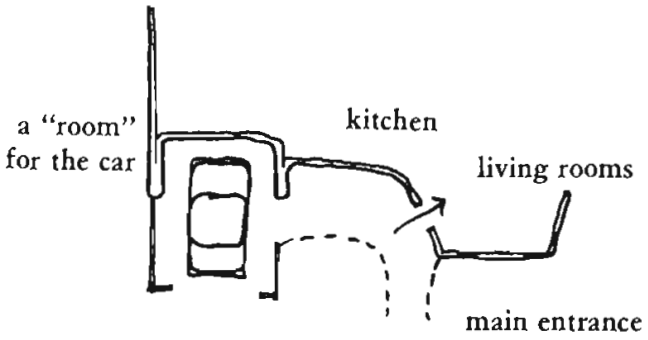
way of life in a modern house, the place where car and house meet is almost never treated seriously as a beautiful and significant place in its own right.

Therefore:

Place the parking place for the car and the main entrance, in such a relation to each other, that the shortest route from the parked car into the house, both to the kitchen and to the living rooms, is always through the main entrance. Make the parking place for the car into an actual room which makes a positive and graceful place where the car stands, not just a gap in the terrain.



Place both kitchen and main common living room just inside the main entrance—INTIMACY GRADIENT (127), COMMON AREAS AT THE HEART (129); treat the place for the car as if it were an actual outdoor room—OUTDOOR ROOM (163). If it is enclosed, build the enclosure according to STRUCTURE FOLLOWS SOCIAL SPACES (205); and make the path between this room and the front door a beautiful path, preferably the same as the one used by people who come on foot—ENTRANCE TRANSITION (112), ARCADES (119), PATHS AND GOALS (120), RAISED FLOWERS (245). If you can, put the car connection on the north face of the building—NORTH FACE (162). . . .

114 HIERARCHY OF OPEN SPACE*

. . . the main outdoor spaces are given their character by SITE REPAIR (104), SOUTH FACING OUTDOORS (105) and POSITIVE OUTDOOR SPACE (106). But you can refine them, and complete their character by making certain that every space always has a view out into some other larger one, and that all the spaces work together to form hierarchies.

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Outdoors, people always try to find a spot where they can have their backs protected, looking out toward some larger opening, beyond the space immediately in front of them.

In short, people do not sit facing brick walls—they place themselves toward the view or toward whatever there is in the distance that comes nearest to a view.

Simple as this observation is, there is almost no more basic statement to make about the way people place themselves in space. And this observation has enormous implications for the spaces in which people can feel comfortable. Essentially, it means that any place where people can feel comfortable has

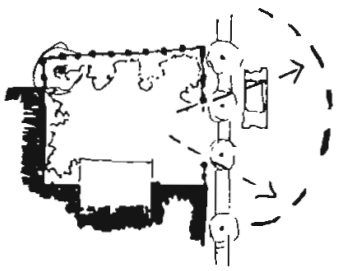
1. A back.
2. A view into a larger space.

In order to understand the implications of this pattern, let us look at the three major cases where it applies.

In the very smallest of outdoor spaces, in private gardens, this pattern tells you to make a corner of the space as a "back" with a seat, looking out on the garden. If it is rightly made, this corner will be snug, but not at all claustrophobic.

Seat and garden.

Slightly larger in scale, there is the connection between a terrace or an outdoor room of some kind and a larger open space, the street or a square. The most common form of the pattern at this scale is the front stoop, which forms a definite enclosure and a back, off the public street.



Terrace and street or square.

At the largest scale, this pattern tells you to open up public squares and greens, at one end, to great vistas. At this scale, the square itself acts as a kind of back which a person can occupy, and from which he can look out upon an even larger expanse.

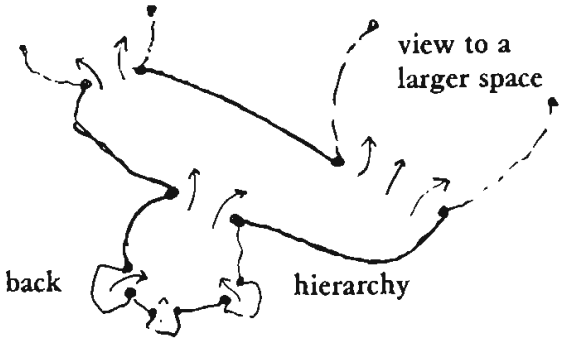
Square and vista.

Therefore:

Whatever space you are shaping—whether it is a garden, terrace, street, park, public outdoor room, or courtyard, make sure of two things. First, make at least one smaller space, which looks into it and forms a natural back for it. Second, place it, and its openings, so that it looks into at least one larger space.

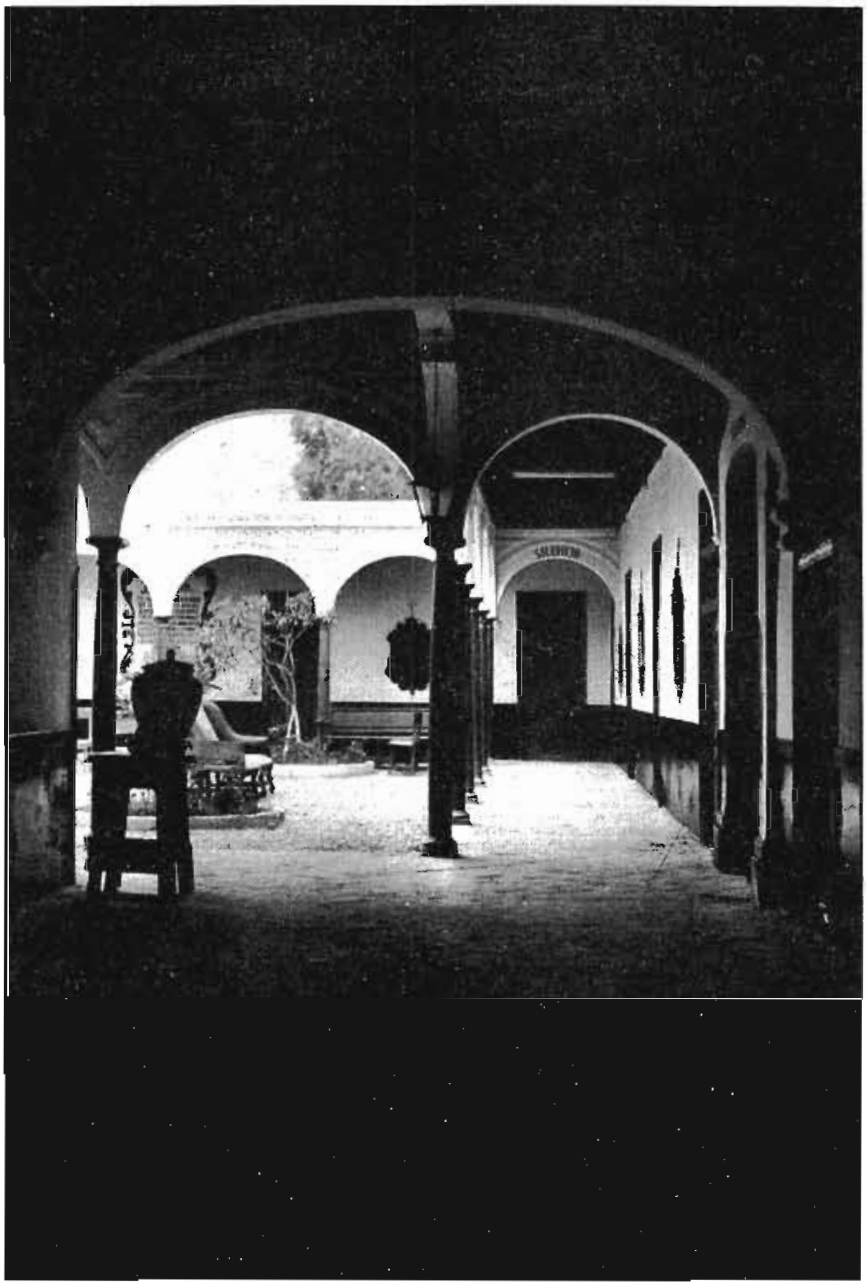
When you have done this, every outdoor space will have

a natural "back"; and every person who takes up the natural position, with his back to this "back," will be looking out toward some larger distant view.



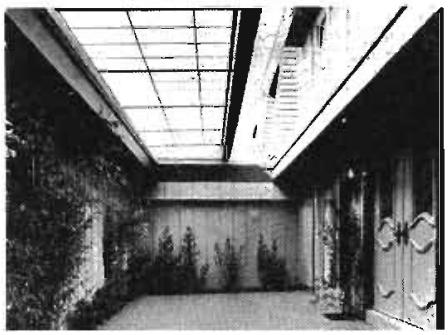
For example: garden seats open to gardens—GARDEN SEAT (176), HALF-HIDDEN GARDEN (106); activity pockets open to public squares—ACTIVITY POCKETS (124), SMALL PUBLIC SQUARE (61); gardens open to local roads—PRIVATE TERRACE ON THE STREET (140), LOOPED LOCAL ROAD (49), roads open to fields—GREEN STREETS (51), ACCESSIBLE GREENS (60); fields open to the countryside, on a great vista—COMMON LAND (67), THE COUNTRYSIDE (7). Make certain that each piece of the hierarchy is arranged so that people can be comfortably settled within it, oriented out toward the next larger space. . . .

115 COURTYARDS WHICH LIVE**



. . . within the general scheme of outdoor spaces, made positive according to the patterns POSITIVE OUTDOOR SPACE (106) and HIERARCHY OF OPEN SPACE (114), it is necessary to pay special attention to those smallest ones, less than 30 or 40 feet across—the courtyards—because it is especially easy to make them in such a way that they do not live.

The courtyards built in modern buildings are very often dead. They are intended to be private open spaces for people to use—but they end up unused, full of gravel and abstract sculptures.



Dead courtyard.

There seem to be three distinct ways in which these courtyards fail.

1. *There is too little ambiguity between indoors and outdoors.* If the walls, sliding doors, doors which lead from the indoors to the outdoors, are too abrupt, then there is no opportunity for a person to find himself half way between the two—and then, on the impulse of a second, to drift toward the outside. People need an ambiguous in-between realm—a porch, or a veranda, which they naturally pass onto often, as part of their ordinary life within the house, so that they can drift naturally to the outside.

2. *There are not enough doors into the courtyard.* If there is just one door, then the courtyard never lies between two activities inside the house; and so people are never passing through it, and enlivening it, while they go about their daily business. To overcome this, the courtyard should have doors on at least two op-

posite sides, so that it becomes a meeting point for different activities, provides access to them, provides overflow from them, and provides the cross-circulation between them.

3. *They are too enclosed.* Courtyards which are pleasant to be in always seem to have "loopholes" which allow you to see beyond them into some larger, further space. The courtyard should never be perfectly enclosed by the rooms which surround it, but should give at least a glimpse of some other space beyond.

Here are several examples of courtyards, large and small, from various parts of the world, which are alive.

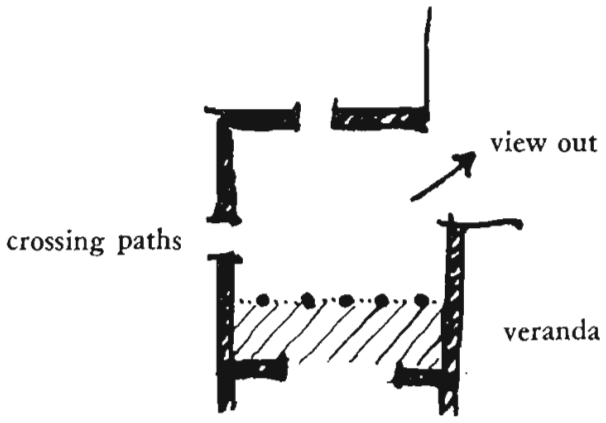
Courtyards which live.

Each one is partly open to the activity of the building that surrounds it and yet still private. A person passing through the courtyard and children running by can all be glimpsed and felt, but they are not disruptive. Again, notice that all these courtyards have strong connections to other spaces. The photographs do not tell the whole story; but still, you can see that the courtyards look out, along paths, through the buildings, to larger spaces. And most spectacular, notice the many different positions that one can take up in each courtyard, depending on mood and climate. There are covered places, places in the sun, places

spotted with filtered light, places to lie on the ground, places where a person can sleep. The edge and the corners of the courtyards are ambiguous and richly textured; in some places the walls of the buildings open, and connect the courtyard with the inside of the building, directly.

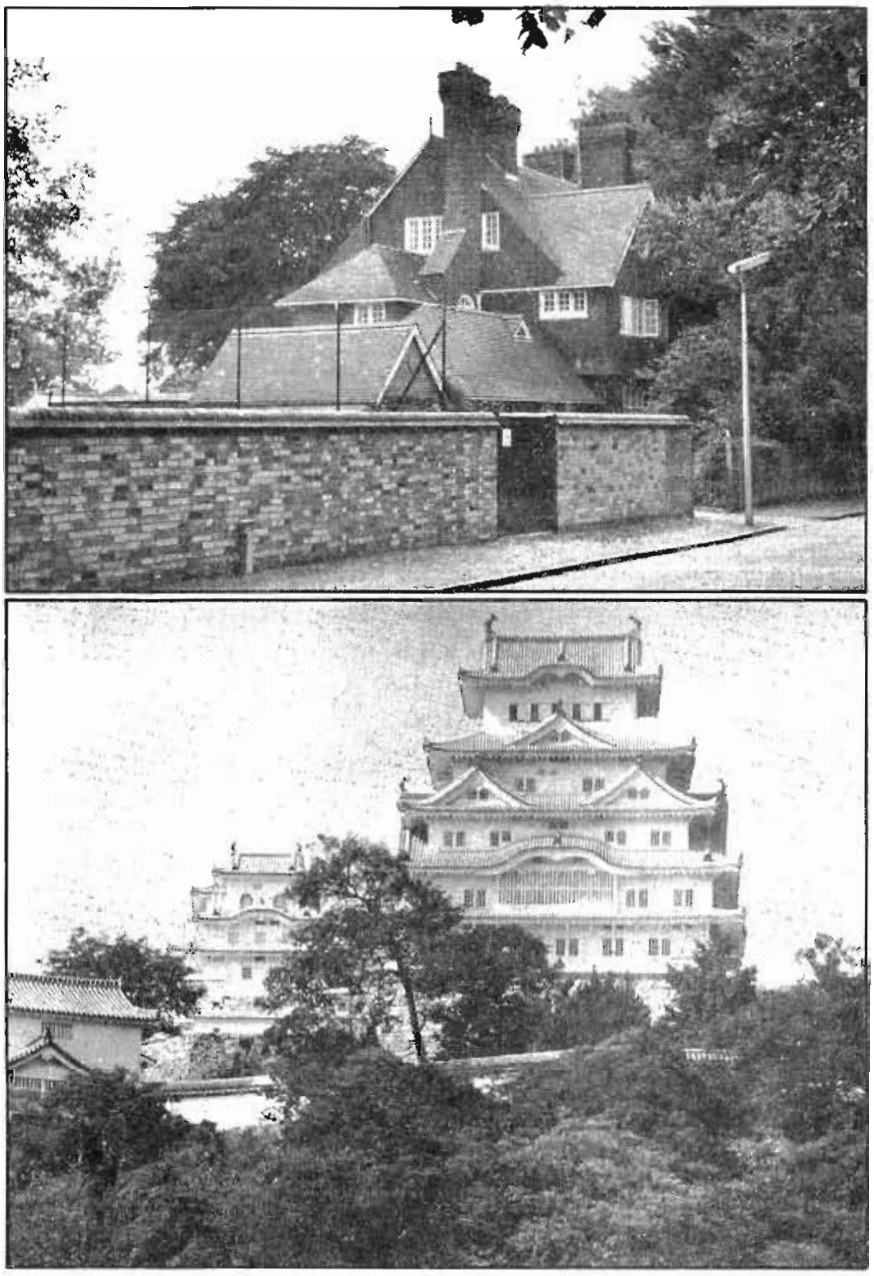
Therefore:

Place every courtyard in such a way that there is a view out of it to some larger open space; place it so that at least two or three doors open from the building into it and so that the natural paths which connect these doors pass across the courtyard. And, at one edge, beside a door, make a roofed veranda or a porch, which is continuous with both the inside and the courtyard.



Build the porch according to the patterns for ARCADE (119), GALLERY SURROUND (166), and SIX-FOOT BALCONY (167); make sure that it is in the sun—SUNNY PLACE (161); build the view out according to the HIERARCHY OF OPEN SPACE (114) and ZEN VIEW (134); make the courtyard like an OUTDOOR ROOM (163) and a GARDEN WALL (173) for more enclosure; make the height of the eaves around any courtyard of even height; if there are gable ends, hip them to make the roof edge level—ROOF LAYOUT (209); put SOMETHING ROUGHLY IN THE MIDDLE (126). . . .

116 CASCADE OF ROOFS*



. . . this pattern helps complete the BUILDING COMPLEX (95), NUMBER OF STORIES (96), MAIN BUILDING (99), and WINGS OF LIGHT (107), and it can also be used to help create these patterns. If you are designing a building from scratch, these larger patterns have already helped you to decide how high your buildings are; and they have given you a rough layout, in wings, with an idea of what spaces there are going to be in each floor of the wings. Now we come to the stage where it is necessary to visualize the building as a volume and, therefore, above all else, as a system of roofs.

Few buildings will be structurally and socially intact, unless the floors step down toward the ends of wings, and unless the roof, accordingly, forms a cascade.

This is a strange pattern. Several problems, from entirely different spheres, point in the same direction; but there is no obvious common bond which binds these different problems to one another—we have not succeeded in seizing the single kernel which forms the pivot of the pattern.

Let us observe, first, that many beautiful buildings have the form of a cascade: a tumbling arrangement of wings and lower wings and smaller rooms and sheds, often with a single highest center. Hagia Sophia, the Norwegian stave churches, and Palladio's villas are imposing and magnificent examples. Simple houses, small

Hagia Sophia

informal building complexes, and even clusters of mud huts are more modest ones.

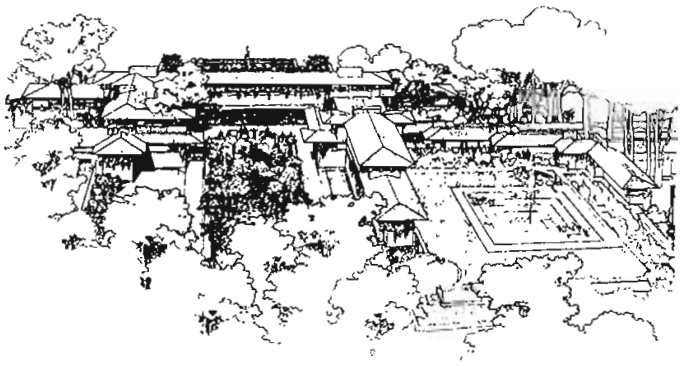
What is it that makes the cascading character of these buildings so sound and so appropriate?

First of all, there is a social meaning in this form. The largest gathering places with the highest ceilings are in the middle because they are the social centers of activities; smaller groups of people, individual rooms, and alcoves fall naturally around the edges.

Second, there is a structural meaning in the form. Buildings tend to be of materials that are strong in compression; compressive strength is cheaper then tensile strength or strength in bending. Any building which stands in pure compression will tend toward the overall outline of an inverted catenary—ROOF LAYOUT (209). When a building does take this form, each outlying space acts to buttress the higher spaces. The building is stable in just the same way that a pile of earth, which has assumed the line of least resistance, is also stable.

And third, there is a practical consideration. We shall explain that ROOF GARDENS (118), wherever they occur, should not be over the top floor, but always on the same level as the rooms they serve. This means, naturally, that the building tends to get lower toward the edges since the roof gardens step down from the top toward the outer edge of the ground floor.

Why do these three apparently different problems lead to the same pattern? We don't know. But we suspect that there is some deeper essence behind the apparent coincidence. We leave the pattern intact in the hope that someone else will understand its meaning.



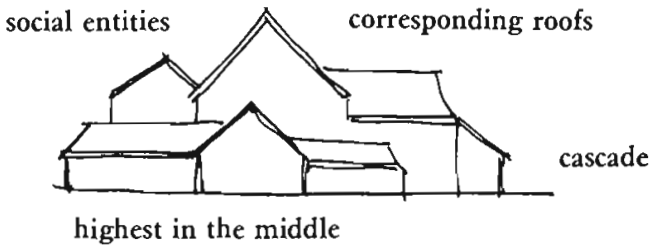
A sketch of Frank Lloyd Wright's.

Finally, a note on the application of the pattern. One must take care, in laying out large buildings, to make the cascade compatible with WINGS OF LIGHT (107). If you conceive of the cascade as pyramidal and the building is large, the middle section of the building will be cut off from daylight. Instead, the proper synthesis of cascades and wings of light will generate a building that tumbles down along relatively narrow wings, the wings turning corners and becoming lower where they will.

Therefore:

Visualize the whole building, or building complex, as a system of roofs.

Place the largest, highest, and widest roofs over those parts of the building which are most significant: when you come to lay the roofs out in detail, you will be able to make all lesser roofs cascade off these large roofs and form a stable self-buttressing system, which is congruent with the hierarchy of social spaces underneath the roofs.



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Make the roofs a combination of steeply pitched or domed, and flat shapes—SHELTERING ROOF (117), ROOF GARDEN (118). Prepare to place small rooms at the outside and ends of wings, and large rooms in the middle—CEILING HEIGHT VARIETY (190). Later, once the plan of the building is more exactly defined, you can lay out the roofs exactly to fit the cascade to individual rooms; and at that stage the cascade will begin to have a structural effect of great importance—STRUCTURE FOLLOWS SOCIAL SPACES (205), ROOF LAYOUT (209). . . .

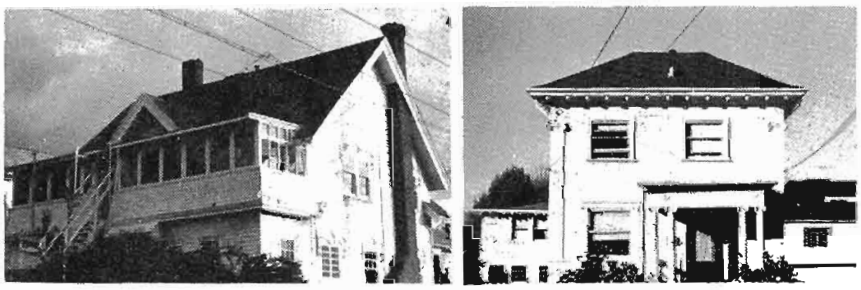
117 SHELTERING ROOF**

. . . over the WINGS OF LIGHT (107), within the overall CASCADE OF ROOFS (116), some parts of the cascade are flat and some are steeply pitched or vaulted. This pattern gives the character of those parts which are steeply pitched or vaulted; the next one gives the character of those which must be flat.

The roof plays a primal role in our lives. The most primitive buildings are nothing but a roof. If the roof is hidden, if its presence cannot be felt around the building, or if it cannot be used, then people will lack a fundamental sense of shelter.

This sheltering function cannot be created by a pitched roof, or large roof, which is merely added to the top of an existing structure. The roof itself only shelters if it contains, embraces, covers, surrounds the process of living. This means very simply, that the roof must not only be large and visible, but it must also include living quarters *within* its volume, not only underneath it.

Compare the following examples. They show clearly how different roofs are, when they have living quarters within them and when they don't.



One roof lived in, the other stuck on.

The difference between these two houses comes largely from the fact that in one the roof is an integral part of the volume of the building, while in the other it is no more than a cap that has been set down on top of the building. In the first case, where the

building conveys an enormous sense of shelter, it is impossible to draw a horizontal line across the facade of the building and separate the roof from the inhabited parts of the building. But in the second case, the roof is so separate and distinct a thing, that such a line almost draws itself.

We believe that this connection between the geometry of roofs, and their capacity to provide psychological shelter, can be put on empirical grounds: first, there is a kind of evidence which shows that both children and adults naturally incline toward the sheltering roofs, almost as if they had archetypal properties. For example, here is Amos Rapoport on the subject:

> . . . "roof" is a symbol of home, as in the phrase "a roof over one's head," and its importance has been stressed in a number of studies. In one study, the importance of images—i.e., symbols—for house form is stressed, and the pitched roof is said to be symbolic of shelter while the flat roof is not, and is therefore unacceptable on symbolic grounds. Another study of this subject shows the importance of these aspects in the choice of house form in England, and also shows that the pitched, tile roof is a symbol of security. It is considered, and even shown in a building-society advertisement, as an umbrella, and the houses directly reflect this view. (Amos Rapoport, *House Form and Culture*, Englewood Cliffs, N.J.: Prentice-Hall, 1969, p. 134.)

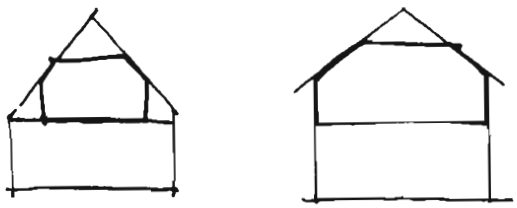
George Rand has drawn a similar point from his research. Rand finds that people are extremely conservative about their images of home and shelter. Despite 50 years of the flat roofs of the "modern movement," people still find the simple pitched roof the most powerful symbol of shelter. (George Rand, "Children's Images of Houses: A Prolegomena to the Study of Why People Still Want Pitched Roofs," *Environmental Design: Research and Practice*, Proceedings of the EDRA 3/AR 8 Conference, University of California at Los Angeles, William J. Mitchell, ed., January 1972, pp. 6–9–2 to 6–9–10.)

And the French psychiatrist, Menie Gregoire, makes the following observation about children:

> At Nancy the children from the apartments were asked to draw a house. These children had been born in these apartment slabs which stand up like a house of cards upon an isolated hill. Without exception they each drew a small cottage with two windows and smoke curling up from a chimney on the roof. (M. Gregoire, "The Child in the High-Rise," *Ekistics*, May 1971, pp. 331–33.)

Such evidence as this can perhaps be dismissed on the grounds that it is culturally induced. But there is a second kind of evidence, more obvious, which lies in the simple fact of making the connection between the features of a roof and the feeling of shelter completely clear. In the passage which follows, we explain the geometric features which a roof must have in order to create an atmosphere of shelter.

1. The space under or on the roof must be useful space, space that people come into contact with daily. The whole feeling of shelter comes from the fact that the roof *surrounds* people at the same time that it covers them. You can imagine this taking either of the following forms. In both cases, the rooms under the roof are actually surrounded by the roof.



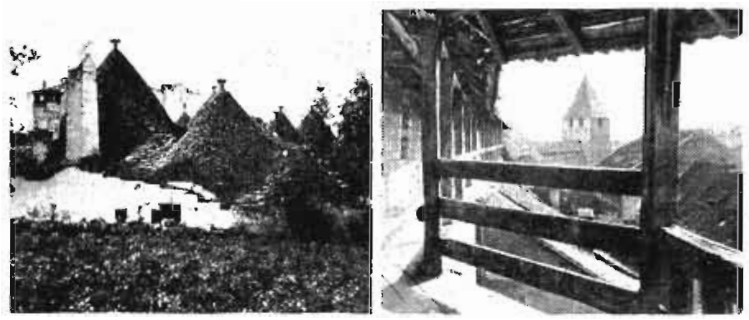
Two roof sections.

2. Seen from afar, the roof of the building must be made to form a massive part of the building. When you see the building, you see the roof. This is perhaps the most dramatic feature of a strong, sheltering roof.

> What constitutes the charm to the eye of the old-fashioned country barn but its immense roof—a slope of gray shingle exposed to the weather like the side of a hill, and by its amplitude suggesting a bounty that warms the heart. Many of the old farmhouses, too, were modelled on the same generous scale, and at a distance little was visible but their great sloping roofs. They covered their inmates as a hen covereth her brood, and are touching pictures of the domestic spirit in its simpler forms. (John Burroughs, *Signs and Seasons*, New York: Houghton Mifflin, 1914, p. 252.)

3. And a sheltering roof must be placed so that one can touch it—touch it from outside. If it is pitched or vaulted, some

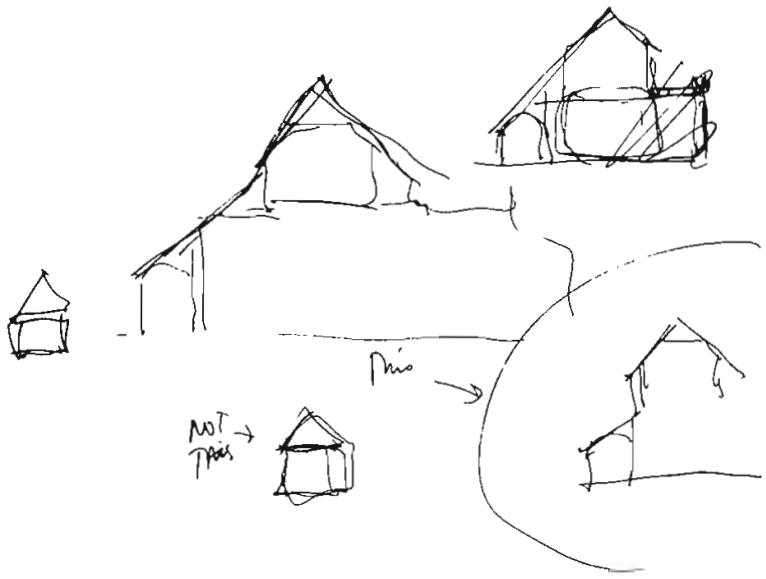
part of the roof must come down low to the ground, just in a place where there is a path, so that it becomes a natural thing to touch the roof edge as you pass it.



Roof edges you can touch.

Therefore:

Slope the roof or make a vault of it, make its entire surface visible, and bring the eaves of the roof down low, as low as 6′0″ or 6′6″ at places like the entrance, where people pause. Build the top story of each wing right into the roof, so that the roof does not only cover it, but actually surrounds it.



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Get the exact shape of the cross section from ROOF VAULTS (220); use the space inside the top of the sloped roof for BULK STORAGE (145); where the roof comes down low, perhaps make it continuous with an ARCADE (119) or GALLERY SURROUND (166). Build the roof flat, not sloped, only where people can get out to it to use it as a garden—ROOF GARDENS (118); where rooms are built into the roof, make windows in the roof—DORMER WINDOWS (231). If the building plan is complex, get the exact way that different sloped roofs meet from ROOF LAYOUT (209). . . .