

THE SMALL HOUSE : MAKING MORE OUT OF LESS

A study of space use and perception in dwellings

by: Thomas Randolph Selden

B.A. Music, Swarthmore College 1971

Submitted in partial fulfillment of the requirements for the degree of Master of Architecture at the Massachusetts Institute of Technology, January 1979.

(i.e. February 1980)

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Edward B. Allen, Thesis Supervisor,
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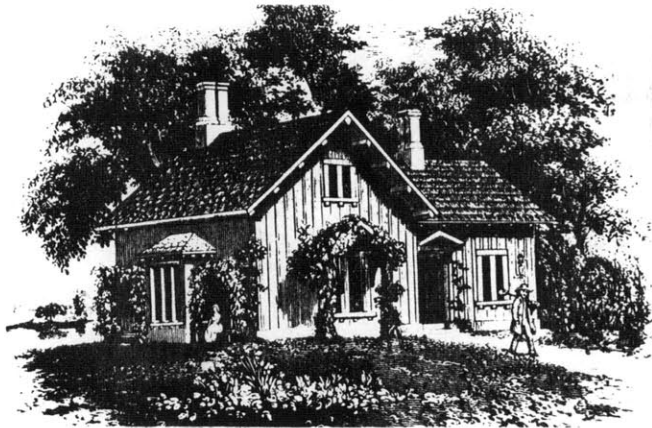
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THE SMALL HOUSE

MAKING MORE OUT OF LESS



"LITTLE AND GOOD IS TWICE GOOD"

Baltazar Gracian



ABSTRACT

THE SMALL HOUSE: Making More Out of Less

by Thomas Randolph Selden

Submitted to the Department of Architecture on January 18, 1980 in partial fulfillment of the requirements for the degree of Master of Architecture.

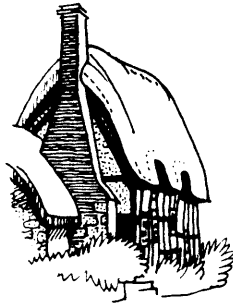
The subject of this Thesis is the interior space of small dwellings. The discussion first considers the physical use of space and conventional attitudes which affect its organization. The author illustrates economies of space which may result from a critical examination of our privacy requirements and the discriminating application of screening elements to meet these needs. Finally, the author addresses some psychological effects of small living spaces and proposes ways to minimize these effects.

Thesis Supervisor: Edward B. Allen

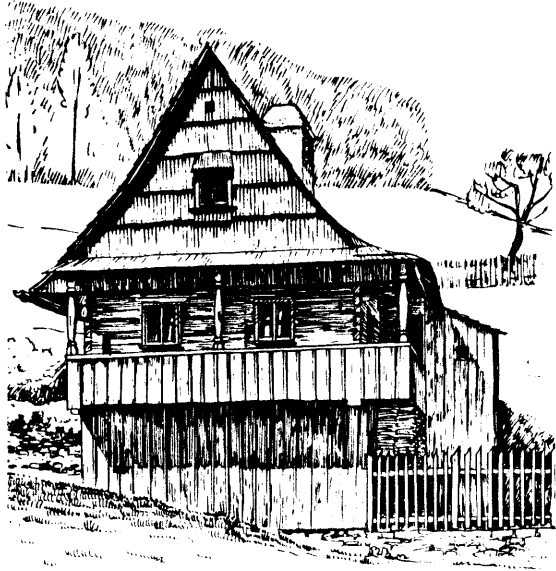
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ACKNOWLEDGEMENTS

Ed, I always looked forward to our meetings, for the consistently good suggestions you gave me, for the message that simple is beautiful which is the unspoken message that comes from knowing you, and for your dogged determination never to let me lose inspiration or control in this project. Thanks.



This thesis is dedicated to, but not worthy of, my wife Stephanie, and my two daughters Sarah and Christina, for whom sacrifice and understanding has become a way of life, and without whose support none of this ever would have been possible.



CONTENTS

Abstract	iv
Acknowledgements	v
Introduction	1
Physical Space	11
Tailoring Space	30
Psychological Space	52
Bibliography	77
Illustration Credits	79

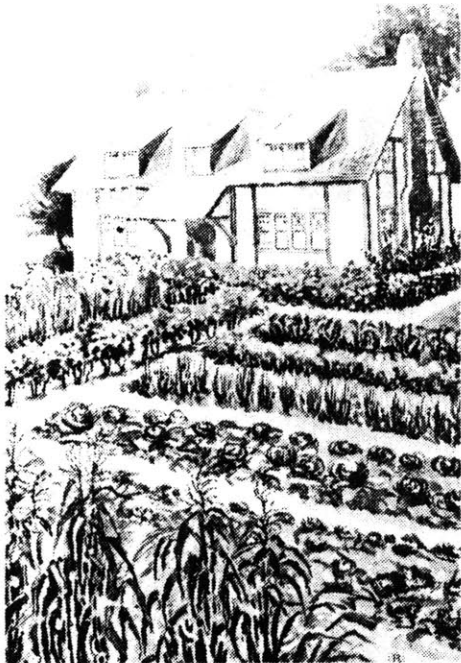
INTRODUCTION



Small houses have a romantic appeal to people of all ages. The earliest human experience of this fascination with small places can be seen in the delight of the child who discovers he can make his own private room by merely placing a blanket over his head and being his own centerpost. Soon he is finding places behind the curtains or couch, or under the table, where a space just his size and all his own awaits

him. In a few years he has begun to stretch blankets over tables and chairs to create a canopied space and has probably discovered every secret place in the house and every hollowed hedgerow and overhanging bush in the yard. This phase for some children is their last opportunity to have a place of their own. Some don't even get this far because of parental constraint or a lack of open space opportunities.

But the luckier ones continue. They build or persuade bigger people to build for them playhouses, treehouses, teepees; sometimes they just cover pits in the earth. The teenager grows to be a young adult. The dream of a house emerges, a dream built of a myriad of images from places he has lived, visited and imagined, full of wonderful things, unreal and inconsistent, a hodgepodge collection of very



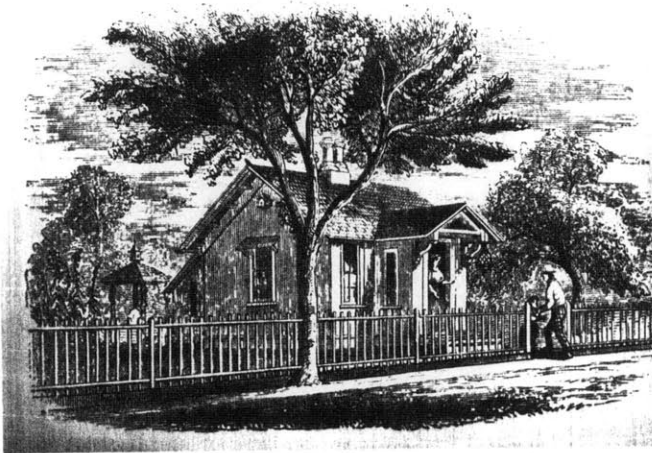
personal stuff. But the dream begins to fall back into the distant reaches of the mind as the house hunter confronts the bleak realities of cost, of interest rates, of tight credit and of scarcity of choice in the housing market.

We are coming into an era where smallness is a virtue; where to maintain or possibly improve the quality of our lives we must turn our ingenuity toward making more out of less. The message comes from all directions. Conservation of natural resources, energy, space and labor is both an environmental and an economic necessity.

The houses we build have a significant impact on our environment, directly as relates to the site on which they stand, and indirectly because of the energy required for their operation and the

materials required for their construction. Not only the environmental impact but also the initial cost and the operating costs of a house are a direct function of a house's size.

In this paper I hope to examine just how housing needs might be realized with the fewest possible gestures. If it is true, as I believe it is, that we are not getting nearly the best use out of the space we pay so dearly for in so many ways, then it should be useful to examine how we might do better. The result might not always save dollars. Beyond a certain point, of course, it becomes more expensive to condense complex living requirements into a tight space than to expand the space. But understanding the nature of space relationships will almost always allow us to get more usefulness and more pleasure from a



given area.

Most seekers of a small house will probably have lived with and become accustomed to space limitations. To protect those who are trading in castles, the Surgeon General might require that a warning such as the following be engraved on the corner stone of every small house:

Small houses are limiting. Furniture tends to remain in one place, as opportunities for variation are fewer. To the extent that people must share spaces, conflicts arise and relationships are tested. Because there are fewer unfilled corners and more intense usage, inhabitants must be more careful to put things away after use, not only for their own convenience but also to avoid the ire of those who are sharing the



space with them. Unless there is an ample amount of undesignated space, hobbies and interests which require space that is unavailable in the house will have to be pursued elsewhere. The sounds of other people and their activities, being closer at hand, will be more noticeable and will require more careful accoustical treatment than would be otherwise necessary.

But what of the virtues of smallness? Small houses force us to decide what we cherish and what we can dispense with. They do not allow us to accumulate those great quantities of might-be-useful objects that become like a ball and chain, enslaving us to their care. Besides, small places are easier to tend, clean and repair. When resources are limited, as they most always are, it is more satisfying to furnish a large place minimally.



Though a small house may be limiting, unlike an apartment, it is your own. Its small size and particular shape reflect the many choices that you made for yourself. Unlike the feeling which may come from living in rented rooms, even the smallest house affirms in the strongest terms one's unique existence.



Whether one is space bound and must expand the usefulness of a given place, whether one has space but wishes to economize on building costs, whether one has neither ample space nor funds and wishes to get the most out of both, or whether one has both funds and space but is interested in the spiritual qualities of smallness, I hope the material presented herein will be useful.

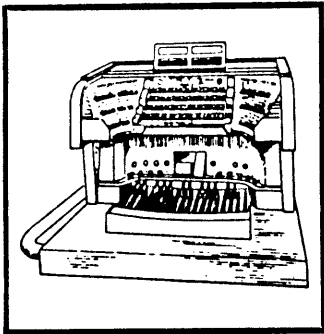
This work is built of three pieces. The first, comprising Chapters I and II, is a discussion of the kinds of physical space which make up the dwelling house and how this space can be shaped ("tailored") to respond to conflicts of use. The discussion questions conventional perceptions of space and encourages the reader to think of space in terms of human physical needs rather than cultural conventions. I have not, however, taken the discussion to its logical extreme, which would have entailed examining to what degree we need anything more than the most rudimentary shelter and possibly why we need shelter at all. While this might be an interesting subject to take up somewhere else, it would not have been especially relevant to the majority of people who are considering building a small house.

In these first two chapters I have presented and discussed certain kinds of interior space which I feel universal to all inhabited forms, specifically: space to act, space to be with others, space to store possessions, and space to connect spaces. I have also avoided discussing specific space saving ideas except where this was necessary to illustrate a general concept. Popular literature is full of space saving ideas. What I feel is lacking is an articulation of attitudes which can generate an economical use of space and which recognize the unique character of each situation such that the interests of economical space use can be melded with other architectural and human requirements in the design solution.

The final section presents psychological aspects of small

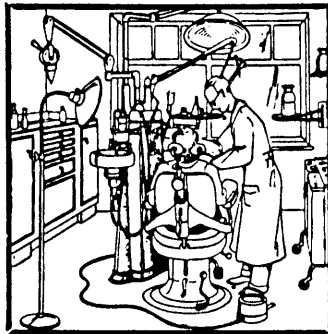
spaces. With reference to scale,
degree of remove, perception of
boundaries, and view, I have
proposed relationships which
enhance our feeling of spaciousness
without enlarging physical
dimensions.

I



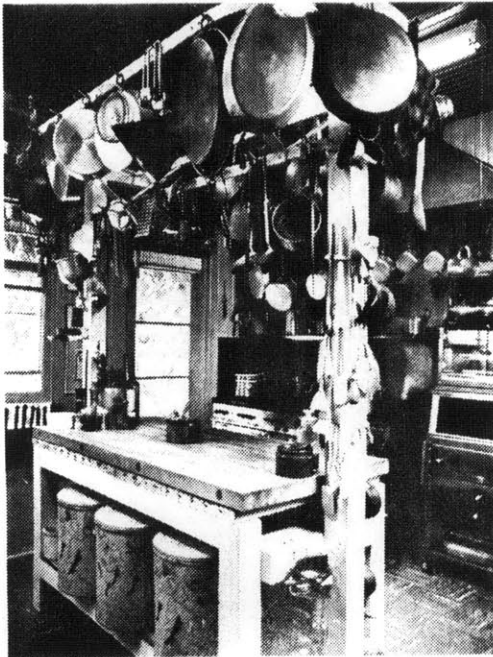
PHYSICAL SPACE

Useful physical space falls into at least 4 categories: elbow room for individual activities, social space, passage, and storage.



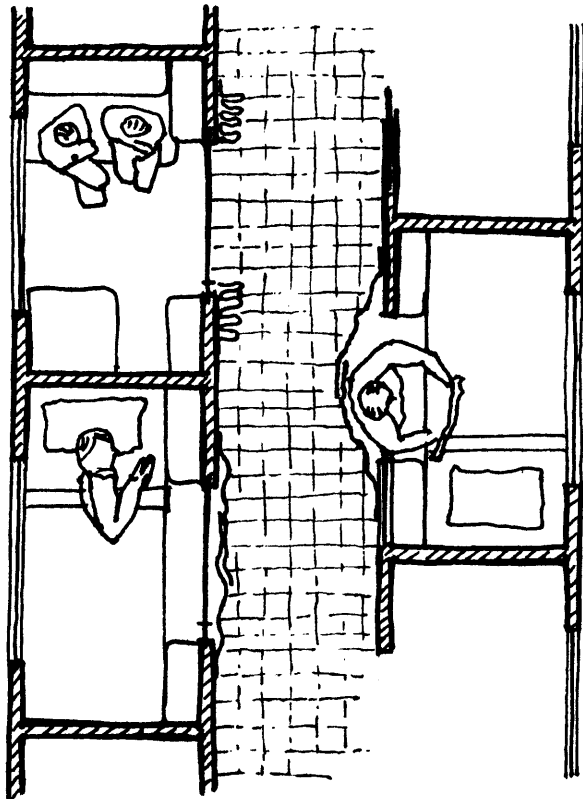
ELBOW ROOM

Elbow room is the space we need around us to keep from bumping up against our surroundings in the



course of an activity. It includes the work area, where all tools, materials and other paraphernalia are laid out for the job at hand. The amount of space required varies by activity, baking requiring considerably more space than paying bills, for example. Generally, elbow room is most often thought of as a horizontal dimension. But anyone who has worked in a tiny kitchen or workshop will have noted that a horizontal work surface can be considerably smaller if the needed tools are located in the vertical planes of the immediate surroundings. This suggests reserving shelves, pegs, hooks, etc., around the work area for active uses as opposed to storage.

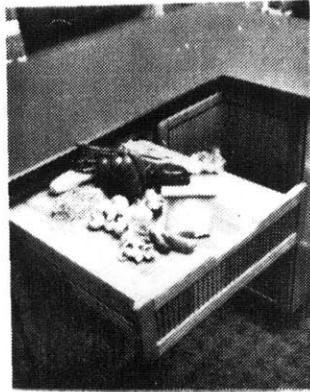
Elbow room is characteristically described in terms of a center of activity. Its outermost zone is penetrated only



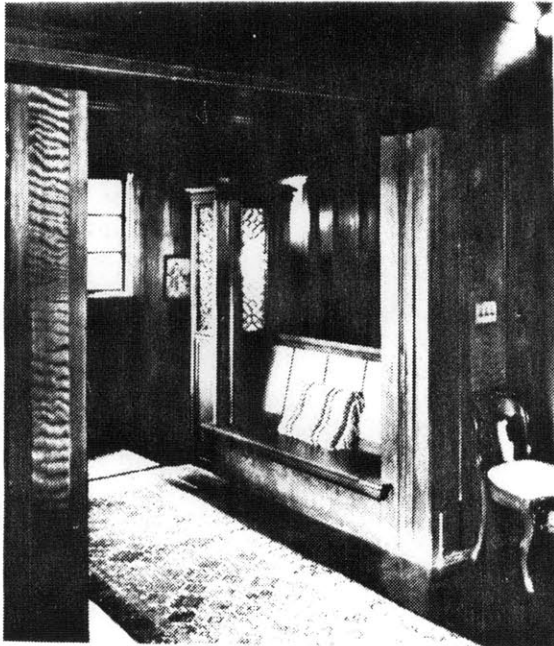
Curtains allow the roomette to expand at the critical moment

rarely in the course of an activity. Thus, if the boundaries which circumscribe an activity are made of a rigid material, the little used space in this outermost zone will not be available for any other use. However, responsive, nonrigid enclosures offer an element of compromise. Curtains, for example, allow shower stalls to be smaller than the maximum size required for body movement in the course of showering. The single sleeping compartment aboard American trains has both a rigid door and loose fitting curtain, the latter so that the user can stretch his space into the hall for temporary maneuvers without compromising his privacy or encroaching excessively on the hall's space.

Our need for horizontal work surfaces varies considerably depending on our activity. Surfaces

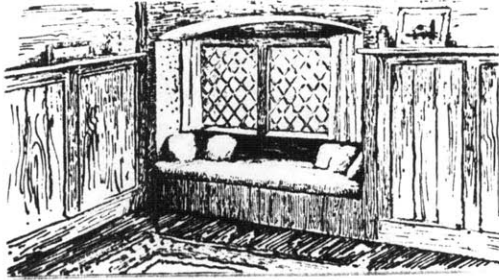


which are used infrequently often become clogged with objects that seem to gather like moss. But not having adequate surface area when it comes time to perform a food canning operation, or prepare a meal for a crowd, is a frustrating predicament which can be avoided by including extra surfaces which slide like drawers beneath a minimal counter top.



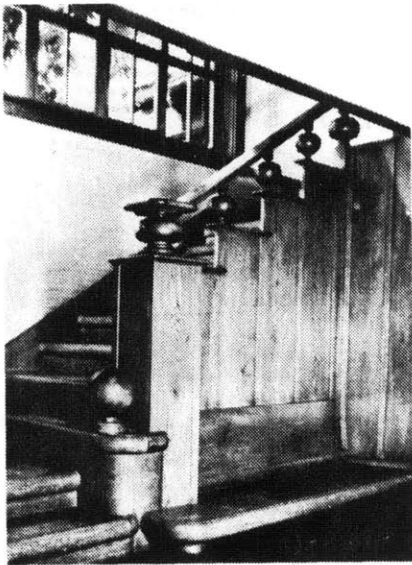
SOCIAL DIMENSIONS

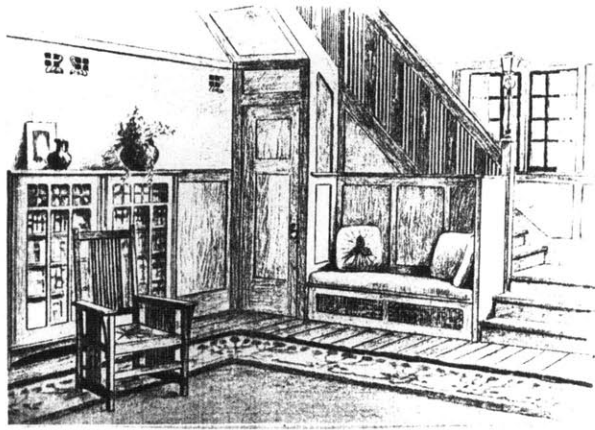
Social dimensions express a wide range of human interactions from intimate to distant. Not all parts of the house have a social dimension, since not all parts are intended as places for people to be together. The social dimension is much more than the space required for individual activity multiplied



by the number of people using it. Instead, it is a space which reflects the necessary elasticity of human engagement.

The smallest example of a social dimension might be a window seat. On a larger scale, social dimensions might be expressed in the relationship of one room to another. Unlike other space uses, social dimensions are to a great extent nonnegotiable. That is, while a solitary cook will adjust to an unusually tight kitchen, most people find it discomforting to be in closer proximity to other people than is customarily associated with their degree of intimacy. The designer of small houses must be aware of this lest he attempt a compromise which makes his design incompatible with the kinds of social interaction he has in mind.





In terms of space conservation, a look at attitudes toward the distribution of social spaces within the living space will be helpful. The range of social spaces in a dwelling can exist in a single area or can be distributed over several areas. The extent to which this distribution occurs reflects the designer's attitude toward the appropriateness of certain spaces for social use. In examining these attitudes, one may find acceptable hitherto unheard of combinations, one of which is illustrated in the accompanying photograph of a bathroom which doubles as a living room.



When space is at a premium, people seem to approach the need for social space in one of two ways. In the first, social functions are relegated to certain rooms or areas (the living and dining areas).

Other activity areas, such as the kitchen, bathroom, bedroom, etc., are then compacted to single-user or minimum dimensions. This approach makes socializing into a formal and intentional act. It also expresses the attitude that kitchen work is a solitary activity not meant to include social interaction. Instead, the living room becomes the stage. The rest of the house, especially the kitchen, may be just as cramped and unfriendly as the wings of that stage and is probably off bounds to the audience.

At the expense of a short digression, it is interesting to observe a sequence of choices which leads some people to the conclusion that this first approach is their only option. For many people in America, the living room is thought of as the interior equivalent of the exterior facade. It contains all

those things its owners want to be associated with - the symbols which identify their ideal self image. For them it is a sacred place, a protected place, where only certain prescribed behaviors are acceptable. Many of these same families will likely find themselves spending much greater amounts of time socializing with each other and with close friends in the kitchen than in the living room. Notwithstanding this fact, if space is to be sacrificed, the kitchen is often the first victim because of the relative importance attached to the symbolism of the living room.

The second approach to social space plays down the singular importance of the living room and recognizes the importance of allowing social interaction to occur wherever it might happen to be most appropriate and convenient to the

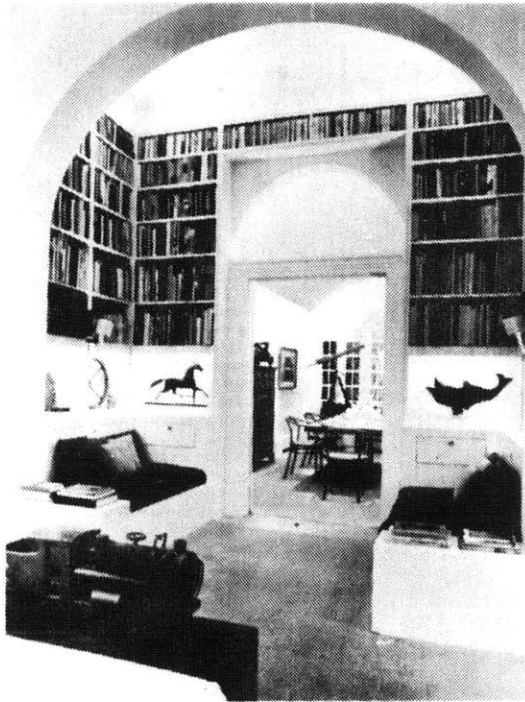
way one uses the house.



A great many social events with family or friends revolve around meals. Usually one of the group has to prepare the meal, so it only follows that the kitchen should either include or be directly within comfortable conversation range of the primary social space. But this violates the concept of the living room as a sanctuary. By opening the channels for conversation with the kitchen, the living room becomes invaded by the smells, noise and the functional realities of the kitchen. The kitchen itself then must be tamed. The appliances, cookware and fittings take on a new selfconsciousness. Spice containers are chosen to follow in the footsteps of the porcelain figurines, since now they too will be sending out their symbolic message to the visitors to the house.



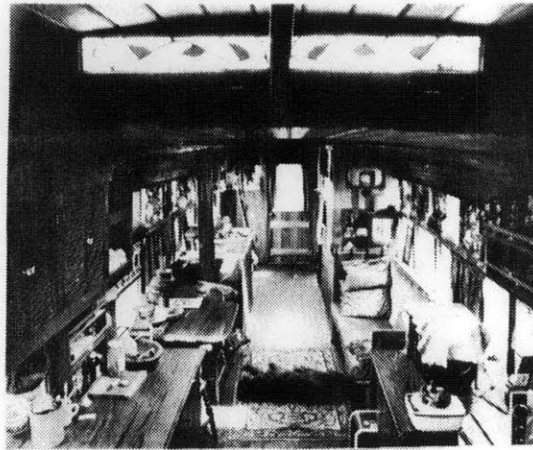
Of these two approaches, the second allows social opportunities to occur within the natural course of events, perhaps at the expense of guarded appearances. Without taking a position on the value of either approach, it is fair to say that the second also allows for greater space conservation because it encourages space sharing.



A passageway becomes a place

PASSAGE

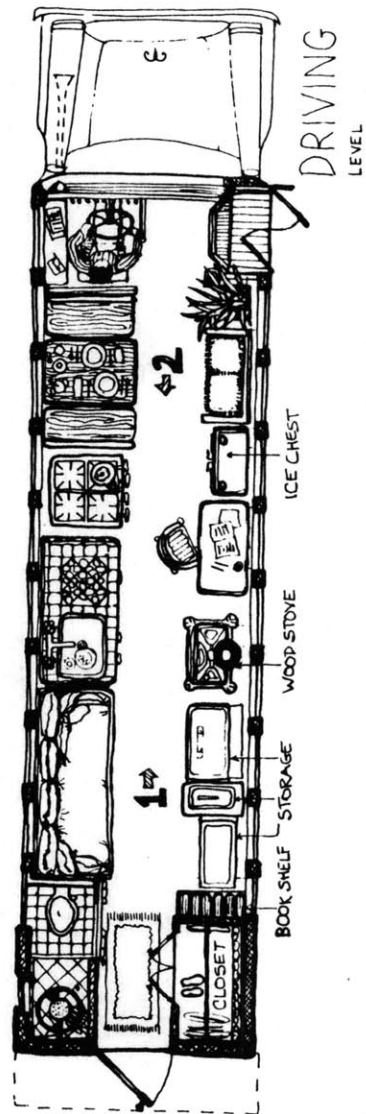
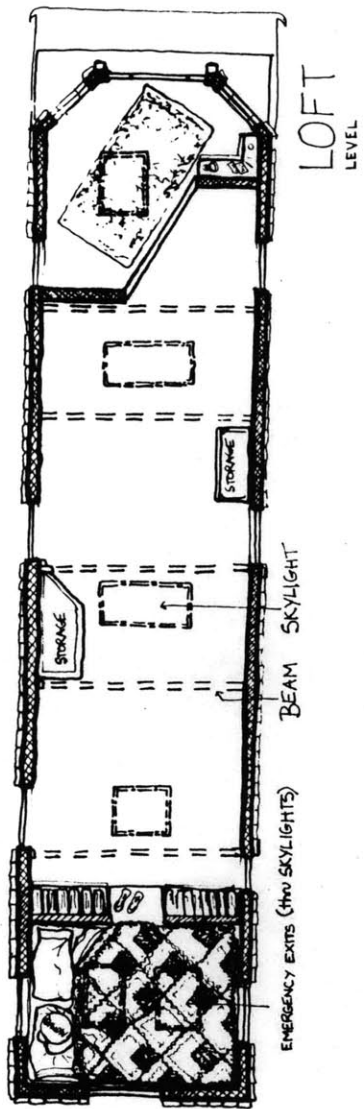
Passage is required to connect one activity area to the next. The most economical element of passage is the doorway, which may be nothing more than a wall penetration slightly larger than the human silhouette. Other passage elements are the narrow corridor, the hall, the stair, and parts of a larger room. The dimensions of a passage



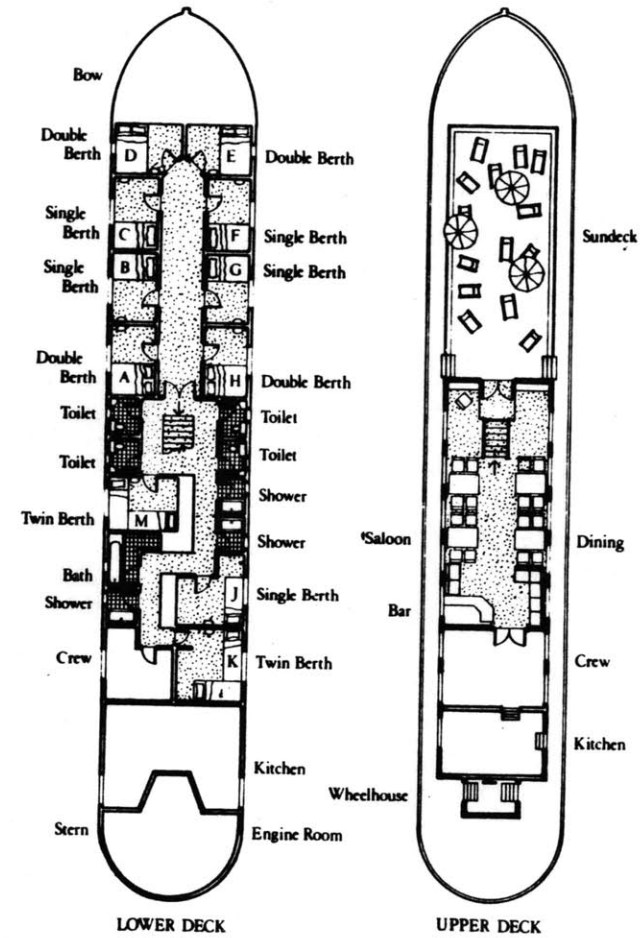
linear living

free for movement vary with the speed and size of passers and objects, the amount of simultaneous traffic, and the associative meaning of the space. Passage space can be isolated from activity areas and other functions or combined with them. In a house, connecting spaces are best utilized if they are not devoted exclusively to passage. Combination with other spaces and functions is desirable but sometimes limited by privacy or control issues.

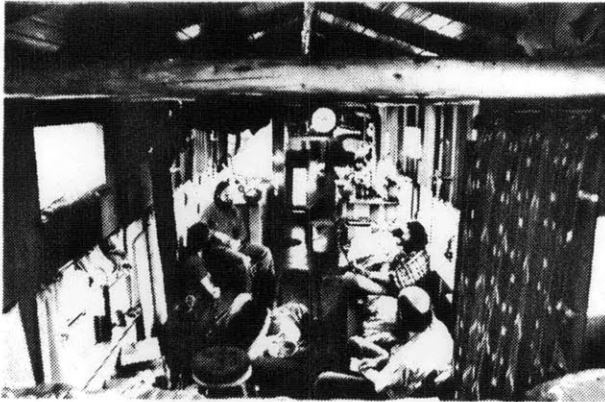
In barges, trailers, train cars and other inhabited forms which are narrow in one dimension (themselves having to conform to passage limitations of a higher order), internal passage is linear and often central. These central passage spaces serve as access and activity areas simultaneously. While they are extremely efficient in their use



Palimurus



On the left a converted bus. Above, a canal touring barge.



of space, they do not address the issue of the privacy of the passer or the passed, nor do they allow gatherings round and easy social movement.

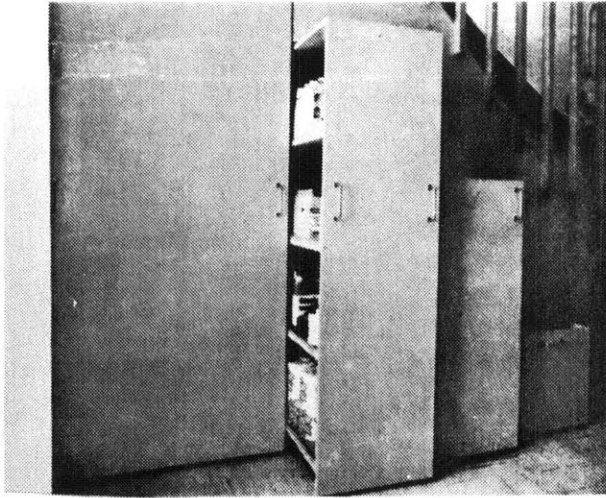
While passage space allows one to get from one place to another, it also offers an abundance of free access to whatever might make up its edge. To the extent that we invest this edge with useful functions, we can reduce the access requirements elsewhere in the house. It is false economy to make passages so narrow that this access resource is lost, unless of course it is not needed in the first place.

STORAGE



Storage represents one of those negative states - the state of not being used - which few people like to spend time thinking about. When one needs a widget, one is usually not inclined to contemplate rearranging one's storage priorities. And when one has no need for the widget, one may not care where it's being stored, much like the proverbial man who wouldn't repair the roof in the rain, but saw no real urgency to do so when the day was sunny.

Very few people feel that the objects surrounding them represent a current and up-to-date picture of their use needs. It may be more accurate to say we are all being slowly buried in accumulations of improperly stored objects. And as this happens, we perceive our usable



These shelves on casters provide access to a considerable volume of under-stair space.

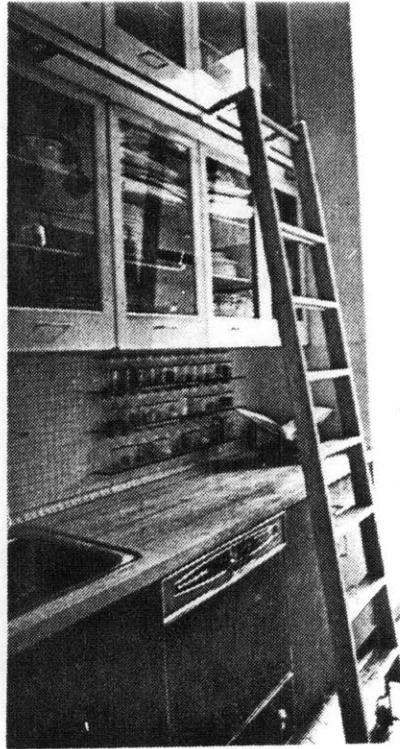
space to be shrinking.

Every object in a house is either being used or being stored accessible for use. How far removed we store an object from its place of use depends on (a) how often we use it, and (b) how portable it is. The more frequently an object is used and the less portable it is, the more physically tied it becomes to its place of use. Conversely, the less frequently an object is used and the more portable it is, the less physically associated it must be with its place of use.

This may seem obvious. But choosing a full size television which is a chore to carry about will have a dramatic effect on how flexibly space in the house can be used. This is significant because, to the extent that functions can be disassociated with specific

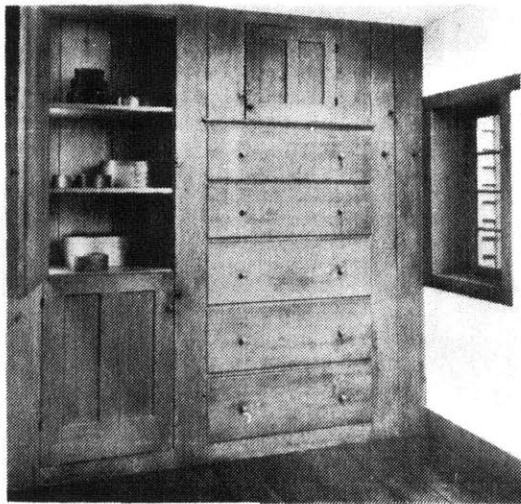
locations, those locations can assume a wider range of roles. Central heating enabled many warmth requiring activities to be disassociated with the location of the stove or fireplace. The "wireless" lost its commanding of place with the advent of the more portable radio; and miniaturization of televisions make it now possible to carry these sometimes intrusive devices away from areas where they are bothersome to others.

The best location for the storage of most objects is as near as possible to their intended place of use. But certain areas (especially kitchen and dressing areas) have greater requirements for storage space than others, yet may be confined to proportionately smaller floor areas. One common strategy is to include a storage room or closet nearby to accommodate



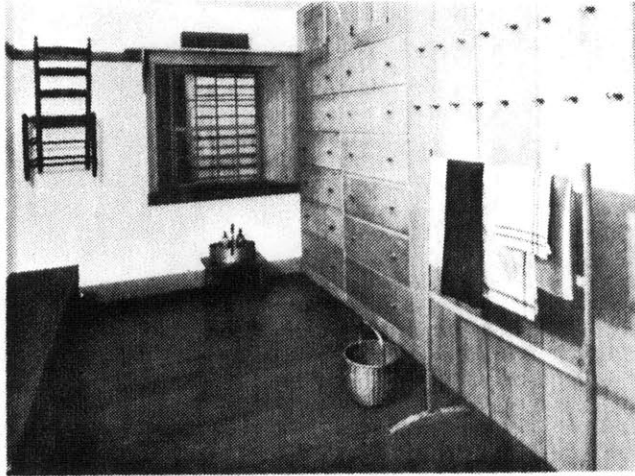
the overflow. This requires additional floor area and its associated cost. A second alternative is to appropriate "wasted" spaces in other parts of the house to storage. Depending on how difficult these are to get to, they may be somewhat inconvenient. A third strategy which adds storage space without increasing floor area is simply to increase the ceiling height in the area in question, creating a zone for passive storage which one must use a step stool or ladder to reach. Although anything involving ladders and step stools brings with it the possibility of injury, this is an especially appropriate strategy where floor area is limited and where basements and attics are not desired.

Free standing furniture and large appliances are stored where they are used. Together they occupy

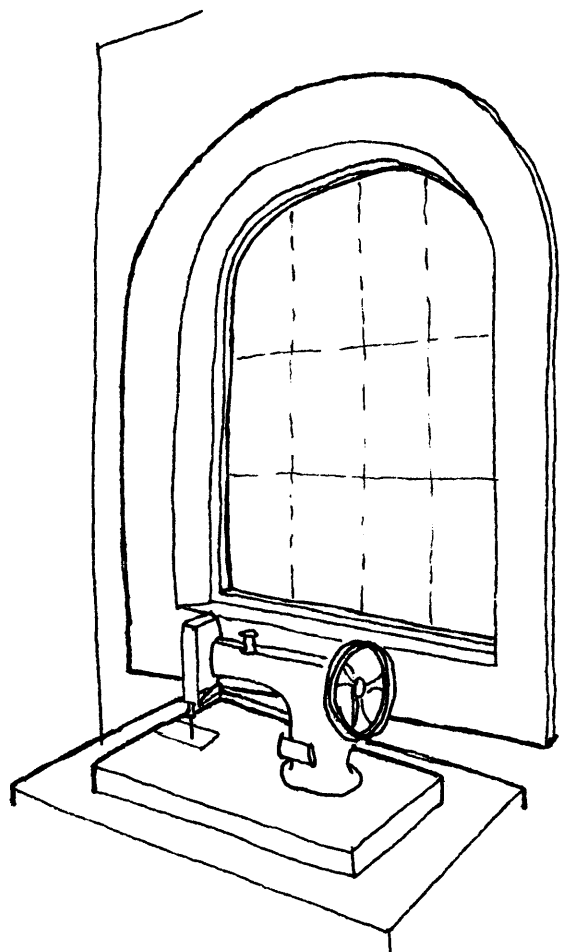


twenty to thirty percent of the floor area in an average house and may lay claim to over sixty percent of the floor area, if one includes both the access area they require and the area they cut off from usefulness because of their placement. This rather extravagant use of space can be minimized by the use of built-in furniture. Built-in furniture is generally contained in a perimeter wall (as opposed to in the space of the room). While this makes walls thicker (desirable from an insulative and acoustic point of view), the free space in the room remains just that, uncluttered and unobstructed. Because their location is fixed, built-ins can be surrounded top, bottom and sides by other space uses so that every square inch of space is utilized.

Among the arguments against built-ins is the fact that they are



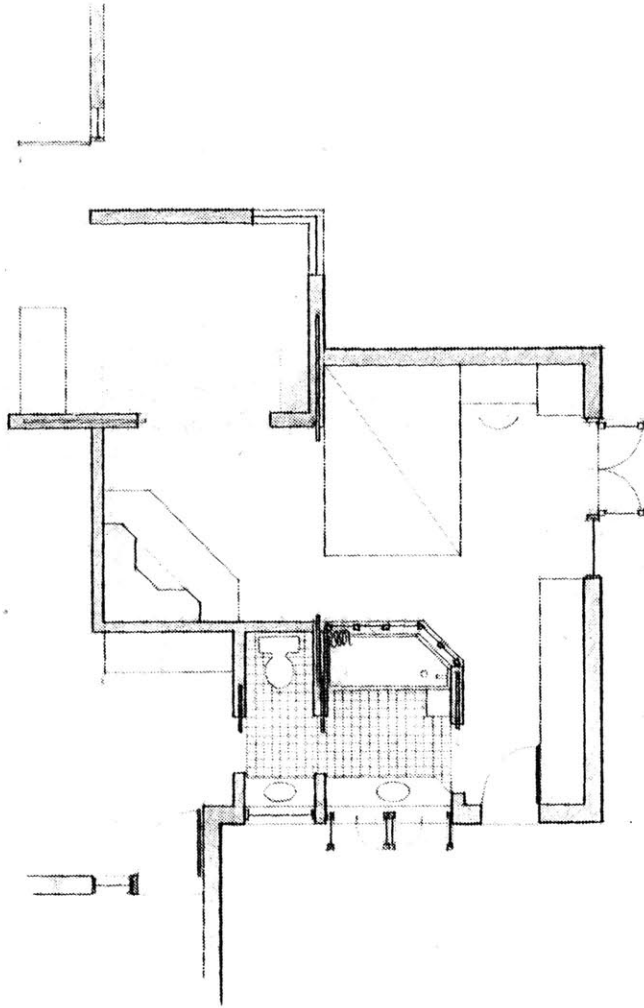
inflexible. They cannot be moved around to fit the unknown desires of a future user. And they cannot be rearranged for the sake of variety. But since smaller spaces by their very nature limit furniture arrangements to begin with and must be more carefully planned in advance, this may in practice not be a real drawback. When space is at a premium, built-ins become an extremely attractive alternative.



II

TAILORING SPACE

Space is created by that which contains it. Without definition, space is not perceivable. But this definition can have many forms. In this chapter we will be discussing ways to form or tailor space which are especially appropriate to the small house.

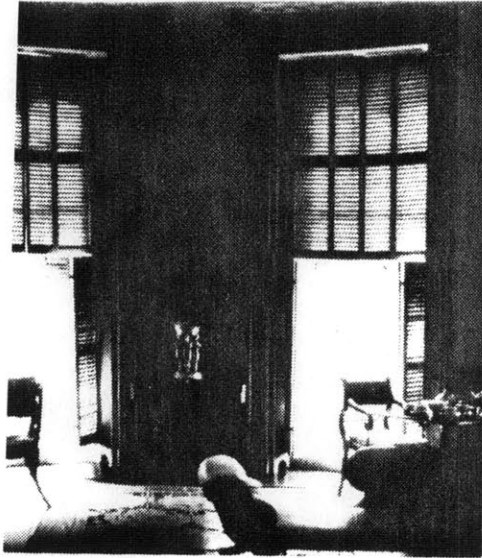


Bathrooms require screening for privacy, and controlling moisture, noise and light invasions to the bedroom. Here, the bathroom enjoys a generous outside view which can be shared by the bedroom through a half height wall with glass above when there is no conflicting use. Because of the transparency of the screen, the bathroom acts as a window box to the bedroom; both gain by this relationship.

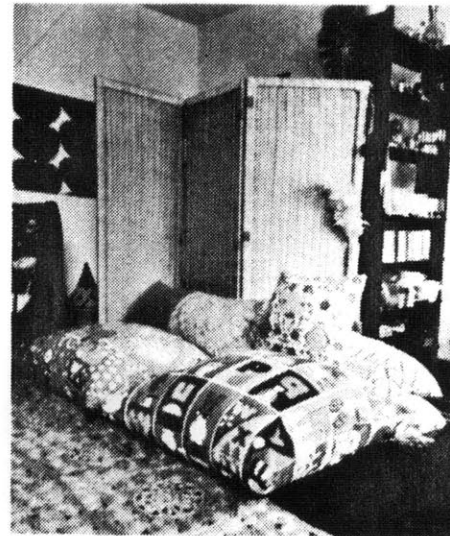
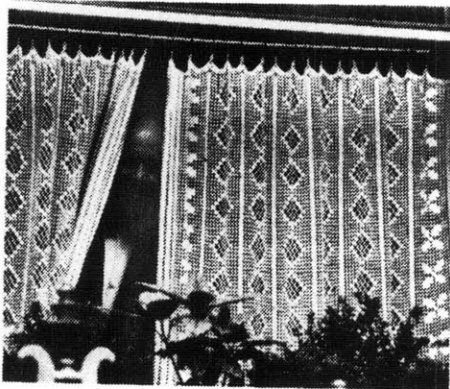
SCREENS

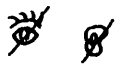
The process of allocating space to activities in a dwelling requires an understanding of how spaces with conflicting uses or environments can be separated partially or wholly from others. This is the process of screening. Just as we would not build a foot-thick stone wall to keep mosquitoes out, so should we be more subtle in selecting exactly which elements we want to effect by a screen and more discriminating in choosing devices to accomplish this at a minimum expense of space.

The objects of screening are, in most instances, either human senses or environmental forces. To illustrate the process of selective screening I have limited our discussion to awareness or privacy screens. Below are listed several screens which one might wish to



surround one's self with. Each is accompanied by an appropriate personal statement and a suggestion of some activity which might necessitate such screening.





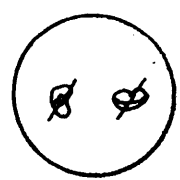
1. To control being seen or heard. "I don't want anyone to find out what I'm doing."
 Activities: making love, writing a personal letter, making a present, etc.



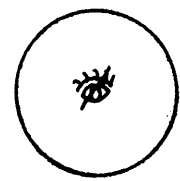
2. To control being seen. "I don't mind being heard as long as no one sees me (or certain parts of me)." Activities: showering, changing.



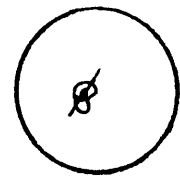
3. To control being heard. "I don't mind being seen, but I would hate to be overheard."
 Activities: Having a private but relaxed conversation.



4. To control hearing and being interrupted. "Please be quiet and leave me alone."
 Activities: Work requiring intense concentration, composing music, writing poetry.

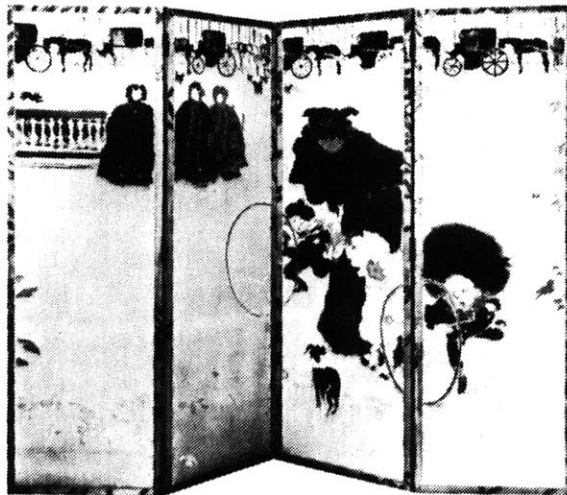


5. To control seeing. "Please shut that closet so I don't have to look at your mess."
 Activities: Seeking visual order.



6. To control hearing. "I'd like to listed to the news, if you don't mind going somewhere else to talk." Activities: Listening intently to anything.

People vary widely in the privacy they associate with different activities. This is attributable to a complex mixture of upbringing, culture, self-awareness and fashionable behavior. It would be foolish to defend either my own values or those values which happen also to be space conservative. Instead I suggest that if the reader is looking for space economy in his own design for a living arrangement, he should list in some systematic way (morning to evening, person by person, etc.) all the activities which might occur in the space, and for each activity identify the appropriate privacy screen. The chart on the following page illustrates how one might begin. By lumping together activities which are compatible and have similar privacy screen requirements, and by examining the nature of screening required in terms of its flexibility

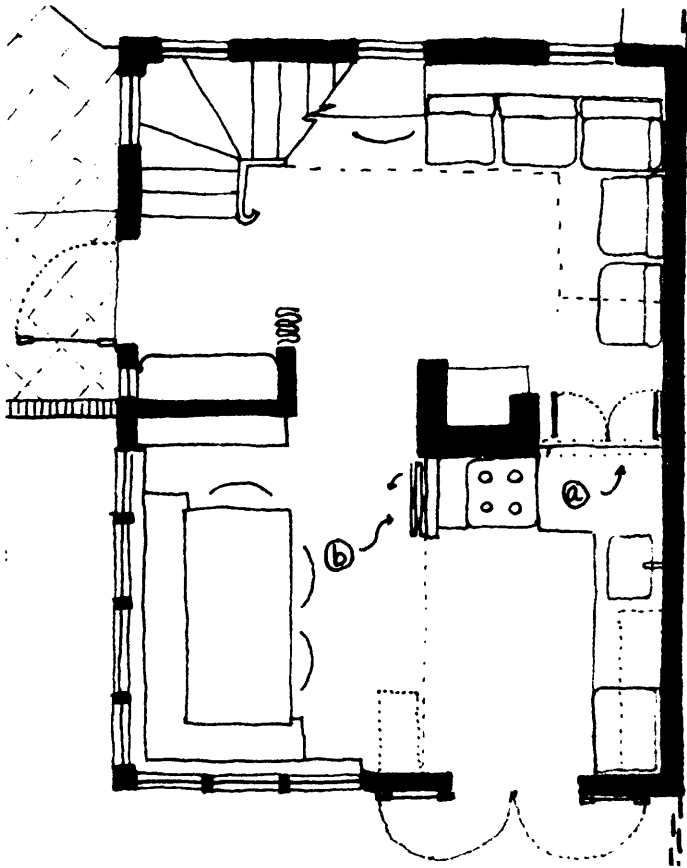


and permanence in space, one will become aware of just which accepted space use conventions need be followed, and which can be abandoned in the interest of space conservation.

This process is necessarily a personal one. I have gone through it myself and present below some of my own discoveries about how selective screening can be advantageously applied to kitchens, dining and living areas, bathrooms, bed alcoves and bedrooms. These should not be taken as instructions on what to do as much as illustrations of space savings which might result from undertaking the analysis.

KITCHENS

Kitchens receive a variety of screening treatments, depending on one's attitude toward the trade off between a separate kitchen's social isolation and a combined kitchen and living area's heightened level of noise and smell pollution. One might want both a kitchen which is distant from areas where guests will be entertained, and one which is close to these same areas at family times. If these alternatives can be achieved by using movable elements as screens (such as curtains, windows, doors, and sliding storage walls) an unnecessary duplication of space can be avoided.



When the shutters at (a) are closed, the kitchen noise is blocked. When open, they allow social interaction. The kitchen can be separated from the eating area when desired by unfolding door at (b).



DINING AND LIVING AREAS

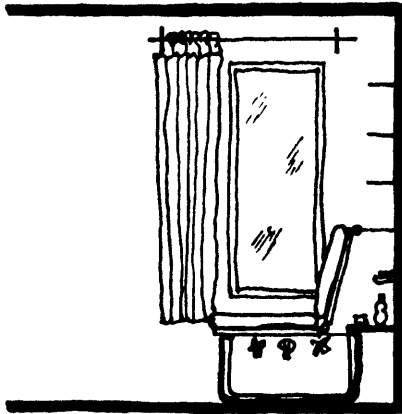
Dining and living rooms are rarely used at the same time for acoustically conflicting activities. There is little need for sound control between them. Dining and living rooms are usually separate because of a felt need for a ritual transition between everyday living and the special act of breaking bread together. Not to be overlooked is the pleasure of unveiling a table replete with delectable victuals and artful settings to surprised guests. This separateness can be achieved without resorting to fixed walls. Curtains conceal secrets from eyes and, when not in use, present few storage problems themselves. Specialness can better be had by varying ceiling height, floor materials, color, and so on, than by erecting walls.

BATHROOMS

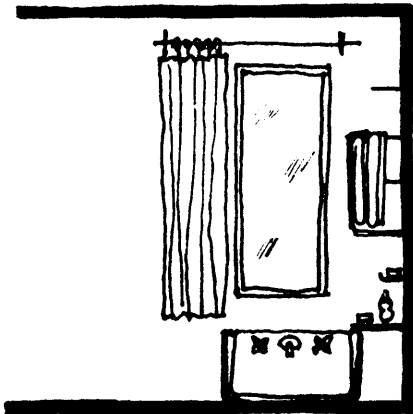


Bathrooms benefit from similar treatment. While attitudes diverge widely on the subject of the need for privacy in bathroom activities, it is probably fair to say that people expect a greater degree of privacy for elimination than for bathing, cleansing and grooming activities. Also considering the issue of odor and the fact that segregation of functions allows more than one person to use bathroom facilities at a time, there is advantage to following the European example of separating the toilet from the cleansing and grooming areas. Then to assign to each function its respective privacy screening requirements, the toilet might be nothing more than an enlarged and ventilated closet, while the bathing area may become part of a pleasant, expansive room

full of light and perhaps plants,
used as a sunroom by day and a work
area by night.

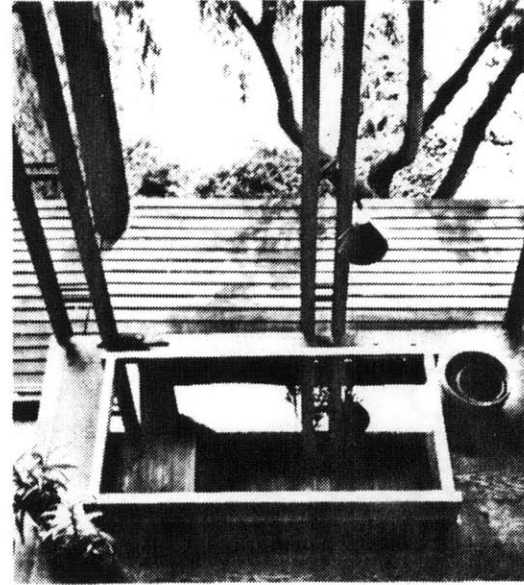
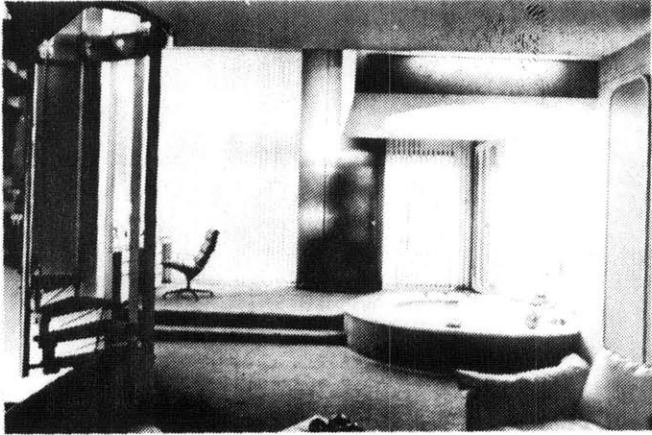


Bathing areas serving dual
functions must provide for
protection against potentially
destructive water and humidity.
But with the proper ventilation,
floor covering, splash control and
visual screening, the bathing area
can be almost anywhere. The
bathtub could be covered when not
in use and could serve as a
windowseat. The "room" may be
nothing more than a curtain which
encloses whatever space is
necessary for changing or derobing.



Window seat/bathtub

Further segregation according
to privacy requirements might place
the hand and face washing and
grooming areas in an even more
public place than the bathing
facilities.



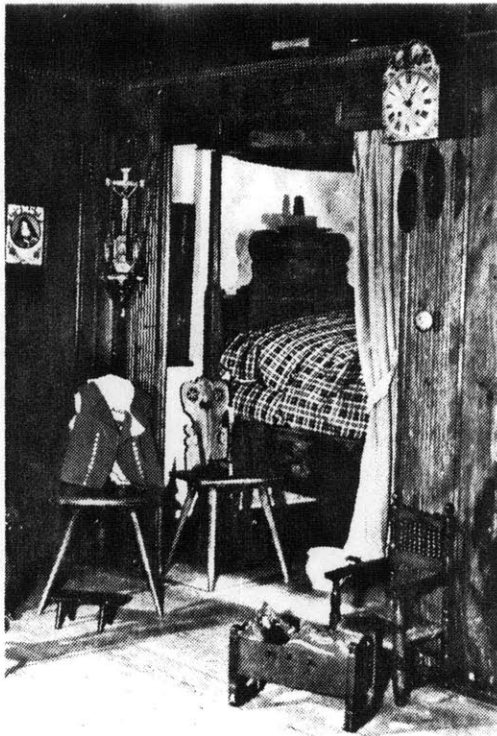
Finally there will always be times when one wants to escape the presence of others completely. Oscar Lewis gives us a good illustration of how the lack of privacy can become an extreme burden, quoting one of the children of Sanchez:

"As I grew older I became more aware of the restrictions one had to put up with when a whole family lived in a single room. In my case, because I lived in fantasy and liked to daydream, I was especially annoyed by having my dreams interrupted. My brothers would bring me back to reality with, "Hey, what's the matter with you? You look dopey..."

It would have been a great luxury to be able to linger at the mirror, to fix my hair or to put on makeup. I never could because of the sarcasm and ridicule of those in the room. My friends in the Casa Grande complained of their families in the same way. To this day I look into the mirror hastily, as though I were doing something wrong. I also had to put up with remarks when I

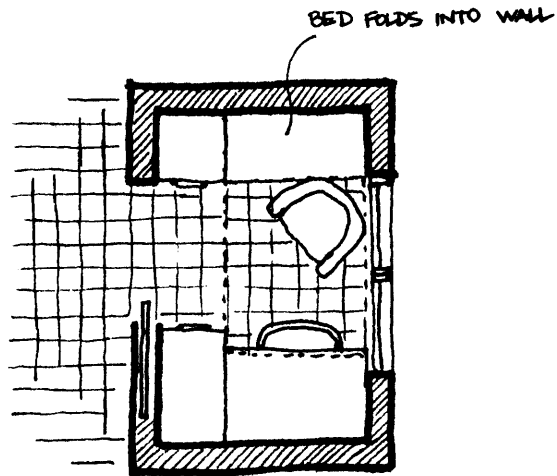
wanted to sing or lie in a certain comfortable position, or do anything that was not acceptable to my family.

Living in one room, one must go at the same rhythm as the others, willingly or unwillingly - there's no way except to follow the wishes of the strongest ones..."



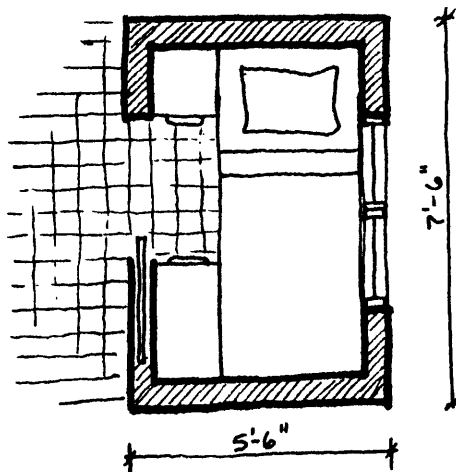
BED ALCOVE

The smallest privacy, which would serve the need for a place to be alone, to sleep and perhaps to study, could be offered by a bed alcove with a solid closure. At its bare minimum, this space could be no larger than that required for the bed. Of course, the space should be provided with an operable window for light and ventilation, a few shelves for books, clocks and other paraphernalia associated with sleeping, a light, and an opening to



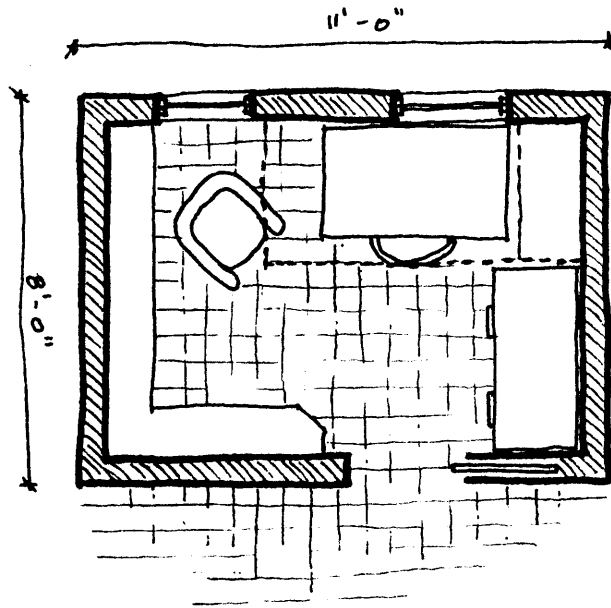
the interior of the house which is at least large enough to allow getting in and out of bed and making up the bed without difficulty.

For single occupancy this bed alcove could double as a dressing area and study, if the bed were designed to fold into the wall. In this case, provisions must be made for standing room during the bed lifting operation - space which could be either within the alcove or borrowed from the hall temporarily, as in the earlier example of a roomette with curtain. The space beneath a bed frame 48" off the floor is more than adequate for storing a desk, desk chair and easy chair.



Convertible study/bed alcove

Such a minimal privacy space does not completely satisfy the need for personalized space within the house. Children, especially, need a place to build their block



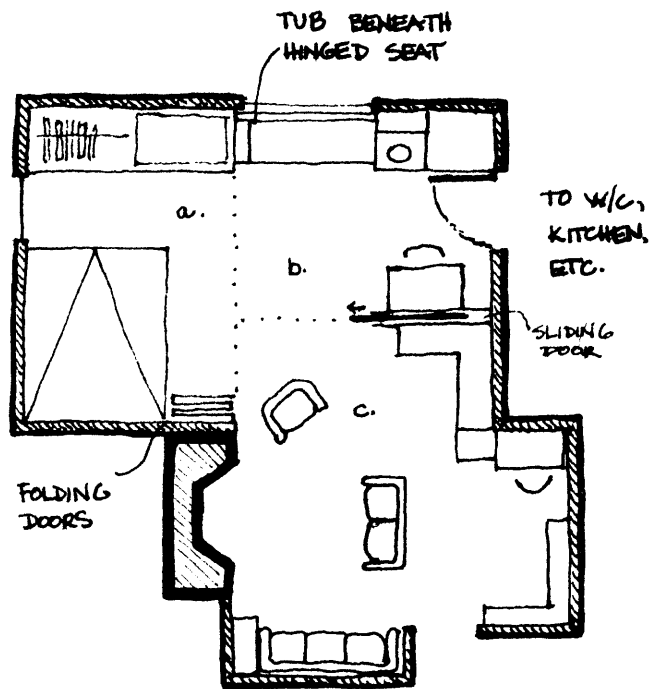
A small study/bedroom

fortresses, lay out their train tracks and just generally spread out, without feeling that they are invading areas off bounds to them. But these play spaces do not require a high degree of privacy and thus can be part of larger public spaces.

Grownups, too, have a strong desire for a place which is altogether their own, which might be a cabinet, a writing desk or, perhaps, a reading chair.

SLEEPING/DRESSING AREAS

Bedrooms are divided into two zones: one zone requiring extreme privacy (control of being seen, or heard, and hearing) which would allow sleeping, making love, reading or working in solitude; and a second zone requiring less privacy



This living area can expand to include dressing area and sleeping area.

(controlling being seen). This second area would include clothing storage and dressing areas and would be separated from the sleeping area by an acoustical and visual screen. With such an arrangement the second area could act as an extension of the larger living space by the simple removal of a visual screen.

Should these ideas not appeal to the reader, hopefully they will at least provoke thought and point to the kind of self examination which must go into defining screening requirements. A good exercise to help with this process of becoming aware of the importance one attaches to various kinds of screening is to design in sketchy form a one room dwelling. Get everyone who will live there to participate. Try to imagine present lifestyles fitting into a one room context. Make note of those



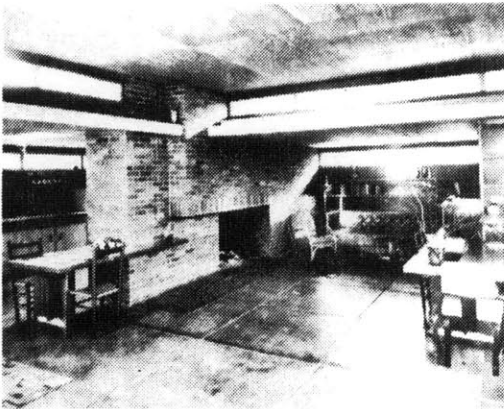
relationships which are absolutely intolerable and those to which everyone might be able to adapt. After having gone through the exercise for one room, establish within the whole space a second room with full height fixed walls and repeat the process.

All kinds of screening are available to the designer. It must be remembered, however, that screening is an act of reduction or negation, in that it removes a channel of communication which is not desired. By overdoing this we can very easily impoverish our environment.

While it may be advisably cautious for a professional to err on the side of screening too much, the reverse is true for the user-designer. If he allows for future modifications, the user-designer can

afford to be slightly optimistic about how open to the environment he is willing to be, knowing that if he is wrong, more conservative screening can be accomplished by adding another element to the screen.

ROOMS VS. OPEN PLAN



The question of whether space should be defined by rooms (as opposed to zones within an open plan) is often debated. Because one's attitude toward this question will have dramatic space use implications, we should take a critical look at it and consider the alternatives.

The room confines space. Its fixed walls interrupt the flow of activities from other areas. The

room is useful only to the person who is inside. With rare exception, it adds nothing to one's feeling of space in the house. When no one is inside it, the room is space waiting for people, while, on the other side of the wall there may be people waiting for space. If space is at a premium, the inclination to divide a space into an assortment of specialized rooms is one which should be avoided.

Rooms are essentially spaces which have been set apart from the whole space contained by the house because of a desire to either screen out the house or screen in the room. The question must be asked, however, whether the screening sought requires the full height acoustical walls one generally associates with rooms. If it does not, rooms may be too limited a response to the screening problem.

But if we banish rooms, we lose their many desirable qualities as well. For example, rooms contain the thermal environment. At a time when energy is becoming costly and scarce, arrangements which allow us to heat limited areas are especially attractive. Prior to the development of central heating, the rooms of a house were treated as separate thermal spaces, each being given a stove, fireplace, brazier, or no heat source at all, as befit its use. If the small house is to avoid the use of rooms, we must provide other ways to focus heat on use spaces. In the days of virtual one room existence, early settlers in this country hung heavy blankets from hooks that circumscribed an area around the fireplace to create a thermal zone for activities on cold evenings. We can do similarly using curtains. Curtains would allow us flexibility as to the size

of the zone, as well as fold away out of sight when not in use.

Another potential characteristic of the house of rooms is for each room to be a world unto itself with a distinct personality. Rooms can be like places in the mind, reflecting the full range of our emotional states; a kitchen, filled with the images of waking and sustenance; libraries, like dark caves of the mind, where the thoughts of many ages are imbedded in bound volumes. How this wonderful sense of variety and identity can be achieved without rooms will be taken up in our next chapter.

III

PSYCHOLOGICAL SPACE

We have discussed physical space within the house from a functional standpoint. We have seen examples of how cultural attitudes and personal preferences might restrain our use of space and how, by becoming more aware of our attitudes, we might be able to loosen these constraints to some extent. We have also explored several physical solutions which

meet privacy requirements in a selective way. These topics have pertained to the physical limits of space. In the following chapter we will discuss how small spaces affect us subjectively. I will present several architectural approaches to the modeling of space which enhance the feeling of spaciousness in the small dwelling without actually changing physical dimensions.

SCALE

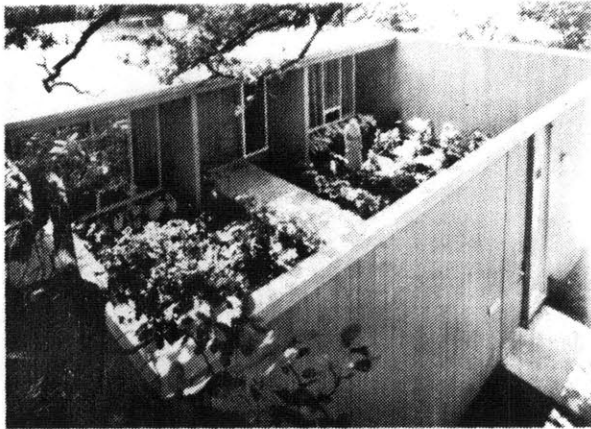
We perceive size in relative terms. In viewing a scene we are quick to establish a scale relative to which we measure the objects in view based on relationships we expect from past experience. For example the Boston Opera Company recently performed Hansel and

Gretel using adult actors for children's parts. To make Hansel and Gretel appear child-size, the stage props were doubled in size. Chairs, tables, cabinets, even the cups and plates in the cupboard, were enlarged. The illusion was quite convincing.

Without carrying it to an extreme we can use this mechanism to our advantage. Architectural elements and furnishings which seem appropriate for an average size house will in a small house seem larger. The space which contains them will seem more confined. Materials whose sizes we are familiar with (modulars such as tile, brick, block, standard width stock such as flooring, paneling, plywood sheets) should be chosen with an awareness of the scale of their intended context. The massive qualities

of an 8 x 8 post in a New England barn may be very appealing. But in a small house, columns of such size will considerably dwarf the surrounding space.

DEGREES OF REMOVE



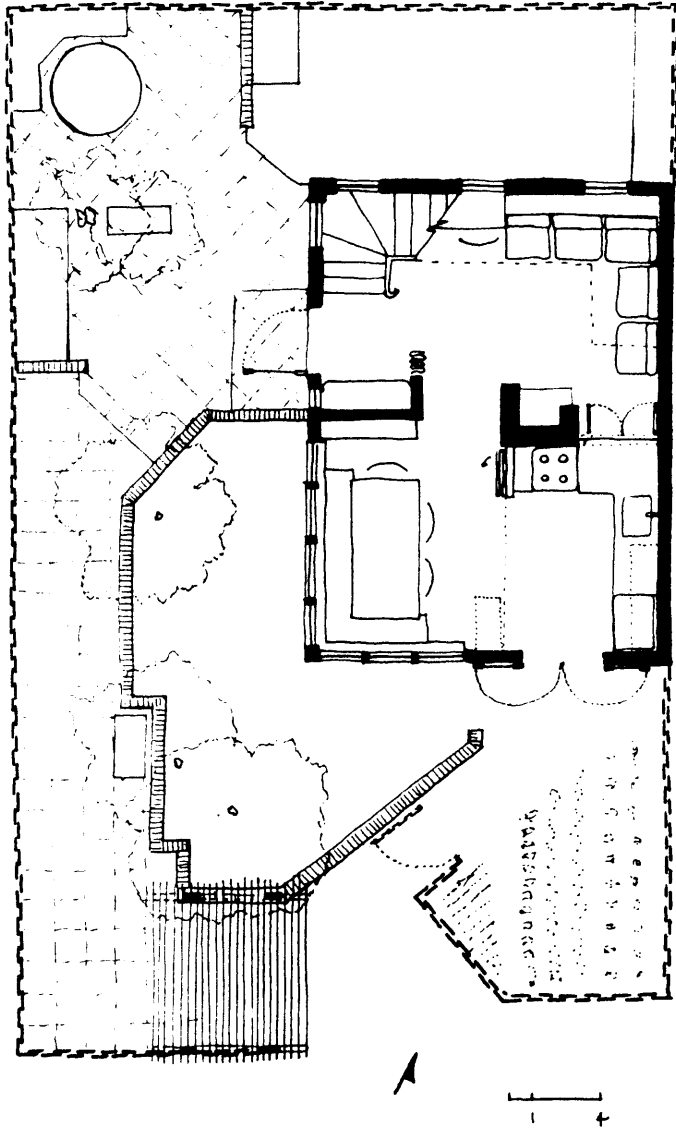
As poorly fortified as they are our houses offer us enough physical protection against intrusion to enable us to sleep at night. In most houses this protection is more of an illusion than a reality, but nevertheless we rely on it. While many people refuse to consider single story designs because they fear sleeping at the same level as that on which an intruder might enter, they often overlook the fact that, from a ground floor bedroom, escape is much easier, not only from

intruders but also from fire.
Fears are rarely weighed
objectively however.

Our feeling of security is in
direct proportion to the degree to
which we are removed from the
perceived threat.

Distance of remove is measured
from the location of the threat
when one first becomes aware of it.
Thus, the further away the threat
when it is first identified the
more time one has to prepare one's
defense.

External threats are of two
sorts. One is the undifferentiated
feeling of uneasiness which comes
from being too close to the noise,
light and activity of external
goings on. The second is the
threat presented by an intruder who
intentionally violates the sanctity



A succession of transitional zones becoming increasingly intimate

of one's house. The desire to put distance between one's self and the source of threat is probably a manifestation of our primitive flight response. The feeling of being far removed from a threat is somehow more satisfying to this part of us than is the knowledge that we are technically well protected from harm by physical devices such as bars or grills.

Because in a small house there is little internal depth into which one can retreat from a threat, the effort to increase the sense of remove begins in the siting of the house. The object is to increase the distance of the path from the likely source of threat to the house without making it seem artificially elongated. Violations of this path's edge or other clearly identified boundaries of the house's domain offer advance

signals that a threat exists. One can also increase a small house's remove by articulating the approach to it with a succession of increasingly intimate zones. Level changes or partial coverings overhead are two among many elements which help make the gradual transition from public byways to the more private interiors.

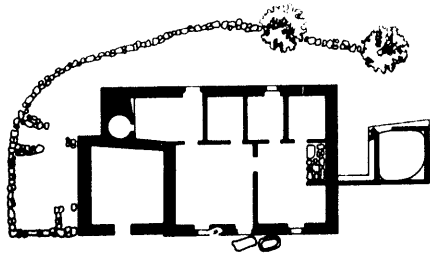
While we have also discussed the importance of maintaining at least an illusion of remoteness by careful attention to path, there is yet another factor at work which influences the way we feel about space: its apparent relationship to other spaces. Assuming that care has been taken to achieve several stages of remove, we must then attend to our visual and auditory connection with the external space at our destination. This issue is often confronted by

small restaurant retreat located close by a busy street. No doubt the reader has had a disappointing experience similar to that which follows: "We were led through a ceremonial entryway into a warm place where we took off our coats. Then we followed a passage which opened into an interior garden, stepped down and turned a corner around a shallow pool of lingering fish and found ourselves in a room full of appetizing smells where light flickered on the faces of the good-humored patrons. We were seated next to a wall. Soon I realized we were sitting next to the front door which we had left seemingly far away." Illusions are worthless if they cannot be maintained.

Of course physical threat is not in the forefront of our minds when we ponder our design options.

But the subconscious desire to protect ourselves from harm is probably at the root of why we feel at ease in some spaces and not in others.

Thus far we have discussed removes from sources which are external to the house. But in a small house inhabitants may encounter one another more frequently and so have a correspondingly greater desire to increase their distance from one another. Just as it is possible to increase our sense of remove by increasing path length so we can enhance the feeling of remove between two interior spaces by increasing the connecting distance between them. This can be done by simply providing an exterior path instead of an interior connection. With proper acoustical separations the impression will be of being in

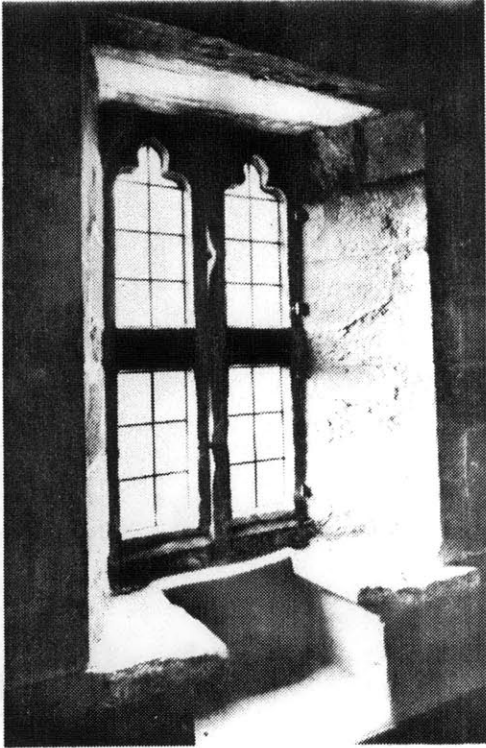


an entirely separate structure. Yet the arrangement retains the cost advantages inherent to single unit construction and allows the possibility of opening up the connection in the future.

SPATIAL VARIETY



Another characteristic commonly associated with small houses is a lack of relief from the sameness of the space within. The tediousness we associate with a lack of spatial variety is just as real as our aversion to eating the same food, wearing the same clothes and listening to the same piece of music repeatedly. Yet being a dimension of experience which is hard to measure, variety receives too little attention in small house design.



A small but significant place

It is hard to say just how much variety a small dwelling needs to prevent its inhabitants from feeling a monotony about it. One probably would be quite satisfied to achieve something near to the level of variety one has experienced in the richest living environment of memory. To establish just what this level is one must explore this memory. Focus on a living environment you are familiar with. Note how many different places existed there (not in function, but in feeling and personality). Ask yourself what characteristics seemed responsible for each place's unique feeling. Finally, think about what your mood was in when you sought out these places and where you would have gone had they not existed. By making this exploration one becomes aware not only of which elements determine spatial variety but also

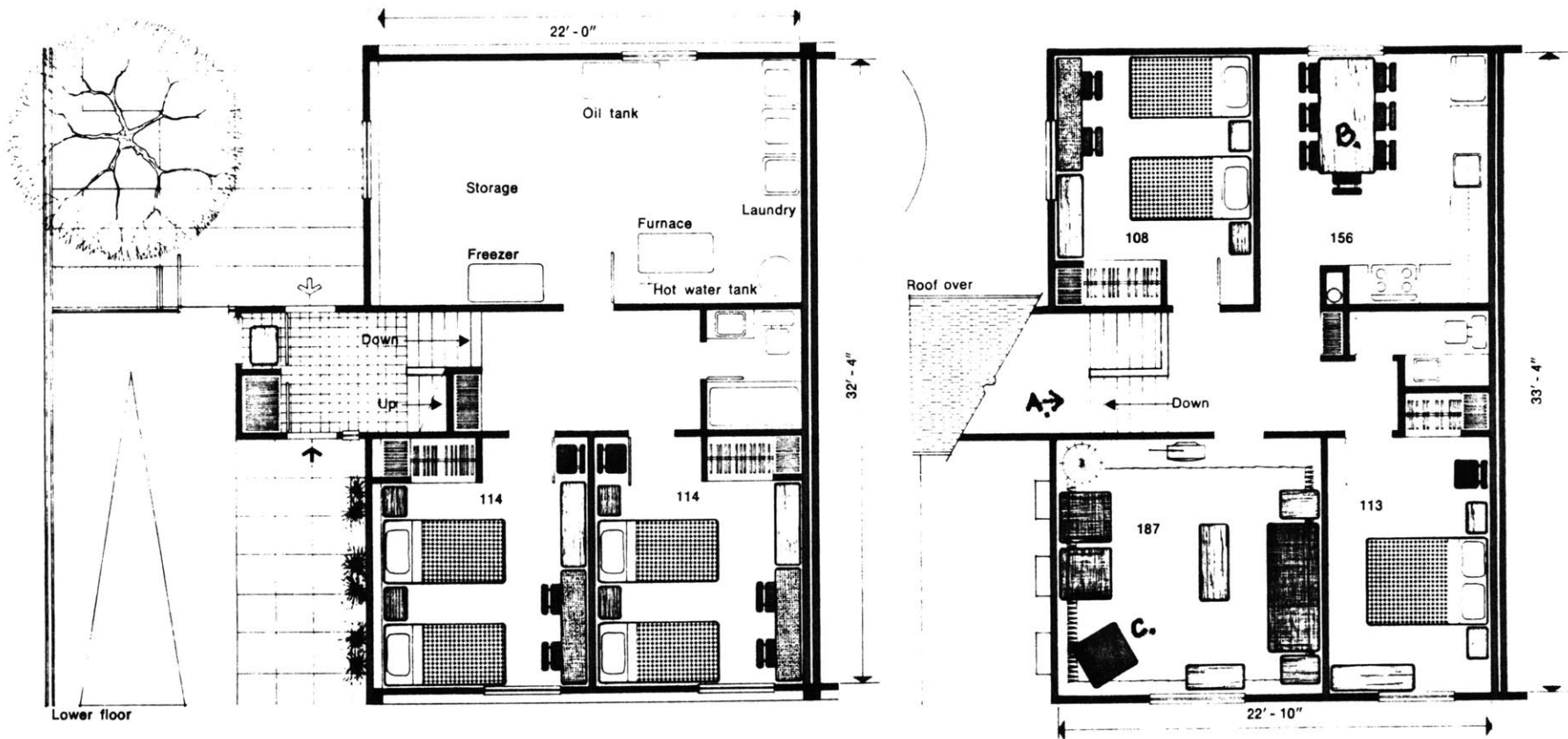
how important spatial variety has been in one's life.

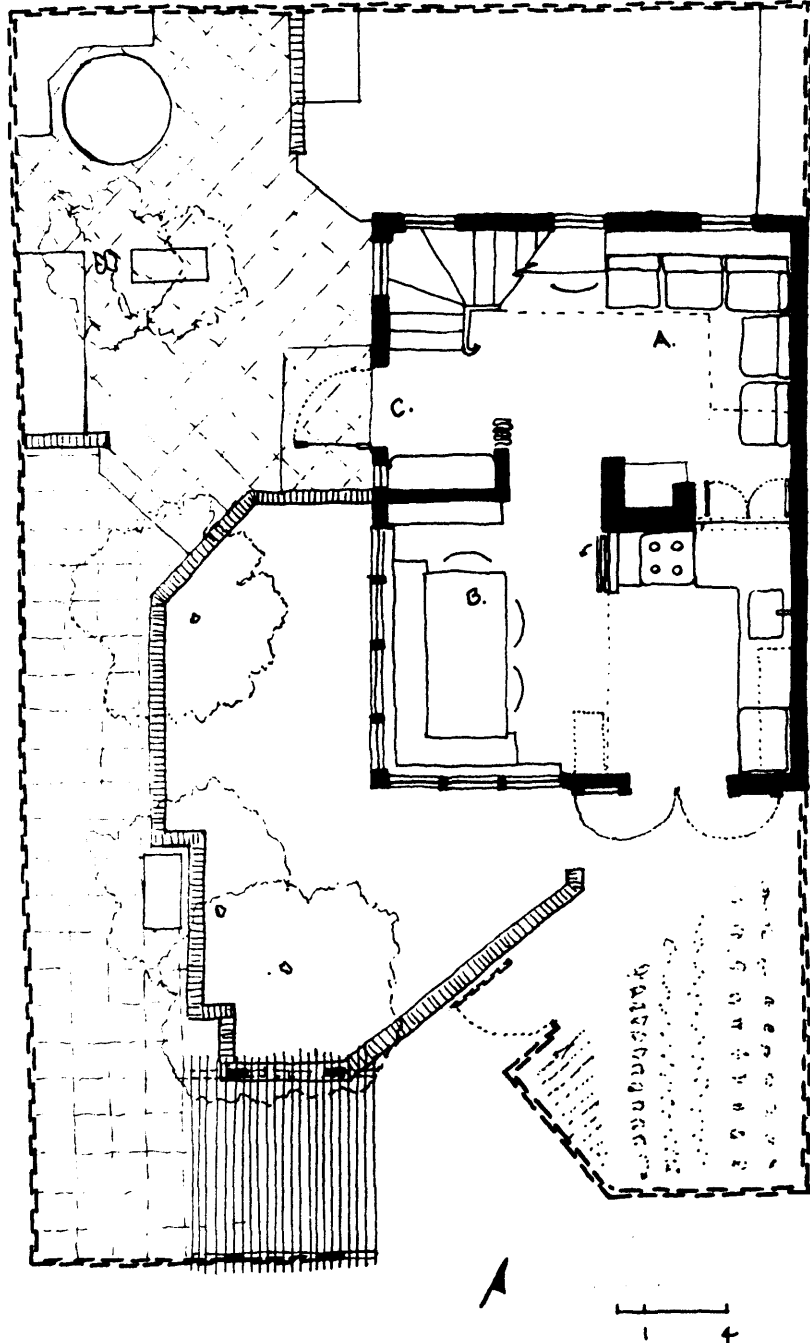


When you have reached the stage where a house design is beginning to take shape, see how many different kinds of place you can find in your plan. Taking your plan find places in it which are analagous to places in your remembered environment. How does the new design compare? Describe what each place in your design might be like and what physical attributes will make it that way. In most cases this will be a painful process, most likely calling for a complete reworking of the design from its most basic elements. But it is equally worth while.

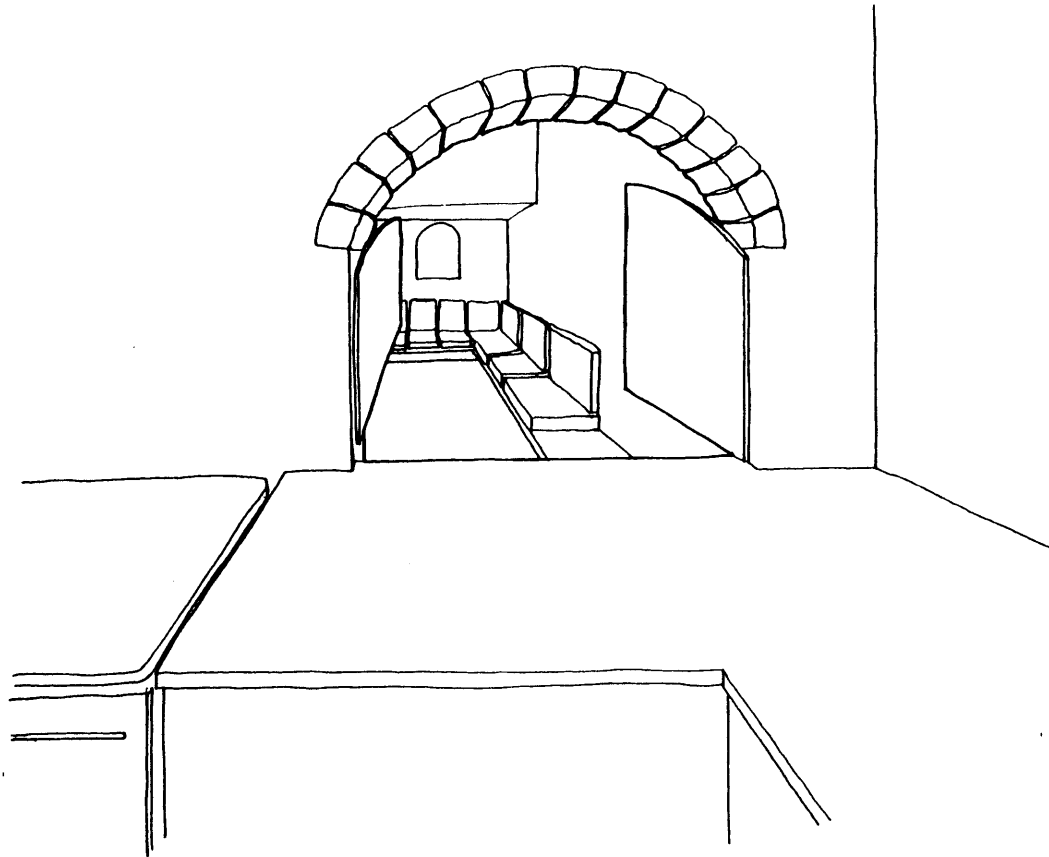
As an exercise I have presented two plans in which the reader is encouraged to look for

place variety. The first plan is from the Central Mortgage and Housing Corporation of Canada, and represents a four-bedroom, eight person bi-level semi detached house.



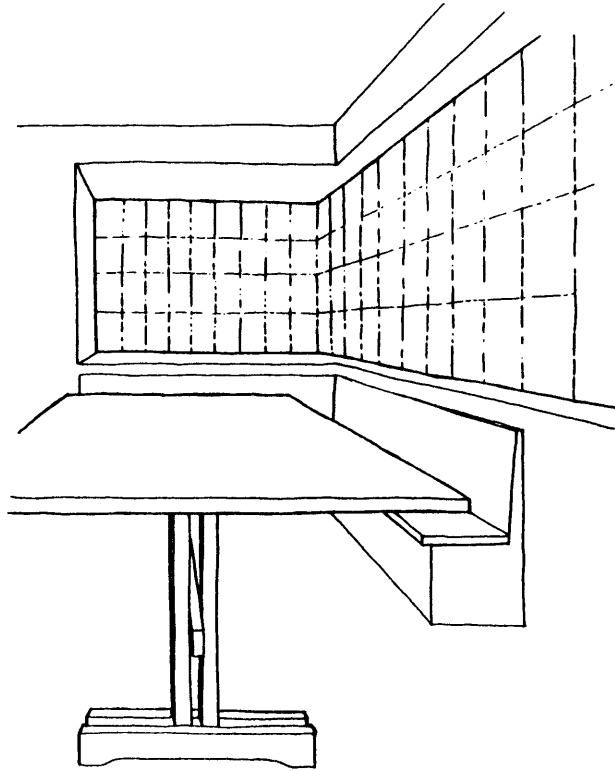


The second is a preliminary version of a design of my own. It is not meant to be a model, but was made for another purpose and thus has much to gain by being subjected to this exercise. I present it here only to provide a basis of comparison. In each plan find those places you would most frequently encounter in the course of living there. (I have noted some with letters A, B and C.) What do you see around you? How would you describe the space? Next find your favorite places, those you would seek out for their particular qualities. What are these qualities?



Kitchen's view of the living area

The best way to develop a feeling for a place is, of course, to make a drawing of it from a realistic vantage point. Doing that for my own design suggested several changes. Making the drawing of the view from the kitchen to living room I discovered the window behind the couches was not well positioned for a through view. Also the feeling of warmth and surrounding I had tried to achieve in the living area seemed limited to the seats just under the stair, suggesting that the ceiling height be lower over the whole living area. Finally, I slid the chimney over about one foot (hard to do once it's built) when the drawing suggested the opening was not adequate to allow easy and comfortable communications with the living area when one was at work in the kitchen. In this case the drawing was quite helpful in

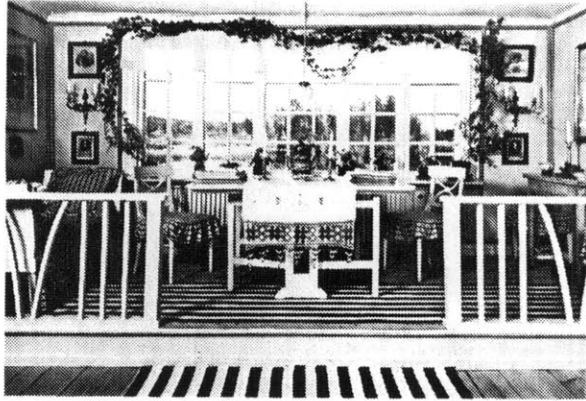


suggesting changes which would have been very expensive to accomplish after the design had been built.

A cursory look at the CMHC plans make it obvious that variety and character were not among the designer's objectives. I am sure the dimensional requirements of the CMHC are well met here. But as I hope this inquiry has pointed out, the least of the problems entailed in small house design is that of providing adequate dimensions.

PERCEPTION OF BOUNDARIES

Implicit in the perception of a space's size is an understanding of its boundaries. And the nature of those boundaries influences our feelings about the space. As we discussed in the previous chapter,



when decisions are being made as to the materials which will constitute the boundaries of a space, care should be taken to filter out only the undesired external elements. In this way many of our perceptual channels can be left open and the communication through the boundaries can be as rich as possible. To the extent that our senses are free to penetrate a boundary, it becomes less confining and oppressive.

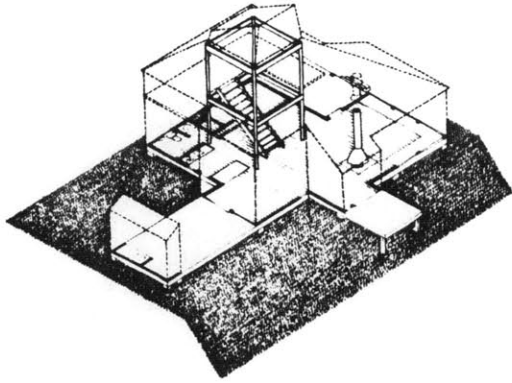


Boundaries which are opaque present choices as to how their surfaces will be treated. Generally speaking, the more reflective a surface's color, the further away it will appear. Ceilings can be "raised" if they are made a lighter shade than the walls. White floors (cleaning problems aside) appear to recede, leaving one with the impression

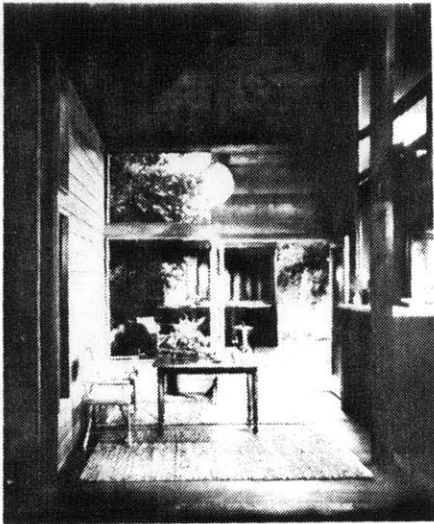
that furniture is suspended in space. Dark walls, on the other hand, seem to draw close in to increase one's sense of containment.

Mirrored glass is often used to extend the depth of view. Mirrors also can be positioned to provide otherwise unattainable vantage points from which special views can be enjoyed. The closer a mirror is located to the viewer, the smaller it need be to contain a given field of view. However, to use mirrors in a way which doesn't appear contrived is difficult.

While the nature of the boundary material is important so is the question of which boundary of those perceivable will be chosen to identify the space. It is especially important in designing small spaces to leave some ambiguity in this regard, so as to encourage



a number of different interpretations of what the boundaries of a given space actually are. A good example of this can be seen in the Jobson House designed by Moore, Lyndon, Turnbull, Whitaker in 1961. The space surrounding the eating table can be interpreted to a) stand alone, b) merge with the outdoor deck and storage unit, or c) belong to the larger room (which the photograph only suggests in the extreme foreground).



Two views of the Jobson house

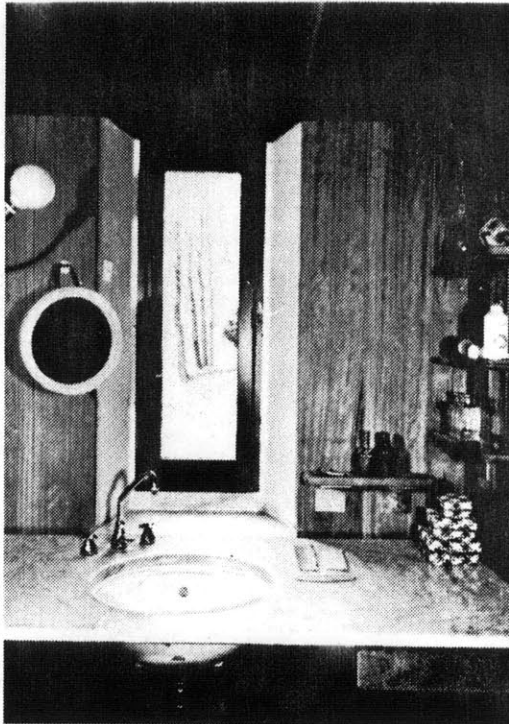
In this design a certain complexity of definition has been achieved which discourages the feeling of a singular confining boundary. Devices which tend to merge indoor and outdoor spaces are continuity of materials (floor, ceiling or wall), maintenance of grade, openings which suggest passage (door height at least),



and sympathetic sizing. For example here the storage unit could have been placed further away from the house but the then larger deck would have dominated the space around the table and discouraged us from reading them as parts of a whole.



Finally, the outdoor space must have a strong enough boundary to offset our tendency to interpret the building skin as the ultimate boundary. In his own house, Peter Chermayeff demonstrates how a small kitchen can be considerably expanded by associating it with boundaries beyond its own, in this case a low wall which defines the edge of the brick terrace. Compare the feeling of spaciousness in this photograph to that of the larger kitchen in the photograph which follows. Part of this is due to color, part to the treatment of openings.

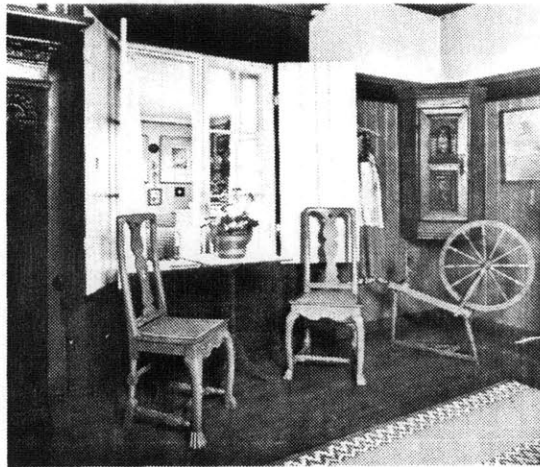


VIEWS

Views allow us to escape visually the physical limits of the environment which immediately surrounds us. Some views remind us of how our present space fits into the larger world. Others, by their frames, focus our attention on one corner of that world which we otherwise might not notice.

Views can be to the outdoors or to other parts of the house. Views to the outdoors connect us to places where our eyes can roam without subjecting our bodies to the elements. Some views take advantage of the contrast of indoor and outside environments to excite the viewer: picture snow settling on

the branches of a lone plum tree, seen from beside the fire. This juxtaposition appeals to our sense of touch. Views which connect distant objects through the foreground to our present place allow us to visually wander through remote spaces. Such views appeal to our desire for movement and exploration.



Indoor views are rarely exploited in domestic architecture. They offer us the opportunity to enjoy other rooms without actually being in them. The viewed room may act as foreground to an outdoor space visible beyond it. In rooms which have no exterior exposure, views of this sort are almost essential to relieve an unpleasant feeling of enclosure. They function in much the same way as do outdoor views.

In the small house, carefully arranged views will lessen our feeling of confinement. But because views out are sometimes opportunities for others to view in, privacy may require us to consider sight lines and ways to discourage two-way viewing.

To enhance the perception of spaciousness, views must be located where inhabitants will not have to seek them out intentionally. Instead, views should be encountered incidentally in the course of using the space. The planning of this begins with site reconnaissance which identifies particularly appealing views and lighting conditions which in turn inform the organization of the house. Once a plan has been sketched out, human figures should be drawn in positions where inhabitants will most often find themselves. These places can

be identified fairly accurately since they are associated with furnishings which are either fixed (kitchen sink, fireplace, bath, stair, etc.) or predictably located (beds, desks, tables, etc.). It is helpful to check the location of openings for views by making elevation sketches in addition to plans. But the precise location of openings should not be decided until at least sub-floors have been completed, so that one can stand in the places in question and note on the floor the side limits and vertical measurements of the ideal opening.

Attention to scale, degrees of remove, variety of place, perception of boundaries and handling of views are but some of the ways to modify the psychological effects of small living spaces. However, these are find adjustments to the grosser

organizational decisions which have been made in light of careful analysis of screening requirements, discussed in Chapter II. In conjunction with these considerations, a creative attitude which questions the conventions of space use, will allow the reader to make more out of less in small house design.

BIBLIOGRAPHY

Cooper, Clare; The House as Symbol of Self, May 1971, Working Paper #130, Institute of Urban and Regional Development, Univ. of California, Berkeley, CA

Freedman, Jonathan L.; Crowding and Behavior, Viking Press, NY, 1975

Hall, Edward; The Hidden Dimension, Doubleday, Garden City, NY, 1969

Kira, Alexander; The Bathroom, Viking Press, NY, 1976

Lewis, Oscar; The Children of Sanchez, Random
House Inc., NY, 1961

Morse, Edward S.; Japanese Homes and Their
Surroundings, Denver, 1961

Proshansky, Harold M.; Environmental Psychology,
Holt Rinehart & Winston, NY, 1976

Rapoport, Amos; House Form & Culture, Prentice
Hall, Inc., Englewood, CA, 1969

Summerson, John; Heavenly Mansions, Norton, NY,
1963

ILLUSTRATION CREDITS

Many of the illustrations contained herein I own to other sources. Below I have listed their page numbers. When more than one such illustration appears on a given page, I have credited in a counter clockwise order beginning with the upper left, and proceeding around the page. The figures found in the right hand column below refer to the illustration source list which follows.

Page	Source	Page	Source
ii	23	32	24
iii	7	32	8
iii	17	32	8
v	27	34	30
vi	22	39	12
1	27	41	11
3	32	41	20
4	7	41	20
5	27	41	26
6	22	43	16
7	27	47	8
11	18	48	24
12	8	55	2
14	Brochure	60	24
14	6	61	25
15	32	62	4
15	6	63	25
16	32	64	5
16	13	68	29
19	33	68	3
19	8	70	24
20	28	70	24
21	21	71	28
21	21	71	18
22	21	72	10
22	Brochure	73	29
23	21		
24	8		
25	8		
27	8		
28	1		
29	1		

1. Andrews, Edward Deming; Religion in Wood: A Book of Shaker Furniture, Indiana University Press; 1973
2. Architectural Record Houses of 1957, pg. 180, J.T.Upton House, New Orleans, LA
3. Curtis & Davis, Architects; Architectural Record Houses, 1971, pg. 49, David Haid House, Chicago, IL, David Haid, Architect
4. Barley, M. W.; The House and Home, Vista Books; London, 1963
5. Central Mortgage & Housing Corporation; The Use and Design of Space in the Home, 1974
6. Cardwell, Kenneth H.; Bernard Maybeck, Artisan, Architect, Artist, Peregrin Smith, Inc.; Santa Barbara, 1977
7. Cleaveland, Henry W.; American Village Homes, American Life Foundation and Study Institute; Watkins Glen, NY, 1976

8. Conran, Terrence; The House Book, Mitchell Beazley Publishers, Ltd.; 1974
9. Conran, Terrence; The Kitchen Book, Mitchell Beazley, Publishers, Ltd.; 1977
10. Debaights, Jacques; New Interiors for Old Houses, Van Nostrand, Rineholt Co.; New York, 1973
11. Demachy, Alain; Interior Architecture and Decoration, William Morrow & Co.; New York, 1974
12. Dennis, Ben; Houseboat, Smuggler's Cove Publishing; Seattle, WA, 1977
13. Gilliatt, Mary; Bathrooms, Viking Press, 1971
14. Grandjean, Etienne; Ergonomics of the Home, John Wiley & Sons; New York, 1973
15. Haney, Robert, and Ballantine, David; Woodstock Handmade Houses, Ballantine Books, 1974
16. Hansen, Hans Jurgen; Holzbaukunst, Gerhard Stalling Verlhe, 1967
17. Jones, Sidney R.; The Village Homes of England, The Studio Ltd.; London, Prior to 1938
18. Le Journal de Maison, July-August 1979 edition
19. Kira, Alexander; The Bathroom, Viking Press, 1966
20. Sunset Press; Planning and Remodeling Bathrooms, Lane Publishing Company, Menlo Park, CA., 1978
21. Lidz, Jane; Rolling Homes, A & W Publishers, Inc., New York, 1979
22. Loewe, Ludwig; Schlesische Holzbauten, Werner-Verlag, Dusseldorf, 1969

23. McArdle, Alma deC.; Carpenter Gothic, Whitney Library of Design; New York, 1978
24. Moore, Charles; The Place of Houses, Holt, Rinehart & Winston; New York, 1974
25. Muthesius, Hermann; Landhaus und Garten, F. Bruckmann A-G., Munchen, 1910
26. O'Brien, George; The New York Times Book of Interior Design and Decoration, Farrar, Straus and Giroux, Inc.; New York, 1965
27. Penoyre, John and Jane; Houses in the Landscape, Faber & Faber Ltd.; London, 1978
28. Plumb, Barbara; Houses Architects Live In, Penguin Books, New York, 1978
29. Segerstad, Ulf Hard af; Carl Larsson's Home, Addison Wesley Publishing Co.; Reading, MA, 1978
30. Soby, James Thrall; Bonnard and His Environment, Doubleday and Co.; Garden City, New York, 1964
31. Bidlake, W. H.; The Modern Home, A. C. Armstrong & Son; London
32. Stickley, Gustav; The Best of Craftsman Homes, Peregrine Smith, Inc.; Santa Barbara, 1979
33. World Exhibition of Photography, Stern Magazine, Verlag Gruner, Hamburg, 1964