THE SHELTERING ROOF:

"Beneath his low illustrious roof, Sweet Peace and happy Wisdons smooth'd his brow."

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People say a lot about themselves with architecture -- it's their shelter, their home, their comfort. We can look at a person's house or living space and find a personality, life oozing out through the clapboards or bricks. People choose Greek revivals and Victorian mansions and on the surface they're conscious of style, how much they can afford, and what the neighbors think of their choice. Deep down, though, our feelings about things gone by in our lives and things for which we yearn also seep through and express themselves in the places in which we live.

Man has built his roofs for years with attention to local materials, the elements and inherited construction methods. He has also been tied to social and cultural influences, political pressures, and personal and psychological imagery. Technology and symbolism have gone hand in hand. All of the factors in balance make a shelter, a place of refuge, a home. When one of these factors, however, begins to overpower the others, the
balance is destroyed and we are left with only an uncomplacent and unsatisfying feeling of a building without meaning.

It happens when technology runs rampant — when the tin, lightweight asphalt shingle provides a cheap, quick roof over one's head — and the meaning of a house's shedding water becomes less important. A person climbs a ladder and in a few hours has covered the house with rolls of asphalt shingles. Years ago the thatcher would come to put on a roof and the days of painstaking care would show for the life of the building in the huge, heavy shape of the thatching. The roof of the building symbolizes shelter.

The roof began as a physical shelter. It kept out the sun, rain, and winds. Over the years, it began to symbolize protection. Now we have an incredible variety of ways of saying "shelter" with roofs. Some roofs don't say it at all, some say it too loudly, but some manage to both act as shelters and tell us all the things they stand for.

The satisfaction with what you end up with has to do with a healthy balance of all the elements of the roof. The elements form a set of characteristics that must be fulfilled to create the successful roof.

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THE SHELTERING ROOF

"Beneath his low illustrious roof, Sweet Peace and happy Wisdoms smooth'd his brow."

Thomson, Winter, 1726-1746

Stephannie J. Bartos
May, 1975
Dedication

I am writing this to my mother who wants to move out of the house she loves, out of the life she feels comfortable in, and into an adventure. Her new house, like her new life, should have some things that speak of her past, like redwood and big desks and quilts and beautiful mahogany silver chests. Yet it should also have exciting un-thought-of things and ideas that are maybe a little foreign and strange at first that make for lots of thinking and dreaming . . .
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FOREWORD

"I sound my barbaric yawp over the roofs of the world."
Walt Whitman. Leaves of Grass: Song of Myself, 52.

I began this thesis searching for a way to look at architecture and buildings and to discover the stories about people that lived and worked in them. For many months I struggled with numerous ways and forms of doing a project that dealt with people's needs, desires and whims; things that are not immediately apparent in a building's design. I've sat through enough art history classes to realize that everything grows out of something else (the Darwinian Theory of Art History?) but I have a sorely undeveloped sense of the everyday person and how that person fits into architecture.

I've always loved Thomas Wolfe and John Dos Passos, books about life and people and America. It's difficult to speak a love for small-time people, everyday people -- those that get up and go to work and come home and watch T.V. People that always buy the same beer. People with mobile homes, Christmas and family dinners and Saturday afternoons. People you meet
in the hardware stores and supermarkets and at Yellowstone Park. People with kids and roller skates and Airstream trailers and staypress pants.

And how did roofs come out of this? I was originally searching for a piece, an element that shows up in one form or another in every building; an element that has an evolution from the very beginning of buildings to present day, a part that every person has in their mental house-building kit. When I thought of the roof, I found that it spoke strongly of "sheltering", that primeval instinct that man has developed into architecture. The roof is that element of a shelter that covers us, consoles us and gives us privacy. It means "house" to us now. I wanted to find out why.

When I was 13 years old, my family moved from that land of all lands, that golden-acked Southern California, to a stark, March-weathered Connecticut countryside. Everything was grey, the sky, the trees, the people. My family has always felt unwelcome in New England. I know that New Englanders are known for their virtues of strength and their quiet, inner passions that bred our nation's Revolution, but those attributes translated themselves to me in a subverted laugh, mocking my accent, my tan, my short dresses. It may have had something to do with my obvious desire to go back to the West Coast and warm my then-skinny body in the maternal sun.
When my father (not an architect) and my mother (not an architect either) decided to build their house, they had already made an enemy of New England by rejecting the local prim and proper and upright little houses, the steep gables, clipped eaves and symbolic chimneys.

It was a low-slung house, stretching out flat on the land, hugging it, loving it. The spans were ranch-style, flung out to the outside wall. The passage of the building plans by the Town Engineer became the town discussion. The snow, they said, would build up on it and cave the house in. The pressure would be too much. My father told his critics that they knew nothing about buildings (which was not entirely true) and they told him that he knew nothing about New England (which was closer to the truth). In any case, he convinced them that his roof would not fall in, and they let us build it. Needless to say, the strong, horizontal roof mimicked our funny fit in New England; it did 12 years ago, and it still does today. But the house, in spite of its motel-image still seems wonderful to me, with its gentle, relaxed roof and its sweeping overhung eaves. There's always been a special thing about being able to see the roof from inside the house. The eaves come down so low that you can reach up hard and touch their heavy wood shakes when you're outside. It had the quality of warm relaxed, happy life, and it bespoke, for all of us, a love for California.
So a roof can tell the story of my family, and probably the stories of other families as well; lives gone by, lives to come. We discovered that our roof evoked a collection of feelings, which here I will call "Senses": The Sense of Function, the Sense of Evolution, and the Sense of Symbolic Significance. The first, function, is an overall feeling of how the roof works and responds to the problem of sheltering its inhabitants -- a protection from heavy Connecticut snows. The sense of evolution tells us a history of people and a house -- a move from California -- generations past and present; and maybe a hint of what is to come. The symbolic significance of shelter comes from an overall concept or attitude toward a roof -- a low slung image, qualified by the way that bits and pieces (eaves and wood shakes) -- fit into the framework.
THE SENSE OF FUNCTION

Shape & Silhouette
Material
Pitch
Parts & Pieces
"Lord, Thou hast given me a cell
Wherein to dwell,
A little house, whose humble roof
Is weather-proof . . ."
Robert Herrick, "A thanksgiving to God for His House," *Noble Numbers*

A roof must first of all function well. We have come to assume certain requirements and demand satisfaction of them. A roof must provide protection from moisture: it must keep out rain, snow and ice. It must not create internal condensation. It should, when warranted, act as a sunscreen. Or, it must function as a sun-collector for energy-gathering and food-drying activities. It must be shaped to allow the space underneath to be used according to the owner's needs. The roof structure should be efficient and easily buildable by existing (and local) means.
The sense of function, or of fulfillment, is an important requirement of a successful roof. You get the same satisfaction when you finally find a piece of clothing that "works" wonderfully well. A 60-40 parka, for example. A coat that sheds water to a limited extent and breathes enough to prevent condensation inside. Roomy enough to go over sweaters or a separate down-filled parka in cold weather. Equipped with a hood for unexpected light rains. Snap closures over the zipper for a simple wind baffle. Adjustable Velcro cuff fasteners for easy handling and small-to-large wrist sizes. A drawstring waist to pare down the roominess and prevent winds from whipping up inside. A zippered pocket in back to carry maps and other big flat stuff. Pleated pockets in front to carry everything else.

The same pleasure that one feels when wearing a garment like this comes through in the shape and silhouette of a roof, the use of materials, the selection of slope, and the parts and places that are added to the main structure.

SHAPE & SILHOUETTE

The functional demands that result in shape and silhouette choice range from climatic influences, to use or program considerations to structural methods. The shape and silhouette of a roof has become a symbolic image for the whole house's reaction to these functional demands.
Climate both directly and indirectly affects that selection. A desert roof, responding to extreme solar heat combined with infrequent rain and low humidity compared to the gable roof that acts as a snow shed. Aymar Embury in "Colonial Roofs" in Pencil Points (1932) says it well: "On the flat bare plains of Long Island and the wind-swept open seaside dunes, they rarely erected the prim, demure, stately, two-story house of the villages . . . "1 Apart from the immediate climatic effect, our selection of shape and silhouette is tremendously influenced by our psychological reaction to climate: "Beneath our Northern skies, within our landscape we must have roofs that show."2 (Embury) The sense of function includes within it a statement of man's ability to battle back the greyness of his intemperate climate with a human-formed landscape. Shape and silhouette are basic responses to the climate and region that you can hold in your mind after the details fade away.

Building codes will cause a shape or silhouette response: the most famous is the Mansard roof developed in 19th Century France. The steeply curved roof pitch topped with a low hip appeared on the Louvre in the 16th Century. It later developed as a city-house form in Paris due to the restriction in building codes: houses were not to exceed two stories, and the Mansard roof allowed almost full use of the attic story when penetrated with windows. This roof form was originally an artistic invention; the Parisian building codes stimulated
widespread use of a now well-known roof shape and silhouette.

The cruck-built barn has a structure that shows off function. The gentle bend of its principal members ("blades" hewn from the trunk and first branch of a huge oak tree) shape the softened, thatched, gable roof.
In another case, the symbolic katsuogi of the Japanese shrine, a short, thick log placed on the ridge pole, is thought to have been originally a weight to hold down the ridge caps. Although it does little now, it is maintained on shrines and wealthy farm estates as a symbol of the original technology and religious input.

The overall shape and silhouette is also a functional reaction to the program or use underneath. Floor plans can cause symmetrical vs. assymmetrical responses, as in a simple gabled Early-American roof, that grows into a salt box as a kitchen shed is added. Roof and living patterns can grow together.
The roof itself and our feeling of function is greatly affected by the choice of material. The small piece of roofing (tile, slate, shingle, straw) can predetermine the reaction to the environmental problems. The beautiful deep-red clay tile used in the tropical climates provides the highest heat collection value. No matter how picturesque in sunny Mexico plains, such a tiled roof heats up during the day and bakes its inhabitants during the night. When the hacienda is closer to the mountains and has cool winds and chilly nights, the roof's radiation is needed below after sunset.

Pieces of straw are individually a fairly flexible and weak material. But they can be bound and plaited and piled atop each other to make a heavy, durable, rain-shedding roof of thatch. The time taken to thatch a roof is shown in the strong shape and silhouette (see previous section) for the sixty or seventy-year life of the building. The straw or reed that goes into a thatched roof has been selected for its water impermeability (to shed, not
absorb water) and flexibility (to result in ease of binding). The thatched roof today is considered an elegant roofing solution by both architect and engineer; but in past times, thatching was used for economy, regarded as a symbol of the poor:

"The rude inelegance of poverty Reigns here; else why that roof of straw?" 5

Heather was used chiefly for the poorest of houses and outbuildings; very few of these buildings remain today. Long straw was more durable, lasting for several decades, and had the most flexibility for binding and combing.
The material used for better buildings long ago and in most present-day thatched roofs is reed. The basic bundles are secured to the roof with pegs and willow reeds or hazel "sways", then combed and clipped. The eaves in thatched buildings are strong, overhanging elements. In Japan, straw roofs will gain thickness from ridge to eave. This is done to add to the water-shedding ability. This thickness grows with repair: the deeper the straw, the older the house.

The image of windows peering from beneath more than a foot of straw has often been remarked upon. Thomas Hardy calls the small English Hamlet Bere Regis a "blinking little place". The entire village is thatched, each tiny building exudes its functional air.
Thatch was time consuming to build and maintain, and the straw had the unfortunate disadvantage of collecting bugs. The shingle solved these problems: it too shed water easily when applied to the roof frame in a scale-like fashion; this process took less construction time than thatching, and the roof was easier to repair. Today we have wood shakes, wood shingles, asphalt shingles, and slate or tile that function in a similar way. All are susceptible to water seepage and frost heave, but with the shingles' long wedge shape that can be overlapped and built up like a thatch, these problems can be controlled.

**PITCH**

Slope is another contributor to the sense of function. Originally, questions of pitch related to function only. Today almost the complete reverse is true: pitch is determined largely by cultural demands. We frequently see a tile roof with a very shallow slope (less than one-in-four). For a climate with any rain, the roof will leak. Or, when we see a roof pitched so steeply that the structure is overbearing we have an unsatisfied reaction to a certain hypocracy in spite of the picturesque quality produced.

Roof pitch penetrates our emotions more deeply than functional response, as society equates certain images with security and prestige. Children's drawings of houses frequently show a simple gable roof above the standard box. The house shown here is a drawing by a child who lived in Corbu's Pessac.
in France. His own house was typical of the Pessac development: a formal, rectangular, flat-roof statement. And yet his drawing shows the pitched gable, a roof type more common to the surrounding French countryside than his own community.  

Womb symbolism in the peaked, pitched roof is much stronger than a flat structure. Clare Cooper, in *House as the Symbol of Self*, discusses womb symbolism and the house, quoting a selection of Bachelard's *Poetics of Space*:

"The notion of house as a symbol of "mother" or the "womb" is one that is fairly common in literature, and indeed has been the inspiration of a number of "organic" architects who have tried to re-create this safe-enclosed, encircling feeling in their designs. In the following description, we see how the house takes on a symbolic material function in response to the fear of the man within and the storm outside.

'The house was fighting gallantly, At first it gave voice to its complaints; the most awful gusts were attacking it from every side at once with evident hatred and such howls of rage that, at times, I trembled with fear. But it stood firm . . . The already human being in whom I sought shelter for my body yielded nothing to the storm. The house clung to me, like a she-wolf, and at times I could smell her odor penetrating maternally to my very heart. That night she was really my mother. She was all I had to keep and sustain me. We were alone."  

This may be a subtle or subconscious reason for a desire for pitched roofs.
The modern shed style is an example of a pitched roof or roof piece being used for both functional value and cultural association. Its most common regional use is in the Northeast U.S. The steep one-half gable in its best uses will evoke images of New England houses and barns; it will also formally blend with older neighborhoods although it copes with new desires and values. A sensitivity to light penetration, open vertical circulation, and additive methods of design and construction can be pointed out as a determinant or desired result of the shed roof. When it is lost, the resulting knitted pieces of the stylish half-gables can create unreparable leakage problems along with a jumble of unorganized pieces, a meaningless silhouette.

The average American house built today maintains its pitched, peaked roof. The attic is infrequently used; a trap-door in a closet ceiling is a minimal penetration for repair access. Although the shed roof style has an open roof pitch underneath and cathedral ceilings from the Maybeck era still occur in some contemporary Californian houses, that space under the pitch has atrophied. The garage is now the collector of junk, memorabilia, old rocking chairs and Christmas tree decorations.

PARTS & PIECES

The bits and pieces, the add-on parts of a roof also lend an image of function to a shelter. Detailing allows a
The existence of overhanging eaves or northern skylights both tell us functional information about a house.

Penetrations through the skin of the roof are function-determined by the need for exterior ventilation, light or view, and by the need for additional space under the cap itself. Dormers, skylights, clerestories, monitors and walkways are responses to these needs.

They are important in non-windowed areas because they protect the sidewalls from heat gain by cutting off direct sun penetration. Eaves can lower the C.I.E. (sky lighting factor), a measurement of the overall brightness of the sky. In strong-sun months, the sky brightness can cause eye irritation and seeing disabilities (extreme value contrast, glare, bleaching of visible objects). The window will have less contrast with the interior, and the view to the outside is much softer.

Eaves are also a functional response to rain. They reduce seepage of rain water into the house, and the overhanging roof avoids expanded exposure to rain and ice to the roof and sidewall joint. A roof overhang, if deep enough, allows us to open windows and doors during rains. Thus the eave is a mini-shelter like a porch.

Overhanging eaves and porches are useful transition zones. (They are reception areas, places for people to stand out
There are problems with eaves and other small roofs. In the Northern climates, snow melting on the roof may drip, and form hazardous icicles during night-time freezes. Collected rain from the roof will fall in a stream from the eave line. The force of this stream can cause a cutting away of the ground, and the rain will have difficulty in being absorbed back into ground water. A beautiful response to this problem can be seen in the linear collecting troughs under the overhangs on the Japanese Imperial Palace buildings in Kyoto. A simpler solution for today's home gardener or handy-person is to reflect the eave line in the ground by a trough of gravel. The water can then disperse and be absorbed by the ground before collecting as run-off.

Gutters and downspouts are roof-pieces that prevent run-off problems of rain. The gutter collects water at the roof-edge and drains it to a corner. Rain barrels for a long time collected the drainage from the roof, but eventually downspouts were attached, and water was collected into storm sewers. Future approaches to run-off water will more likely collect it as valuable usable water (after a several-minute "clean-off" period to wash the roof) for either white water (drinking, bathing, cooking) or grey water (food washing, plant watering, toilet flushing) depending on local atmospheric pollution. The collecting devices for
water recycling will add a whole new set of functional pieces to our vocabulary.

Many of the variations of functional responses have grown and developed over time. The roof's shape and silhouette, its construction material and method, its pitch and its parts carry a history in their development, a story of the past, a Sense of Evolution.
THE SENSE OF EVOLUTION

- Primitive Huts
- Portable Roofs
- The Little House
- Ritual
- Style
THE SENSE OF EVOLUTION

"He has done with roofs and men, 
Open, Time, and let him pass."
Louise Imogen Guiney, Ballad of Kenelem

PRIMITIVE HUTS

The sense of evolution that a roof evokes begins with the primitive hut. Contemporary man has a powerful empathy for the importance that the first shelter held for his primitive brother. The sheltering feeling of the primitive hut in our roofs comes from our continual searching for our cultural beginnings, by recreating the images of things that we feel were our first shelters.

Joseph Rykwert in Adam's House in Paradise discusses Filarete's Treatise on Architecture, a work that depicts Adam, being driven from heaven, putting his hands above his head to shield himself from the rains. (See illustration) Rykwert
Adam sheltering himself (after Rykwert, ref. 35)

The personification of architecture and the primitive hut (from Rykwert, ref. 35)
also notes that Filarete takes the unreasonable ("but imaginative") action of assuming that the extended fingertips and sloped backs of Adam's hands foretold the double-pitched roof. I agree that it is unlikely that today's gable was designed with this image in mind, but it does show a connection of the immediate sheltering of oneself to the hat, the umbrella, and eventually, the roof.

This sense of evolution builds up through hints of the past: in primitive shelters (both stationary -- the hut, and temporary -- the tent), in the concept of the diminutive (the "little house") and in ritual.
Past notions of the primitive hut in architectural history have shown a roof simply supported by trees (the ancestors of the column). Such ideas have evolved through a lack of archeological research and evidence; this premise was generally founded on the assumption of man's ability, even as a primitive being, to conceptualize a "shelter". These developed into a kind of intellectual chauvinism, as shown in the post-and-lintel structures at the left.

Evidence within the past century has shown that the roof has been from early times the basic built-shelter element. The first primitive home may have been the cave, or thicket, but as humankind strove to imitate, duplicate or improve on existing nature, the cover and enclosure began to evolve. The "roof" or cover was built throughout the world in conical fashion on a low earth wall, the berm enscribing a pit, hence the name, pit-dwelling. The chicken-and-egg question of square vs. round-plan pit-dwellings has pursued us for centuries. In Japan, for example, the discovery of the remains of both round and square pit-dwellings, the precedent problem is still unanswered. The pit-dwelling roof was a massive, sheltering upside-down nest. The earth came up to meet the roof directly, first as a berm, later developing into a low wall. A shelter covered with grasses instead of skins (tipi-style) may have been built earlier but it may have had structural problems: without the tension of the tightly-sewn skins the weight of the thick rushes, grasses or...
Kikuyu Hut, B.E. Africa

Mandan earth lodge - Upper Missouri

East African hut

Niamtougu - Togo, W. Africa

(all after Kahn, ref. 23)
sod would splay the bottoms (see sketch). Earth-forming may have been a structural response; perhaps early foundation design. The pit-dwelling eventually acquired four posts in the center of the floor, being lashed together to form a three-dimensional rectangle that held "rafters" stretching from the "beam poles" to the ground. A covering of rushes (which later became thatch) was added, leaving a hole in the center -- the chimney. 11

The primitive hut evolved into strong roof forms in three very different cultures: in Japan (the farm dwelling and the shinden-style house), in Northern Europe (the rural hall), and in the Mediterranean (the dome).

**Japanese Roofs**

In Japan, the 4-poled center roof support gained a ridge pole that protruded at both ends, creating protected, open, small gables that allowed smoke to escape. At this point, the pit-dwelling branched into two strains -- the thatched domestic farm architecture and the light, slender, tile-roofed raised dwellings of the aristocrats.

The raised dwelling most probably was lifted to store the grains that would be planted for the next season's crops, and to protect these contents from moisture and rats. Fertility and religion and harvesting became interwoven to develop the famous Shinto shrine-style: the wooden structure was raised above the ground on heavy wooden poles. In some cases the roof was supported separately from the walls -- by two poles on the
length-wise axis that carry the ridge beam, and much of the roof weight. They have come outside from the hearth, and stand alone, noble, from ground (with no base) to roof peak. It is easy to see how the Shinden-style houses of the Heian aristocrats and still later, the Shoden-style warrior dwellings of the Medieval period developed from this honored prototype.

The farmhouse still resembles the pit-dwelling in its huge, massive, all-important roof. It has still a simple floor plan (although one-half of the floor was often built up a foot or so for a sleeping area), and the cooking fire vents at the gable.

The silhouette of the Japanese farmhouse often looks hipped, with an odd over-hanging ridge. It is a combination of hip, ridge and gable that avoids an expanse of exposed vertical walls, giving the few penetrations from interior to exterior the
The result is an enclosed shelter similar to the early roof-hut.

The Rural Hall

The early "houses" in England and Northern Europe began as pole-framed pit-dwellings but developed a scheme much different from the Japanese strains. The central members that formed a square were repeated linearly, creating an elongated "earth lodge": an enlarged, rectangular pit-dwelling. This development theoretically came from a need to store crops and grain. The developing life-style, too, may have demanded alterations. Communities in this part of the world have long been subject to cold weather and warring tribes. The need to live together may have influenced the small pit-dwellers, beginning the growth toward the Rural Hall.
A section through this early lodge is similar to that of the pit-dwelling: it shows poles, lashings, some kind of reed or stick "rafters" and thatching. The use of cruck-building techniques (see illustrations) allowed roofs to grow high, "by lofty gables, so as to allow room for the smoke to rise out of contact with human eyes, as it seldom could have done with the cave..." 12

The roof was either thatched or covered with sod, the latter cut thick enough that the grasses holding it together flourished, attracting livestock. The former earth berms became side walls, still so low that the animals could easily reach the roof. The sod roofs exist today on buildings -- scattered sparsely through the English rural countryside.
The open-beamed ceilings allowed for the collection of smoke on the upper level. The smoke outlet was a simple grate set into the roof. When chimney-building became widespread, the clear span from floor-to-roof was not needed; upper floors and lofts were then possible.

Thus developed the rural hall's pitched roof. All penetrations occurred within it.

"The vulnerable point of the building was not the door, but the window (or wind's eye), an opening in the center of the roof ... so in times of especial danger, an armed man was posted on a small platform under that opening." 13

North Americans have adopted this heritage of the pitched covering to mean "house". We can find it today in almost every "style" of building, from pioneer structures to the Queen Anne style and today's shed roofs.
The Dome

The dome has long been a puzzle to architectural historians. It has been thought, up until quite recent times, to have sprung full-conceived and built from the head of man. Traditional reasoning suggests a man viewing a round-topped cavern, complete with light hole at the top to make it visible, then sitting down and figuring out the trapezoidal stone that will make it buildable. Architects did not invent building though; cultured societies did not say, "Ah the answer to our problems: the dome!"

According to E. Baldwin Smith in his scholarly treatise, The Dome, suggests that our round-topped roof-form did not even begin in stone; it was originally a wooden structure. Although most domes and barrel-vaulted structures exist in unwooded arid regions, these areas were likely heavily forested at one time. We may speculate that domes originally built of wood and reeds or thatch, would likely have disintegrated completely, leaving only their successors, the masonry domes.

The pit-dwelling may have been an ancestor to the dome as well as the previously discussed roof forms. Woven and thatched domical covers exist today in many primitive cultures. We can see them in Africa in smooth, hemispherical shapes and in a bulbous form, tied at the top, yurt-style (the yurt is a semi-domed structure, centrally focussed and thatch-covered).

Edward Allen, in Stone Shelters, presents the trullo domes of the Apulia region in Italy. These are corbelled domes,
flat stones laid in a slightly overlapping pattern, heavily weighted on the haunches creating a monolithic structure. He too, questions the birth of this building method, and suggests that a stone-walled pit with wooden cover may have preceded the stone-dome building.
Where does the heritage of today's dome come from? As the early wooden dome, according to Smith, took on the utilitarian values of granaries, baths and kilns, it also acquired the symbolic image of the ancestral house, it represented the sky, the place where the gods dwelled. It was this growing symbolic importance that precipitated its translation into the more permanent masonary materials. It acquired a mortuary tradition as well and has been a standard form in burial architecture from pre-Christian to present times.

Dome-building in the United States had been restricted to churches, synagogues, religious monuments and government buildings that imitated the Classical adaptations of the hemisphere. The introduction of Buckminster Fuller's geodesic dome set off new uses of long-spanning domes in cultural pavillions and athletic centers, but also stimulated its use here as a house form. The dome is used today in U.S. counter-culture building, both for the individual dweller on the small scale and in a larger form as a communal center and/or group living quarters. The "alternative" choice of the dome for house-building may have reaffirmed the magical qualities of hemispherical enclosure and the celestial symbolism of the heavens. The dome has a strong centreal convergence, but has difficulty with acoustical focusing and the problematic division of the space. It is roof and walls and enclosure all at once; because of the continuity of
the structure, penetrations have always been a problem. Nor

does the geodesic dome welcome the previously employed struc-
tural and symbolic element, the oculus. The roof has taken

over.

Where is the future of the dome in roof-making? Pro-

bably not in the zomes and zarches and other mutant domes of Ant
Farm descendants, but in the small parts of a roof: bays and

monitors, places of containment, seclusion and meditation. The

hemispherical roof has a sense of the primitive hut, a feeling

of enclosure that is singular and self-regarding. It will con-
tinue to define very special one-person places as it has in the
historical motifs of towers, bay windows and cupolas.

PORTABLE & TEMPORARY ROOFS

While the pit-dwelling was a permanent building, com-
plete with a foundation of sorts and a semi-permanent roof, the
nomadic cultures developed temporary structures or lighter-weight
movable ones.
Some groups that combined travel with agriculture built a version of the raised-dwelling. This protected their seeds for future crops, as did the similar raised-dwelling buildings in Japan. For cultures that did not remain in one place or even return to one place to plant every year, these structures had to be temporary. Thus probably developed the succot, now a miniature ceremonial house in the Jewish rite of thanksgiving. The succot was originally a woven roof set on simple posts in fields during harvest. It was a structure built for temporary shelter so people would not have to make a long journey back to their villages at night after work. According to traditions handed down and appearing in modern ritual, the roof was built so that one could see the stars through it. Today the succot appears in a booth-like form in the feast of tabernacles.17

**Tents**

Cultures that use only portable shelters have existed throughout history and can still be found today. From these cul-
t tures we have the tent and the tipi, and their derivatives, the cabana, gazebo, baldechino, umbrella and the parasol.

An early Mesopotamian translation calls the tent or canopy the "clothing-which-gives-rest". The Bedouin tent of the nomadic Arabs, as described by Dale McLeod in *Shelter*, is a direct descendant of the early portable houses. The main structure is a simple system of poles, which with ropes, act as a space frame that carries a cloth roof, a rectangle woven of goat's hair or sheep's wool. The prosperity in the household was reflected in the length of the tent, the number of poles and the richness of decorations.

Tent dwellers appreciate a freedom of movement and a symbolic closeness to nature that house-dwellers will never know. An American Indian is quoted in *Touch the Earth* on the symbolic significance of the tipi:

"The tipi is much better to live in; always clean, warm in winter, cool in summer; easy to move. The white man builds big house, cost much money, like big cage, shut out sun, can never move; always sick. Indians and animals know better how to live than white man; nobody can be in good health if he does not have all the time fresh air, sunshine
and good water. If the Great Spirit wanted men to stay in one place, He would make the world stand still; but He made it to always change, so birds and animals can move and always have green grass and ripe berries, sunlight to work and play, and night to sleep; summer for flowers to bloom, and winter for them to sleep; always changing; everything for good; nothing for nothing . . . "20

Many other roof forms have grown out of the tent -- such as the cabana, the gazebo, the baldechino, and even the Christian tabernacle.21 Some are still lightweight and made of soft materials. Some are even carried in procession, imitating the eternal journeys of past generations.

The cabana is a light beach tent, a cover that has come directly from the Arabian tent model. It is used temporarily today on beaches, in back yards for parties and wedding receptions and for church bazaars and bingo games. We can even see the portable roof in the circus tent -- a building form that belongs to the last of America's modern-day nomads. The gazebo and baldechino are structurally very similar -- a wooden or cast iron translation of a soft, lightweight structure held up on poles. The lace and baubled decorations on the early structures have been translated into intricate jig-sawing and wrought-iron work.

Cottage City

A more recent translation of the temporary tent into a permanent structure can still be seen in Cottage City on
Martha’s Vineyard off the Massachusetts coast. The site of a Methodist summer camp, Cottage City would fill annually with large families that came for prayer and communal religious celebration. Each family stayed in a tent, often a lean-to or a more fancy pitched canopy. These developed into complete enclosures, with double-flapped doors in the gable side, facing a collection of small open clearings. The largest clearing, centrally located amidst all the tents was used for open-air meetings.

As time went on lace decorations and fancy cloth cuttings appeared along the canvas seams; people began personalizing their tents and within a limited framework rich ornamentation grew. The tents began to be translated into wooden houses. The floor plans and roof pitches remained the same although the fabric was altered. The custom of families sitting in front of their tents to feel the cool summer breezes and the warm hospitality became physically recreated in front porches.

With the invention of the jig saw and the development of cottage-style Vineyard architecture in the middle of this metamorphosis, the fabric personalizations could be imitated after a fashion in wood -- and the creation of a fairy land of lacy wood houses was complete within a few years. Many of these houses are still standing today, painted bright and vivid colors, but local opinion holds that the buildings...
pale in comparison with their former selves. The Cottage City ornamented roof shows a strong sense of evolution.

**Umbrellas & Parasols**

A very functional little roof is the nicely portable roof, the umbrella. The umbrella was first seen in the United States in the mid-1700's. It's early use here was decorative, although it had been a protector from the rain in the place it came from -- the West Indies. It became more widely used during the Victorian era, a time that gave us the well-known black bumbershoot typified by the staid
Englishman and the Harvard undergraduate. Umbrellas used in the U.S. were usually red up to this point. 22

Carrying an umbrella to protect one from the rain was (and is) a piece of a house carried along on a trip. Today's see-through vinyl umbrellas are bell-shaped to enclose the top half of a person -- the roof has become room also, but the roof here no longer welcomes another person. It is a private individual roof/room that can symbolize the isolation and separation of people. A dark gloomy rainy day fills our city streets with solitary umbrella carriers, sad rows of little black bubbles jostling up and down.

The parasol is the parapluie's little sister. It is a logical extension of the umbrella -- it serves to protect the bearer from the sun (sol) instead of the rain (pluie). Because it disintegrates less in the line of duty it can be made of materials that will communicate personality, social class, mood, and marriage status of a young woman. Thus the parasol, so often paired with the southern belle becomes a portable ceremonial covering.

Both the umbrella and parasol are miniature tent structures; they can be easily erected or collapsed when desired. They are made of flexible materials on portable frames, they are designed to fulfill functional and symbolic needs in ways similar to our non-portable roofs.
THE LITTLE HOUSE

The symbol of the "little house" appears again and again in our culture today. John Summerson in *Heavenly Mansions* writes of the evolution of the Gothic Style as built upon the "little house" concept of shelter, as seen in the baldechino, the canopy over the throne, the ceremonial shelter carried over the bishop in procession.

The architects Moore, Lyndon, Turnbull and Whittaker frequently present a version of the little house in its domestic designing. This form appears as four columns with a sleeping deck on an upper level in the Sea Ranch condominiums in Northern California. The deck here is the only gesture to roof-making, the little house stands free under the roof of the entire building. Charles Moore's house in Orcinda, California contains the little-house idea complete with roof. The house is best known for its sliding wall panels that expose the interior to the beautiful heavily-treed surroundings. The main roof itself becomes a canopied little cover with the walls opened. Seated at the grand piano, one is almost entirely exposed to the exterior site, with a corner of the roof as a cover; a slight reminder of civilization. The rest of the structure itself sports two "little houses": an exposed shower, with four columns and a little roof above, and a slightly larger column-and-roof structure to define a living area.
Bed Canopies

The bed canopy, which you can order easily from Sears Roebuck, parallels the huppa, a wedding canopy (see "Ritual"), in philosophy of ceremony, consumation and fertilization, and is a "little house" in its own right. It is raised from the ground as are the harvest granaries of ancient culture. The canopy-bed we have today is often covered with pink frills or white netting. A hundred years ago it was more frequently the bed of a married couple; longer ago than that Louis XIV among others slept in an elegant and elaborate canopied bed. It is now relegated to the ultra-frilly woman, the boudoir-inhabitant or the eight-year-old girl. This may be a result of modern society's insistence on the enticement of the male by the female, or it may be a carry-over of the glorification of the virgin.

The participants in the Bacchanalia of Roman times focussed their orgiastic activities in and around small booth-like structures (similar, perhaps to the Jewish harvest booths); posts covered with palm leaves. Not content with these temporary and symbolic diminutive shelters, the Bacchanalians actually wore crown-like structures on their heads fashioned of the palm leaves used on their hut-roofs.
Roof-making occurs in children's games as well. Horace mentions huts of leaves and twigs used as a child's game in Roman times. Today we can see children building "protective" overhangs of cushions, and using sheets on a clothesline as tents. We have all probably played in a symbolic house under a table or piano at one age or another.

The little house concept will also appear as symbolic roofs in non-roof places: the mantle over a fireplace, the pediment over a window, the celestial arch in a triptych and the arch of a door or passageway.
The little house shows up architecturally as a miniature roof within an overall scheme: in entryway covers, bay window rooflets, porte-cochères, pergolas and tower tops.

Summerson realized the importance of the primitive structure and the diminutive house ("the aedicule") when he said, "Let us never lose sight of our little hut." 26
RITUAL

The roof (as a primeval shelter) appears early in our lives in the canopies over our bassinettes, and plays an important part in ceremony, religion and even everyday life. We end our lives with the domed mausolea and ceremonial baldechines over our graves.

The gravestone, for example, is a complicated puzzle. The shape brings to mind arches, mausolea domes, rainbows, and tryptich panels. It is a solid piece of stone rather than a framework and void, however, and tending to confuse the origin further. It may represent a doorway, a passage to an afterlife, but it is more likely a simple roof over the head of the deceased.

Another ritual shelter is the symbolic canopy, the huppa, used in Jewish wedding ceremonies. This decorated, garlanded, cloth cover symbolizes passage rites. It may have evolved as a protective shelter used when man was involved in the venerable but vulnerable action of consumating his marriage, or it may be a crown or blessing over the ceremony of fertilization. Another theory is that the huppa was conceived by ghetto dwellers who, with many living under one roof, would contrive a "little house"; a tent, for the newly-married couple to stay within during their first night together. This little house was actually inside the main dwelling. The huppa grew to be a symbol of class, and although today it is often
a simple hung silk cloth, it can still, when more elaborate, represent grandeur.

The gazebo is a ceremonial roof-cover built for modern rituals and celebrations. Although the religious influences are no longer present, the gazebo can be seen as a modern translation of the tabernacle and baldechino. It is the center focus of a group meeting; it is a bandstand; it is the control point of Fourth of July festivities. We think of it along with the pleasurable rituals of summer, promenades, parades, concerts and the like.

The roof has taken its place among our ritual activities as well. An old custom in Europe, the pinning of a wreath to the weathercock symbolizes the completion of a building. Henrik Ibsen's focal character in The Master Builder, Mr. Solness, fell to his death climbing to attach one of these wreaths. It meant to him, a final dismissal of his overwhelming fear of heights, a rejuvenation of his ability to be a master builder and a reawakening of his life.28

A version of this custom exists in the United States, although it, too, is dying out. When a house under construction was finally framed and the roof on, the head of the working crew had the honor of climbing to the ridge and attaching a fresh-cut tree to the peak. When the
tree went up, the roof-raising was symbolically completed and
the owner obligated to provide a feast for the workers.

I remember waiting with excruciating excitement
for the tree to go up on the roof of my parents' half-complete
house. The house had begun on a drawing board in their room
in a rented house. I watched it grow like magic on paper,
and when it was ready to be built, we found that we just
couldn't get a builder; we couldn't afford any of their
prices. So, my father decided we'd build it ourselves.
He subcontracted out much of the heavy building and fram-
ing, and we all worked alongside the masons and carpenters.
I bucketed mud and earried boards and mixed concrete. I
had as many blisters and bruises as anyone, and a few more
black thumbs.

As the roof was being framed the workmen began
grinning and whispering. I finally found out that they
were going to nail a tree up on the ridge when the ply-
wood skin went on. They hadn't done it for years, having
only worked for contractors, and they joked about my
father's not knowing what it would be. I was horrified.
What if no one had told my father that he was supposed
to have a party? I died waiting for him to come home
that night, but he just smiled, and said, yes, in fact,
I've made sure the bathtub will be there by then.
Bathtub? Well, the day the tree went up, the bathtub, sitting unconnected in the living room, had been filled to the brim with ice and cans of beer. And, the food, I'd never seen so much in all my life, laid out on piles of boards and slate. It was quite a party, for although I was only allowed to stay two hours, I could hear it going way into the night from two streets away.

They certainly raised the roof.

This by-gone ritual may date back to early settlement times in America when one's neighbors would come together to raise a house or barn in one day. The men would saw and hammer while the women cooked all day; when the roof was up the celebration would begin. In fact, our phrase, "raising the roof" may not stem from the simple idea of party noise actually lifting the roof from its supports, but may descend from remembrances of the glorious feasting during and after pioneer roof-raising.

Ritual maintains a powerful position in our daily perception of shelter -- a small roof will celebrate the entering of a house, the beginning of a marriage, the passage of life into death. One roof can carry timeless meanings for a multitude of people of various cultures.
The evolution of an individual roof often occurs with changes in living patterns. A simple framework, such as the gabled roof can endure over time because it fits and fulfills many needs. This country (like many others) has developed a strong, simple indigenous roof form in its dwelling-house. It is the simple, peaked, double-pitched roof. It does not include all house developments in the country; there are some forms that do not fit this at all. Yet the gable has almost become a national symbol. It ranges widely in its mutant, local forms, but each shanty, salt box and mansion can carry the vernacular sense in its own variation of the gable. Many of the counter-culture houses (Shelter, Handmade Houses, Survival Scrapbook) pick up this form by going back to pioneer and early settler structures. Even the more sophisticated owner-built houses have not pushed toward a fresh look at the sheltering image. They have imitated past shelters and roofs (barns, log cabins, Victorian pastiches) or built very singular, much-personalized houses. Perhaps future generations of owner-built houses will bring about a stronger roof statement.

The need to maintain a sense of vernacular tradition is a result of the permanency of buildings and their roofs. An overbearing style or singularity will shorten
the symbolic life-span of the roof. Monuments and monumental buildings are an exception to this; roofs with worldwide recognition (the Chapel at Ronchamps, the Sydney Opera House) escape the test of time. This is because they do not come under the scrutiny of every-day house-dwellers; they do not need to accept individual imprinting or to fit generations of changing life patterns. Style may often supercede other demands. Today's quick dissatisfaction with many buildings is tied up in the faddish selection of roof style: many flat roofs, mock mansards and false shed roofs will fade in quality as their lack of a sense of evolution comes to bear.

A change in philosophies of living, life-styles, and everyday habits demands changes in the philosophy concept of the roof. The disintegration of the mansard roof in the 1880's was an example of this. The classically-arranged life patterns that fit so well into a square, symmetrical building were being challenged by a looser rambling, not-so-predictable passage through a day or a year. As the new house plans began to respond to a less organized restricted way of living, the mansard roof became outmoded, not so simply as a symbol of a by-gone style, but because it just wouldn't fit on the houses anymore. The mansard roof did not symbolize shelter anymore; it didn't shelter a new way of life. Today looking back at mansard roofs of the late 1860's and
1870's, we see a gentleness and quaintness as they sit atop the sedate brick and brownstone buildings of that era. The soft concave curve of the slope, the shallow yet delicate hip forming the peak, the fine diagonal patterning of slate or shingles form a very tightly defined cap to fit a tight plan underneath.

Our modern-day mansard seen so frequently perched on units of multi-family housing has gained the ability to haunt us in our sleep. There is an uncomfortable ambivalence present in the wide use of this roof form. The mansards of Rolling Green in Milford, Massachusetts, and other housing projects built within the past five years, are attractive to many because they seem to recall the house of an elegant era, and with it a respectability, a sense of quality. And yet they fail completely to impart these feelings to the buildings they grace today. The integrity of the roof and its sheltered underpinnings or the 19th Century has completely vanished. The non-curved slope is almost vertical, heavily shingled, and usually too long in proportion to the building underneath. The gentle, light, little tri-pel cap is gone; the heavy, steep attached brow is here to stay.

A roof should reflect the people that live under it. It should carry a feeling of history and of change and the imprint of the owner and of past owners. This indivi-
duality, a narrowing of choices and personal statement comes about with a Sense of Symbolic Significance. This symbolic sense of shelter evolves from a personal selection of an overall concept or approach to "sheltering" (the Big Idea). This Big Idea is qualified by the parts and pieces that alter it to fit the individual (the Importance of Parts).
THE SENSE OF SYMBOLIC SIGNIFICANCE

The Big Idea
The Importance of Parts
"The dream house must possess every virtue. However spacious, it must also be a cottage, a dove-cote, a nest, a chrysalis. Intimacy needs the heart of a nest."

Gaston Bachelard, Poetics of Space

How-to-build-it books today are full of ideas. They bubble over with different colors and materials; kitchen counters and skylights and Franklin stoves drip into your lap as you turn the pages. But they're unfortunately of little help in probing deep into oneself, trying to find out what is really wanted below the white plaster. An architect can sit down with a client and go through magazine after magazine, the prospective house-dweller saying, "I like this, and this one . . . no, not this one . . ."
times knowing why, sometimes not knowing. Yet magazine editor, architect and client are often unsophisticated about the conceptual or symbolic significances that make a house live through the years, through style changes, and through generation changes. A house and its parts need a sense of worthwhileness, a feeling that asks gently for care, maintenance, and love. As resources dwindle and housing shortages grow, the individual needs to care for things that become more and more precious. A feeling of identification, not just a mood, a whim, a color choice, a special weathervane, but all of those things can create this bond.

I heard a story from a friend who had moved to a tract housing development when he was in second grade. His return from his first day of school in his new neighborhood was a traumatic one: he located his street but was unable to tell which house was his! To remedy the situation, his father made a huge weathervane and attached it to the roof of the house. It was a direction finder for both the wind and the little boy. The next-door neighbor thought this a wonderful idea, and soon the street had two beautiful weathervanes, both very different. As my friend grew older, the weathervanes grew more numerous, some simple, some gaudy, all statements of identity. Many parts of a house can carry this quality of personalization, of imprinting, but the roof is the largest piece, the top piece,
and its "big idea" should be selected and imprinted with enormous care.

**THE BIG IDEA**

The "big ideas" that follow here are simple groupings of houses and their roofs according to the feelings and responses they evoke. These groups are not categories: they don't divide up all the roofs in the world into neat packages -- they overlap, they get tangled up. I only mention a few groups, and these are restricted to buildings in the U.S. There are undoubtedly five or ten times as many feelings and concepts that roofs can be grouped into; they will vary with the individual who does the looking.

**The Sheltering Roof**

The sheltering roof is a sweeping cover. It tucks down at the edges so winds and snow are less likely to seep up inside. It has a strong, simple line, a clean silhouette, and is a response to the harsher climates of our country. It is a plains house, with its back up against the wind. It is a New England farmhouse with kitchen shed forming a lop-sided sweep, shaped like a drift around a snow fence. It is a strong, handsome shape that people build when the weather is hard and the land unfriendly. It makes few compromises: it juts out from the land in a man-made shape but it makes a house that becomes part of the landscape over the years.
A sheltering roof should be visible from the interior of the house. Hundred-year-old versions of the sheltering roof have eaves and overhangs that you can see from the windows or enclosed porches. The New England version will probably have its eaves clipped back to stunt icicle growth, but the sweeps of this roof can be viewed from a dormer cut in or popped out of the structure. The prairie house has eaves skimming close to the ground, often no dormers above its one-floor scheme. The best of the sheltering roofs have a strong texture to the roofing material: heavy, thick shingles, slate, clay tiles or even thatch.

This is a roof that you can see from far away, and with its chimney smoke it completes our sense of returning home to warmth and shelter.
The Rambling Roof

The rambling roof is a collection of parts put together. It covers a complex, often linear plan, and the roof reflects changes of space in its line and shape. It is more complex in silhouette than the sheltering roof; it begins to indicate more complex philosophical expression. It has a romantic image that comes from a loose, relaxed approach to life, a willingness to respond to local decision and demand. This roof will break into components over spaces: a rounded roof over an attached sun-room, an entire gabled addition, or an entry or porte-cochere cover of competitive proportion to the rest of the structure.
These parts give the rambling roof the ability to see itself. It differs from the sheltering roof in that the former allows observation of its singleness, its sweep, while the rambling roof creates spaces from which to view other specially-designed parts of the roof. There is an exciting dual quality of a person's experiencing a space on one hand and sensing the image it has to others at the same time. This comes from being able to see the rest of the roof through a "frame" of roof: from under or through the structure of joists, rafters, eaves, slope or roofing material. The romantic notion may also stem from the ability to peek at outside from a small place, a place formed by the shaping of the roof. This brings to mind the notion of the den of briars or small hut that sheltered a tiny place from wild exteriors.

The rambling roof will acknowledge action within. It rambles, it turns, splits, moves up and down in response to activities and needs inside. It is an organic roof and has the personifying quality of seeming to breathe, undulate, pulse with the life and activity underneath.

A Canopy

A canopy will sweep over what it needs to cover, and will often "marry" the outside to the inside. It is a creator of ambiguity; it is not intended as a statement.
of fear of the elements, it is a relaxed, loose shelter, changing the environment and welcoming it as the same time.

The word **canopy** (according to the *Oxford English Dictionary*), probably stems from the 15th century French *canape*, meaning "a canopie, tent or pavillion". It also was used for a bed with a net. Today it architecturally describes "a roof-like ornamented projection, surmounting a niche, door, window, tomb, etc." It is used to mean an overhanging shade or shelter, and is often applied poetically to the sky ("the overhanging firmament") and the heavens. Canopies are also often seen in forested symbolism: "Beautiful walks . . . shaded with the green canopy of every pleasant . . . tree."^2^9

The ambiguity of inside to outside is important to structures that depend heavily on man's relating to Nature in the general sense and the immediate green and brown surroundings in the more specific sense. The use of the word to describe the shelter given by trees adds to the symbolic tie to nature in architectural canopies.

The canopy quickly brings to mind the soft, pliable materials of its ancestor, the tent, yet as referred to here as a roof grouping, it can also be built in hard, permanent materials.

The trellis, a crystalized form of a flexible sun
canopy was adopted in our warm, bright climate as a substantial building element. The name pergola was used for the developed trellis, built with stone columns or wood posts and covered with leafy vines. The pergola as built by the Southwestern Architects (Maybeck, Greene and Greene, and Gill) was closely tied to the house, as in Bernard Maybeck's Bingham House (Montecito, 1917). The living room opened through a large glass door to a pergola, here a covered arbor.

Frank Lloyd Wright continued in the canopy tradition, finding that the entire country, in the 'twenties and 'thirties, had become more interested in the combination of indoor and outdoor living. "Falling Water", for example, in Bear Run, Pa., had enormous slabs that still acted as canopies with their strong horizontal directions. The author of The Early Work of Frank Lloyd Wright, says:
"Next, perhaps, came the challenge of roofs. As a rule, Wright's roofs were pitched more gently than those admired in northern Europe; still, the enfolded cover, which Ruskin had called architecture's glorified end, was handled with consummate skill.

Wright also nationalized the porte-cochère, drawing on the pergola image and formalized it to shelter the automobile. This fancy car-umbrella for the wealthier classes later showed up across the country as the car-port, a roof attached immediately to the side of the house or built free-standing on columns and/or parallel walls. The latter was connected to the house by the breezeway, the middle-class pergola, a simple roof on posts, a man-made arborway occasionally enclosed with glass.

The rich development of the canopy roof shows up today mostly in the Southwest, where the hot, baking sun demands houses to have low extended eaves for sheltering. The canopied roof can be seen in the Northwest as a protector from heavy winter rains. As a symbol, however, it hasn't gained much momentum beyond the carport nationally. Where exterior porches are created by extensions of a main roof, the blending of space is not promoted by the architecture. The roofs are used to gather in outdoor space, and the house begins to possess this space. Columns are often placed di-

of roofs. As a rule, Wright's roofs were pitched more gently than those admired in
rectly under the corner of the roof, and within several years the porch has grown out to its limits.

The ultimate future of the canopy may be in a return to its original materials: soft, pliable fabrics and meshes. It may be a furled cabana, easily stretched out from a house for a summer party; it may be a more frequent use of an open-air tent on both small and large scales. As energy resources increase in scarcity, and buildings become less mechanically climate-controlled, people will start opening their buildings again, moving outdoors and enjoying less finely regulated temperatures and humidities. Non-air-conditioned blistering summers may bring a need for the sun and rain shelter with sides opened for cooling breezes -- the canopy.

The Flat Roof

The flat roof is a clean, smooth roof in two versions: the non-roof and the usable roof.

The non-roof is a relatively modern phenomena; an outgrowth of dense living, it appeared first in cities as the 1890 triple-decker. Economy dictated the full use of the third level as an apartment, and the innovations of impermeable membrane roofing did away with the peaked roof. Many of these first flat buildings have cornices or other projections that cap or finish off the structure; but the progression toward the non-existent roof had begun. Soon
buildings, both residential (in urban areas) and industrial, had walls that simply stopped. The roof was invisible from the ground, and could then carry mechanical equipment unseen.

The contemporary use of non-roof was brought with the International Style from Europe, a product of our booming technology and building skyscrapers. This roof gained architectural recognition in the 1920's and 1930's. In the following decades, the flat-roof craze swept the United States. It caught on early in the Southwest, where rains and snows did not exist in volume great enough to demand pitches. The Mission Style had been popular for many years, and many Southwestern Indians built flat-topped adobe houses. Although the adobe-dwellers used their roofs for food and grass-drying, this need did not carry over in suburban housing when the flat roof became popular.

The flat roof has not proved to be the ultimate solution as was once thought (the impermeable membrane
eventually cracks and leaks). People tend to reject the flat roof in many parts of the country and yet architects persist in designing flat-topped structures.

These buildings look clipped and shorn of their sheltering significance. They have lost their aura of care, and love, and the time and effort it takes to make a house. The overall concept is a non-roof, a non-approach to covering humans.

The other is a garden, a look-out, a stage. You can climb up through your house and closer to the sky and space. You can haul up your telescope, your lawnchair, or spring cleaning for stars, sun or air. Mediterranean hilltowns and island towns are built so the roofs are a landscape in themselves; private outdoor spaces range on top of the houses rather than beside them.

The advantages of roof gardens and roof terraces are realized to their utmost level in crowded living situations -- when ground use is constrained. African and Mediterranean cultures use their roofs for sun-drying of produce. Fruits, grains, tobacco, coffee and other beans use natural energy for curing in beautiful patches along these roofs.

The extended balcony or walkway is a miniature version of the flat roof; it functions as an upside-down
canopy. Using the top of a roof does not give one a feeling of shelter; in fact, it turns the womb inside out and a person perched up on a roof or out on a balcony high above the ground can feel a sweep of freedom, a giddy liberation from earth-bound problems.

The Utilitarian Roof

The utilitarian roof is a modern, sensible, sturdy roof. It carries a strong image of function. It appears on our tract homes, with asphalt shingles, and simple galvanized gutters and downspouts. It is the corrugated galvanized iron on our barns and old garages. It is also a tin-sheet roof, steeply sloped and rusting. It has a stark outline, broken perhaps by a simple chimney shape. The house that it shelters is not a complex one, the roof with no frills covers a house with few surprises. The house has a plan that will fit snugly inside a rectangle.

The utilitarian roof is like a pair of sensible walking shoes: physically comfortable, easy to maintain, long-wearing and sometimes ugly. And yet to get up in the morning and choose your heavy walking shoes to wear will
strongly direct your day. Your feet will feel good in them: it's a close, but not too tight fit, and you know exactly how they will perform. The utilitarian roof is cheap and quick to build. It does not begin with historical symbolism or cultural impact, but it has a sense of shelter all its own. The tenant farmhouse covered in tin or corrugated iron has a sound in the rain that is un reproduceable anywhere else. The noise from that cheap, functional cover is something special to anyone who has spent a storm under a tin roof, a feeling that will last a lifetime. A countryside of metal-roofed shacks brings an image of people that work hard for their lives, people that work long hours in their fields and kitchens, people that sleep close to the sound of rain.

The Prim & Precise Roof

The prim roof is a wrapped-tight roof, almost spherical in its shape. It is easy to take care of, neat and precise. It is introverted and self-regarding. It shelters a trim little house that shelters people who serve tea in two different china pots, a heavy one for the winter months, a light flowered one for summer months.

It is a roof that tucks down around the edges, like my grandmother's. She's a person who vacuums the upstairs and changes the bed linens on Monday, vacuums the downstairs and scrubs the kitchen floor on Tuesdays.
She does a little bit of shopping every day and always saves a few hours in the afternoon to make a "treat" in case some of her family should stop by. And someone usually does. She paints the wood on the front porch and all the window trim every two years. The roof on her house is simply peaked, with one ridge beam, running parallel to the heavily treed street she lives on. The slopes run down almost to the ceiling line of the first story, and the second and third stories are tucked up inside the roof. The attic room has small openings in each gable end, but no dormers. The middle level, with bedrooms and bath, poke their windows out on the front and back ends, through the roof.

The prim roof is difficult to break out of. For me, it represented the regularity of my grandmother's life and schedule. The roof also collected and sheltered the front porch, a mother hen gathering her chicks, tucking her wings in underneath. The house had been built in the early 1940's. My grandparents suffered a great deal during the Depression, and perhaps their small house with its wrapped-tight roof gave them the symbols of security and self-sufficiency within a small manageable framework.

The roof clearly defines the limit of this house. The porch, although open air, is so tucked in that it is
definitely part of the house. There is little ambiguity in this roof -- in the question of what is shelter and what is not.

The Picturesque Roof

The picturesque roof has a dual quality of viewing and being viewed. The roof structure, surface or detailing has a large emphasis in relation to the rest of the building. The picturesque quality relates to the cottage-style house, a bungalow, a vacation house. It has a feeling of delight or humor that may be below the surface. Picturesque roofs, sometimes with very simple shapes and an exuberant amount of detailing from wood cornice boards to elaborate weathervanes. The humor, delight or fancy in a picturesque roof may come from the way very simple frameworks are elaborated upon.

The penetration and look-outs built into a roof promote an image of a personified house -- an ambiguous notion of a person tucked away in the roof peeking out, or the house itself watching, seeing. At the same time, the decoration and ornamentation on a simple framework show it off. Patterning in roofing tiles, elaborate chimneys, wood-detailed roof walkways all add to viewability. Intertwined is the personification of the house, the roof acting as the hat.
The thatched cottage, a small stone structure with heavy straw roof, carries the delightful quality of the picturesque in the strength and singularity of its concept not only in its material, but also in the way this material is put together, a powerful silhouette and strong, flowing lines. Within this strong overall structure, the personifying effects of the hat-like proportion of roof to building and penetrations peeking through the straw, "eyebrow"-fashion, and the windows and doors peering out from beneath the overhangs give the thatch a certain uniqueness of form and fancy. This uniqueness is the heart of the roof's sense of the picturesque.
The All-American Roof

The advances of technology and deterioration of a need for tradition have generated an entirely new roof-image in the United States -- the All-American roof. Many roofs that developed in the past show up in the pure symbolic copying in modern times, as in the mock-widow's walk and fake hipped roof on the A & P Super Market, or the monitor on top of the Howard Johnson Restaurants.

The All-American roof on the Pennsylvania Turnpike or USA Route 1 is a landmark; it symbolizes safety and security within a hostile landscape (the asphalt forest). We all notice it, look for it, measure our driving trips by its frequency of passing. We know that this symbol of America means a hamburger and a coke. Although there are self-appointed connoisseurs of the hamburger that would surely disagree, most of us would concur that it tastes pretty much the same under every All-American roof, whether Savarin's, the White Tower, Ho Jo's, or McDonald's. The roof lends a quality of sameness to the hamburger, a very important attribute to families traveling with children with rigid tastes.

This form, however, is not limited to restaurants and gas stations but ranges widely to collect banks, car washes and shopping centers under its roof. It may have
begun as a trim little roof over a general store. As the center of town grew up, the owner may have added a bit of decoration, a weathervane and piece of molding here and there. As a new gas station or store appeared, the competition grew and the desire for landmark qualities made the roof a focus for attention. It gained importance as motor vehicle transportation became predominant. A large, loud statement needed to be made to deal with the speed of the approaching potential customer.

The All-American roof presents a certain sense of humor to the viewer. This is often due to the juxtaposition of incongruous elements: Polynesian thatched roofs perched on the edges of busy highways, miniaturized gambrel roofs for ice cream bars, or white steepled English church roofs for Gulf gasoline stations.

The All-American roof somehow escapes all questions of style. They blatantly borrow from one era and another, mutating these historical forms via juxtaposition, extraordinary color or scale. The All-American roof carries with it a sense of the absurd.

But within this sense of absurdity, this roof is a symbol of the Ugly American. It voices our supposedly stillborn sense of good taste. And yet the All-American roof freely uses ideas and concepts from many cultural heritages, a conglomeration that talks about all of us.
THE IMPORTANCE OF PARTS

The small and immediate parts of the roof are often what qualify and support the overall concept. These parts range from the dormers and skylights (mentioned under "Sense of Function") to roofing material, patterning, structure emphasis and ornamentation.

Some of the small parts are actually complete roof statements in their own right. The cupola, for example, is a tiny roof on a miniature house. It perches often atop another roof; it is actually a roof within a roof. It is symbolically a penetration or breakthrough of the over-all structure and yet it reinforces the roof-making concept on a small scale at the same time. The dormer, too can be a complete space with roof in itself.

These small parts do not simply give the individually-designed house a richer expression. An entire village or region may have a strong house and roof framework that creates a cultural tradition. The choice of parts that fit into that framework -- whether space-making devices, climate-control, functional pieces or ornamentation -- is also established to some degree by regional influences. In fact, the richest variation and ornamentation will occur within the strictest design constraints or the tightest framework -- because the individual's imprint becomes more notable and obvious. The Methodist Church camp in Oak Bluffs on Mar-
that's Vineyard (see page 24), as it exists today, shows a very strict overall concept (simple gable, ridge perpendicular to the street), with decoration and ornamentation restricted to the cornice boards on the gabled end. The unity of the village is expressed by the similarity of houses, roofs and decoration positions. But within this framework, each house owner has the cornice board cut into an original intricate pattern, duplicated on no other house in the village. Choice of color was individually exercised as well, and even today these houses have their ornamentation brilliantly painted in any choice of color desired.

The importance of ornamentation has been understood by women for centuries. On houses as well, ornamentation is a result of personality statement and self-presentation. Choices range from the subdued and sedate to the loud and audacious. Rooftop Christmas decorations are a good example. People, less inhibited because of the briefness of the season, crown and edge their roofs with blinking colorful lights in many styles and fashions. The town of Downey, California every year celebrates Christmas with a competition of lights and decorations. The temporary ornamentation has become more and more outlandish over the years and is hardly limited to the roof. But the roofs do well in collecting a variety
of expression: they sport elaborate lighting effects, blinking written messages, nativity scenes and, on one roof, a life-sized Santa complete with sleigh, packages and eight (plus Rudolph) full-scale reindeer.

Ornamentation need not be quite so extensive to have meaning. A molded cornice board or a simple wrought-iron weathervane can speak just as strongly of personal preference and expression. The roof and its detailing on a roof can be a house's bow-tie. It is the presentation of the house-dweller to the public.

Roofing materials are another small part to manipulate within the overall concept. These materials should be selected with time and care, because the variations are many and the final choice is significant.

Choices of roofing material will give a strong visual statement of line. This choice relates to and defines the overall concept and affects the feeling of the roof -- serenity, calmness, business, and life. A roofing material can create a graphic affect -- vertical or horizontal lines, patterning that cause a calm or busy feeling.

In 1919, H.V. Walsh wrote "Selecting the Right Roofing Materials", an article in The American Architect and Builder magazine. He presented the formal criteria for roofing material selection such in the Beaux Arts
methods. Although today a Beaux Arts approach to architecture seems stiff, overly formal and sociologically superficial, much of what Walsh had to say is still meaningful. He first discussed functional demands of slope on roofing material, and gave us the "Architect’s Roof Protractor". 31

Walsh classifies roofing material into the scale (or shingle) type, which is a "fish" covering. The former includes wood shingles, slate, clay tile, and asbestos, metal cement and ready-roofing shingles. The latter group is made up of seamed roofs, both flat or standing seams (tin, copper, lead) and lapped seams (built-up roofing, canvas duck, and corrugated materials). The seamed roofs make strong vertical lines. In between are the mixed lines -- made with corrugated materials, Spanish tiles, or shingles with strong patterns.
Color and texture are the other half of the artistic effect of roofing material, according to Walsh. Smooth-textured, monotonous surfaces are appropriate for classical or monumental buildings, while the rough, mottled-colored roofs are good for semi-public and residential work. This division shows the importance of the symbolic feel of the material -- Walsh goes on to say that an asbestos shingle that is "smooth, plain", and a "red color is very ugly when placed on a country house... its slickness is irritating". But it is possible to use asbestos shingling on buildings with a trimness of finish.

While we no longer have such a strict separation of classical or monumental buildings and residential buildings, we should appreciate the gesture of trying to recognize the different effects that material choices will cause. The following pages are samples and illustrations of roof lines, textures and colors. Roofs are an excellent medium for patterning and texture, and can give rare feelings of depth, richness and care.
OVERVIEW
"All that makes the woods, the rivers or the air
Has its place between these walls which believe
they close a room
Make haste, ye gentlemen who ride across the seas
I've but one roof from heaven, there'll be room
for you."

Jules Supervielle, Les Amis Inconnus, quoted by
Gaston Bachelard in Poetics of Space, p. 66.

People say a lot about themselves with architecture -- it's their shelter, their home, their comfort.
We can look at a person's house or living space and find a personality, life oozing out through the clapboards or bricks. People choose Greek revivals and Victorian mansions and on the surface they're conscious of style, how much they can afford, and what the neighbors think of their choice. Deep down, though, our feelings about things gone by in our lives and things for which we yearn also seep through and express themselves in the places in which we live.
Man has built his roofs for years with attention to local materials, the elements and inherited construction methods. He has also been tied to social and cultural influences, political pressures, and personal and psychological imagery. Technology and symbolism have gone hand in hand. All of the factors in balance make a shelter, a place of refuge, a home. When one of these factors, however, begins to overpower the others, the balance is destroyed and we are left with only an uncomfortable and unsatisfying feeling of a building without meaning.

It happens when technology runs rampant -- when the thin, lightweight asphalt shingle provides a cheap, quick roof over one's head -- and the meaning of a house's shedding water becomes less important. A person climbs a ladder and in a few hours has covered the house with rolls of asphalt shingles. Years ago the thatcher would come to put on a roof and the days of painstaking care would show for the life of the building in the huge, heavy shape of the thatching. The roof of the building symbolizes shelter.

The roof began as a physical shelter. It kept out the sun, rain, and winds. Over the years, it began to symbolize protection. Now we have an incredible variety of ways of saying "shelter" with roofs. Some roofs don't say
it at all, some say it too loudly, but some manage to both act as shelters and tell us all the things they stand for.

The satisfaction with what you end up with has to do with a healthy balance of all the elements of the roof. The elements form a set of characteristics that must be fulfilled to create the successful roof.

THE SENSE OF FUNCTION

The functional aspect of a roof is affected by the user's needs, climate, structural know-how, and availability of materials. A roof should respond in many ways to these stimuli: in its shape and silhouette, the materials used, the slope or pitch and the smaller parts that are added on.

The functional response is clear in a simple, stark, steeply-pitched roof, closely shingled in wood, with clipped eaves and perhaps one or two dormers. The simplicity of the shape and the starkness of the silhouette of the roof jutting from the sky and penetrating the ground are the results of long, hard, winters, and an owner's needs. It is a shelter to cover a hard-working person with little time for pleasures and frivolities. Shape and silhouette can reaffirm both the climatic response and the user's basic needs.
The availability and local uses of materials give hints for choices in roof-making. The fuzzy warmth of thatch vs. the cook starkness of copper roofing present different functional and symbolic concerns. Materials must be selected carefully, for their time-honored functional capabilities carry a strong symbolic notion that a designer can use to one's advantage.

Roof pitch is one of the strongest functional images. The slope of a roof is a key to the use of that roof -- a flat roof appears in sunny climates where roof gardens are a delight and a steeply pitched roof can be seen in intemperate regions where no one would venture out onto the roof. And yet, even the mobile home industry, that could produce functional aluminum curved-topped roofs the most cheaply, responds to the "sense of function" with a minimal (one-in-twelve) pitch of corrugated metal.

The functional bits and pieces that are added on to a roof allow generalized regional or cultural forms to vary locally. Penetrations (skylights, eyelids, dormers) through the skin of the roof are functional. Projections such as eaves and smaller roof pieces work as transitional zones. Detailing of both the roof and the added part reinforce the functional sense. A chain hanging from an eave is a beautifully simple response to water falling from
the roof. The water runs down the chain to the ground; there is no splash or erosion at the ground.

A roof should perform well, and there should be a "sense of function" or the overall feeling that the roof works and is responding to its performance criteria: that of sheltering its inhabitants.

THE SENSE OF EVOLUTION

A roof needs to show its evolution: its heritage, history and culture. Its tale need not be blaring or blatant; it can be subtle and easy-to-miss and devilish. The story the roof tells of past generations of design, or past lives of the people that made it, can be an epic, one that takes a long time to tell. It should reflect the present-day people that live there, and you should come to know a roof and its story as you come to know its people: gradually, like a good friendship.

The successful dwelling-house will give hints of primitive roof-huts, a tie to our very first ancestors, and a tie to our childhood dreams and game-playing. The roof appears in pure ritual form today -- as ceremonial canopies and renewal artifacts; it shows up, too, as a transformed and decorated "shelter" -- in hats and parasols.
The roof on your house should carry many of these meanings. It should be full of subleties beyond its initial and more obvious statements -- it should remind you of times past and places been. It should also have a glimpse of the future, a hint of where its builders and inhabitants want to go ... 

A SENSE OF SYMBOLIC SIGNIFICANCE

A sense of symbolic significance is made up of the overall concept (the Big Idea) and an attitude toward the bits and pieces of which it is made (the Importance of Parts).

Your roof is your family billboard: it can be freshly painted or weathered for years. The use of a house and the living patterns can sparkle within the framework of a covering roof. The roof on your house can tell a lot about your way of life; choices you've made along the way, children you've had, loves you've lost. My family's Californian roof in Connecticut shows a direct relationship between what they felt and what they built.

The roof, as the dominant feature of the dwelling-house, needs an overall, unified concept to function as a symbol of the living underneath. That concept can range from the sweeping canopy or the umbrella-enclosure to the pastiche of put-together parts. The concepts are endless,
and they should be -- because people's attitudes and desires and dreams are endless.

After an overall concept is established, bits and pieces have to be fit together to make the roof work. It's the development of these parts that completes the story about the people that make and use the roof. There must be reasons behind these local decisions, a non-arbitrariness that results from hard thinking or hard dreaming. Dormers and decorations need to be qualified -- a deviation from or reinforcement of the big idea.
THE ABILITY TO DELIGHT
THE ABILITY TO DELIGHT

"I linger on the flathouse roof,
the moonlight is divine.
But my heart is all aflutter
like the washing on the line."
    Nathalia Crane, The Flathouse Roof

Roofs are hats in a sense, and perhaps that attitude or flair with which we select a hat can be seen in the ways we select a roof. Hats, too, can be lived under and peeked out from. They can float, wide and swooping upon our heads, a free fling of openness to the world. They can sit, prim and proper, bowler-style, with a sense of preciseness and preciousness, atop our lives. A hat can be a plain black felt brimmed structure, carrying a bright orange flower (my favorite hat) that makes one feel an élan, a giddyness and a verve for walking, skipping along a street. Or it can be a knit cloche, a hat that covers the head snugly, wisps of hair sticking out at
the last moment to soften the severity (my mother's favorite). Sometimes I wish that roofs were as immediately changeable as hats, that a person could wake up in the morning and put on a new roof, one that carried the mood of the day. At the same time, though, I'm glad to come home at night to something that doesn't change so fast; I'm glad to sleep at night under a roof that seems permanent, solid -- it works, it has a feeling of history and heritage, it is special to me.

Yet a roof, complete with the senses of function, evolution and symbolic significance, can carry a quality that pushes it even deeper down into our hearts and psyches. It can make us laugh and giggle; it can make us quiet and pensive. It is a roof on a fabricated castle in Disneyland, a real one in Zurich. It is a roof that someone has built with time and care, beautiful time-worn patterns in simple asphalt shingles. It has the ability to delight.

A personality can show itself on the roof. It can symbolize an open, blatant gesture but the detailing can suggest a counterpoint -- a surprise, a vocabulary that gives life. Its very existence should tickle your fancy; it should make you smile with the knowledge of someone that cares about it.
A roof needs that hint of the fantastic, something that can range from the super-serious to the supernatural. We personify houses when we see the windows as eyes and doors as mouths, the hearth as heart. The roof is the cap, the hat. The image of a house can be a self-image. Carl Jung is quoted by Clare Cooper in *House as the Symbol of Self* to say that he:

"... built his house over time as a representation in stone of his own evolving and maturing psyche; it was the place, he said, where 'I am in the midst of my true life, I am most deeply myself.' He describes how

'From the beginning I felt the Tower as in some way a place of maturation -- a maternal womb or a maternal figure in which I could become what I was, what I am and will be. It gave me a feeling as if I were being re-born in stone. It is thus a concretisation of the individuation process ... During the building work, of course, I never considered these matters ... Only afterwards did I see how all the parts fitted together and that a meaningful form had resulted: a symbol of psychic wholeness.' "

We can pick up details and ornamentation, and even larger elements: concept and silhouette, and displace them to new uses, given hints of dreams. We project ourselves, our hopes and fears into the places we live in. Moore,
Lyndon and Allen, in *The Place of Houses*, call the requirement of this in building philosophy "The Order of Dreams":

"In the absence of dreams all choices are reduced to pseudochoices, no significant choices at all. Without dreams, the other two forces which delimit choice (what we can afford and what is available) are not, as they should be, challenges that spark the imagination. They are simply the dreary limits which shape our world." 34

In *Poetics of Space*, Gaston Bachelard tells us:

"Through dreams, the various dwelling-places in our lives co-penetrate and retain the treasures of former days . . . If I were asked to name the chief benefit of the house, I would say: the house shelters day-dreaming, the house protects the dreamer, the house allows one to dream." 35

**Experiment**

Several months ago, I invited fellow architecture students, faculty members and passersby to a two-hour drawing session. Four sheets of 30" x 40" Bainbridge board was tacked to the wall, and people were asked to draw roofs they had "seen, loved, hated, ones they remembered . . ."

I was delighted with the fanciful results, and yet surprised to see so many sketches of roofs without buildings or supports underneath. This may be a result of the request for "roofs", but it may also indicate that people
"BENEATH HIS LOW ILLUSTRIOUS R
PEACE & HAPPY WISDOMS SOOTH'D"
BOARD 4

[Sketches and text in various languages and styles, including:

- "Lama there are the rooms in Khartoum on which the city lives."
- "And on the other hand, my old circus tent, that is about the nearest womb I've ever lived in the world."
- "Proofs to war, drugs, poetry, farewell, waves."
(architects at least) think of a roof as separable from the rest of the building. Most drawings had something very special to say whether they spoke of history, fantasy, childhood memories or monumentalism. My favorite drawing, however, was not a single floating roof, but a collection of a farmhouse, barn and out-buildings drawn by my friend Kevin. When he was finished sketching, he said somewhat sheepishly, "Well, this probably isn't what you wanted, but it's what I thought of when you asked for roofs."

The strong, simple Northeastern roofs were permanently attached to their buildings, and the buildings to the ground. Looking at the stark simplicity of what he'd drawn, and yet responding to its sense of warmth and shelter, I knew that I was no longer such a stranger here. I've learned, like the roofs, to respond to this land. New England and its roofs have crept into my dreams and have found a place in my future.
EPILOGUE

This thesis is really only the first of three important parts of the slice of architecture I had wanted to take. It is a little bit of research, a collection of ideas and thoughts. It's mostly background and hypothesis. The next part is looking and collecting. A lot of traveling and soaking up of what's around. This second section should be drawings and photographs of what I've seen, stories that people tell about their roofs and houses, stories that roofs tell about their people. The third part is the architect's part and that lasts a lifetime. It's the mark you make with what you do, not necessarily a heavy, overwhelming mark, but perhaps a gentle imprint. It's an imprint that you can leave after thinking about something, and looking and searching, when you finally design a building for people to use and love. It's the second and third building, or the fiftieth that's the end to this work.
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