Assembling the rooms

At this stage you should be able to identify your needs in terms of the Order of Rooms, which provide places for living, the Order of Machines, which assist you specifically in daily chores, and the Order of Dreams, which enrich the elements of the first two and give personal value to all the parts.

The next step will be to assemble all these parts to make the whole house. A good house is a single thing, as well as a collection of many, and to make it requires a conceptual leap from the individual components to a vision of the whole. The choices we will soon describe represent ways of assembling the parts. Each may be tried and tested, rejected or combined in the discovery of a way that will accommodate your needs comfortably and will also begin to create the place you want.

There is a general principle to guide you in the process, and it comes from the fact that a good house will have resonances that extend beyond a set of discrete elements. The principle is that, in the assembly of all the parts, one plus one must equal more than two. The execution of this principle to the fullest taxes skill and the imagination.

But in its simplest form it springs from a few very basic phenomena of building. When, as we have noted, you make a room out of a floor, four walls, and a ceiling, you will have, besides those six things, a seventh as well: space, a thing probably more memorable than any of the physical elements that made it. Its creation, of course, is an illusion. You will not have made something out of nothing, only separated a particular part from the continuum of all space.

If, then, you arrange the rooms you have made in some kind of order, you will have not just a set of rooms, but you will also have given the whole house a pattern. If you let it, this pattern can tell much about you—your preference for formal living in a drawing room or for casual living in a family room or on a patio. It can suggest where you most often go when you first enter the front door, and where you like to cook. Pattern can also say more profound things about the kind of order which makes most sense to you—symmetrical, harmonious, and serene, or fragmented, jolting, and surprising.
Rooms, as they form the order of the inside, can, as another bonus, create outside domains. Houses whose rooms partially surround an interior courtyard, like many of the houses in Santa Barbara, show the most obvious way in which this can be done. But the more subtle arrangement of the three large houses on North Water Street in Edgartown, with rooms opening onto different parts of a shared lawn, perform similar acts of claiming the land around them. These claims are bought, as it were, for free, since they are achieved by means of the careful arrangement of parts (rooms) which were needed anyway.

What we have described are four simple exercises showing how the basic parts of a house can be put together to make more than just basic parts: they can also make space, pattern, and outside domains. They dramatize the most elementary act which architecture has to perform. To make one plus one equal more than two, you must in doing any one thing you think important (making rooms, putting them together, or fitting them to the land) do something else that you think important as well (make spaces to live in, establish a meaningful pattern inside, or claim other realms outside).

Two houses—one old and large, the other new and very small—can serve as illustrations of our principle. The first is Stratford Hall in Virginia, the home of the Lee family (page 86). Inside this house the rooms are assembled in an H-shaped plan that accommodated its occupants’ daily activities in the two large wings and reserved enough room between them for the most formal room in the house, the Great Hall, which from its center gave vistas to the outdoors and spoke ceremoniously, as it still speaks, of a great family’s sense of self and its place both in society and on the land. The stairs which descend on each side from the Great Hall are the central elements of the two façades, which front the land—on one side a rolling greensward, some woods, and in the distance, the Potomac River (1), and on the other a flattened lawn and fields. (2) Heavy and dominant, the house claims the land and controls it. The way the rooms are assembled, the way the house is fitted to the land, and the manner and materials of which it is built, all render powerful bonuses and enhance the meaning of the house.

There is a bonus even in the eight chimneys, which are primarily there, of course, to vent the house’s fireplaces. Once there, they also make a place for two commanding platforms between them, and as splendid shapes made of brick and mortar, they are the talismanic objects by which we are most likely to remember the house. (3) All the parts of Stratford Hall combine to create not only the house but also the dream of claiming, ordering, and controlling the land, and of making a special place to live. The rooms, the façades, the chimneys are all there to serve specific purposes, but together they enhance the whole.

Another example of the one plus one principle in operation is the Johnson house at the Sea Ranch. (4) An inexpensive West Coast vacation house, about one-fifteenth the size of Stratford, it has almost nothing in common with the Virginia mansion, save the economy of its concept, and the notion of making a symbolically important central space within.

The house sits high on a ridge of hills overlooking the shore, just where the forest gives way to open meadow and sweeping view of coastline. We and our clients wanted to make a tiny house with a sense at once of a mansion and of a country retreat. So, we built an imposing form in a simple and unimposing way.
A drive through the forest ends at a redwood gate that opens onto a small flowered clearing, cultivated and tended, but not transformed into a separate garden alien from the Sea Ranch. On the far side of the clearing sits the house, fitted between a thicket of redwood and one of tanbark oak. From this side, under its pyramidal roof, it seems like a dollhouse, a simple geometric form with a central entrance porch. (5)

As you enter the double glass doors at the entrance and step up into the main room, you discover that the inside of the house is something the pyramidal roof outside didn't disclose: a surprising octagonal pavilion reminiscent of great halls, tombs, and bandstands in the park, but supported on plywood "cores," the cylindrical pieces left over when plywood has been peeled off in mills, locally available then for ninety cents each. (6)

Between the columns, the space of the central pavilion stretches into niches for specific purposes. Directly ahead is a nook for sitting and sleeping, with the fireplace to one side and a splendid view up the coast on the other. To the right as you enter, the room stretches into a domain for cooking, while on the left a place to eat is lodged between the posts of the octagon and the square corner. Behind the fireplace, on the far left, is a giant closet with a bathroom and dressing room.

Skylights just outside the four edges of the octagon emphasize its shape, surrounding it with constant soft light and surprising shafts of sunshine. This light from above illuminates the white walls, and therefore lessens the glare from the sea and sky, and frames the view of the outdoors. This one-room house seems at once a toy and the center of its own world, a retreat in the forest from which you can survey the coast.

At the Johnson house there was no space,
no money, and really no need to make a separate room to which the other more utilitarian rooms were appended, as at Stratford. Though the house is just one room, it is a room of many dimensions. It provides places for a collection of specific activities and a judiciously wasted space, with its feeling of largeness.

The connection between the specific and symbolic areas is assured by the open spaces between the columns and, more subtly, by the four openings pierced in the octagon above. The distinction between the two realms of things is maintained with equal care, for the octagon in the middle is kept a separate thing, and it never touches the outside walls of the house even when it comes within a few inches of them, as it does behind the fireplace and in front of the large window. The alcoves around the edges, too, are not just dark closets appended to the central space, for they are flooded with light from the windows at eye level, and from the skylights above.

Each of the areas for specific use around the perimeter of the house, as well as the octagon in the center, with its feeling of half-mock grandeur, are in fact much too small to be either functional or effective alone. And so each borrows from the other in this miniature house, and each of the parts performs at least two separate tasks. Together, as at Stratford Hall, they make one plus one equal more than two.

Whatever slight of hand is involved in the process, houses are made, quite simply, from putting rooms together. Happily, for our purposes, the ways to assemble rooms are few. We count the following:

- rooms linked
- rooms bunched
- rooms around a core
- rooms enfronting the outside

plus two other patterns which occur when one room is given preeminence:

- a great room within
- a great room encompassing

Every memorable house we know of was formed in one of these six ways, or in a combination of them.

**Rooms linked**

Rooms can be lined up in a row, as in a little house in Portugal (7) Since this arrangement is so simple, it is memorable. Because covering the rooms in this scheme is the same thing as roofing the house, you can, if you choose, let the roof be the ceiling, and thereby reveal part of the structure of the whole house and also save money. The chances for lighting are ideal, too, since every room can have natural light from opposite sides. Its limitations are obvious: there is no circulation except through one room to another. If the house is small enough, this may present no problem, as in the Parson Capen house (page 72). Or if life is full enough of ceremony, even a large house like Lord Derby's in London could be designed as a series of rooms, most of which were lined up in single file. (8)

- The most direct way of solving the circulation problems in a house where the rooms are linked is to insert a circulation space along one or both sides. A project by Robert Venturi is a good example of a set of rooms all in a row, alike and clear, "general in shape and unspecific in function," as he put it, separated by machine domains, with a porch on one side and an indoor passage along a part of the other (9), so that those rooms where the desire for privacy is anticipated can be bypassed, and those rooms where privacy is not an issue can simply be linked. To maintain the clarity of that linking the corridor is given
glass walls at each end, and the rooms are given great double ceilings which admit natural light at their top and all about their edges, to make as evident as possible the shape and importance of the rooms themselves.

A project of ours for a house near Santa Fe, New Mexico, depends similarly, though in the adobe idiom of the Southwest, on a single file of rooms along a passage. In this case, though, the passage extends the full length of the house. It is widened at one point to become an area for dining, and at one end it opens onto a sunken living room. (10) This house, like the Venturi project, emphasizes rooms linked, with an unreroofed space, a garden, extending the chain at one end.

Another project for a house in England shows rooms linked together on two floors and connected by passageways that are sometimes corridors, sometimes a part of the rooms to which they allow access. (11) At the main entrance a windowed corridor leads to the kitchen, and in the other direction it opens up into the living area, two stories high. On the other side of the house a passageway leads from the living area and opens successively into the dining area, the kitchen, and at the end, a garden. Upstairs, a corridor above the first one connects the two bedrooms to the stairway behind the chimney.

The McElrath house, also two stories high (12-13), is composed of rooms linked both vertically and horizontally by a passage that climbs through a number of levels, dramatizing movement down past a dining area to a living room or, still in full view, up past a bridge to an intermediate level and finally to a skylit master bedroom at the top of the stairs. (14)
12. McElrath house, Santa Cruz, California, by MLTW/Moore-Turnbull, 1967

13. Exterior, McElrath house

14. Stairway, McElrath house
Rooms bunched
A second method of arranging rooms is to bunch them; either they can be gathered around a central entry point or passage, or they can be bunched together completely with a passageway around them. Most houses of any size are organized according to this method, though generally it pushes the rooms together in ways which allow light to enter from only one side or two adjacent sides. Also, in this pattern, the act of covering a single room has nothing to do with roofing the whole house, so you must build a separate ceiling. An advantage of this way of assembling rooms is that it can accommodate them within a minimum perimeter.

The Portuguese house shown here is a simple example. (15) Its rooms are bunched together completely, and the larger rooms are sufficiently public to allow circulation through them to the smaller ones. One large room is unconnected with the rest of the house; it serves farm purposes.

The plan of a traditional Japanese house is admirably clear. (16) The sliding walls between rooms allow the relation of the one to the whole to become apparent. The whole house stays strongly in the mind, even as the three main rooms are themselves elegantly simple. They are carefully proportioned on the module of the three-by-six-foot tatami floor mat and have no permanent fixtures in them, so they are truly empty stages for human action. They are grouped beside an anteroom, arrived at through a small entrance garden. The anteroom itself, only about six feet square, gives directly through sliding panels onto two of the rooms. One of them adjoins the kitchen so it is especially usable for dining. The other, a kind of reception room, has a garden view and a tokkōnoma in which to arrange a favorite picture and flowers or a bowl. At one remove from the anteroom is a third room, which also opens through sliding screens onto the garden. At night the two rooms open onto the veranda along the garden front through which they have direct access to the toilet and so become favored sleeping rooms, as bedding is brought from the closets.

A larger Japanese house (17) is also composed of rooms bunched, this time around an interior passage which links all the rooms and is sufficiently strong and memorable itself to give a comprehensible position to each room it serves. The almost ritually planned movement of people entering and using the house is worth tracing. One comes in through a small entry, thence to an anteroom, which in turn opens onto the passageway. Just inside it, a stair up to a great room is on the left and the dining room to the right. Farther beyond to the right is a living room and to the left, a bathing suite and toilet. Straight ahead is a dressing room, normally open to the living room so that light comes from two sides. Still farther, and not at all a part of the system defined by the passageway, is the ceremonial teatoom and its kitchen.

The rooms, except for the teatoom, whose separateness is prized, are bunched, organized around a passage, but arranged, too, as with the living room and dressing room, so that the extent of the whole house can be seen, opening on opposite sides to its garden.

The room arrangements of these two Japanese houses are particularly easy to grasp because the rooms themselves are so empty and simple, and because the partitioning screens can slide open to reveal the shape of the whole house. An American house like Gunston Hall achieves its clarity of arrangement with much heavier and thicker materials, but the clarity is nonetheless striking (pages 72, 81). A central hall, entered from a
porch, extends all the way through the house past a staircase to a porch on the other side. On each side of the hall are two well-proportioned rooms, spacious in themselves, and gaining spaciousness from their connection with the central hall and from their vistas through it to the rooms on the other side. The rooms, roughly the same shape, are interchangeable. They can be simply visualized, and they build up in the mind's eye a memorable assembly of rooms bunched around the central hall.

The rooms in our Tempchin house are arranged around a central corridor in yet another way. (18) A long arcade, derived from what is locally called a "dog trot," leads from a carport at one end to the house at the other. On either side of the arcade the land falls away slightly. The roof slopes low over square openings toward the driveway, and high with tall openings to the lawn. (19)

Past the front door, these walls that flank the dog trot extend through the house. The passage opens above to a large square window seeking the sun (20) and sidewalks through synchronized openings to skylights or to the living room (21) and the dining room. (22) Directly ahead, it opens down into a sitting room above which an upper study is accessible from the living room.

This house is eclectic, carrying associations with many forms in the architecture of the past. The passage outdoors invites comparison with the arcades that reach to outbuildings in Palladian villas or in the farmhouses of Maryland and Virginia. The central brightly lit hall which extends the arcade with its multiple overlapping openings recalls, albeit in miniature and in the simplicity of sheetrock, the spatial complexities of plaster Bavarian churches.

Three other examples of rooms bunched follow: these pull the rooms completely together, and surround them with circulation. A word of caution should precede their examination: a circumferential passage consumes a large area, which is eligible, by most methods of reckoning, to be called waste space. Indeed, many state building agencies distinguish circulation spaces from rooms, and demand that a certain percentage of the total building area be the latter. This is thought to assure the efficient use of space. But the notion of efficiency of this sort is suspect in a house, since a great deal of the space in houses, in rooms as well as passages, is for circulation—the opportunity for human movement. Comparatively little space is required, for instance, for a seated group engaged in conversation or for people sleeping in bed. Understandably, there is wastefulness in corridors if they are useless except for walking through and unpleasant even for that. But the passage in a house like Homeplace Plantation (page 75) is more than a corridor. During warm weather, it is probably the most useful room in the house, serving as a place to sit, or read, or nap, or play, or keep accounts, and to catch whatever breeze is blowing. The inner rooms lose some privacy, but gain in shade.

The Japanese house (23) has a circumferential passage not altogether unlike Homeplace Plantation's, except that another layer of rooms outside it—nursery, dressing room, maid's room, kitchen, bath, toilet, and old people's room—cause the passageway to be sometimes an interior one, sometimes a veranda. Because of the openness of the sliding screens, the passageways, which are too narrow to provide sitting space, take the pressures of movement off the central rooms so the latter can be used just for sitting, sleeping, and staying and, at the same time, have vistas across the veranda to the garden. On a much grander scale, the Ninomaru at Nijo Castle (24) in Japan is spectacularly
21. Living room, Tempchin house

22. Dining room and central passage, Tempchin house
formed of four sets of rooms bunched with perimeter circulation, all in an irregular row. This arrangement provides a number of corner rooms inside the veranda, placed to receive broad views and whatever breezes cool the soggy Japanese summers. The wood-floored veranda became a space of great importance as a gathering place for the many attendants of the court, and as a path to conduct the visitor from the closed porch at the lower right, where he entered, to whatever audience hall or living room his station entitled him.

Rooms around a core
A third method of arranging rooms is to wrap them around a core. The core can be a solid one, like the chimney in the Parson Capen house (page 72) or the Ward Willitts house (pages 77–78). The core can also be a collection of machines and their domains, as in the Gross cabin. (25) The central stair looks over the kitchen equipment into a high, brightly lit room used for cooking, eating, and lounging. This is adjoined, outside, by a large porch whose edge runs parallel to the core, but diagonal to the room, ending in steps that lead down into the meadow. In this house in the North Woods, machines that make heat—the stove and the fireplace—are bunched back to back at the corner of the stair and adjoining the rest of the core. Under the master bedroom and in front of the fireplace is a low, protected room with carpeted platforms and recesses that face the fire and the two bay windows. On the other side of the machine core two children’s bedrooms open into each other and join with the space at the foot of the stairs to make a small play area.

The rooms can also be wrapped around an open space. The larger houses in Ur of the Chaldees of the period just after 2000 B.C. are arranged in this way (26), and it was
standard for many Greek and Roman houses. (27)

The arranging of rooms around an open space has some special advantages; as with rooms linked in a row this scheme can give each room light and air from both sides. In addition, it can give privacy from the outside world, though not much interior privacy is provided if the rooms open into the same court. By being one-room deep, it provides another advantage in that supporting the roof of the room and the roof of the house are the same act, and perceiving the relation of the parts to the whole is made easier. Another enormous advantage, which will be more fully noted in the section on fitting the house to the land, is the ease with which the house can back against other houses, or against property not belonging to the house.

The disadvantages of the scheme are the inaccessibility of the courtyard to breezes and the sheer number of rooms required to surround an open space of any size, though it is certainly possible for rooms to join with freestanding walls or adjacent buildings to surround an outdoor space.

A house in Cuernavaca, Mexico, has rooms which partially surround an open space, though the enclosure is completed by the blank exterior wall of the house next door. (28) The surrounded space is a garden; along it on two sides an open gallery provides, in the benign Cuernavaca climate, the main room in the house, both for moving and for sitting. (29) The master bedroom intercepts the gallery, but has two doors which, when they are open, continue the space visually past the bedroom, beyond a swimming pool, to a loggia at the back of the site, which serves as a porch for a guesthouse bordering a third side of the garden. The other rooms, a living and dining room, a kitchen and service area, and a guest room, all open onto the gallery. They are used chiefly when privacy is desired or when inclement weather makes the gallery too cold or windy.

The Goldenberg house (30) by Louis I. Kahn is another courtyard house, but it contains rooms and circulation spaces of various sizes and shapes constructed in a variety of ways. Unlike the Mexican example, this is a freestanding house, so major rooms face both out and in. But the clarity of the central open square gives it preeminent importance in the house. Our project for the Jenkins house, with rooms which can be opened wide to the court during the long dry summers in the Napa Valley, is another variation on the same scheme. (31)

The Shokin-tei teahouse at Katsure Villa in Japan is also a freestanding structure, distinguished by its wide eaves and verandas which unite it with the splendidly developed landscape around. In its middle—surprisingly—is an inner court, unroofed and visible only from the ceremonial tea room, so that instead of being central it seems extremely remote. (32)

In a house in Portugal the surrounded space is more like a private street, which cuts through the house from front to back, making at once a patio and an outdoor corridor. (33) At its center it opens into a covered space which contains a well, and makes a proper patio. The form is considerably more open to the public street than the standard courtyard plan, which usually requires one to go through the house itself in order to reach the central open space.

The possibilities of varying the shape of this space, and the precise configuration of the rooms wrapped around it, are of course legion, but the basic arrangement of rooms wrapped around a central core has been probably the most important organizational scheme in the history of house building.
28. A house in Cuernavaca, Mexico

29. Gallery of a house in Cuernavaca

30. Goldenberg house (project), by Louis I. Kahn, 1958

31. Jenkins house (project), by MLTW, 1963
Rooms enfroneting the outside

A fourth scheme for organizing rooms is one in which rooms are marshaled along a line to face some part of the out-of-doors beyond themselves. We call this arrangement of rooms enfroneting.

In one example, rooms of two levels of importance are arranged to enfronet a public space. The main room, in the center, and two rooms of slightly less importance face the front of the building, while subsidiary rooms behind open to the major rooms. This design sprang from the decision to face one particular piece of the outside—in this case, a public square—and to turn the important rooms to it, much as one would line up a military guard for inspection, with the most important or brilliantly plumaged members out in front. (34)

Charles Bulfinch's third Harrison Gray Otis house in Boston is memorable for the simple and dignified way its rooms enfronet the street. (35) But as the plan discloses, the room arrangement becomes more and more loose and informal toward the back of the lot. Indeed here, as in many elegant Georgian town houses in England, the casual arrangement of the back of the house is altogether different from the grand scale of the rooms which face the street. In this way, the rooms can be a part of a number of different realms, from that larger realm of the out-of-doors—whether a lawn sloping to the river, or a city street, or a park—to a much more intimate realm of domestic courtyards.

A plan of several houses in the Circus at Bath shows another variation on this way of assembling rooms. The curving front is formal and highly disciplined, while on the back the rooms, when necessary, bulge outward without any particular regard for what they will look like from outside. (36) On the front or back, all the rooms are clear
and symmetrical in shape, even though that required extensive accommodations to the irregularity of the curving structure. The space of the rooms and the shape of the whole was obviously of far more interest to the eighteenth-century builders than the way the whole house was put together.

The distinguishing characteristic of rooms enframing the outside is that they are arranged in relation to something beyond themselves, and the chief advantage of this arrangement is that it allows the rooms to have an outlook over whatever they face and share its qualities. By the same token, it is only useful if there is something worth facing: either something already there, or something made and shared, like the greenswards in front of the row houses in Bath; or something private, like one’s own garden.

A great room within
So far we have talked of rooms of roughly equal importance, linked or bunched or wrapped around a core or enframing the outside. The two other ways a house can be put together involve the invention of something more than an individual room, of greater import than any of the rest of the rooms. Such rooms have had varying names in the past, and each name leaves a residue of specific images: great hall, salle, sala, long gallery. We shall describe them as Great Rooms within the house and as Great Rooms capable of encompassing the whole house.

Stratford has a Great Room within, though it does not open directly into any other room, and the other rooms retain their independence. (37) Even so, one’s memory of the house centers on that Great Room. Palladio’s villa plans (38) are frequently organized around a Great Room onto which the other rooms do open. This room

provides the basis for arranging everything else—rooms surrounding a Great Room, rooms flanking a Great Room, or bunches of rooms flanking a Great Room.

At Chiswick House, as in the Palladian villas on which it is modeled, a Great Room stands in the center. (39) Chiswick was built by Lord Burlington, one of eighteenth-century England’s most erudite patrons of the arts. Guests would enter the central hall and then be ushered according to their interests to the left, or right, or on behind into one of the rooms where poetry, or art, or humanist sentiments were under discussion. The plan of the house shows how importantly the Great Room figured as a circulation space through the pavilion to its other rooms, symbolically, as well as by being the largest, highest, and most important single space in the whole house.

A great room encompassing
Houses from the past seldom exhibit our sixth system for assembling rooms, a Great Room encompassing, within which particular functions and even other rooms are accommodated. Philip Johnson’s glass house in New Canaan, Connecticut, is a particularly clear example of such a scheme; it is basically a single room, readily retained in the memory because of its simple shape and its all-glass walls. (40) We see it, and we remember it as an open glass box; but inside there is a brick cylinder, enclosing a bath and a fireplace, and two blocks, enclosing kitchen machines. These modify and control the space, and create areas for specific use and privacy inside the crystalline Great Room.

Japanese houses, because of the flexibility of their partitions and the strong form of their roofs and verandas, often qualify as single encompassing Great Rooms. Each of the pavilions at Nijo is a Great Room, with
a clear perimeter and an arrangement inside sufficiently light and flexible not to stand in the way of remembering and responding to the whole (page 164).

Our own houses, especially the small ones, have relied heavily on the use of an encompassing Great Room. The condominiums at the Sea Ranch, for example, are single volumes with large structures inside to hold all the machines, including the sleeping lofts (page 37).

There are, then, six ways of putting rooms together on one or several stories. We know of no more, save their combination. The most difficult part of the design of a twentieth-century house, though, occurs in the area where the generalized rooms meet the special domain of the machine.
Including the machines

Our houses are filled with machines and the domains required for their comfortable use. Accommodating them and at the same time maintaining a coherent assembly of rooms is particularly taxing. Nevertheless, we know of just four ways in which the Order of Rooms and the Order of Machines can be juxtaposed without confusion, and they are:

Forming the rooms around machines
Putting the machines inside the rooms
Putting the machines outside the rooms
Sandwiching the machines between the rooms

Forming the rooms around machines
Frank Lloyd Wright’s Goethsch-Winkler house is formed almost entirely around machines. It was built in 1939 in Okemos, Michigan, and was one of a group of houses with which he hoped to develop a pattern for the small suburban house. (1)

Here the machines and their domains create the house, rather than being separate elements in it. The dining table, which flows out from the wall, the work table, the built-in seat by the fireplace, as well as the bar, the toilet, the sink and the refrigerator and the storage shelves—all are machines designed for a specific purpose and anchored in place. (2)

They are not only fixed in the space; they fix the space. All of the machines and the domains around them create areas of specific use which delimit the flowing space of the living rooms and the corridor. Even the major space is formed by them.

In the Goethsch-Winkler house the living spaces are machine specific. The house is made up of elements which are each tightly fitted to a particular activity, machined as it were, to a very specific and limited number of actions.

Putting the machines inside the rooms
A condominium unit at the Sea Ranch illustrates an opposite approach. (3) Though admittedly a vacation house and therefore simpler than a year-round residence, it shows in one way what results from rigorously separating machines and their domains from rooms. Here the machines are placed in a compact tower set in the midst of a more casually composed living space. In the crawl space beneath the floor is the furnace.
On the main floor are a stove, refrigerator, sink, dishwasher, and kitchen storage; on a balcony above is a sink and a closet adjacent to a private space that contains a toilet and a bathtub. At the top is a bunk bed, a more primitive kind of machine, and the whole tower is laced about with still other simple machines—a ladder and some stairs, underneath the lowest of which is the water heater.

Even the telephone, the thermostat for the furnace, and the switches and dimmers for most of the lights in the house are located in this central machine core, so that there is an evident order and a simplicity to the whole, although its actual appearance is rather complex. The clarity and, above all, the specificity of this arrangement was of great concern to us, for as we have already noted, it allows the remaining area of the condominium to be a room pure and simple, a large stage.

Another house of ours, the Karas house in Monterey, California, has a machine of another shape right at its center. (4) The Karases, with all but one of their children grown, liked the wooded part of Monterey they lived in, but were tired of their large conventional ranch house. They asked us for a design which would allow them freedoms of spirit which their old house dampened. They owned a pleasant wooded lot at the edge of a forest, with a view over Monterey Bay; and they were anxious to keep to a budget which might maintain their high spirits in financial realms as well. (5)

The house is compact and almost square in plan. On the ground floor, a square doughnut of rooms surrounds a one-story block (the "machine") which contains fireplace (6), powder room, a small kitchen, a stair, and a furnace. On top of this block is a platform suitable for musicians, who are very much in evidence in this household.
At the second-floor level, alternate corners are enclosed for two bedrooms and a bath, all entered off the musicians' platform. And higher still, at the top of a ladder, is a sleeping platform for adventurous guests. The house is extraordinarily high, and in the two corners where there is no second-floor room the space goes up to the exposed rafters. On the north wall (7) a window above high bookshelves looks out onto a box painted white, which reflects sunlight into the house. A bright yellow painted circle acts as a surrogate sun, doubly unexpected on the north side and in this cool and often foggy forest.

**Putting the machines outside the rooms**

Another approach to the wedding of rooms and machines can be seen in the Bonham cabin in the Santa Cruz Mountains, which we have already described. In it the kitchen and bathroom are so small, so specific, that they become in our terms machine domains, and are in saddlebag lean-tos attached to the one main room of the house.

The same approach, in a totally different time and place, was used in a design of a vacation house for an English conductor and scholar who wanted a house for work as well as leisure away from London. (8) The site chosen is a two-acre rectangle bounded on one side by a village lane, on another by a hedgerow blocking the view to the neighboring farmer's pig pen, and on another by a splendidly expansive view east across the Hollandsesque landscape of Norfolk. On the south and final side, the neighbor is a handsome but simple thirteenth-century parish church, whose original stained-glass windows have been replaced by clear ones so that from the site there is a view not only of the church but through it as well.

The little house consists of two tall brick masses at right angles to each other, white-
washed, and with their sloping roofs covered with red concrete tiles—a common and cheap building material in Britain. Into the angle and facing the view and the church, a Great Room is nestled. It looks rather like a quartered gazebo, and is made of wood and glass with a tin roof.

In this house, as in the Bonham one, the other rooms—here a study, kitchen, stair hall, two tiny bedrooms and baths—are sufficiently small to be regarded as machine domains, and they flank the Great Room on two sides of the house.

Both houses are reduced, eroded versions of the idea of the Great Room within. In their cases, though, unlike the cases of the Italian and English Palladian palaces we have described, the Great Room is simply the only room, the only empty stage for human improvisation. Whatever is left over, the specifics, are consigned to adjacent machine domains.

The advantage of this arrangement is its simplicity and economy. Instead of a series of moderately sized rooms, too small for much improvisation and too large for most specific activities, both houses provide one generous room and, clearly and separately defined, a group of machine domains.

Sandwiching the machines between the rooms
Two other houses which we have discussed already provide examples of the final way we know to join rooms and machines.

Robert Venturi's project for a house in Chestnut Hill lines all the rooms and machines up in a row, first a room, then a machine, then a room, and so on. Louis Kahn's Goldenberg house project, following a more complex set of requirements, layers the rooms and machines around the central courtyard in a less immediately perceived, but equally distinct order (page 169).

Our house for the William Jewell family in Orinda, California, is another example of a room and machine sandwich. (9-10) Mrs. Jewell is from New England and was not much enamored of California indoor-outdoor living. Though she wanted the clarity and separateness of good Georgian rooms, and had a scrapbook full of fine New England houses, she did not want to shut out or deny the particularly gentle and sunny climate in the valley behind the hills east of San Francisco Bay. Nor did she want the hot, uncomfortable, and faintly prickly sensation which the uncompromised reproduction of "Georgian" houses creates in these climes.

Our response was to make four rooms, smooth-walled and simply shaped, opening onto a set of porches and bays more roughly finished and from there to the outside. (11) Bathrooms and laundry are sandwiched between the rooms on the first and second floors, leaving the main rooms clearly defined, although one, a large cooking room, has machines within it.

The virtue of sandwiching is that it allows for a set of rooms of similar size, assembled in rather traditional ways, unbroken and unspoiled by the unwanted intrusion of machines and their domains.

Accommodating the automobile
Once the assembly of rooms and machines has been considered, it is worth noting the problem of connecting the whole house to that special machine, the automobile. Is it a friend?—in which case you admit it; or a foe?—in which case you exclude it. Do you need to step from your car into your house under cover immediately, or do you prefer to leave the world of the road behind and walk some distance to the house? Should the automobile arrive at the front door or back, or both places? What form of shelter,
9. Plan, Jewell house, Orinda, California, by MLTW, 1964

10. Section, Jewell house

11. Exterior, Jewell house
if any, does it need: a garage, a carport, or just plastic wrapping?

In answering these questions it is important to note as well that the farther from the public road the car travels the more it will cost to prepare a route for it, and that the more you build to shelter it, the less you will be able to build to shelter yourself. Consider what else you can do with the shelter, what other machines might share this domain, or how the space, when it is empty, might, for example, sometimes be a place for children's games or theatricals. Remember, too, how the structures which shelter the car may also help configure the site, and also affect the relationship between the public world of the road and the private world of the house. For houses which are isolated and remote the automobile is, in effect, a kind of mobile porch.

As we have already noted, at the Johnson house at the Sea Ranch the automobile is excluded by a large redwood fence between the parking area and the house. The fence has a sliding door in it, which opens, with only a little effort, enough for people to pass through. With a bigger push, it opens more to let cars or trucks enter when necessary. This fence is not only a screen between the cars and the house, it also screens the house from the road. The screen makes a sheltered enclosure that contrasts to the spectacular views of the Pacific from the other side of the house.

Another solution is used in many of the houses in Santa Barbara, which have a walled entry court into which the automobile can pass and stop either at the front door or in a carport.

In more densely populated suburbs, though, there is usually a blatant inconsistency in the way the automobile is allowed to approach the house. Once, as we have seen in Edgartown, houses in American towns nestled up close to the street, and with a prominently placed doorway they invited entrance. "Traditional" houses in our suburbs, now set far back from the street, still follow this pattern, as though the car had never been invented. Since it has, the result is that the carefully formed front door for pedestrian entrance almost never gets used, and nearly everyone comes into the house from a garage or carport, and after tripping over rakes, lawn mowers, and roller skates, winds up in the kitchen.

A short-term remedy to this problem can be seen in the site plan of the Smyth house, in North Carolina. Here, in somewhat grudging concert with its stolid suburban neighbors, the house confronts the street from the vantage of its required seventy-five-foot setback. It is realistically presumed, though, that everyone will arrive at the house by car, and so an ample driveway is built up to the house. Near its end a set of parking spaces is provided for visitors, and a set of steps and a walkway invite them to the front door. For the owners the driveway continues into the garage, which is connected to the house by an arcade leading, not into the kitchen, though near it, but into the central hall of the house. (12)

Another remedy is to place the front door near the garage so that the part of the house which invites entrance most strongly can also accommodate the most likely mode of arrival.

We have, then, in our search for clarity, some fairly simple categories: six kinds of room arrangement, four ways of introducing machine domains, twenty-four basic combinations.

Next comes the chance, with four ways of fitting the house to the land, to bring to over eighty the plausible, but still unembroidered, schematic possibilities.