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Supper is ready and in comes the family,
with appetites and anecdotes and actions of the day.
Sunset glows on faces both smiling and serious.
The cat sniffs through the kitchen.
The dog cherishes a bone.
Peace curls in the laughter,
joy sprouts from the children,
and the grownups know deeply
that they have come home.
The scene disappears, is replaced by another.
Still it sweetens the air; it will be there to breathe.
When the family has troubles,
all the times of together
surround them, uphold them, enfold them with love.
A family is written
in its moments of sharing,
each person the hero, and peace is his quest.
Each learns that the winning comes only through joining,
and the dragon's mistake was in living alone.

The Family Song — excerpt
— Jean Burnham

I have recently completed an exhibition consisting of a series of studies of small solar houses. These studies were stimulated by comments made during a panel discussion on the future of solar energy. One participant asserted that solar energy had no future because he had never seen a beautiful solar house. Now it would be easy to dismiss such a remark as ludicrous or even ignorant. Yet it stayed with me, for I sensed a kernel of truth in it.

Putting aside taste, many first generation solar houses are lacking in qualities which speak to the nature of House. Some are additionally, simply crude, awkward or ugly. In some cases these failings are a result of the designer's lack of skill or knowledge. But more often, it seems to me, they result from the designer's willingness to let the solar space conditioning response dictate most of the building's qualities. In short, they are single issue, single concept buildings. Certainly plans are made which support the normal range of home place activities, but this in addition to the solar space conditioning concern seems to provide the entire conceptual basis for many of these buildings.

Before I incur the wrath of a host of solar power advocates, I hasten to add that much standard residential design seems to proceed from an equally narrow if not the same conceptual basis. Clearly many houses destined for the anonymous marketplace are motivated principally by economic thinking — what that nonexistent "normal" patron will buy — just as the preponderance of solar houses are motivated by the desire to make the solar systems work. Thus many standard single family houses, born of market economics, are also single issue responses.

Distressingly, many high style houses also possess very narrow conceptual bases. Many of the award winning published designs seem to exist solely to speak to a single abstract intellectual convention possessed by the architect but unlikely to be understood by a great many of the uninitiated. Other reasonable concerns are arbitrarily eliminated from such designs. The selected formalism may indeed be well articulated, but is it any "better" to address this formalism than to deal to the marketplace?

Each approach is a symptom of our fractured and specialized way of life. Neither makes the tiniest gesture to a wholistic view by attempting to proceed from a fairly general conceptual basis. Specialization has its virtues. It is without doubt valuable to make a better brick, but if we are in reality trying to make a suitable homeplace, making better bricks results only in houses which are both superficial and unendearing.

I believe the principal stumbling block to making beautiful and rewarding homeplaces is our failure to insist that the concepts we proceed from address and reflect many dimensions of their circumstances and our being. We typically try to accommodate what we must and express a narrow message. We try very hard to find this narrow message because we believe it will make our building "unique" and by extension, ourselves special. Yet the uniqueness achieved is shallow and does not wear well. It seems far better to start with a broad conceptual basis which will, when skillfully worked, provide many messages and meaningful qualities to many people through time.

What I have attempted to do in the series of solar house studies is to integrate responses to the concepts so that no element of the building reveals its origins. Many solar buildings scream their solar power origins through roof shapes which can have no other genesis. How much more satisfying a design is when the roof angle grows out of a number of concerns and when, in fact, it works well for each of many concerns.

The conceptual basis of my first solar house studies consists of the following points: sympathetic energy response, small houses, small sites, clear spatial order, articulated edges and faces, and connections. I don't suggest that this is the only appropriate basis for all small houses. I am not including in this list the necessity of making a reasonable response to bodily life support and daily activities; this is taken for granted.

Opposite
Red and Blue, view of entry

Sympathetic Energy Response

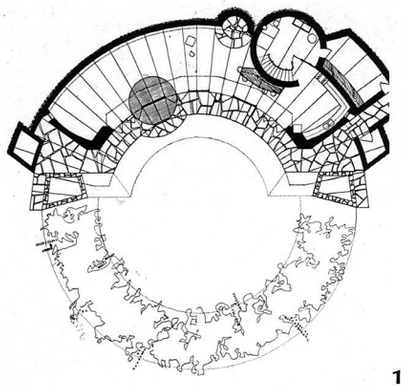
Appropriate energy response to architecture is an imperative of our time. Every house should employ the basic climatic design principles in its orientation and shaping. Every house should possess appropriate conservative construction. Many houses should derive a substantial portion of their space conditioning energy from passive solar systems. In some circumstances some houses may employ active solar systems. The real challenge of energy and the house is not technical performance; it is the placing of energy on an equal footing with other ideas for the qualities of the place so that we may realize an integrated, whole living place rather than a machine for collecting energy.

Frank Lloyd Wright's second Jacobs house, constructed in Middleton, Wisconsin in 1943, responds well to this challenge.[1] It is the integration of concepts for energy, spatial organization and connection to the natural place which makes this building a gracious and meaningful living place. The massing, orientation and window placement on this structure are ideal for passive solar response. The north wall, which is largely closed, as it should be, is bermed to help integrate the building and the gently rolling land. It faces the public approach, thus marking the boundary between public and private domains. The entry is the only significant opening in this wall. The south face is open not just to admit desired solar gain, but also to connect the major spatial focus of this house to an outdoor room in the form of a circle. In fact, the sense of this place is of an inside private world and outside public world perfectly expressed in the form of the prime cosmic symbol carefully folded into the landscape. The house, the berm and the planting make up the boundary between the worlds. The energy response is nearly perfect, yet no one would call this a solar house. It is much more.

Small Houses

Small houses are in our future. The trend toward smaller household size, changing lifestyles and dwindling resources all ensure it. The making of a small house is distinctly different than making large ones. All the means for creating the qualities of a small place are spare. They must be spent with care to gain maximum advantage. Small houses do not permit extravagant form essays, while they do lend themselves to simple traditional forms. They make necessary the concentration of spatial impact in limited places, careful metering of inside/outside relationships, and best use of spatial and form detail.

For models one might look to Wright again; he did many small houses, especially during his Usonian era. The single-mindedness of the open space plans in many of Wright's smallest houses is their principal liability. They may feel spacious, but they lack spatial richness and psychological distance. For me the modern master of the small house is Bernard Maybeck. His Orin Kip McMurray house of 1924 demonstrates his strength in this area.[2] This house is a simple modified L plan with a low pitched gable roof. It is placed on the land in a way which exaggerates its size. Restrained variation in edge form, openings and landscaping make it seem very rich and complex. A sense of spaciousness is achieved by concentrating a large percentage of the building floor area in the living/dining room. This room is developed as an expansive space with a rich edge including a full height bay, an inglenook, a balcony and a large window, each on a different edge. This is a space which might belong to a much larger house, and it gains its sense both from this association and from its tangible properties. Distance is realized by using level changes to exaggerate the sense of separation from this great room to the sleeping rooms and by developing a different sense of outdoor orientation for each bedroom, thus fostering the feeling of many places in one small place.



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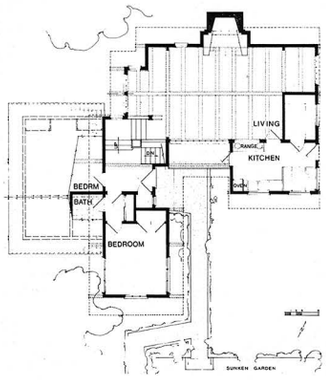

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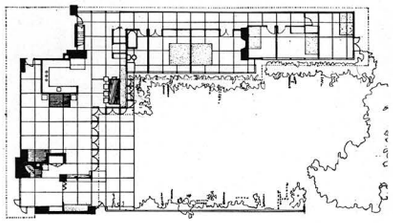

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1 Second Jacobs house, Frank Lloyd Wright, lower floor plan.
2 Orin Kip McMurray house, Bernard Maybeck, lower floor plan.
3 Lusk house, Frank Lloyd Wright, lower floor plan.

Small Sites

Making more effective use of the land we claim for residential purposes may also be a necessity of our future. The waste implicit in current suburban land use patterns is appalling. A typical suburban street is a desert of lawn with houses floating in it, unreleated to specific place. This pattern generally replaces a balanced natural plant community or productive agricultural uses. The residential place produces nothing. From both an economic and aesthetic standpoint, the conclusion is the same: use smaller sites.

Making full use of the small site requires careful consideration of the spatial arrangement of house, lot and street to prevent the lost space which is built into the traditional setback arrangement. Space for production of food should be considered in planning every site. Traditional suburban site planning once accounted for this. The Farallones Institute offers a different approach to making a small place productive in *The Integral Urban House*.[3] When a larger piece of land is available, prudent use of effort and resources calls for reworking it as little as possible. Thus the crucial relationships here are in the spatial connections between the house, the near site which we claim and the far site which we do not.

Traditional courtyard houses provide us with models which can be adapted effectively for use on the small tight packed suburban site. Typical courtyard houses make spatial and functional sense of all the occupied site. The Jacobs house by Wright provides a model for the alternative circumstance. This house and a number of Wright's other small Usonian houses effectively tie a small outdoor area to the house. This area is claimed and remade for the resident's use. Land beyond the house and outdoor focus may be left or restored to natural, stable plant communities. Wright's Lusk house project for Huron, South Dakota illustrates this principle employed with an "L" shaped plan.[4]

Clear Spatial Order

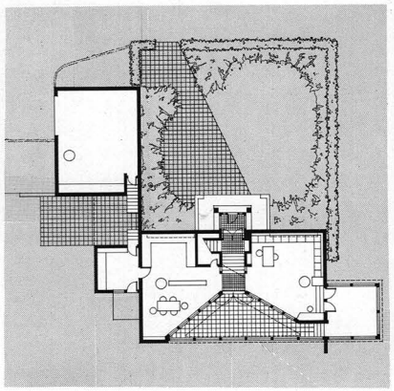
Accomplishing a clear spatial order may not be a universal desire or need, but it is a way of putting one at ease in his or her place. In this sense, it is perhaps especially appropriate that the homeplace possess a clear organization to aid in establishing a secure lifespace.

The basis of spatial order may be found in any number of meaningful distinctions in our lives. For example, we may recognize the relationships between collectively and individually used space. We may separate the spaces which support ceremonial events from those intended for more prosaic activities. We may make special places to celebrate specific objects or ideas.

Recognition of spatial order derives from our ability to perceive inside and outside, center and periphery, separation and connection. We accomplish distinction in spatial order through managing the size, shape and position of rooms, the nature of their edges and the connections between rooms. Or it might be more accurate to say that we manage *perceptions* of these properties. How big a room seems is often more important than its actual size. Understanding a sense of center is often more important than finding the measured center.

The resources available to make the order of small houses are limited. We cannot proceed as we might in large houses. Normally we can't afford to use much floor area for circulation or spatial connectors. Programmatic requirements limit our flexibility to distribute floor area to develop an emphasis. The limited number of rooms makes it difficult to employ elaborate layered spatial patterns. Edges generally must be simple.

Two of my designs demonstrate possible responses to these limitations. Both have compact forms and floor area of about 1,600 square feet. Little of the floor area is devoted to circulation, and many of the measures mentioned above are used to create a sense of spaciousness and distance.



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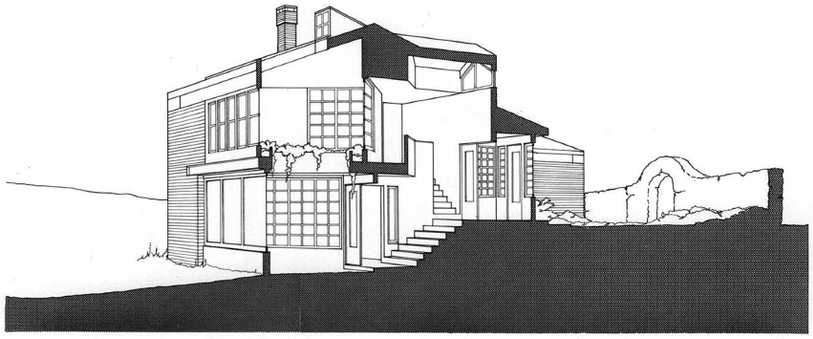

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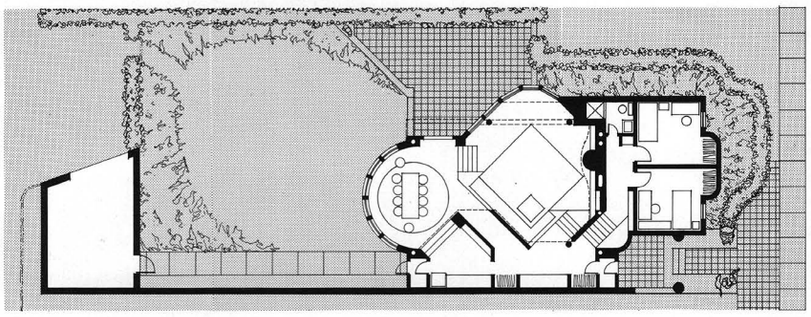

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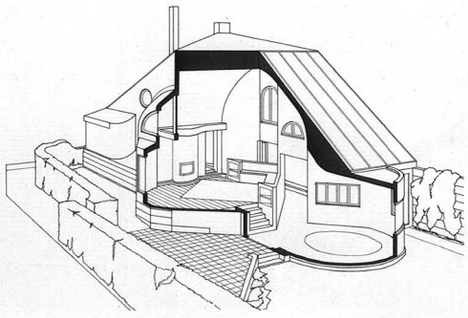

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1 New England? lower floor plan.
2 New England? model, south elevation
3 New England? section perspective.
4 Embryo, lower floor plan.
5 Embryo, section perspective.

New England? was designed for an open prairie location. The house and its fruit garden are intended to be surrounded by prairie grass. The garden is a vestige of suburban man's symbol of conquest — the lawn. It is also the formal hall for receiving visitors which the house can no longer accommodate. The focus of the spatial order in this house is the axis which connects the garden with the two-story window space on the house's south face; i.e., the garden is the public face, the connection to the larger world. The stairhall connects the paths between all the house's realms. The window space provides the spatial center of the house's inner world and its singular open view back to the larger outside world.

The *Embryo* is a more closed, inward turning house. It was designed for the long narrow lot typical of the older portions of many of our towns and cities. The center of this house's order is the living room. In a rough sense, the other rooms are heaped about it. The living room gains its place in the order by virtue of its position at the crossroads of the household paths, its great volume, its more elaborate and distinctive shaping, and the nature of its edges. The character of the edges is all important in this house. Other rooms gain their place in the order primarily from their common edge with the living room. The dining room is strongly connected by virtue of a continuous ceiling plane, a partially open common edge, a direct open stair connection, and common shaping. It is at the same time subordinate because of its lower floor height and smaller volume. The bedrooms are strongly separated by an apparently massive closed wall. The living room turns its back on them. The master bedroom is directly connected, but by a doorway and stair which are circumspect and small. The smaller bedrooms have no direct connection.

Articulate Edges and Faces

The edges and faces of buildings speak strongly to most of us. They are present and real; we can touch them, and they us. Edges are the definers of the spaces we make and experience. Every building will tell a tale, whether the designer intends it or not, and its faces reveal that story to us — if nothing else, telling us what its maker did not care about or take care with.

There are some basic qualities which will be invariably impressed in some measure upon our building's faces and edges. Many of these qualities may be understood as dichotomies: open/closed, formal/informal, tidy/disordered, front/back, intimate/impersonal, humble/proud, aggressive/retiring. They are seldom stated or perceived unequivocally. Rather, they come across to us as most persons do — a mixed collection of qualities of varying measures, with the whole making a unique statement.

The meanings for these qualities come from varied associations. The meaning of *open* and *closed,* for example, may come from the implication of physical or visual access. Thus a sense of "openness" corresponds to our understanding of our opportunity to pass through or to see through an edge. Openness may also be associated with human actions. Our openness to one another is reflected in body posture and position, gesture and facial expression. A gesture of "open arms" is a potent message of welcome. This gesture might be represented in a house by a generous but modest path flanked by low flowering hedges leading to an intimate doorway. Intimacy at the doorway might be seen in the scale, shape and color of the door and in traces of relaxed informal activity surrounding it: the porch swing with its implication of whispering pairs, the flower box, the tricycle and the broom.

Many of Maybeck's houses possess most articulate faces. While this was in part because he was not bound by styles, he was also not afraid to employ stylist elements in any way he saw fit. It is interesting that many of his more whimsical designs convey the most powerful qualities. The Young house of 1913 reveals clear, almost comical qualities.[5] It is a small scale house with a large scale gesture in the large window; humble but proud. Its sense is casual and informal as seen in the asymmetry of the elevation, the mismatched detail, and the almost flowery landscape elements. At the same time it reaches for grandeur and formality in the pulpit balcony and the beginning of a great stair. The messages are clear but mixed. They perhaps speak of changes which were then underway in American lifestyles. The faces of my *Embryo* house seek to give mixed/balanced messages which are similarly appropriate to our time. Thus balances are struck between formal and informal, open and closed, humble and grand.

Spatial and surface detail are the essential means through which we can convey fairly subtle messages on building faces. We are not in this age, masters of building detail, partly because we have accepted the logic that building process should dictate detail. On the way to this conclusion we have lost many ideas for the meaning of detail. In the small house, detail must be used just as sparingly as space. It may be appropriate to develop most carefully the detail which focuses edges such as windows, fireplaces, doors. The detail which touches us physically is potentially very impactful: windows because they command our eyes, seats because we look for inviting places to rest or contemplate, stairs and doors because they mark our paths, knobs and handles because they are keys, and cupboards and shelves because they hold our treasures.

Connections

Buildings are capable of conveying the framework or the stimulus for more specific meanings. This is

1 E.C. Young house, Bernard Maybeck, street elevation.
2 Embryo, model, front elevation.
3 Embryo, model, garden elevation.
4 Triangle, model, entry court.
5 Triangle, model, private yard.

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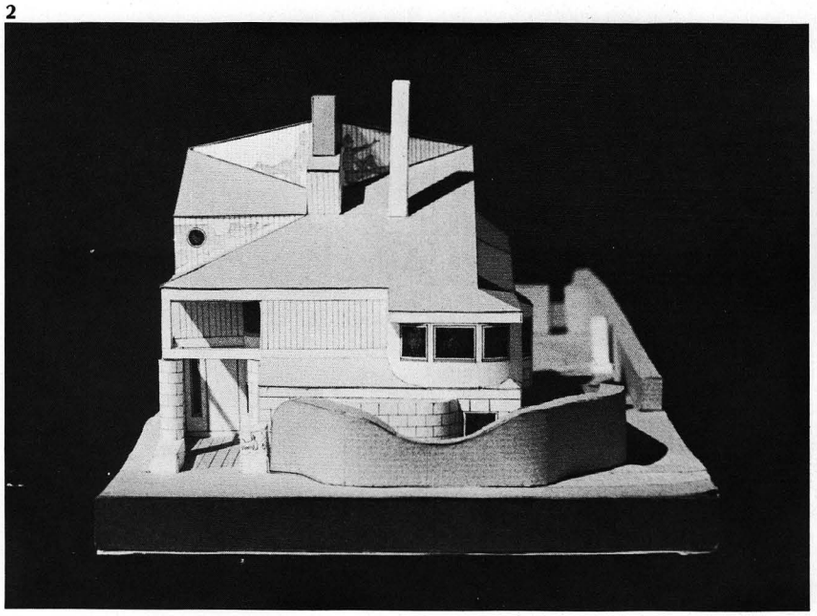

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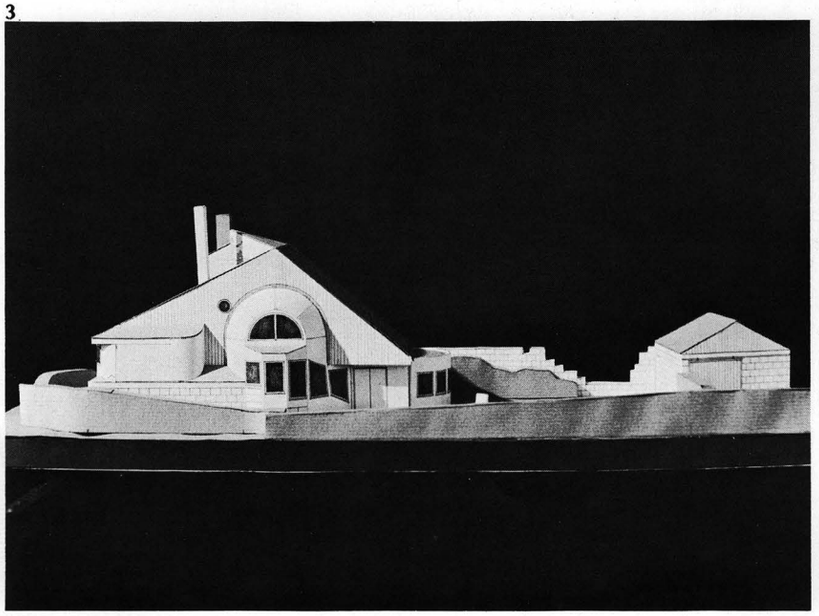

mainly accomplished through features or relationships for which the viewer supplies both the specific interpretation and the meaning. The use of natural materials in a direct and simple manner was a part of the rhetoric of the Arts and Crafts movement. When we see materials used accordingly, we may respond positively; certainly many people do. This response might be one of sensory delight, or it might also be that this use of material coincides with a belief which associates natural materials directly applied with an appropriately simple or beneficial way of life. The meaning is established by this belief.

Most buildings carry some allusions. These may be derived from the designer's intentions or the sponsor's desires. Or they may be inadvertent reflections of our cultural values. In this sense our dwellings are reflections of us both as individuals and as members of the much larger cultural group.

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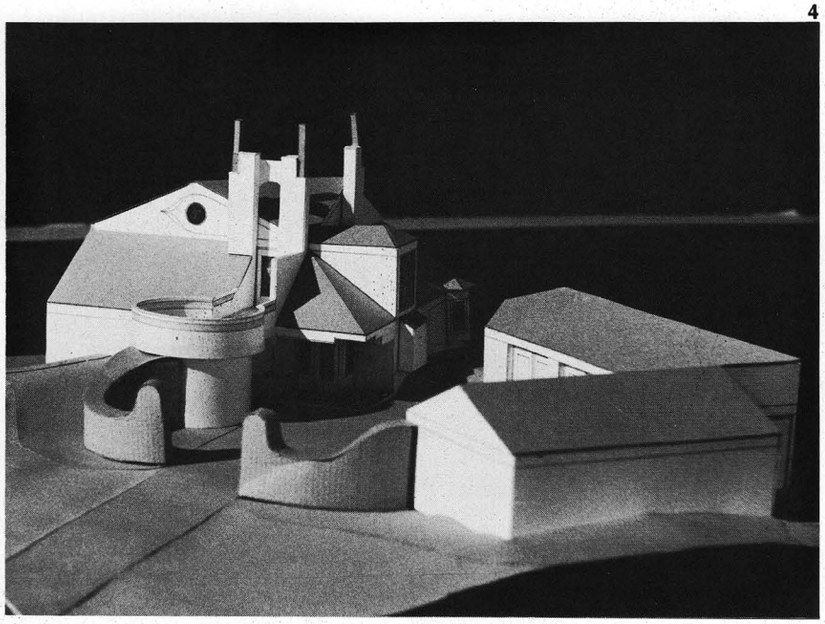

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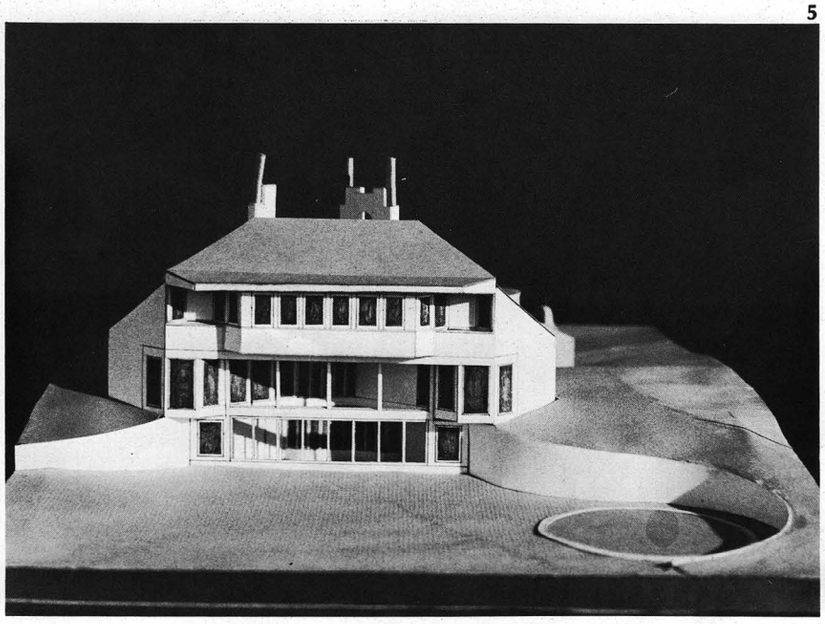


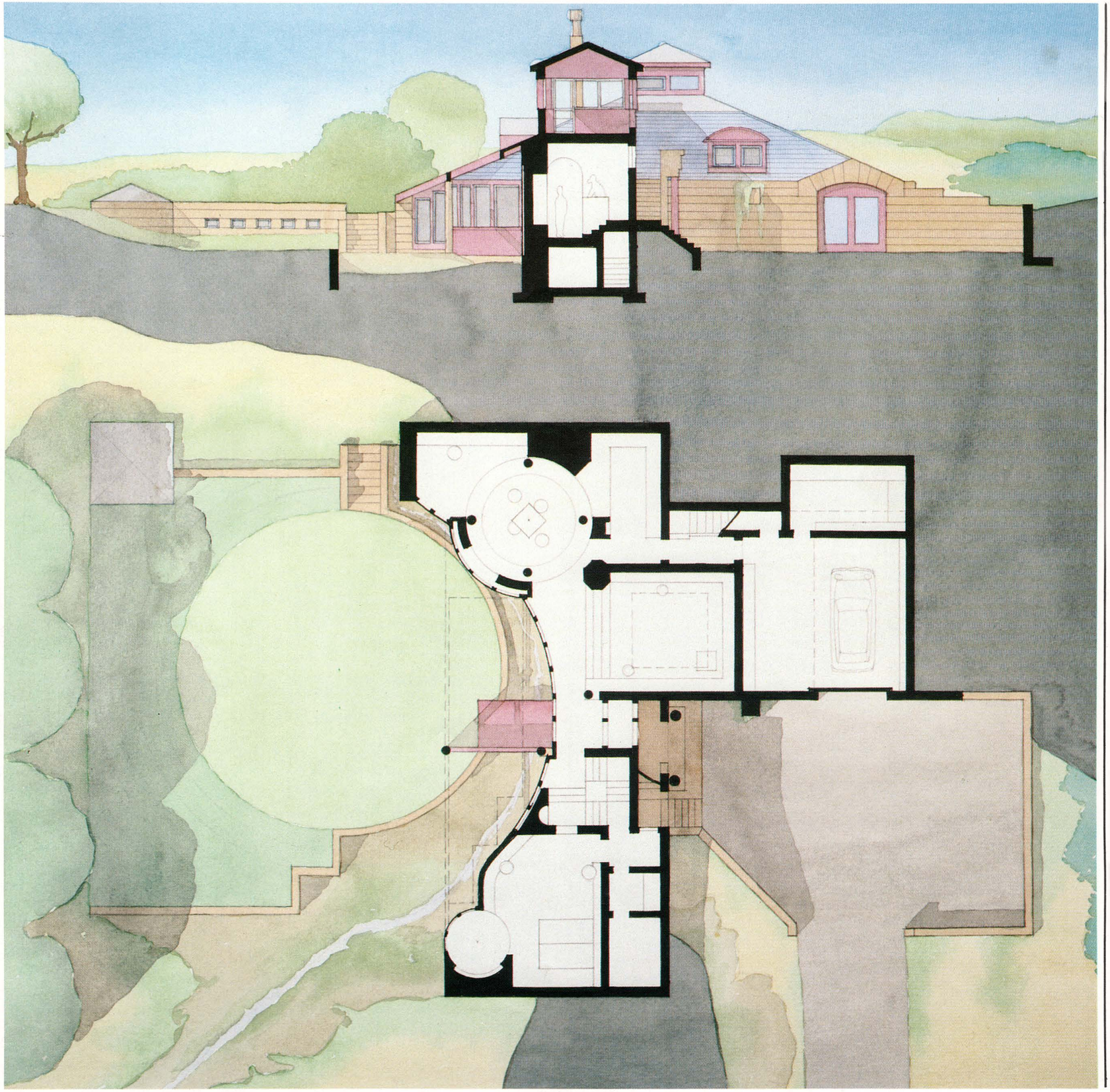
No single reference should dominate the potential meanings of the homeplace. Specialization and separation are already a nemesis of humanity. Our roles are specialized, as are our abilities and perhaps even our personalities. This specialization is making us more vulnerable physically, emotionally and spiritually. The attachment of self-worth to narrow facets of our existence is preventing us from being content in our lives and eliminating many sources of satisfaction and appreciation. Correspondingly our houses have been sanitized, specialized and economized into the minimal roles of shelter and asset. They don't speak to us much anymore because we ask them to confine their comments to these meager, rather dry aspects of our existence.

We can get houses to accept richer reflections by making connections to more meaningful realms in our lives. If we refer to past building forms or styles, they should be strongly associated with more complete images of homeplace. Wright chose to do this by employing two dominant symbols from Northern European culture — the hearth and the sheltering roof. Images of human form, position, posture and facial expression may be meaningful. The position that two houses assume relative to one another may often be appreciated in terms of how we position our bodies in different situations. Facial expression and gesture are our most powerful forms of nonverbal expression. They may have a place in the house mirror. Maybeck's Goslinsky house may be seen in these terms.[6] The set back plane of the front elevation reminds us of a surprised or bemused face. In the original construction, the doorway was to the side of the projecting entry hall. With this in mind, I can see this house as a bemused participant on this street with an arm or hand outstretched to give some protection or distance from the street while sheltering the entry. This may be one way of making the building's relationship to the street meaningful.

Our relationships to other living things are powerful sources of reflection; they are desperately needed. The more we isolate our daily lives from apparent interdependence on the biosphere, the more necessary contemplation of this relationship becomes. There are ample precedents in historical architecture. Both Wright and Maybeck integrated living plants into their designs. Both men employed the relationship between house and natural context as a sympathetic and poetic one. Each also employed natural form, particularly plant forms, as model for aspects of house form: Maybeck generally for applied decoration and Wright in geometry or basic pattern. The creatures which people our mind are also powerful sources of reflection, as are symbols of cosmic relationships. For precedents and models in these areas, we may have to look outside of our American traditions.

Humor is a necessary and important manifestation of the human spirit. It is one of the ways we cope with uncertainty and adversity. We can say outrageous but perhaps necessary things if we say them in a way which displays the humorous aspects of our subject. Of all buildings, houses deserve this most important reflection of humanity. My *Triangle* house employs an inversion in expected images on its public and private faces as a way of dealing with our mixed feeling about formality and informality in our lives. The public face of this house is small scale, intimate and casual, while the private face is monumental and formal. The faces are switched as if to ask us if we really know how we should behave in these times of rapid change and uncertainty.

In concluding, I will describe two of my designs in more detail so that you may relate them to the conceptual basis I have been discussing. The first of these is a recent study of a solar bermed house which I will refer to as *Red and Blue*. The second is *The Dragon's Armchair* one of the solar house's studies.



Red and Blue

Red and Blue is a larger house, about 2100 square feet, designed for a site on the prairie.

It is a passive solar house. The north, east and west walls are almost completely closed. Large portions of these walls are buried. The garage aids in protecting the north face of the building. It also shelters the entry court from northwest winds. The south face is almost entirely glass. Some parts of it are clear windows while others are trombe walls. Insulating drapes are used on all these windows. Thermal mass is provided in the walls of the stair tower, the dining room and the living room and in the floors. Supplemental heat is supplied by a large masonry stove located between the living room and the dining room and by a smaller stove in the master bedroom. Canvas awnings protect the south facing glass during the summer months.

The site plan uses principles reminiscent of Wright's Jacob's house. Together the house and its captured outdoor room make up a private world which is rimmed by the prairie: the outer world. One major difference is the entry court in *Red and Blue* which gives it a face to the outer world. The Jacob's house turns its back on the outer world.

Red and Blue is a little larger than the *Dragon's Armchair*. It strives to seem much larger. Some of the devices used to create the sense of spaciousness are similar. Basic open space planning, high ceilings and borrowed outdoor space are used to make the dining room/living room a truly spacious area. In addition layering of edges is used in the dining room and between the bedrooms and the rest of the house to make those edges expansive. Distance is created in the same ways used in the *Dragon's Armchair*. Other principles are also applied. The house is elongated physically on the east/west axis. This effect is exaggerated by providing a vista from a window in the master bedroom and by curving the south wall. The house's north/south dimension is also stretched out by a studio corridor, largely underground, leading from the dining room to the quiet room in the southwest corner of the garden.

The most important edges in this house are not exterior walls. They are the edges which define a series of basic building elements buried within the house. These elements are employed to make this relatively small house into a series of distinct diverse places: to enlarge this private world in our minds into a rich engaging set of scenarios. The elements are as follows:

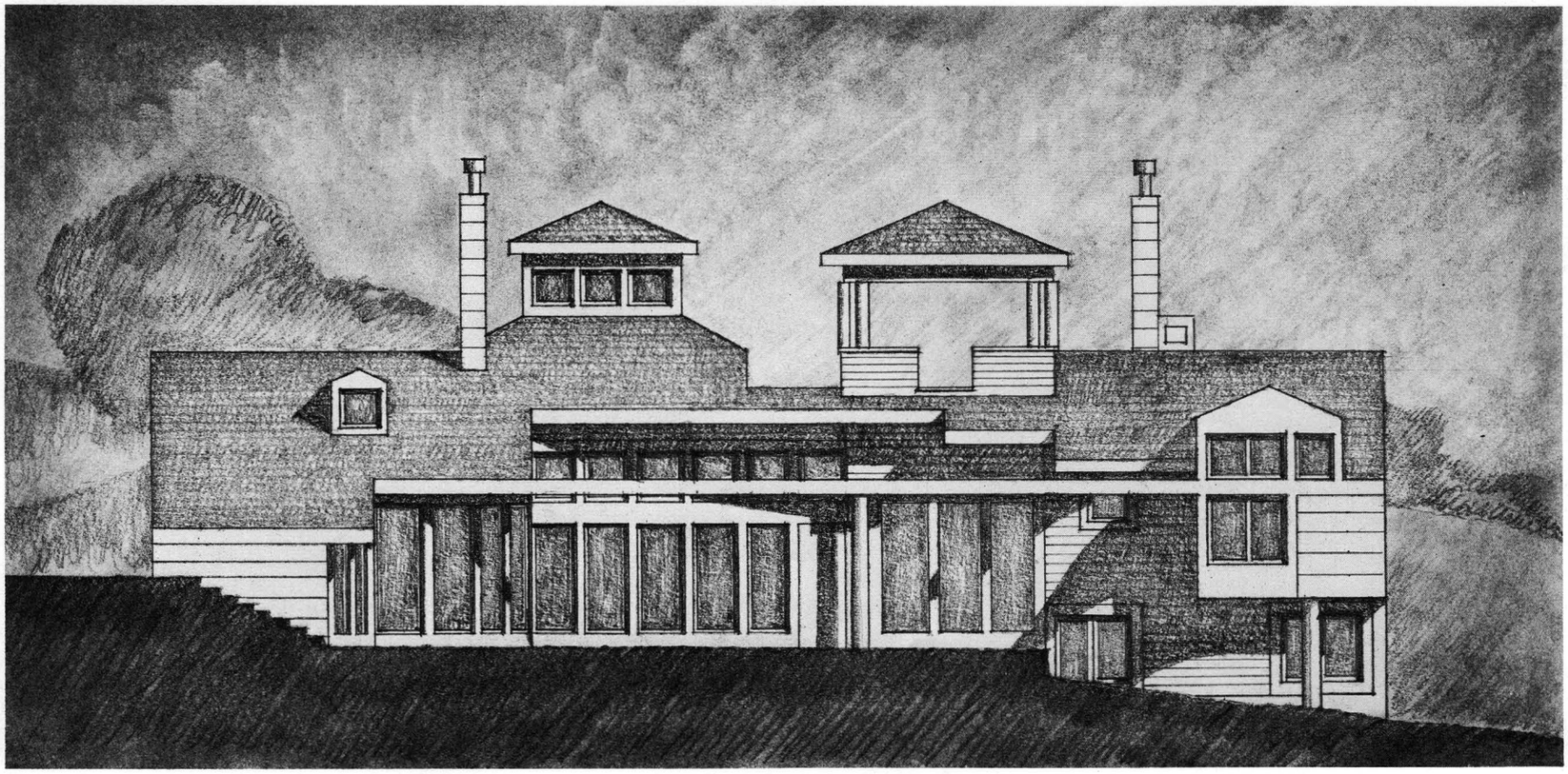
a cave	the quiet room
a gallery	the work corridor
a doomed pavilion	the dining room
a dias	the living room
a tower	the stair
a high place	the screened porch
courts	the soft court in the garden
	the hard court at the entry
a bridge	between the house and the soft court

The edge in each of these cases is developed to convey the sense of the elements involved.

The exterior detail on this house is developed to capture the sense of neoclassicism as applied in American colonial architecture especially in New England. In fact the plan form is, in part, derived from the connected farm forms of upper New England. These connections are developed because of their potency in conveying images of whole home places to many Americans.

Opposite
Red and Blue, east elevation/ section.
Red and Blue, entry level plan.

Below
Red and Blue, south elevation.



The Dragon's Armchair

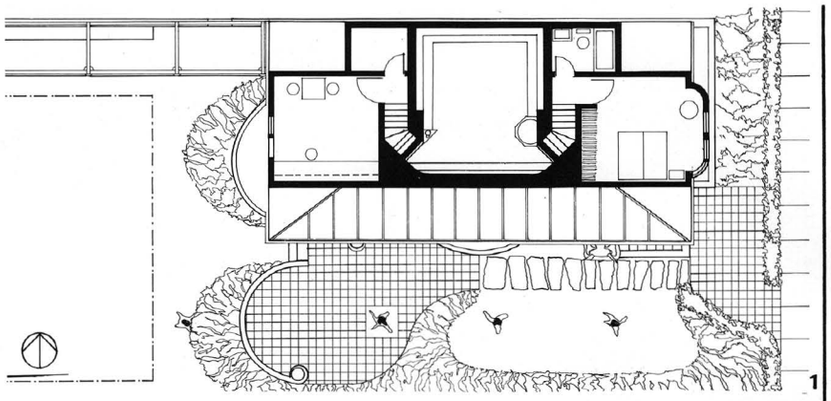
The Dragon's Armchair is a small house. Its gross floor area is about 1,600 square feet. I used this design and *The Embryo* to study the possibilities for the long, narrow (50' x 150') town lots. In this case the north-south axis is parallel to the short side of the site. I have also assumed other lots along a block would be used as intensively as this one. Effective use of the site and the desire for a sympathetic energy response led me to use zero lot line planning and an active solar system in this house.

The principal solar gain surface is the roof. An air type collector is employed, one similar to a design used on the Maine Audubon Society Headquarters in Falmouth Foreside, Maine.[7] That collector was site-fabricated of ordinary, readily available materials. Heat storage in *The Dragon's Armchair* is in a rock bin located under the elevated living room. Fans are required to charge the storage. Heat circulation between the storage and the interior of the house on the heating cycle is entirely by natural convection. During the summer the collector functions as a solar chimney, assisting in drawing air through earth tubes and the storage into the house.

Location of the house at the property line on the north boundary and near the front line permits the full site area to be developed functionally and spatially. A small, clearly marked transition zone connects the street, the house and the remainder of the site. An outdoor room is adjacent to the open south side of the house. The closed north wall of an adjacent house is expected to provide spatial closure and ensure privacy for this space. The rear of the lot is reserved for a private work zone and garden. The size, shape and orientation are most appropriate to these functions.

The spatial order in this house is based on the public/private heirarchy, the social importance of the living area and the quest for the sun.

1 Dragon's Chair, upper level plan.
2 Dragon's Chair, entry level plan.
3 Dragon's Chair, model, south elevation.
4 Dragon's Chair, cutaway axonometric.
5 Dragon's Chair, model, view looking northeast.
6 Dragon's Chair, model view looking northwest.



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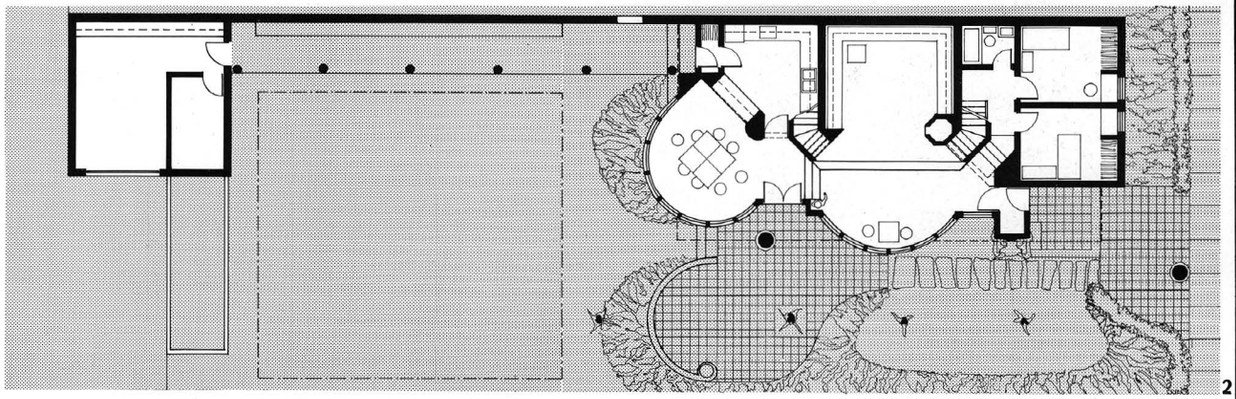

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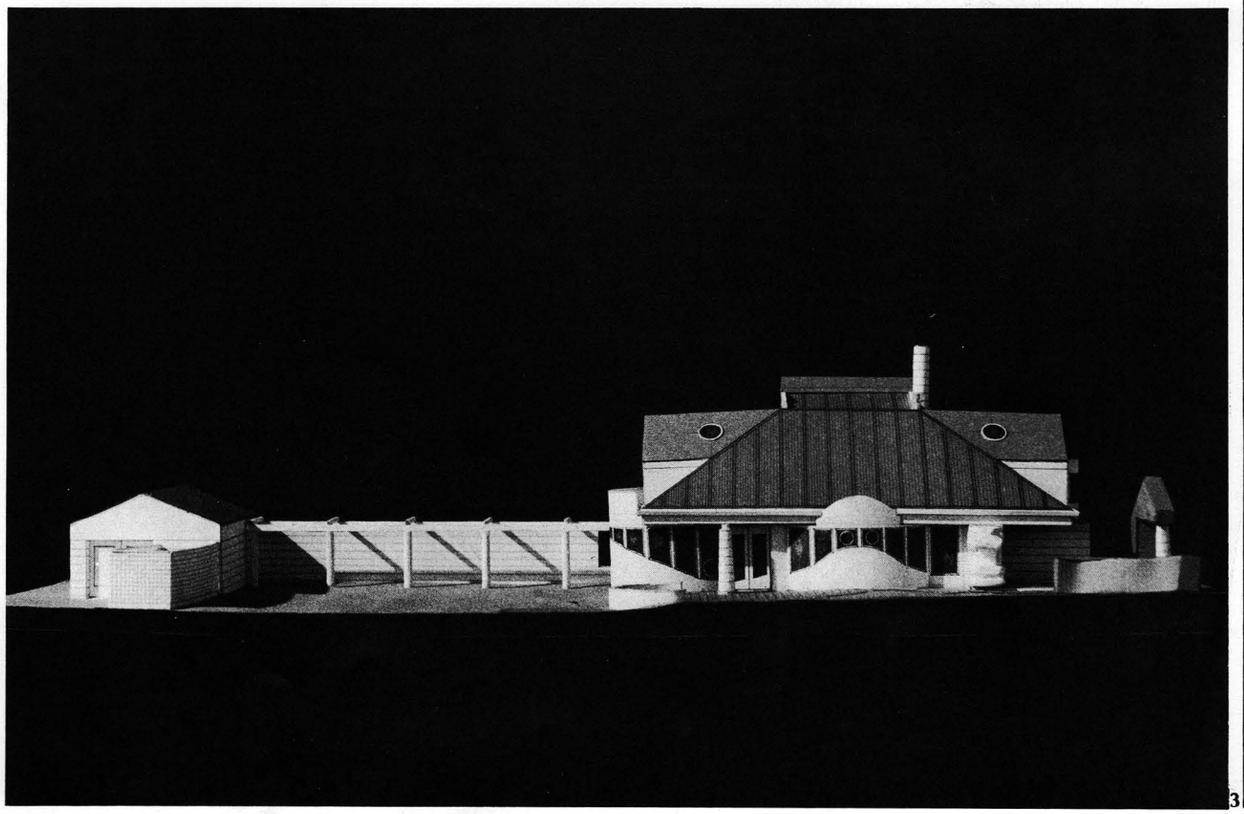

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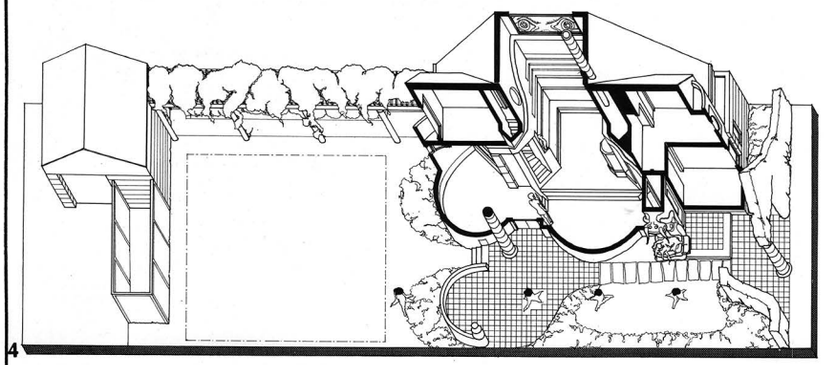

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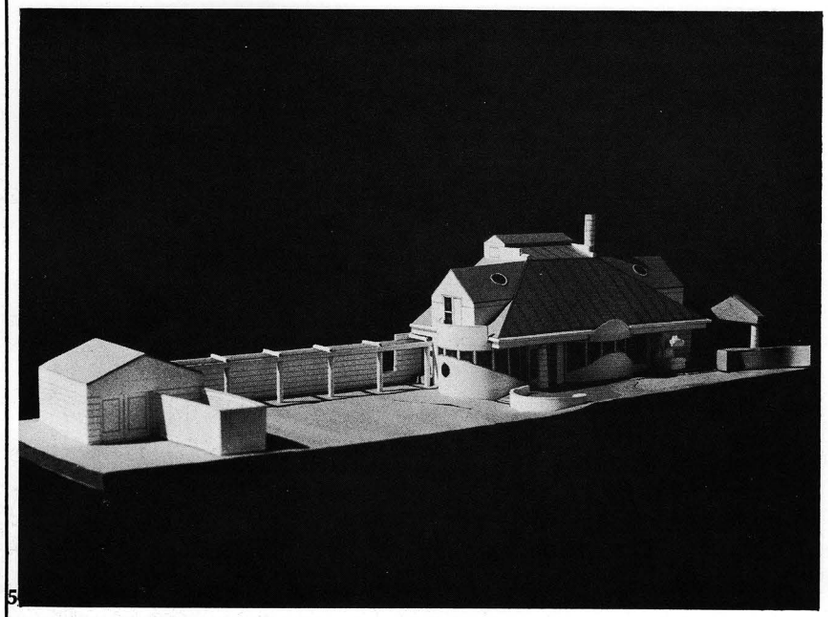

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6

The site is divided into three zones: the public zone is the outside entry area at the front of the site; the semi-private zone consists of the indoor entry, the living room including its corridor edge, the dining room and the outdoor room; the private zone wraps around the east, north and west edges of the site and includes the sleeping rooms, the kitchen, the studio and the outdoor garden/work area. One of the functions of the abstract dragon from which the house takes its name is to mark the edge between these zones.

The spatial order is focused around the living room and its fronting corridor. This room serves not only as the center, but also as the collector of all the house paths. It is the largest volume. It possesses the greatest elaboration and the most differentiation in shape. The other rooms in the semi-private zone share these qualities to a lesser degree. The rooms in the private zone assume subordinate positions and background qualities.
Spaciousness is accomplished in this house by the large volume of the living room and by permitting it to borrow the corridor and the outdoor room. The distance to other rooms is exaggerated by level change and by orienting those rooms away from the center.

The dragon is the obvious illustration of a connection in this house. Physically it is an abstract band which embraces and bounds the center of the house, its semi-private domain. Its back merges with other elements in the living room, providing shelter for the seating and a framework for memorabilia and book shelves. Outside, the dragon's mouth contains a planter, the mailbox and a porch light. In our minds the dragon may take on other meanings. He may be a positive embodiment of organic life force enfolding and protecting us. Or we may see in him the demons within each of us.

Approaching the house from a distance we might see the dragon as fierce and hostile. Up close, the absence of teeth and the flowers in his mouth demonstrate his benign nature. The dragon's mouth faces the path to the exposed outdoor portion of the semi-private domain, while we must cross his neck to reach the inside. Stories certainly make us wary of passing a dragon mouth. As for stepping on his neck, the well-known "Don't tread on me" flag serves to remind us not to step on serpents without their permission. This may well be true of dragons.

Connections to human form and expression are most apparent in the north window. It admits top light into the living room. The eye region of a human face is depicted on this window in a form which is common to the expression of both mild surprise and disgust. The ambiguity of this gesture is intended to permit us to read in our beliefs concerning neighboring.

There are several other references in this house. The living room is at one level an overstuffed armchair. The exterior front face refers in part to an Empire style mansion.

NOTES

1. John Sergeant, *Frank Lloyd Wright's Usonian Houses,* Whitney Library of Design, 1976, pp. 82-85.

2. Kenneth Cardwell, *Bernard Maybeck, Artisan, Architect, Artist,* Peregrine Smith, Inc., 1977, pp. 210-212.

3. Farallones Institute, *The Integral Urban House,* Sierra Club Books, 1979.

4. Sergeant, p. 26.

5. Cardwell, p. 181.

6. Cardwell, p. 112.

7. The architect for this building was George Terrien. Richard Hill designed the solar collector. Maine Audubon Society, "Maine Audubon Society Headquarters: Energy Systems" available from MAS, Gilsland Farm, 118 U.S. Route One, Falmouth, Maine 04105.