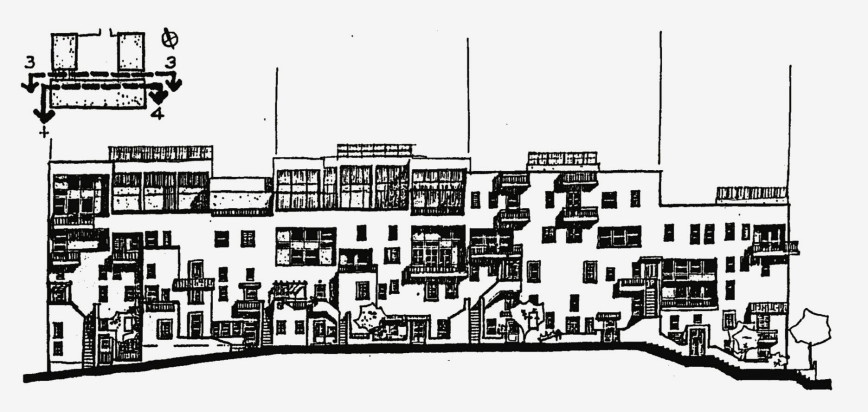


Elevation of the inside of an important block in an urban tissue derived from the existing typology of a neighborhood in Kaisariani in Athens.
Drawing from a design study conducted by Christina Gryboyjanni a former M.Sc Architecture student at MIT.

The post modern period in architecture allows us once more to be inspired by the past. Architects always have learned from precedent. Among architects there is a renewed interest in local traditional architecture. This reflects a desire to connect again to the roots of one's culture; a desire shared alike, it seems, by professionals and lay people. But making a connection between tradition and the demands of modern times is not an easy task. Sometimes attempts to do so lead to superficial borrowing.
We may see the application of decorative and iconographic elements to buildings that have otherwise very little in common with any traditional example.

When we want to connect to our cultural traditions, we must study in depth the building types these traditions maintained for many centuries. We must study them, not in the way historians would do, but from a designer's point of view. We want to understand the design principles behind the building types to decide how we can use them today. Our goal is not to copy but to transform what was done in the past into something compatible with the values we hold today. We want to learn from our cultural heritages, not to deny present day realities, but to establish a continuity between tradition and renewal.

HOUSE TYPE

While there are different kinds of buildings we can choose from — the place of worship, the palace, the castle, or the house — we should first of all study the house type. Because it is from the common houses that the more special buildings are derived. The temple, the palace and the castle usually offer enriched, enlarged, and embellished variations on the spatial and structural principles already found in the house type.

In the house type we find architectural values people share. The house is the place where we spend most of our time, where we are born, marry, raise children, and grow old. The house type is perhaps the most widely shared experience in a culture. Because we are so familiar with it, we may even forget to notice it at all. In their implicit way house types have always offered a stable physical environment fitting social life as the glove

fits the hand. Amos Rapoport was, I believe, the first to seriously study house typology on a cross cultural, comparative basis. He argues in his book, *House Form and Culture*, that the house type cannot be explained by purely functional or technical reasoning.[01] In other words: neither climate, available materials, family structure, nor use, tell us why a particular house type is shaped the way it is. Of course, we understand why, for instance, the Malay house was built from bamboo and that it stands off the ground for good technical and environmental reasons. But within technical and functional constraints there always remains room for further choice. Here the culture, the social patterns, and shared preference of a people are expressed in the house form itself. The particular shape of the Malayan house with its expressive roof together with the particular organization of its spaces inside express a people's identity and are closely linked to other cultural expressions like clothing, and customs of social behavior. This makes the house a cultural artifact: the collective product of what a people is all about.

Over the years at MIT I have had the opportunity to study house types with students who came from very different parts of the world. Many brought with them keen interest in the houses their parents and grandparents had lived in. They sensed that these 'old fashioned,' traditional, and local buildings represented important cultural values. I encouraged them to explore what they liked in those buildings and to learn from the experience invested in them. My interest as a methodologist was to learn more about the general principles of house typology: to find a method for the analysis and comparison of house types. This article offers a brief summary of some of the things we learned. I will also discuss ways in which designers can work from the traditional patterns to arrive at new solutions. In the context of a single paper my overview can only be superficial and incomplete, but I hope it will show the validity of the study of vernacular house types as a source for present day design.

DIFFERENT WAYS OF SEEING TYPE

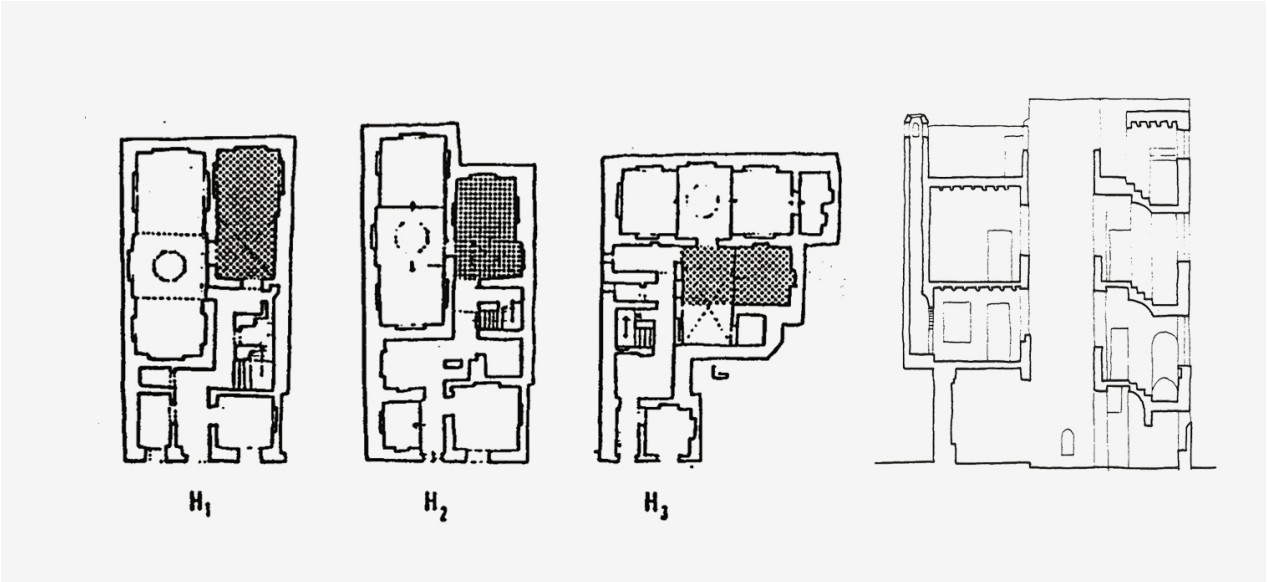
Each house type can be described in a number of different ways. Each way suggests a different systemic organization. Three WAYS OF SEEING the same type can be distinguished in all cases:

First of all, we can see the type as a spatial organization. Here we observe the kinds of spaces the house type offers and the ways in which these spaces relate to one another. The example of the Qa'a houses of Medina, Saudi Arabia, studied by Sameer A. Khasjugjee[02] shows us a relatively narrow courtyard to which the most important spatial elements relate: there is the Diwan, a raised floor under a vault in open connection to the courtyard; and there is the Qa'a proper, itself having a center space with a skylight from the roof, and two diwan-like spaces connected to it opposite to one another. Then there are the stairs as well as the entrance. The latter is always angled to assure privacy from the street. There is, of course, much more to the spatial organization of this house type but what has been said may suffice to make the point that spatial organization is very much part of typology.

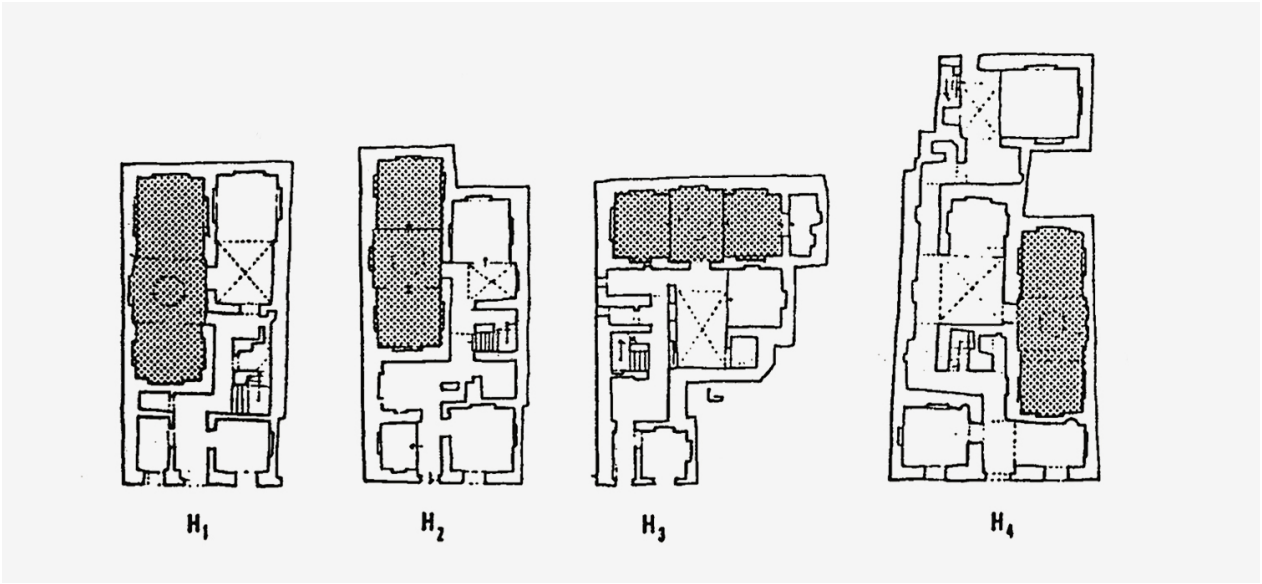
Secondly, we can see the house type as a physical system. In the Medina example we find heavy stone walls that change to brick walls on the second floor. The walls form rectangles to stabilize a building that can have four to five stories. The ceilings are high to assure sufficient ventilation in the hot climate.

01 Amos Rapoport, *House Form and Culture* (Englewood Cliffs, NJ: Prentice Hall, 1969).

02 Sameer A. Khashugjee, "Principles and Application for Qa'a Houses in Madina," (Thesis, Massachusetts Institute of Technology, 1983). https://dspace.mit.edu/handle/1721.1/75502.



Plans and typical section of Qa'a houses in Madina, Saoudi Arabia.
From Sameer A. Khashugjee, "Principles and Application for Qa'a Houses in Madina,". Thesis, (Massachusetts Institute of Technology, 1983): 18—21.



Plans and typical section of Qa'a houses in Madina, Saoudi Arabia.
From Sameer A. Khashugjee, "Principles and Application for Qa'a Houses in Madina,". Thesis, (Massachusetts Institute of Technology, 1983): 22.

Finally, we can see the house in a stylistic way. Here we look, for instance, at the way the windows are placed in the facade, the kind of windows and doors used, and the decorations applied around edges and surfaces both inside and outside.

We can, of course, choose other ways to see the type. The power of a type is indeed that it is a whole and we can always find another way to describe it. Each description is necessarily only partial. Descriptions need not be in conflict with each other; indeed, the type is always more than the sum of all possible descriptions given. For our purpose in this paper, however, the three WAYS OF SEEING suggested above may suffice. They touch the most important and general aspects of the type.

RELATIVE INDEPENDENCE OF THE SYSTEMS

When we study the interrelation between these three systems — the spatial, the physical, and the stylistic — we find that they are relatively independent of one another. Using exactly the same construction principles as applied in the Medina house, for example, we could build a house with a very different spatial organization. Conversely, we could use a different technology to arrive at a spatial organization very similar to the one we find in the Medina example. Finally, we know from recent attempts to connect to traditional values that one can use stylistic elements from a traditional house type and apply them to a building that has no spatial or technical similarity to this type at all. Hence there seems to be a 'loose fit' between the three systems.

One can argue that any attempt to separate the three systems is a violation of the integrity of the type. This is true but as explained earlier, we do not want to copy but to transform in order to respond to new conditions. In that case we want to understand the relatively independent ways in which the type can be adapted.

It seems to me that from the three systems the most fundamental and the most stable one is the spatial organization. It seems most intimately related to our behavior. We see indeed how technology can change and new materials are adopted while the same space organization is maintained. An interesting example is offered by Jamel Akbar who describes in his doctoral thesis how a new settlement built by the people themselves, using concrete walls and roofs, nevertheless acquires the same spatial urban organization we find in the traditional mud brick towns of Saudi Arabia. Akbar is making the argument that as long as the social structure of mutual responsibilities is maintained, the same spatial organizations will occur.[03]

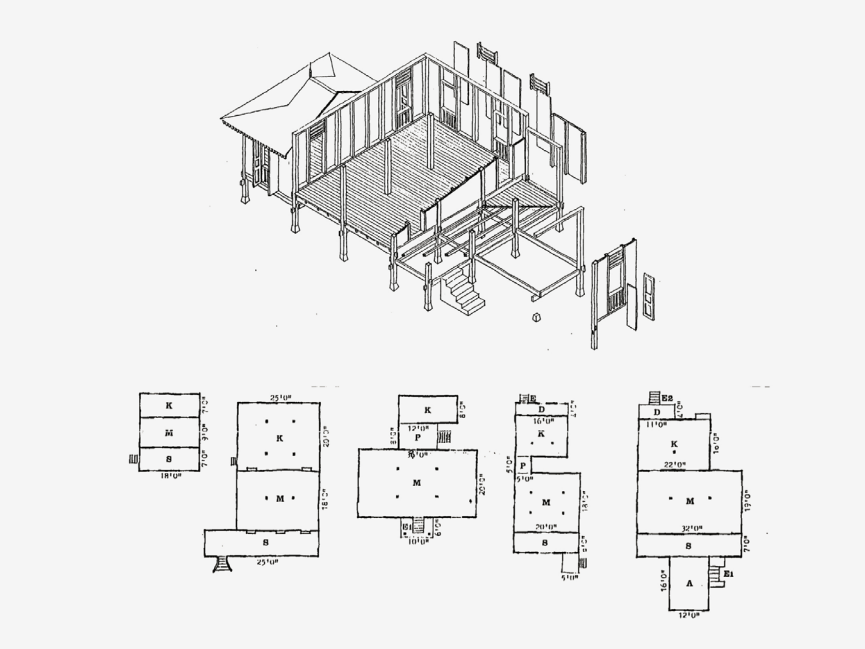
When I suggest that materials can be changed without affecting too much the type itself this does not mean the physical system is less important. We must distinguish the systemic properties of the physical organization from actual materials and construction methods. The latter are changeable to a large degree as long as the former is maintained. The thorough analysis of the Malayan house done by Wan Abidin[04] suggests one could replace the wood columns and beams by similar ones of steel or concrete; or that one could replace the screens of bamboo matting, that let through air without admitting too much light, by screens produced from plastics or metals performing the same functions. If we would do so we would still recognize the house type, with its 'Serambi' — a porch where family activities occur under the shelter of the roof.

Thus it appears that our recognition of the types physical organization does not depend very much on the kind of material used, nor is it particularly important how the joints are worked out This organization is primarily understood as a choice of kinds of physical parts — that is to say: beams, columns, screens, etc., of a particular shape and size and the specific way they are related to one another when distributed in space. What the parts are made of and how they are joined is not a negligible matter, but still seems to be of a second order.

03 Jamel A. Akbar, "Responsibility and the Traditional Muslim Built Environment," (Thesis, Massachusetts Institute of Technology, 1984). https://dspace.mit.edu/handle/1721.1/15572.

04 Wan Abidin and Wan Burhanuddin B. "The Malay House : Rationale and Change," (Thesis, Massachusetts Institute of Technology, 1981). https://dspace.mit.edu/handle/1721.1/42955

Sketch of a Malayan house.
From Wan Abidin and Wan Burhanuddin B. “The Malay House : Rationale and Change,” (Thesis, Massachusetts Institute of Technology, 1981), 28.

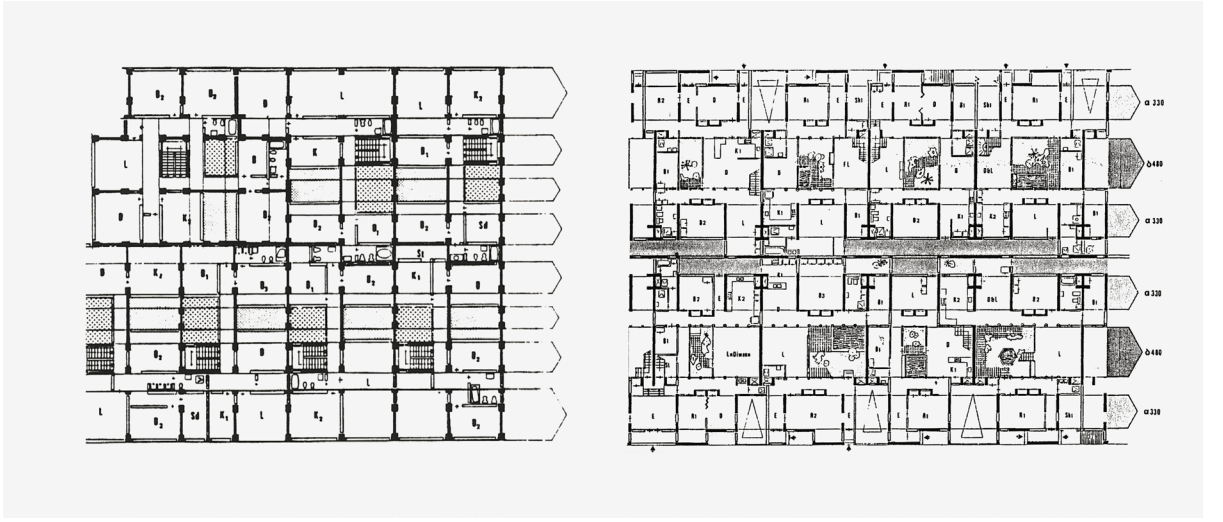


Rethinking the technical systems making up a Malayan house.
From Wan Abidin and Wan Burhanuddin B. “The Malay House : Rationale and Change,” 29, 30, 45.

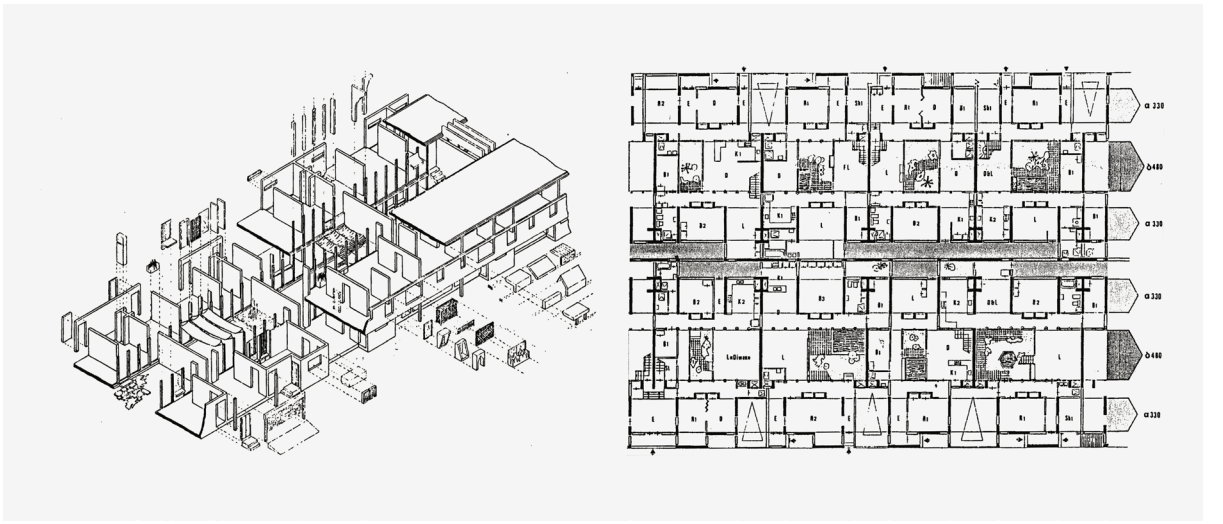
Nevertheless, we may prefer to keep the physical system while transforming the spatial. An example of the permanence of the physical system in a particular culture is found in the way houses are built in Japan today. In spite of what we hear about housing factories offering revolutionary technologies, the vast majority of the Japanese houses are still built in a wood post and beam system that stems directly from the centuries old Japanese house building tradition. The carpenter still knows the various parts and the way they are distributed in space to make a whole. He connects the parts by means of traditional joints, slightly altered sometimes to adapt to modern milling machinery. There are presently factories in Japan that mill house frames designed in this traditional system by means of a com-

puter steering a fully automated array of machines. In this example we find continuation of the physical system without much continuity in the spatial system. The houses built so efficiently in this traditional physical system are mostly westernized in their space layout. On the other hand, stylistic elements may remain. The example also shows that the computer and production technology are very flexible tools. This allows the culture to define the system (the shape and size of parts and their relations) whereas technology offers ways to produce it.

A different choice was made by Khasjugjee, who decided to stay with the spatial arrangement of the Medina House but to modify the physical system.[05]Where the traditional system has masonry walls running in both directions perpendicular to one another, structural walls in concrete now run in just one direction while those in the other direction are brick Infill. We see here how the type's spatial organization has been maintained but is built in a radically different way.



The Madina house reinterpreted with a new physical system.
From Khashugjee, "Principles and Application for Qa'a Houses in Madina,"41, 42.



A proposal for a physical structure and its' infill; plan variations in a continuous urban tissue in Saudi Arabia.
From Jamel A. Akbar, "Support for Court-Yard Houses : Riyad, Saudi Arabia." (Thesis, Massachusetts Institute of Technology, 1980), 105

05 Khashugjee, "Principles and Application for Qa'a Houses in Madina."

Hence there is freedom to vary or keep constant the one system or the other depending on what we judge to be most meaningful in the traditional type.

A third example of the partial modification of a house type is given in Jamel Akbar's master thesis on the modern use of the courtyard house in Saudi Arabia.[06] Here some adaptations are made in the spatial organization, among other things, to accommodate the car, but basically spatial relations remain in the traditional way. The physical system is a concrete structure with variable infill. The floor plans show how each house is different in size and layout within the rules of the type.

VARIATIONS WITHIN TYPE

A type allows for many different interpretations. No two examples are ever alike. As we have seen, typology is basically systemic. Within any system many variations of interpretation are always possible. Indeed, one can define a system as what is constant — in terms of parts and relations — among a large number of different expressions. We can once more look at the examples given so far to see their variations within the type. The examples of the Qa'a house illustrated here are from a much larger number, all different from each other. But in each example, we find the same spaces related in the same way. In the Malayan case we also find constant spatial relations in the floor plans, but very different sizes and proportions of the individual rooms. In Akbar's courtyard houses the sizes of the courtyards vary considerably. In a strongly ordered framework of parallel zones and spatial relations each house nevertheless shows a different spatial arrangement.

In all cases the result is that the houses are perceived as individuals, each having their own identity — but of a same family. Once we are familiar with one example, we can easily find our way in any other houses of the same type.

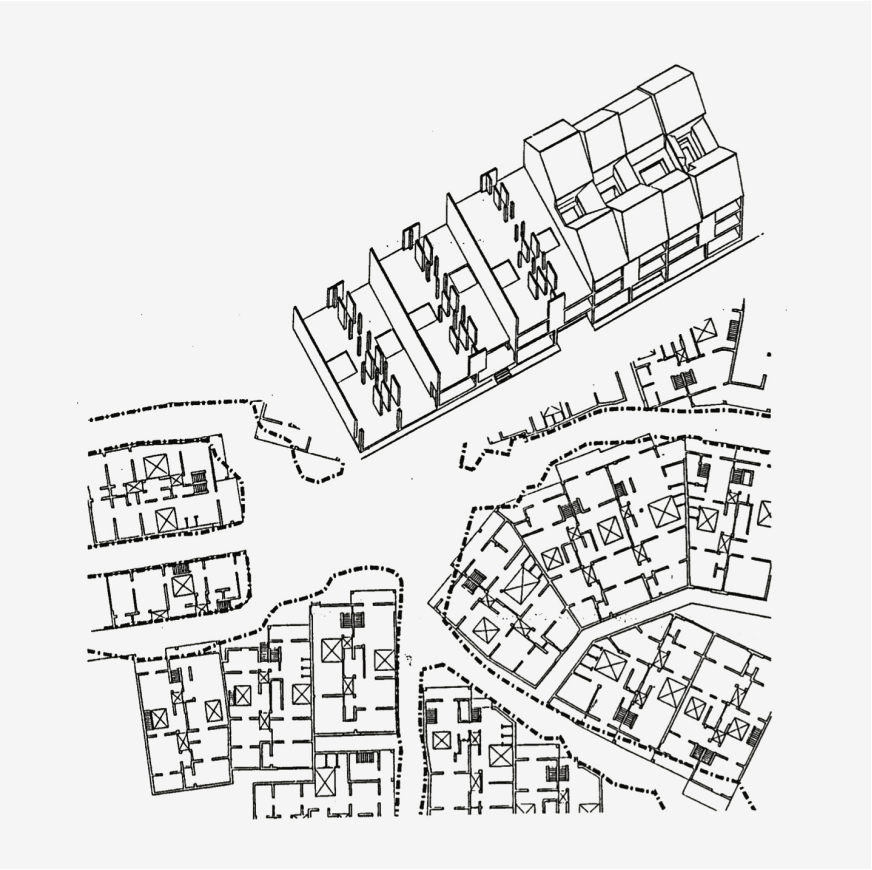
Now we see how the type serves a dual purpose. Each house within a type was built for a specific client with specific preferences and means, and on a specific site; but each was built following the same typological rules. The type makes us share its particular values and therefore share a culture, while at the same time it allows us to express ourselves as individuals within that culture.

Usually houses of very different sizes are found within the same type. In spite of the contrary evidence in the Malayan house we find in most cases that the large house and the small house have rooms of about the same size. The larger house, however, has many more rooms and often it is more typologically complete. When the house has to be small, sometimes certain kinds of spaces belonging to the type are omitted, while others are maintained. We see an example of this kind of reduction in the sections of the traditional house of Ahmedabad, India, as studied by Arjun Nagarkatti.[07] The three examples each have a 'front house' and a 'back house' separated by a narrow courtyard. We see how in the small house the front part is reduced to a single room. In his thesis, Nagarkatti proposed a 20th century architecture with new structural systems, and an urban tissue based on the traditional house type.

06 Jamel A. Akbar, "Support for Court-Yard Houses : Riyad, Saudi Arabia." (Thesis, Massachusetts Institute of Technology, 1980). https://dspace.mit.edu/handle

07 Nagarkatti, Arjun. "An Intervention in an Extant Situation : A Guideline Case-Study - Ahmedabad, India." (Thesis, Massachusetts Institute of Technology, 1984). https://dspace.mit.edu/handle/1721.1/75946.

Cross sections of three traditional houses in Ahmedabad, India-
From Nagarkatti, Arjun. “An Intervention in an Extant Situation : A Guideline Case-Study - Ahmedabad, India.” (Thesis, Massachusetts Institute of Technology, 1984), 17.



Revisioning a 20th century architecture using new structural systems, and an urban tissue based on the traditional house types of Ahmedabad.
From Nagarkatti, Arjun. “An Intervention in an Extant Situation : A Guideline Case-Study - Ahmedabad, India,” 51-66.

A study of the Pompeian house type, of classical Roman times, shows that the type has three open, courtyard like spaces: the Atrium, a space with a roof opened to the sky in the center; followed by a court surrounded by colonnaded galleries, called Peristyle; followed by a back yard. In the smaller houses the back yard may disappear first. Next the Peristyle may go, but the Atrium will always be there. We may thus find typological spatial arrangement in a 'degenerated' form, like the front part of the smaller example of the Ahmedabad type is 'degenerated'. Apparently, there is a hierarchy: some parts must be omitted before others and some may never be omitted. In the same way we would expect the poor version of the Medina House not to have a diwan and perhaps only a primitive Qa'a composed of two parts instead of three. We need to learn much more about the dynamics of variation within types, but the hierarchical principle of spatial organization may well be a universal quality of the house type.

FUNCTION AND SPACE

In the modernist tradition we are used to name the spaces of the house after the functions they hold. In the traditional house type the relation between space and function is more sophisticated. If a space has a specific name — like the Roman 'Atrium' the Arabian 'Qa'a', or the Malaysian porch called 'Serambi' — we may seek to describe the kinds of functions that usually take place in it. Usually we find there is not one specific function. The Atrium, for instance, was a place where many things might occur. It is best understood as the most 'public' space of the Roman house. Among other things it was the space where visitors were received or kept waiting before being invited into more private spaces of the house. The 'Serambi' is where we can expect the usual activities taking place on a porch; sitting and watching the street, meeting with friends and neighbors. But a better way to describe the Serambi is to point out that it is a link between inside and outside space, also connecting the more public street side and the front yard with the more private realm of the house itself. The identity of such typological spaces is not derived from the activities that take place in them, but from the position they take in the system; the place they have in the transition between public and private and, most of all, by their particular architectural quality and shape. Hence an Atrium can simply be described by the particular roof it has with an opening in the middle through which the rainwater flows into a basin in the floor. A Qa'a can be described by its physical organization of three parts; the floor of the middle part about two feet lower than the floors of the adjacent parts of which the ceilings are one story high while the middle space reaches to the skylight in the roof. A Serambi is a roofed floor without walls in front of the house and connected to the ground by a flight of stairs.

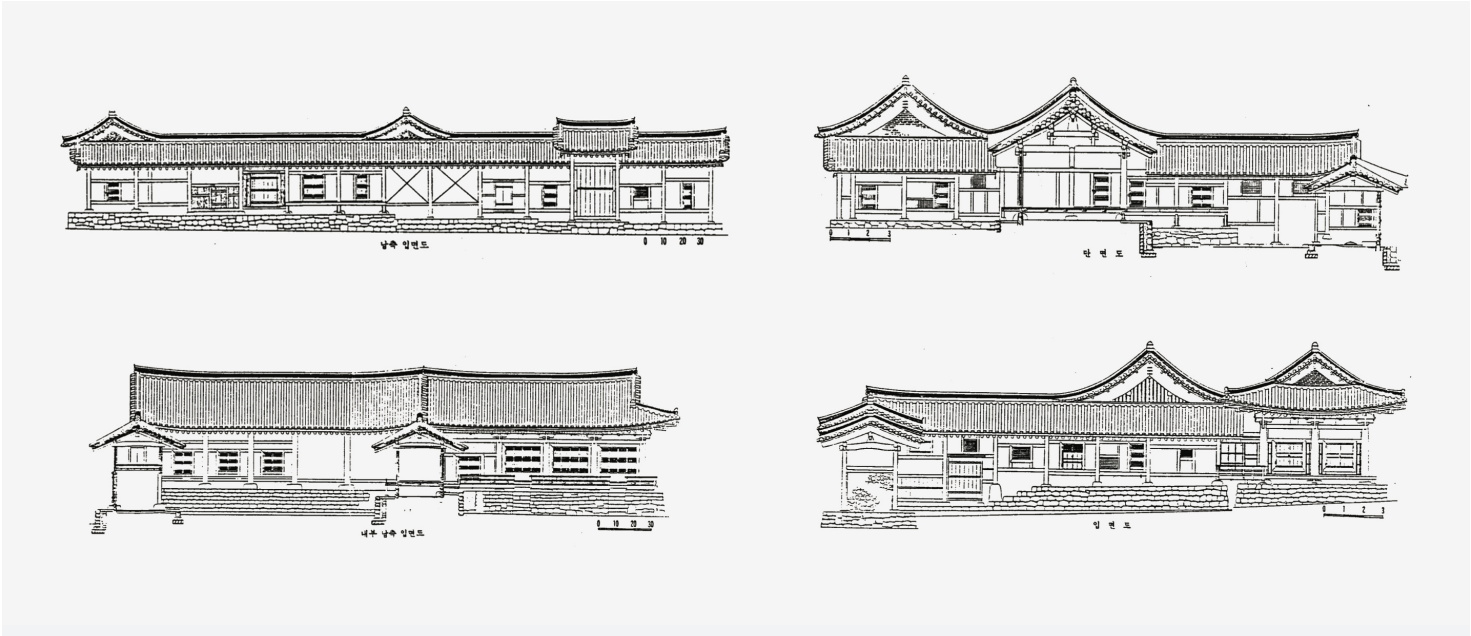
In this way, traditional house types always have certain rooms of a very specific architectural quality. These typological spaces can be described along the three axes suggested above: their particular shape and architecture, their position relative to 'inside' and 'outside', and their role in the definition of public and private realms in the house. The names of these typological spaces are not functional. They evoke architectural qualities. Indeed, it is the function that derives its importance and meaning from the space it takes place in, rather than the other way around. It makes a difference whether the guest is received in the atrium or in another, more private space. Sleeping, eating, working, and doing business may happen in a variety of places, sometimes depending on the season. Cooking, for obvious reasons, usually takes place in a designated space and for formal reasons there may be a banqueting hall, but the norm is that there is no one-on-one relation between function and space.

House types, therefore, defying functional explanation, can best be described in architectural terms. This is not only true for the spaces but also for the physical organization. Here we also have typological parts like beams, columns, lintels, walls, etc., with their own identity but not neces-

sarily defined in terms of materials and technologies. The Greek column is the well-known example of a physical architectural entity by itself. We know it originally as a marble column — itself believed to be the interpretation of wooden posts — but Palladio's classical columns are often made of brick and plaster, and later we see beautiful examples in wood built by carpenters on the North American continent. The analysis of a house type, therefore, is primarily an exercise in architectural distinctions, both spatial and physical.

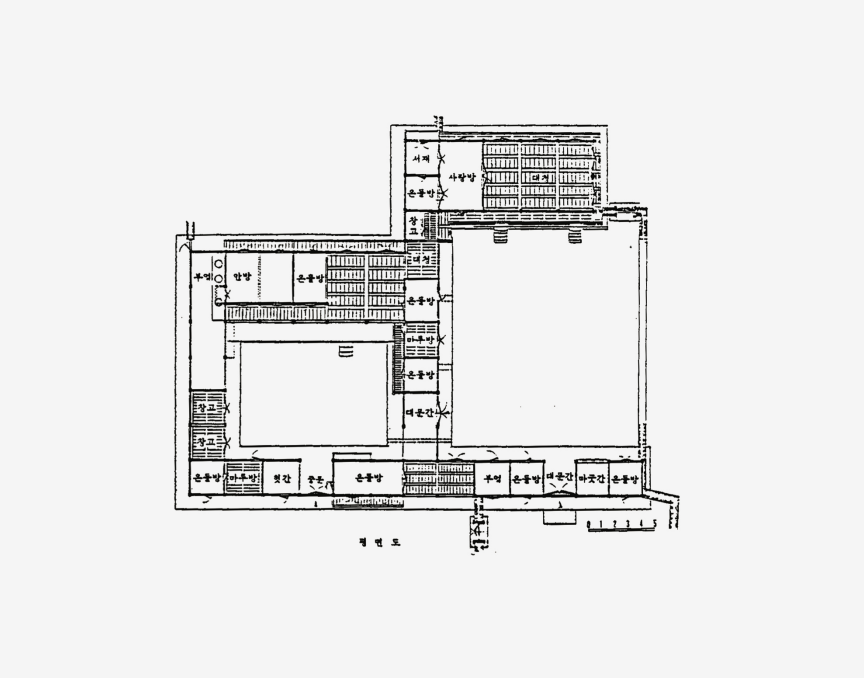
DESIGN RULES

Once we understand house typology in this way there need not be any doubt that we can learn from it for modern design practice. The systemic rules recognized in the type are in fact design rules. They have a formal character. This insight is the basis for the study Doo-Ho Sohn did on a number of traditional houses in the village of Hawhoe, Korea.[08]The strong architectural quality of the houses is evident. At the same time, one only has to look at three of them to recognize a powerful typological base. There is variation within clear similarity. Sohn has appropriately decided to translate the systemic structure of the type in a formal way directly linked to the design activity. He has described the house type in terms of a series of design rules: rules reflecting decisions a designer must take to arrive at an instance of the type. He divides the design rules in two kinds: the truly 'typological' design rules that have to do with the ordering of the whole and the shapes particular to the type and, in addition, the 'technological' design rules, that have more to do with the making of the house rather than the shaping of it.

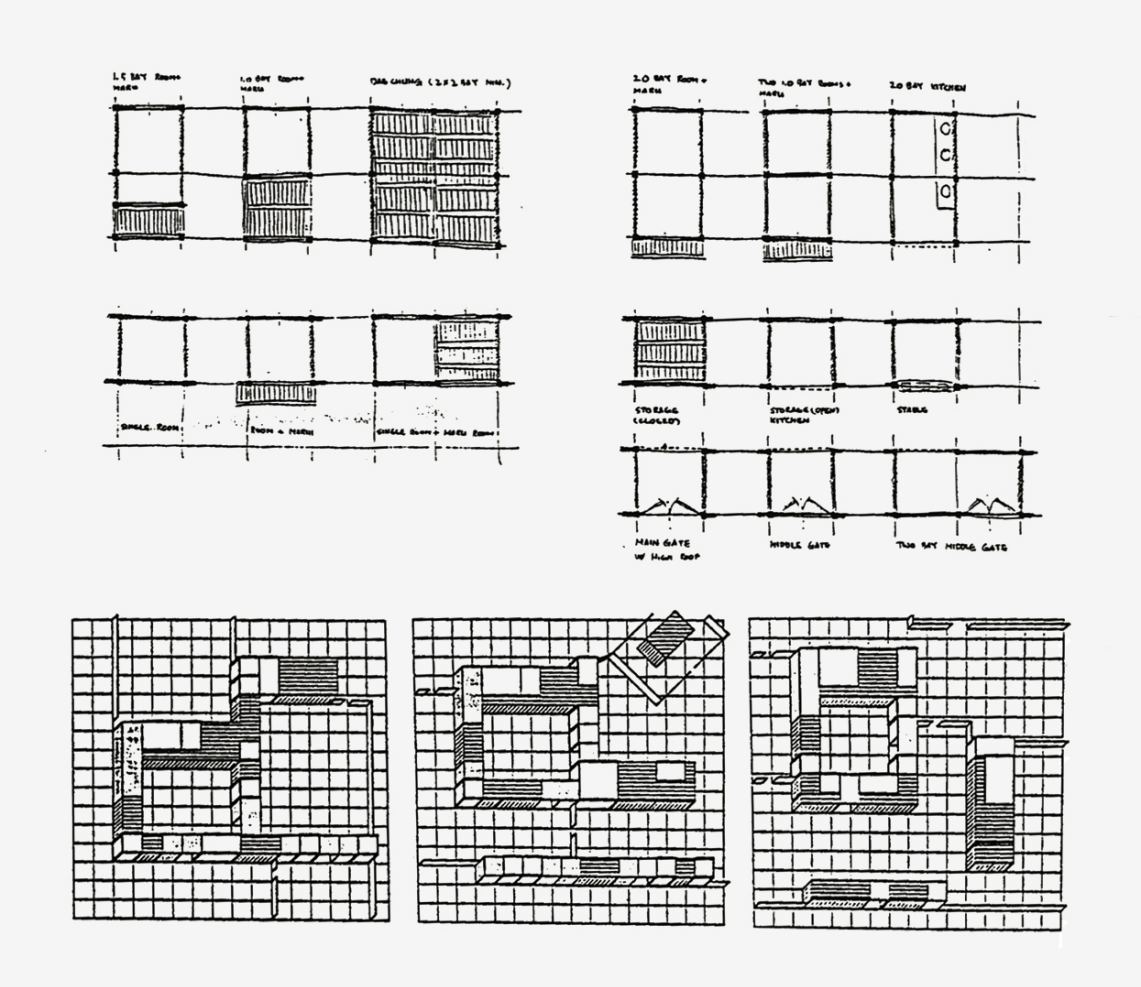


The Madina house reinterpreted with a new physical system.
From Khashugjee, "Principles and Application for Qa'a Houses in Madina,"41, 42.

08 Doo-Ho Sohn. "Design Rule Making : A Study of Hawhoe Houses in Korea." (Thesis, Massachusetts Institute of Technology, 1989). https://dspace.mit.edu/handle/1721.1/77698.



Plan of the Yang-jin Dang house.
From Doo-Ho Sohn. “Design Rule Making : A Study of Hawhoe Houses in Korea,” 32



A design game based on an analysis of the Korean Kan house type and variations of Kan types.
From Doo-Ho Sohn. “Design Rule Making : A Study of Hawhoe Houses in Korea,” 52, 54.

In the thesis study in which he describes his analysis, Sohn takes one more logical step to test the validity of his rules. He builds a 'design game' in which the design rules are used. The game consists of a site plan and a set of simple wooden rectangles of different sizes standing for commonly known spatial parts called 'Kan' from which these houses were composed. Players are invited to design a 'Hawhoe House' by arranging the pieces on the site following the given design rules. In Sohn's thesis, therefore, the type is seen to suggest a design method, placing it firmly in the architectural realm.

LARGE SCALE APPLICATION

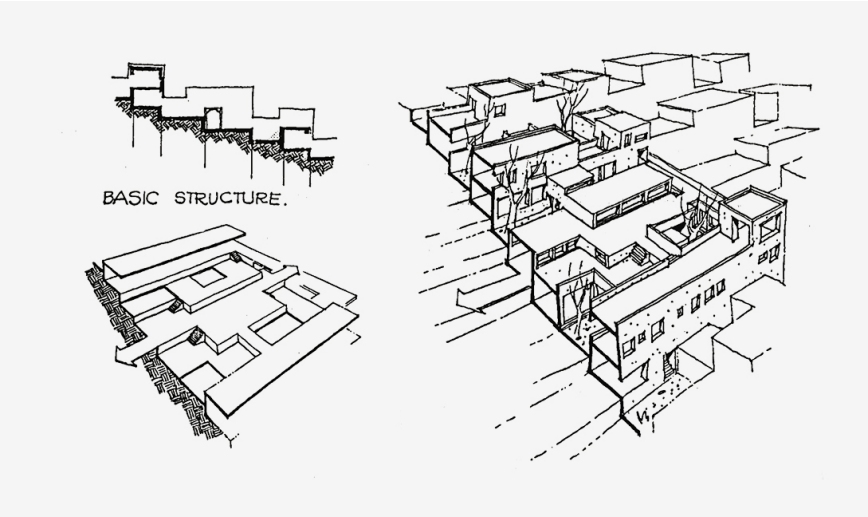
The recognition that a house type is architecturally determined but not functionally, and that this is done in such a systemic way that variations of interpretation come easily, suggests a powerful new approach in residential design. We should focus on the formal architectural qualities of the type. Once these are established, we can always deal with programmatic requirements, making variations within the framework of rules. Because the type gives general principles, we no longer need to design a single example, fully defined in form and function, to be repeated endlessly across a site. Uniformity can be replaced by similarity. When many units are needed, we can just deploy the typological elements all units must have in common, leaving more detailed functional decisions to a later stage. The result of such an approach can be very rich and varied, and yet systematic and efficient to build.

This approach is chosen by Solomon Benjamin in a study inspired by the houses of Ladakh in the Himalayas of Northern India.[09] He found how the existing type derives much of its particular spatial arrangement from the sloping site on which it is built. The houses partly overlap, connected by partially covered walkways between them. This principle is used by Benjamin to formalize an urban tissue by continuous deployment of roofed spaces and courtyards, but without any firm delineation of the boundaries of the houses. The particular territories occupied by each unit are defined later. However, each unit will always have its courtyard, an entry and surrounding rooms on different levels, always thematically connected to the courtyard. Once more we see how relations are kept constant while dimensions may change. No house need be exactly like another. Yet the number of parts to be manipulated is limited and easy to understand.

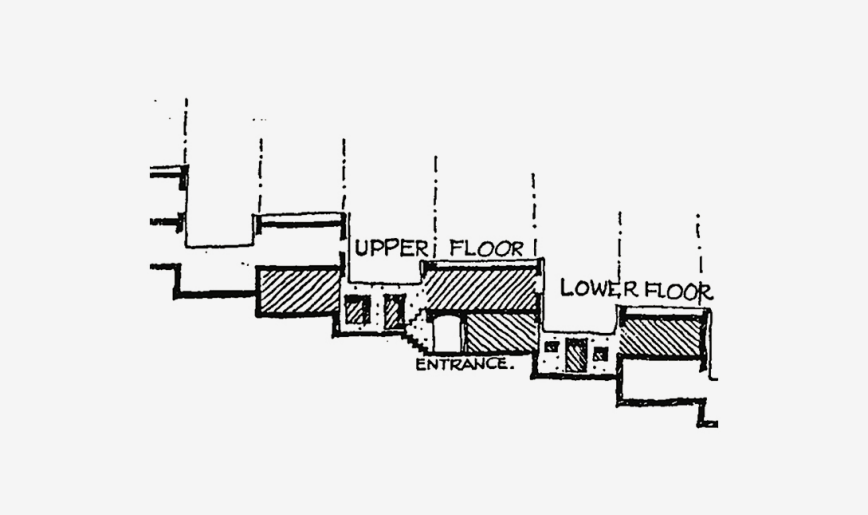
Working in this way, different 'layers of deployment' are distinguished, each demanding a separate design stage. Thus, a series of overlapping 'deployments' are made. First the site is cut and filled to accommodate public and private zones. Next primary walls are deployed. After that the roofs determine the shape and position of the courtyards, and so on. Layers are not strictly repetitive in their deployment. Distances between walls may vary as we go, so do sizes of courtyards and positions of entrances. But relations are always as dictated by the type.

It may be evident that this 'layering' approach is only possible when a type is clearly understood and analyzed in its formal organization. Indeed, the hierarchical organization of the house equates with the hierarchical organization of the urban tissue. Both follow from the same typological source.

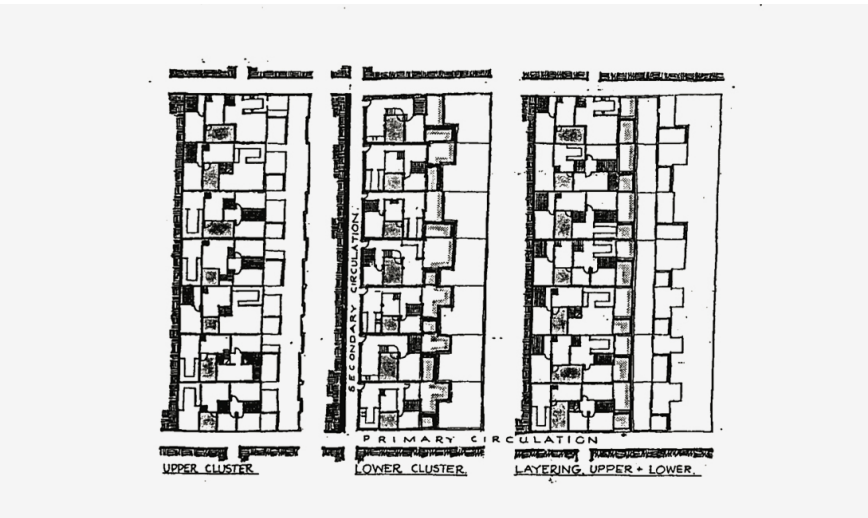
09 Design study conducted by Solomon Benjamin a former M.Sc Architecture student at MIT in 1985.



Basic structure and first stage in the design ‘layering’ of the tissue based on the Ladakh house type. From a design study done by Solomon Benjamin a former M.Sc Architecture student at MIT in 1985.

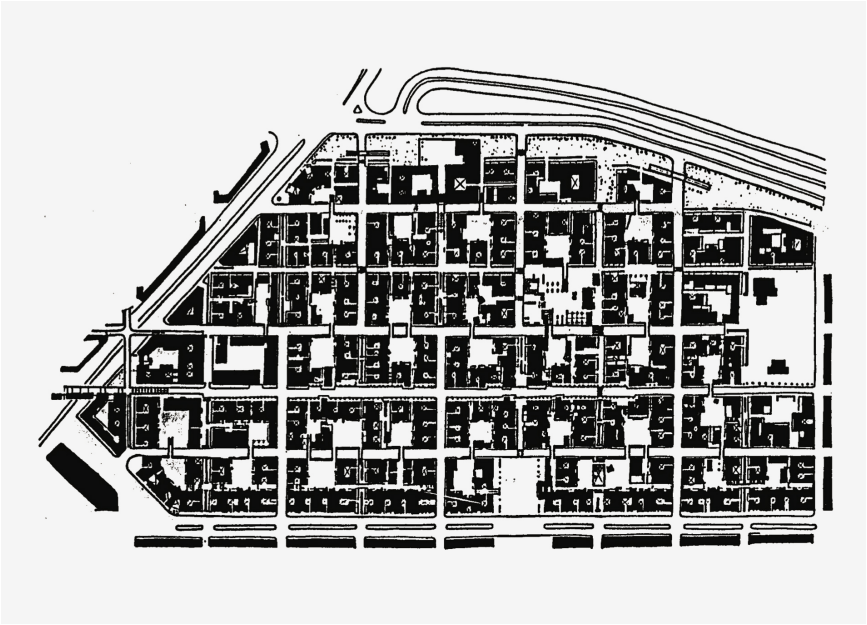


Built-up interpretation and principle sections.
From a design study conducted by Solomon Benjamin a former M.Sc Architecture student at MIT in 1985.

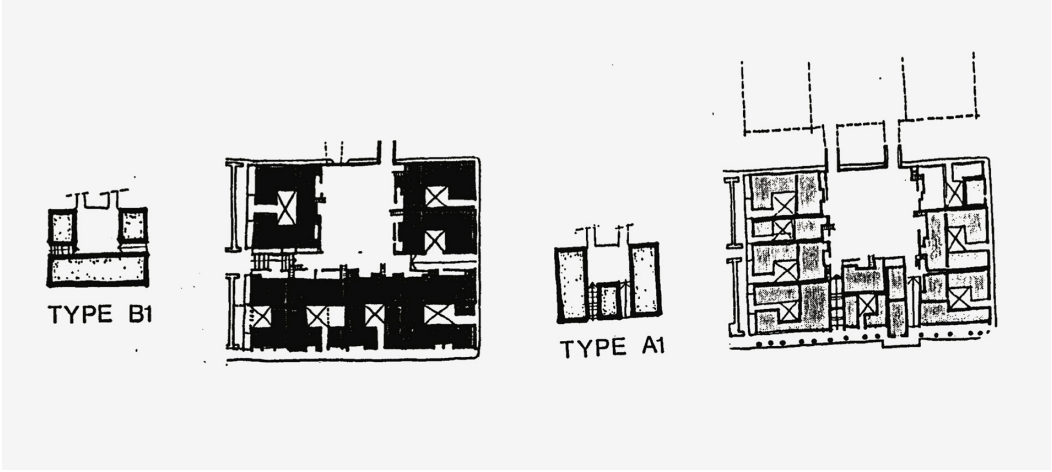


Plan examples.
From a design study done by Solomon Benjamin a former M.Sc Architecture student at MIT in 1985.

Following a similar approach Christina Gryboyjanni takes an additional step.[10] Her urban tissue is formally derived from the existing typological conditions in Kaisariani, a suburb of Athens. She transforms the existing neighborhood, not by elimination of its typological qualities but by adding to them, making the whole more intensive and richer. Accepting the tendency to build higher in what was originally a low-rise neighborhood Gryboyjanni introduces multi story apartment houses with narrow courtyards. In addition, she maintains the one-story house type originally found in the area. She accepts the existing street organization as an array of major and minor streets with communal courtyards behind the houses. The larger buildings are made to relate to the streets and the smaller houses remain related to the internal squares. The latter are raised to accommodate parking below and offer a crossing of the major roads by pedestrian walkways.



An urban tissue derived from the existing typology of a neighborhood in Kaisariani in Athens. Drawing from a design study conducted by Christina Gryboyjanni a former M.Sc Architecture student at MIT.



Two block types. Drawing by Christina Gryboyjanni.

10 From a design study conducted by Christina Gryboyjanni a former M.Sc Architecture student at MIT.

Gryboyjanni's study is a good example of systemic elaboration where the traditional hierarchies of spaces and forms are not reduced by modernization but strengthened in their architectural expression. Once more the study of the typological systems leads to a natural variation: no courtyard or plaza is similar to another, no two houses need be the same. Yet there is a strong unity and a remarkable efficiency of expression.

THE ARCHITECT'S ROLE

When an architect connects in his work to a traditional type he does not borrow from another architect's work. Using existing typology is not a matter of professional originality or lack thereof. When we use a type, we connect to values we share with other people: clients and users as well as colleagues. From this common base the architect must deal with the specific problems at hand — the site, the program, the car and other modern amenities — to find a synthesis. In this way we make something new by transformation of What is familiar. ln the type professionals and lay people share common ground. Here we can achieve a true architecture of the community.

When we transform the traditional type, we must decide what to retain and what to discard. Because the type reflects common values the choice as to what to keep cannot be a personal one but must reflect the shared values of the society we work for. The type is not an invitation just to pick and choose what we fancy but offers a frame of reference by means of which we can best discuss with our clients where to start and in what way to transform. A great advantage of the typological method is that the architect is liberated from the too narrow constraints of a peer group value system and invited to operate in a larger cultural framework.

In a world inundated by new things it is not a bad strategy for the architect to seek maximum continuity with the past without rejection of what is of our own times. Let the circumstances and practical needs be added to the spatial tradition and enrich it rather than replace what is still valued. The originality of the architect should lie in the ways he finds to assure this continuity in a particular way. The challenge to our profession is no longer to be avant-garde and to refuse the past, but to connect to it and transform it, in a continuous and sophisticated process to suit today's culture.

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