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# QUALITY BUDGET HOUSES

A Treasury of 100 Architect-Designed Houses from \$5,000 to \$20,000

#### KATHERINE MORROW FORD

former Architectural Consultant HOUSE & GARDEN

and

THOMAS H. CREIGHTON

Editor PROGRESSIVE ARCHITECTURE

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By the same authors

#### THE AMERICAN HOUSE TODAY

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# YOUR BUDGET AND YOUR HOUSE

How to face the facts of life about low-budget building

This is a book about the things you have to know — and the things you have to do—to get a good, well designed and well built house on a limited budget. It tries to be a realistic book because the authors believe you are not interested in fantasy or wishful thinking. Let us suppose that you want a house of your own. You have been talking about it and dreaming about it and have saved a great file of clippings from magazines. But you can not make up your mind, in the first place, whether you can afford it and whether it is wise; in the second place, you can't decide where to turn for advice and how to go about the preliminary steps of looking and comparing and studying.

Perhaps there is some money put away in the bank, and your credit is good for a reasonable sort of mortgage arrangement. The family income also may be secure, and the prospects for increases may be practically guaranteed. And yet you wonder if it would be foolish to obligate yourselves for a heavy monthly payment for years to come and to borrow to the point where sleep might be lost worrying about it. How big a budget does one really need for the sort of house we want, you ask yourselves? How about these houses some of the magazines show that Paul and Paulette built for a song, doing most of the work themselves on the weekends? Is that really possible? All of the beautiful things that have gone into the scrapbook must have cost their owners a lot of money. Perhaps you have heard stories about families who got in deeper than they realized—who found that extras appeared, that bids were not accurate, and that prices rose. You know perfectly well you would not want to risk the capital you have so painstakingly piled up in the savings account in that way.

Then there's the question about buying a builder's development house, all finished, with possibilities of being as attractive as the sample house you went out to see. But then you realize this must be weighed against planning your own, with the gadgets and tricks that you've dreamt of all these years built right in the way you want them. There are some imaginative and understanding architects in town — you've seen their work published in magazines or newspapers — and you've looked at some of their houses as you drove past, and felt envy for the lucky owners. You wonder whether they would be interested in talking to you as a client — a client with a limited budget and unlimited ideas.

This book is an attempt to answer some of these questions and many more that may not have occurred to you. Any intelligent person knows that a lot of nonsense has been written about how to build houses inexpensively. You can't produce miracles with brick and stone—it costs just so much to buy brick, and it costs just so much to lay stone. At present (things may change in time) it is possible for any honest builder or architect to tell you just about how much a square foot a well-built house will cost to build in your area, and not much can be done to alter that figure. It is possible, nevertheless, to design and build a special house to suit your needs, with a limited budget, in any part of the country. This book proves it: it is full of illustrations of houses built (in the last few years) for people like you at astonishingly low costs — every one at less than \$20,000 for the house, including architect's fee. (Land costs vary, of course, and must be added.) Each has been designed by a good architect.

In the chapters that follow, the authors will explain how this was done in 100 cases. If your budget is limited and you still want a good, architect-designed house, you must recognize certain facts of life. You must know what the designer can do for you and how he can do it. You must know how to make the most of limited space. You must know how to save on materials and construction methods. You must know how to plan for the future—to add more room when it is economically feasible. You must realize what things can be left out, and what you can do later.

You may be interested in the way the houses for this book were garnered from all parts of the country. The authors were in touch with innumerable architects around the United States, told them that they were going to write a book on how to produce a good house on a small budget, and asked them if they had any interesting examples to use as illustrations. Many firstrate architects had designed such houses—more, as a matter of fact, than we had expected. All of them told us how the aim had been accomplished; sometimes by reducing space intelligently without losing needed areas; sometimes by choosing a certain method of building. But no matter what means were employed, one thing was always true of these houses: the architect and the family for whom he was designing (or the builder, in some instances, who was planning a development) worked closely together and faced problems as a team. The family, as one part of the team, is now living in a house they had not dared believe possible; the other half of the team, the architect, has helped one more family find a way to live as it wishes.

Almost everyone of the houses in this book is by an architect whose practice has been concentrated in the house-design field. This is not to say that they have done *only* houses — it is just that they have made a special study of houses. The group whose work is represented in this book includes some of the world's most famous architects. To pick a few examples (which is unfair to the others, because the list could include many more) there are: Richard Neutra (pages 28, 42, 80), now replanning the Island of

Guam — schools, housing, civic center, industry, and all; Victor Gruen and his associates (page 112), outstanding authorities on shopping centers; Schweikher & Elting (page 108), designers of hospitals and college buildings; The Architects Collaborative (page 158), responsible for Harvard's new Graduate Center among other famous jobs; William Wurster (pages 12, 58, 122), currently designing factories, libraries, and many other types of buildings.

Any architect will tell you, if you get him in a mellow mood, that the design of a low-cost, small house is the most difficult, the most financially unrewarding, and the most interesting architectural problem that there is. Some critics have said wrongly, we think — that the small house is not architecture because it has none of the problems of monumental scale and historical importance that a town hall, for instance, presents. Such critics ignore the fact that the design of a house requires of the designer all the judgment in planning, scale, proportion, structure, use of materials, relationship to site, and all the rest, that the most monumental monument requires. The Hunters — husband and wife architectural team whose work is illustrated on page 136 — have this to say about their small-house practice: "We believe that the architect should participate in low-budget house work to raise the standard of building in this category through better plans, better esthetic, and the protection of the owner's investment. Careful detailing and choice of materials in the architect's office can save on-the-job labor and provide reasonable quality for a lower price than haphazard, unplanned building. In doing this the architect can more than save the owner his fee in dollars, while adding other real and tangible values to the house."

A word about how this book should be used. In addition to general discussion of each Chapter topic, there are case

studies of individual houses giving cost and plan facts, materials and economies. Plans are all shown at the scale of 1/16 inch to the foot, which means that you can use a ruler and that every inch you measure on a plan is equal to 16 feet. Costs are given as accurately as possible, and include house construction and architect's fee—they do not include cost of land or landscaping because these are such variable items.

Almost all of the houses shown were built in the last few years; the year of construction is given in each case. To estimate what those houses would cost in the same area in 1954, use the following rule of thumb: if the house was built in 1950, multiply by 1.13; if it was built in 1951, multiply by 1.06; if in 1952, by 1.02; if in 1953, by 1.01.

To adjust for regional differences of cost, remember the following general facts. If the country is divided into four basic regions, building costs run, from highest to lowest, like this: Northeast, Midwest, West Coast, Southeast. There is a 25% to 30% spread between the highest (Northeast) and the lowest (Southeast). Midwest is slightly higher than the West Coast; these two regions run about 15% higher than the Southeast, and about 10% lower than the Northeast.

There is no attempt here to give you details of financing; you will have to talk these matters over with your bank. Just remember four basic facts about mortgages: a small down payment means greater monthly payments; the longer your amortization period, the lower your monthly payments; the lower the interest rate on your mortgage, the lower, also, the monthly payments; certain tax and interest payments are deductible from your income tax. Finally, don't overlook extra costs — landscaping, various contingencies, title, lawyers, and other fees.

If you are seriously planning to build a house, it is necessary to understand certain technical terms which architects and builders bandy about. Some of these terms are used throughout this book, so a brief glossary is given below.

Structural system or frame is the bare skeleton of upright members and cross members on which outside finishes and interior finishes are fastened. It includes posts or studs (uprights) and beams, joists and girders (horizontal framing members) as well as rafters (roof beams).

Rigid frame is a structural frame in which uprights and cross-pieces are either one member, bent to fit, or several members fastened so securely that the connection is as strong as the members themselves.

Module is a dimension used with repetition and regularity to space posts and beams. Modular construction—a structure based on a module—gains economy through standardization of parts and elimination of waste.

Cantilever is a projecting structural support (like a beam or a girder or a reinforced slab) which is securely anchored back beyond the projection or overhang.

Studs are small (2 inches x 4 inches is the accepted dimension) upright framing members, usually 16 inches on center.

Posts are heavier members than studs, usually spaced farther apart.

Girders are heavy horizontal framing members, usually supporting beams.

Beams or joists are horizontal framing members stretching between walls, between a wall and a girder, or between girders.

Ridge beam in a pitched-roof house runs the long way of the roof and receives the rafters at the top of the ridge.

Collar beam is like the cross bar in an A—it ties together the rafters in a pitched-roof house.

Plank is the term usually applied to boards 2 inches or more thick.

Mill construction is a method of building using planks for floors and roofs, and posts for vertical supports.

Siding is finish material on the outside; usually placed over sheathing.

Tongue and groove boards are the kind that lock together, and can't open up for that reason.

*V-joint* or *V-grooved* boards (wood, or wallboard material) have bevels cut on the edges, so that the joint is accented and irregularities are not so obvious.

Batten is a strip nailed along the joint between boards—another way of concealing irregularities and protecting the joint.

Shed roof is one in which the pitch is in one direction only, giving a greater height at one side of the house than at the other.

Clerestory is the vertical space left between two roof lines at different levels. It is a means of gaining light and ventilation in the center of a house, without resorting to skylights.



# THE SITE

#### How to economize on your site

The budget-minded family that needs and is determined to have a house with as much living space as possible will start watching the pennies right from the start—as soon as the week-end expeditions, searching for a site, begin. You don't want to waste money on land, and yet you don't want to buy truly undesirable property on which to build your all-important house. What are the standards to set up, what are the things to look for, and what are the false economies to guard against?

In the first place, don't restrict yourself too much by buying too small a plot in an expensive neighborhood. The house shown on the facing page (designed by Wurster, Bernardi & Emmons), which is illustrated and discussed in detail on the following four pages, is on a half-acre site which was inexpensive because it was beyond the commuting area. One bane of presentday home building in this country is the tiny plot. Even speculative home-builders are beginning to realize that lack of privacy, too-dense population in a community, and tiresome rows of crowded homes are not pleasant background for home owners. The small lot problem can be solved by ingenious planning, and there are examples in this book to illustrate it, so if you must live in a neighborhood where land costs are high, and you must restrict yourself to a small slice of land, don't despair. But if you can find more land-space in a section which is pleasant, not so crowded, and promises to grow into a nice neighborhood in the future, you'll find the planning of the house itself and its landscape more simple and satisfactory.



LOCATION
ARCHITECTS
OWNER

Los Gatos, California Wurster, Bernardi & Emmons Col. & Mrs. Wade D. Killen

cost facts: \$16,695 in 1950. 1080 square feet at \$15.40 per square foot. Budget included wood fences, built-in bookcase, dining-room sideboard and chest of drawers.

MATERIALS: Wood frame; concrete slab, floors and foundation. Redwood siding and trim. Batt insulation in ceiling.

PLAN FACTS: Colonel Killen, a retired Army man, wanted to settle down in a house more specifically pleasant for his family than any ready-built number he had seen. He searched long for a site which would allow him to build

for his \$20,000 budget. Well-placed on the lot, the house is a good small, two-bedroom scheme with broad lawns and concreted patios. Rooms are small but not cramped — glass walls, protected by roof overhangs, make the rooms seem bigger. The property was developed for different uses by a careful land-scaping.

was cheaper than wood floor on joists. No floor covering — concrete is integrally colored. Standard parts, such as double-hung windows, saved money. Flat roof was inexpensive. Plan economies include open carport, lack of entrance hall.

BUDGET SUGGESTIONS: Plaster might have been less costly than redwood interior walls.

One reason for hiring a good architect at this point is that he can help you find ways to use what appears to the unimaginative to be *undesirable* land. (But why not have him help you choose your site, if you don't yet have it!) Steep sites, which the conventional builder considers too costly to build on, can often be bought for less than a flat site. And on these steep sites, if the planning is cleverly handled, visually exciting solutions and space-saving plan schemes can often be worked out.

Don't be too romantic about this, however. It's fine to get up on a hillside overlooking the prosaic town dwellers, and the pioneering-minded may want to build where no community has yet started. One must be practical, however, and think of:

Presence of utilities (water, gas, light, sewers)

Nearness of schools

Zoning (is the neighborhood protected as residential area?)

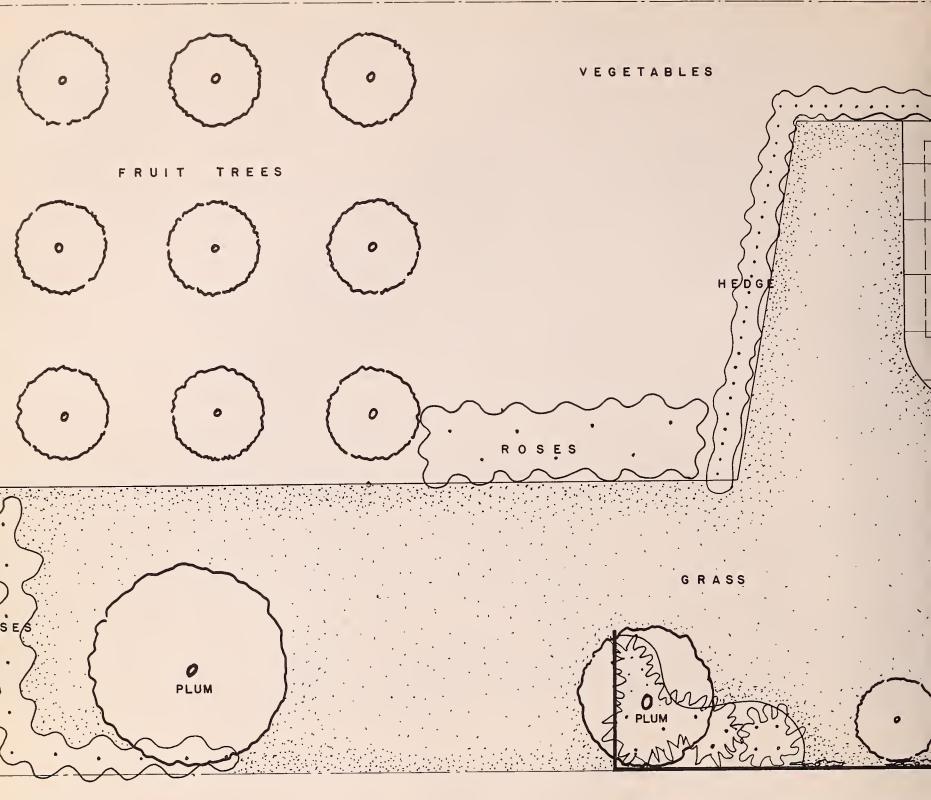
Taxes, now and in the forseeable future

Assessments (due, or likely to become due)

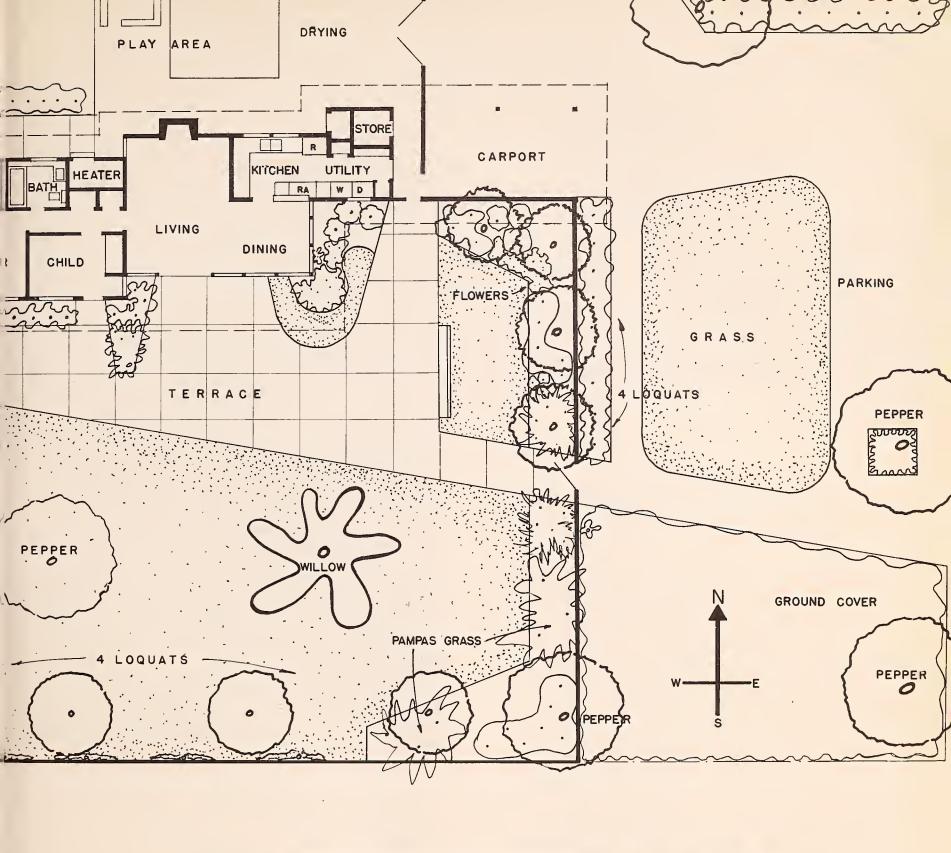
Nuisances (noise, smog, smoke, etc.)

Transportation facilities.

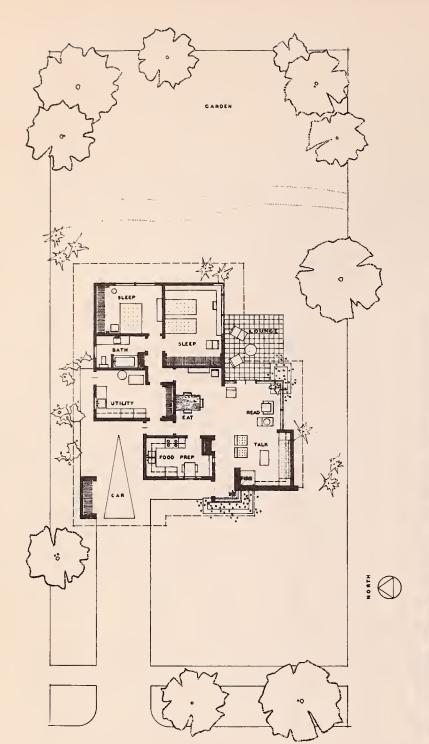
The house which is pictured and described on the opposite and following two pages was designed for a flat site which was found after a long search. This is an excellent example of the economies that can be found in flat building land. The site is a good one for many reasons: it is large enough not to restrict planning of the house; it was not expensive, because it is in an area not yet extensively developed; investigation showed that the climate is good, and that the neighborhood would likely develop into a desirable residential area; obviously it has a fine view, with a number of well-established trees.



One problem the planner faces, when he is working with a flat suburban site, is the fact that privacy from the street is difficult to maintain. The passerby can look right into the property on a direct eye level. The Killen house, as the plan above and the photograph on page 12 indicate, solves this problem by opening the carport off the street and stretching a very good-looking fence across the rest of the street front of the property. Here this is not, as it is in some cases, an unfriendly aspect of the house from the street.





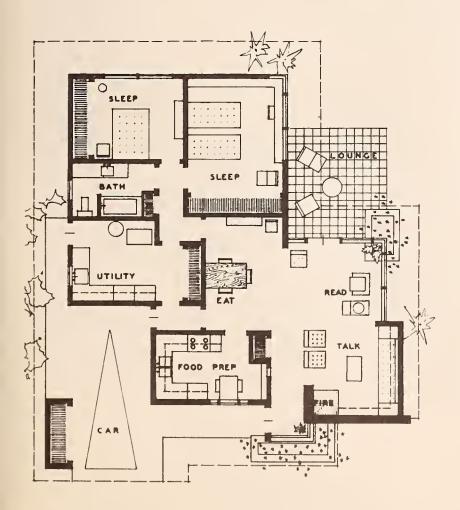




A neat solution to the vexing problem of a typical long and narrow city lot, with houses built close on either side, is the Melvin house in Madison, Wisconsin, designed by William Kaeser. The entrance side of the house facing the street, with a carport approach, has solid walls, with the exception of a kitchen window—thus insuring privacy for the living and sleeping parts of the house. The rear of the plot is reserved for a garden and the living terrace.

6





ARCHITECT Madison, Wisconsin
William V. Kaeser
OWNERS Mr. and Mrs. E. K. Melvin

COST FACTS: \$20,000 in 1951. 1300 square feet at \$13 per square foot.

**MATERIALS:** Wood frame with redwood siding.

PLAN FACTS: With no children to provide for, Mr. and Mrs. Melvin's program for building was a simple one. They wanted an easy-to-care-for house with two bedrooms. The living area, which is nicely set apart from the bedroom and bath portion of the house, has space allocated for conversation and relaxation around the fireplace, a well-lighted area for reading, and dining space conveniently near the kitchen. The outdoor living terrace, opening from the living room, is placed at the rear of the house for privacy from the street. Both the utility room and kitchen have convenient access from the carport, as does the main front entrance.

**BUDGET SUGGESTIONS:** The architect points out that "In this cold country it is not possible to leave out much except in the way of finishes." In this case, the only possible economies on a more restricted budget would be to omit wood and tile finishes inside.



ARCHITECTS Hammel & Green

OWNERS Mr. and Mrs. Roy Strong

**COST FACTS:** \$19,800 in 1952. 1370 square

feet at \$14.70 per square foot.

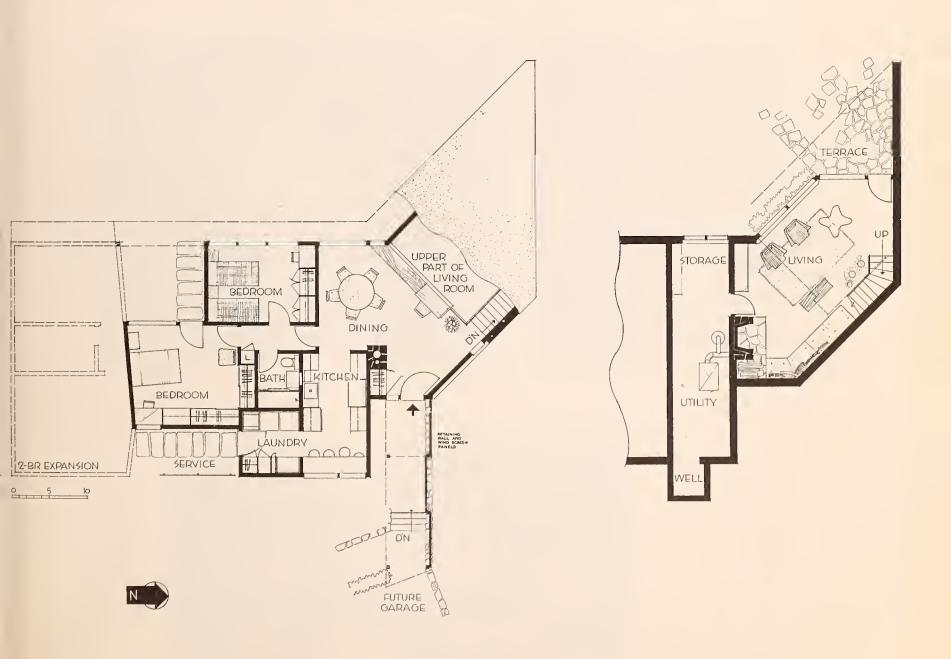
**MATERIALS:** Concrete block foundation and frame superstructure. Exterior, redwood tongue and groove, Masonite panels, pine fascias, and pitch and gravel roof.

PLAN FACTS: Completely informal living, combined with outdoor living and its sports plus a floral and landscaping business, were the basic interests of Mr. and Mrs. Strong. With two children young enough to occupy one bedroom at present, they started with a minimum of two bedrooms and planned to add at a later date the two-bedroom and bath extension, as indicated on the floor plan opposite. When this takes place, the master bedroom will become a multi-purpose room. The photograph to the right shows how the living room fireplace tucks in under the dining room level. **ECONOMIES:** Concentration of mechanical equipment; minimum bathroom with a clerestory; 7-foot-4-inch ceiling heights (with exception of the high part of the living room). Mr. Strong dug his own well and built the stone chimney of the fireplace.

**BUDGET SUGGESTIONS:** A less expensive heating system could be substituted for the radiant panel heating. Other economies could be less expensive wall materials, omission of sealed double glazing.



Seldom, if ever, does a hillside present a typical problem. That there is more than one way to best exploit such a site is demonstrated by the house shown here and on the opposite page, in Minnesota. Stepping the house down the slope and tucking it into the hill is a natural solution, and in this instance resulted in a two-level house. One level contains two bedrooms, bath, dining room, kitchen, and laundry. The high-ceilinged living room, on the lower level, is reached by means of a staircase leading from the dining room. On this lower level, with its own outside entrance, are housed the utility, well, and storage room.





LOCATION
ARCHITECTS
OWNER

Sausalito, California Campbell & Wong Mrs. Worth Oswald

COST FACTS: Approximately \$13,700 in 1952. 950 square feet at \$14.50 per square foot.

MATERIALS: Redwood inside and out, with post and beam construction.

PLAN FACTS: For a person living alone a much more open plan is entirely reasonable, since privacy between rooms is not essential. Such open planning was a specific request of Mrs. Oswald. With most of the space given over to living and dining area, combined with the floor-to-ceiling glass wall opening to the cantilevered porch, this in fact small house

has a sense of much spaciousness. No door between the dining space and bedroom, and a partial partition (several feet below the ceiling, separating kitchen and entrance) not only increase the open airy feeling but help to keep costs down in construction. The kitchen thus enjoys the wide marine view and is daylighted by means of a skylight.

**ECONOMIES:** Use of economical construction system, in addition to a saving on grading the site; also the open plan which dispenses with solid partitions between areas.

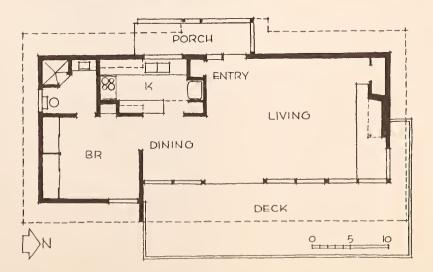
**BUDGET SUGGESTIONS:** Less expensive finishes might have been used, such as less redwood throughout and hand-made tile in kitchen and bath.



A house on stilts is an economical way of coping with an almost vertical steep site. The "economy" is in saving the cost of grading. This method lifts the house high in the air, and in the case of Mrs. Oswald's house (shown on these two pages) gives a full-range uninterrupted view of San Francisco Bay. A cantilevered deck-porch, extending the entire length of the living-dining area, adds 450 square feet of outdoor living space. This deck in combination with the enclosed lower space beneath the house (which will be developed into rooms in the future) avoids the sometimes long-legged appearance of the house-on-stilts.









LOCATION
ARCHITECT
OWNERS

Hingham, Massachusetts Hugh Stubbins, Jr. Mr. and Mrs. W. E. Aiken

**COST FACTS:** \$17,360 in 1950. 1526 square feet at \$11.36 per square foot.

MATERIALS: Cement block foundation, Standard frame; surfaced outside with vertical redwood; inside with plaster. Built-up tar and gravel roof. Wood joist floors with oak strip flooring, except for linoleum in kitchen.

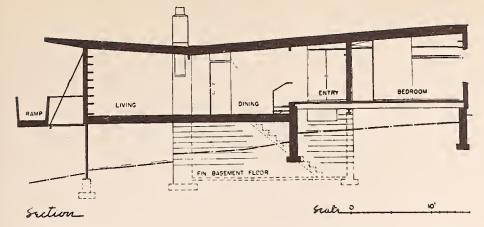
PLAN FACTS: The living-dining room was organized for two favored exposures: to the south, the woodland; to the west, an ocean view. A sun deck or balcony on the western end of the house was connected to the flat-top rock by a small ramp. The butterfly roof, Mr. Stubbins emphasizes, was used not as a stylish element but as the simplest method of accommodating the two levels of the living area and

also as a counter angle to the ground. The exposed beams in the living-dining room are a logical expression of the simple structure.

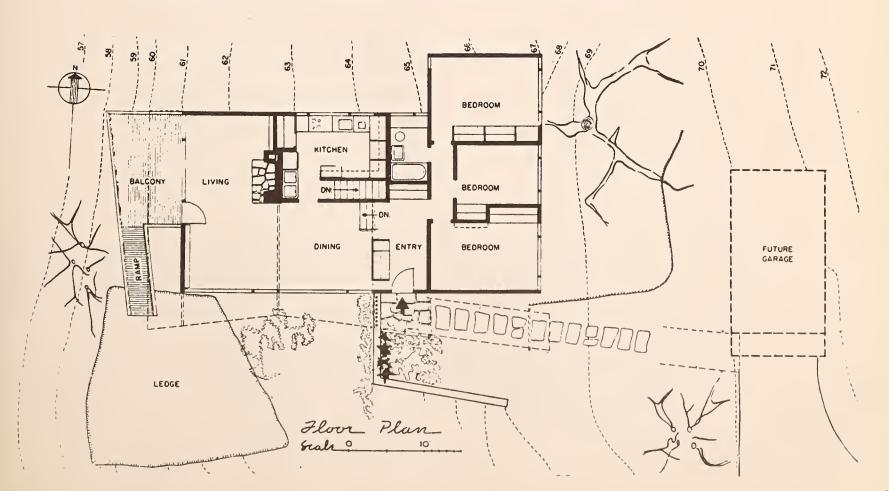
Summing up his solution to the combined problems and restrictions, the architect says: "The basic idea of the house was to achieve the maximum visual spaciousness, including all the basic living requirements for such a family, in a simple form that would lend itself to a limited budget and the special requirements of the site." His successful solution is borne out by another architect who commented: "The owner of this structure must often congratulate himself on hiring an architect who found it possible to provide so much usable space for so little money."

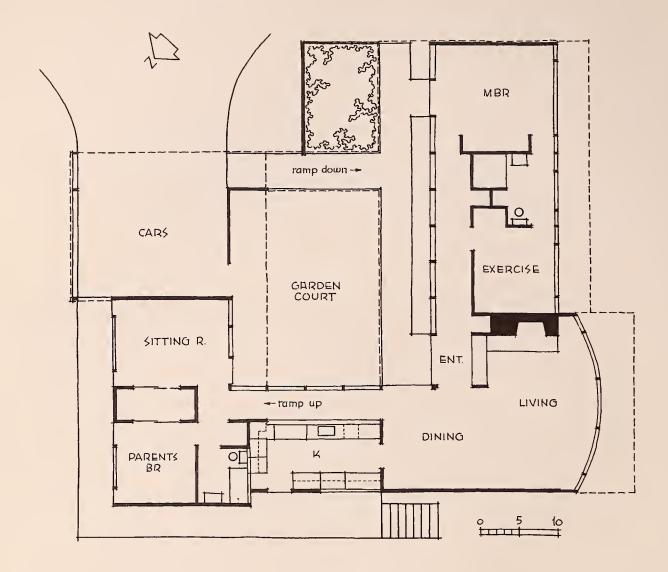
**ECONOMIES:** Compactness, simple form, concentration of plumbing for economy in piping installation. The whole concept was based on economizing at every possible point.





When a family consisting of husband, wife, two school-age sons and a mother-in-law, has a limited budget, is weary of apartment living, and wants above all else a home of its own, it is not necessary to despair. This was the case of the Aiken family. They realized that their budget would not pay for an elaborate house, but they were willing to make certain sacrifices—such as minimum sleeping quarters—in order to have a home they could call their own. Where there is a will, and a good architect to turn to, there is a way. The site the Aikens acquired also presented its own special problem. Two acres of wooded land on a ledgy hill-side, sloping away to the west, gently at first, then abruptly to a salt marsh and to a distant view of Hingham Harbor. Adjacent to the best building site was a large dome-like rock with a flat top. The skillful way in which architect Hugh Stubbins turned all of these factors to advantage is apparent on these pages.





Built on a ridge of the Berkeley Hills, overlooking the San Francisco Bay area, this house has two unusual aspects for a single small site. The main block of the house opens in a westerly direction to a spectacular view; the outward-curving window wall of the living room gives a breathtaking feeling of being perched in the sky among the clouds. In contrast, is an intimate central garden court surrounded on three sides by the house, and a delightful private garden off the master bedroom. At the rear of the house, utilizing the remaining ground on this small plot, are terraced retaining walls with flowering plants and rare dwarf trees—a long-time hobby of the owners.



LOCATION
ARCHITECT
OWNER

Berkeley Hills, California Henry Hill Karl Erskine Von Hacht

COST FACTS: Approximately \$20,000 in 1952. 1820 square feet at \$11 per square foot.

MATERIALS: Wood frame, redwood. Case-

work and doors Philippine mahogany. Radiant heat under oak floors.

PLAN FACTS: Aside from the fact that the ridge property, actually very tiny in its overall dimensions, presented a formidable challenge to the architect, he was faced also with a very special type of design requirement. The use of the site is a particularly ingenious one,

since the problem was to provide ramps, wide corridors and doorways, and easy access to any part of the house and garden for a partially paralyzed young man. His master bedroom, bath and exercise room — all opening to the expansive view — are located in the main portion of the house with the living room. This bedroom opens through wide sliding doors to an enclosed private garden. His parents' rooms and bath are in a separate wing, on the opposite side of the garden court, and connected to the main house by a ramp running past the kitchen. One drives down the hill to the ridge to enter the garage which has access to the entrance ramp and garden court.







LOCATION
ARCHITECT
OWNER

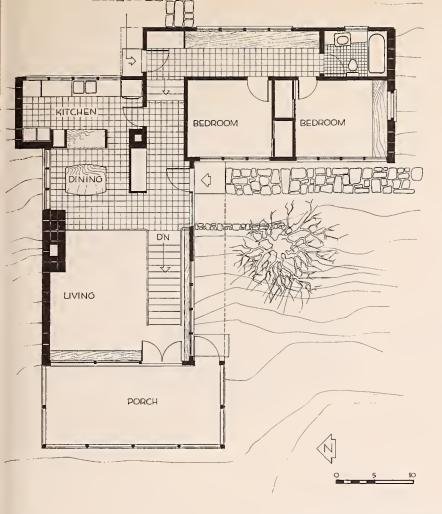
St. Paul, Minnesota Norman C. Nagle Stanley Miller

cost facts: \$18,360 in 1950. 1700 square feet at \$11 per square foot. Budget included built-in furniture, window bench, corridor storage, pass-bar between kitchen and dining. MATERIALS: Concrete block and redwood frame. Utility windows used in combination with fixed units.

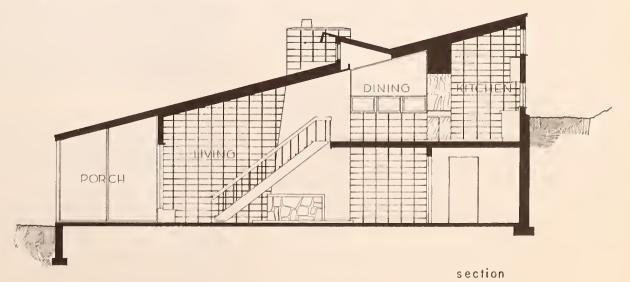
PLAN FACTS: What happens under the sloping roof, which parallels the slant of the hillside, is a dexterous organization of space which fulfills the Millers' wish to have the living area isolated from the bedrooms. The extra ceiling height gained because of the roof pitch gives airiness to the living room and tucks in a strategically located dining mezzanine. The alcove formed in one end of the living room by the dining platform is easily converted into an extra sleeping space for an occasional guest; by means of curtains run along a track under the mezzanine floor, it may be closed off for privacy when desired.

ECONOMIES: Balcony over a portion of the living room instead of a completely separate dining room. Unpainted plaster ceilings. The pass-bar between kitchen and dining space takes the place of a breakfast nook. There is an intentional minimum of corridor walls and circulation. The bedroom corridor was planned to include off-season storage space. Alcove in living room serves as guest room.





The design of the Miller house evolves from the contour of its hillside site, which is 69 feet wide and 150 feet down hill. A one-way pitched roof follows the line of the slope of the hill. Entrance is on the upper level, with the house expanding downward. Thus the interior living arrangements develop on a vertical rather than a horizontal line. Although building on a hill-side is generally more expensive than on a flat site, this one paid its way. The architect estimates that the construction cost was approximately three to five percent higher than it might have been for a house on a flat site, but this cost was more than off-set by the saving on land price: land was purchased for \$1,500 but would have cost \$2,500 on top of the hill.



LOCATION
ARCHITECT
OWNERS

Beverly Hills, California

Richard J. Neutra

Mr. and Mrs. G. Rourke

COST FACTS: Below \$20,000 in 1949. 1250 square feet at \$15.60 per square foot.

MATERIALS: Wood and plaster, with timber chassis.

PLAN FACTS: Still another type of challenging problem was posed for architect Richard Neutra, with a steep slope on an odd irregular shaped lot. By careful study of the terrain, grading was kept to an absolute minimum. The main problem was to fit the house to the steep hillside, and at the same time provide some level outside sitting area, since a patio was one of the stated requirements of the clients. The commendable solution arrived at was the development of a paved terrace opening directly from the entire south wall of the living room. Retaining walls, generously planted, make the enclosed border for this spacious patio-terrace (see photographs below), and at the same time give wash-out protection from the rear of the steep hillside. In addition a balcony on the opposite side of the house makes possible full enjoyment of the westerly valley view. Another requirement was for a separate room and bath for a grown-up son who spends only part of his time on the West Coast. With private entrance, these quarters are adjacent to the service area on the eastern end of the house, so placed as to insure privacy for the main house and the occasionally used apartment.

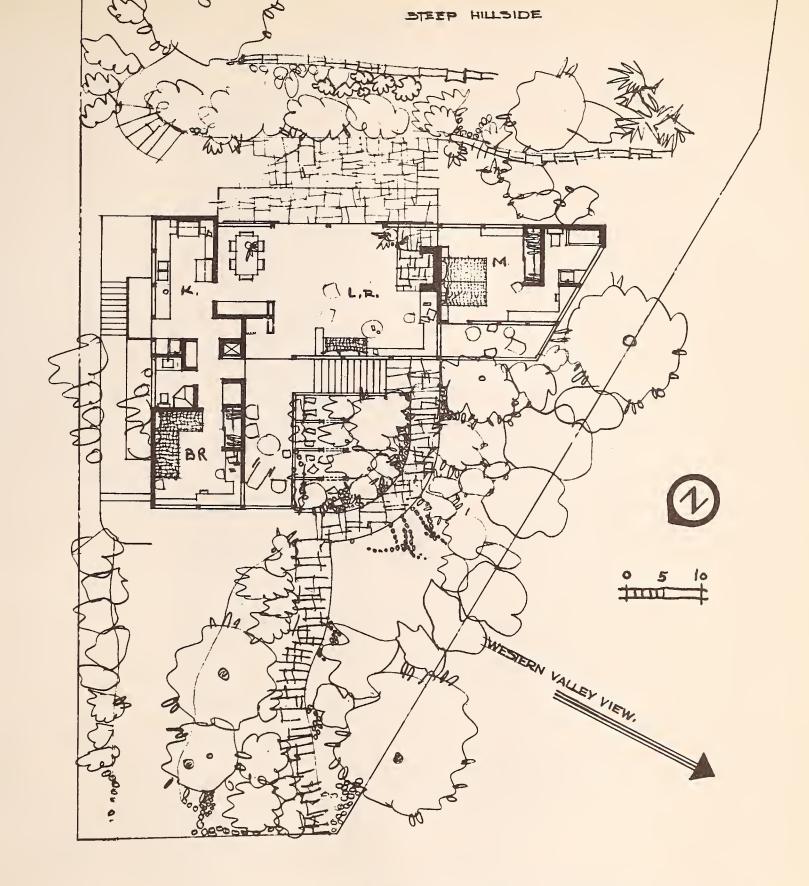
**ECONOMIES:** Skillfully planned layout avoided inclusion of costly halls and corridors; economical use of sloping site.

**BUDGET SUGGESTIONS:** The built-in furniture and wall wainscoting could have been omitted or postponed.









The variety and types of sites discussed in the preceding pages indicate that there are an infinite number of ways which thoughtful site planning and house planning can utilize, to take advantage of less expensive property which most people would pass over as too small, too narrow, too steep, or too public.

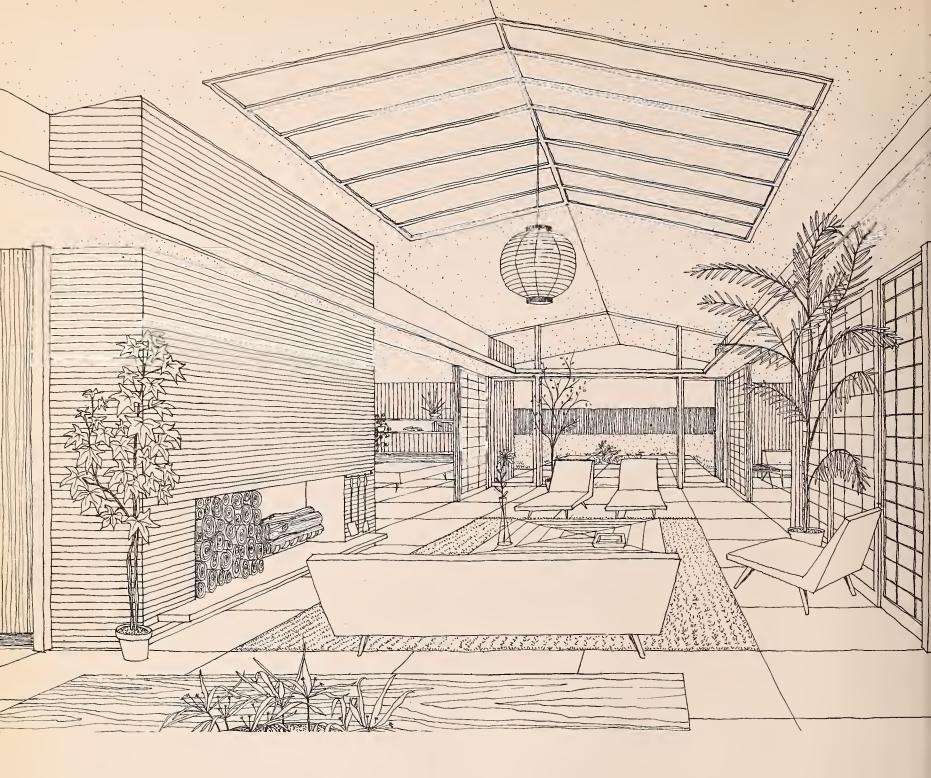


### **USE OF SPACE**

How to save on the space in your house

It is an annoying fact to the budget-minded that the cost per square foot for the house you want to build cannot be reduced very much under ordinary circumstances. (This book is full of extraordinary-circumstanced houses, which prove the point by being exceptions to it. If you build your house with some of your own labor, or if you use totally ingenious construction systems and materials, the normal square-foot cost will no longer apply). Generally speaking, the most you can hope to do in the way of reducing the cost of each square foot of space is to make minor economies—choose the least expensive finishes, postpone certain work, and so on, as other chapters of this book indicate. Every square foot of space is going to cost you somewhere between \$10 and \$18, depending on your type of construction and your locality. To translate this into very simple terms (as accurate as any over-simplification can be) it means that a normal-sized bedroom will cost about \$1,500; maybe more. You need a bedroom; but what about space that is simply for moving around in circulation space, as the architects call it—halls and corridors and such? A hallway running past that \$1,500 bedroom, ten feet long, will add at least \$400 to your budget.

A warning should be injected at this point about figuring square foot costs in relation to the size of your house. Don't expect to save a great deal by cutting off a few feet from the length or the breadth of the house. The reason for this is that the most expensive part of the house is the "mechanical core"—the equipment and all the piping and wiring that goes with it. This remains, no matter what else you eliminate.



LOCATION
ARCHITECT
OWNER

Montauk Point, L. I., N. Y. Edward D. Stone Builder

COST FACTS: Estimated cost under \$20,000. 1200 square feet at approximately \$16 per square foot.

MATERIALS: Post and beam construction, wood. Concrete floor; cypress siding. Built to a 2-foot module. Plastic skylight; bamboo blind for summer on exterior

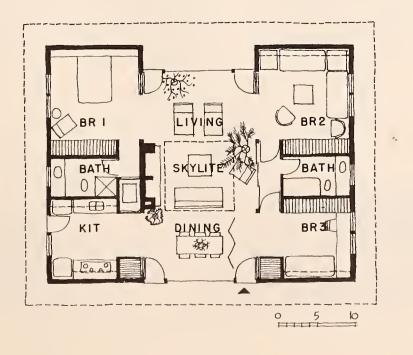
PLAN FACTS: To create one big area of space in a 1200 square foot house, architect Edward Stone placed the living and dining room directly in the center of this rectangular plan.

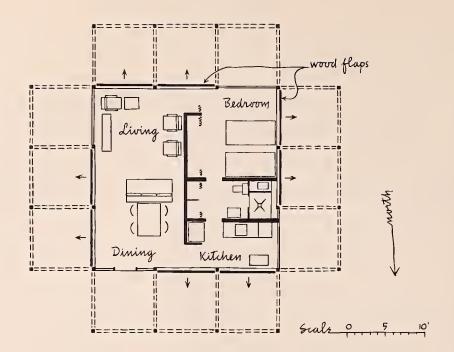
Its spaciousness is further enhanced by the pitched ceiling, floor-to-roof glass walls at opposite ends, and plastic skylight in the middle of the big room. From this central space one may reach directly two bedrooms and a bath on one side, and a bedroom, bath and kitchen on the opposite side. There is privacy for both bathrooms, placed as they are between the storage and wardrobe walls of the adjoining rooms. The fireplace wall acts as another divider and sound insulator. Bedrooms are closed off from the living space by means of sliding partitions.

ECONOMIES: Omission of all hallways and most partitions.

It would seem obvious, then, that a prime way to get a lot of house for limited money is to economize on space as much as possible, and to use what space you can afford to build as fully and as efficiently as possible. A good architect can help you do this; planning the best use of space is, after all, the basis of architecture. A tiny little house poorly planned is an abomination. On the other hand a very limited amount of space well planned can be most pleasant to live in. See, for instance, the house with no corridors (thus saving space) on the facing page, with its plan below.

First, let's consider ways to make very small space seem larger. Many persons begin to think immediately of tricks—such things as the use of mirrors to make rooms seem to be twice as big as they are, using dark colors to make walls seem to recede, and so on. Such means of fooling your own eye and your neighbor's appraisal are useful, in a limited sense. Limited because they make space look bigger, but they actually don't give you any more room to move around in. The houses that follow show more realistic ways to use space.





LOCATION
ARCHITECT

Sanibel Island, Florida

CHITECT Paul Rudolph

OWNERS

Dr. and Mrs. W. W. Walker

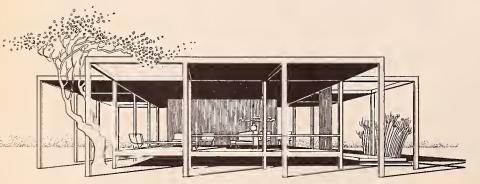
cost FACTS: Built in 1953. 650 square feet at \$16.10 per square foot.

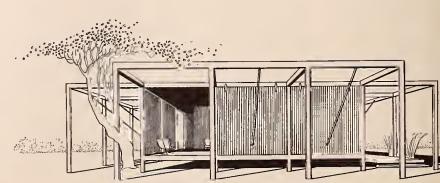
MATERIALS: Wood post and lintel; walls of plate glass and "flaps" hinged at top to give ventilation as well as act as overhangs. Flaps are wood frame sheathed with Masonite. Dry materials throughout.

PLAN FACTS: Completely simple in every respect, this square-shaped cottage is being occupied by the owners until the main house is built, when it will become the guest cottage. Each of the four walls is composed of three equal panels — one of which is fixed glass or

an entrance door, the other two being upswinging, counterbalanced wood "flaps" outside of fixed screening. When the cottage is in use these flaps are raised to serve as sunshades, thus turning the interior into a screened living pavilion. When unoccupied, the flaps close down to enclose the entire house. Within the square are all the necessary amenities: living and dining space, bedroom, bath and a small kitchen.

**ECONOMIES:** Use of light-weight materials because of transportation problem to the island. Modular construction throughout, eliminating wastage. The number of materials and therefore trades involved was kept to a minimum. Pivoting panels and glass panels are all the same size, simplifying fabrication.





The most effective way to add real space is to use some of the rest of your property — the part you haven't built on — as actual extensions of the enclosed house. The extent to which you can use this outdoor space depends, of course, on the weather and the climate, but at all times you can gain the visual extension. You can do this by the use of glass walls, by extending room walls outside as terrace walls, by running ceiling finishes on outside as extended eaves, and by many other means. These "tricks," if you want to call them that, go along with the openness of the contemporary house, and fit well into the design approach which almost any well-planned house, in whatever price bracket, follows today. So you'll be right in step with things if you make your living room (small because that's all you can afford) flow right out into a garden or a lawn space, which you have already paid for, and for which your added costs will be only the landscaping.

The house illustrated across page makes this point so well that it couldn't be demonstrated any more thoroughly. Architect Paul Rudolph chose for this very tiny house the cheapest possible shape — the square. Inside that square there are a minimum of subdivisions (a point we will elaborate later), and then he opened up all four sides of the square with a contrivance which provides roof for the extended space in good weather.



LOCATION DESIGNER

OWNER

Woodstock, New York

Abel Sorenson
Marion Greenwood

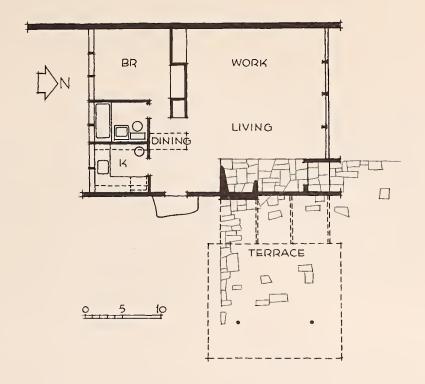
**COST FACTS:** \$7,518 in 1949. 734 square feet (porch figured at one-quarter) at \$10.20 per square foot.

MATERIALS: Frame; gravel roof. Local materials of fieldstone, pine siding. Gum plywood inside. Minimum foundation with floating slab on grade.

PLAN FACTS: For this absolutely minimumsized house of 734 square feet (restricted to this because of completely limited budget), the owner who is an artist needed a room with good north light for her painting. The work area is combined with the living-dining room, which has a fireplace of native fieldstone. To supplement this space, there is a small bedroom, kitchen and bath and a pleasant terrace for outdoor living on the east.

ECONOMIES: A small contractor did all the work himself. The designer, Mr. Sorenson, states "only the extreme cooperation of the contractor made it possible" to build for \$7,518. There are no interior partitions, except around the bathroom; storage wall separates bedroom from living room. Temporary, but adequate heat, is provided by oil stove and fireplace.





Not everyone would want as direct an expression of the indoor-outdoor interplay of space as the Florida house on the preceding pages. We recommend that you look at pictures on pages 28, 44 and 66, to see how the use of outdoor areas can make indoor square-footage seem bigger. The fact remains, however, that the most economical use of space is within a square or a rectangle, and with as few interior subdivisions as possible. Still using extremely simple plans as an example, see, on this and the facing page, how Abel Sorenson used a small rectangle for his artist-client Marion Greenwood. She did not want a lot of subdivisions inside the house, because her house is also her studio; and within a very small budget (and therefore very few square feet) she wanted as much open, unencumbered space as possible. Notice that the bathroom and the kitchen are enclosed, but that otherwise there is only one partition, and that is a "storage wall" (closets used as dividers of rooms from one another) between the part of the rectangular house where she sleeps and the part where she lives and works. Small space has here been used to its utmost efficiency.



LOCATION
ARCHITECTS
OWNER

La Grange, Illinois Crombie Taylor, Gyo Obata Ross Dustin

COST FACTS: \$16,500 in 1952. 1100 square feet at \$15 per square foot.

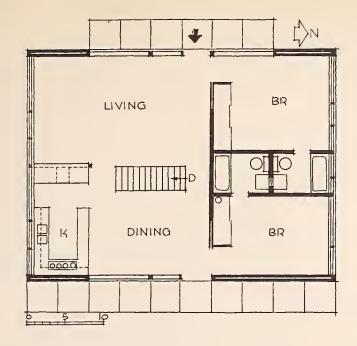
MATERIALS: Frame, with brick cavity walls. Fixed and sliding plate glass and glass jalousies. Modular system of 8-foot bays. Forced warm air heat supply grills located under large glass wall areas.

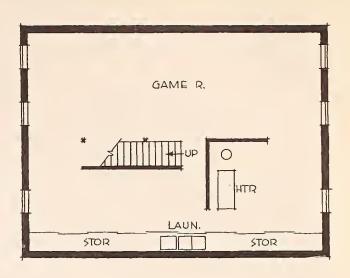
PLAN FACTS: The extreme simplicity of plan elements in this compact little house for the Ross Dustins has much to recommend it, as a straightforward solution for a minimum two-bedroom, two-bath dwelling. Within the overall dimension of 30 by 40 feet, an efficient use of space is achieved by combining in one sizable space living, dining and kitchen area. A just-short-of-the-ceiling partition between

the kitchen and dining area serves as storage space for both. The bedrooms are given complete privacy by a floor-to-ceiling partition wall, backed by generous-sized wardrobes which act also as a sound barrier from the living room. In addition to this main living space, the Dustins wanted a recreation room for ping-pong and other games, and as an adjunct for entertaining facilities. This has been provided in the basement (which also houses the heater room, laundry, and a spacious storage wall) with direct access from the living area by means of a simple staircase.

**ECONOMIES:** Use of inexpensive but attractive brick cavity walls; saving in plumbing installation by placement of bathrooms backto-back; efficient use of limited space.

BUDGET SUGGESTIONS: One bathroom could have been omitted. Less expensive kitchen equipment could have been substituted.





Don't be concerned that a small square or rectangular house is going to look "boxy." There are many ways to handle this design problem attractively. After all, the Colonial New England "saltbox" was just such a minimum rectangular home. It, however, was cut up into small compartments; today it is just as possible to make the more open modern house look well, even when the plan is small and square. Some of the most distinguished, and most publicized, examples of recent residential design have been simple box-like structures delicately and tastefully handled. For your smaller budget, you could let your architect make a virtue of a necessity, and use the design approach which is illustrated by the house on the facing page — a very well-executed, frank statement of a rectangular plan, with a minimum of partitions.







LOCATION
ARCHITECT
OWNERS

Los Angeles, California William Beckett Mr. & Mrs. B. A. Shoor

cost facts: \$11,800 in 1951. 1000 square feet (plus car shelter and terraces) at \$9 per square foot. Cost figure includes built-in furniture.

MATERIALS: Concrete slab; wood frame and stucco. Built-up roof. Steel fireplace, pre-fabricated and moved to job complete; a free-standing triangular structure, with black perforated metal screens at top and bottom, making it possible to view the flames from any side. The hearth is a triangle of grey slate, set flush with the asphalt tile flooring. (See photo page 30.)

PLAN FACTS: Since both Mr. and Mrs. Shoor are employed, they wanted their house to have low maintenance and a minimum need of housekeeping so that they could enjoy their leisure hours at home without too many chores. And, with a minimum budget for building, they wished for maximum visual space and flexibility in the use of the interior.

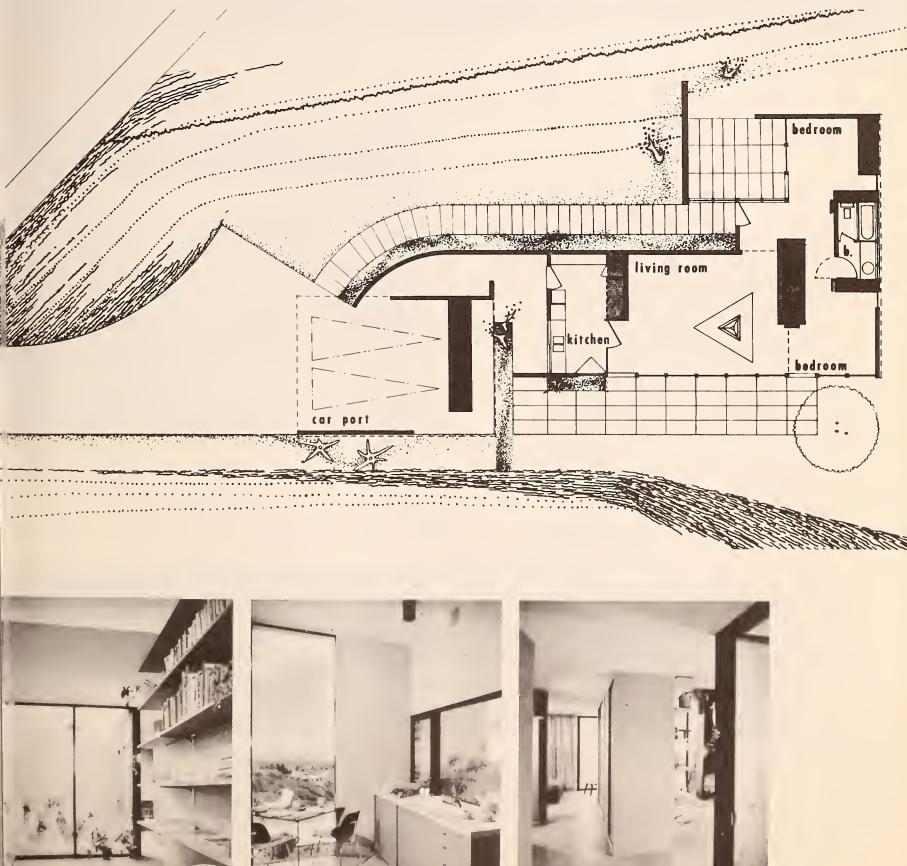
The house sits on a ledge—with the street above, a canyon below, and a view of the city and ocean to the south—and is designed in three flat-roofed portions. The first is a low wing which holds the double carport with a long bank of storage cases at the rear, and is a separate unit which forms a small service yard between the kitchen and carport. The second portion is high with 10½-foot ceilings, and contains kitchen and living areas. The third portion is lower again, to balance the carport, and consists of the two bedrooms and bath. The three levels make an interesting, simple structure which fits into the contours of the mountainous site. An extensive use of glass further enhances the open quality of the house. On the terrace and view side there is 40 feet of glass from floor to ceiling; glass is set between wood posts which are painted black. Two sliding steel doors open this side to the terrace. Obscure glass at the entrance shields one bedroom and its private garden.

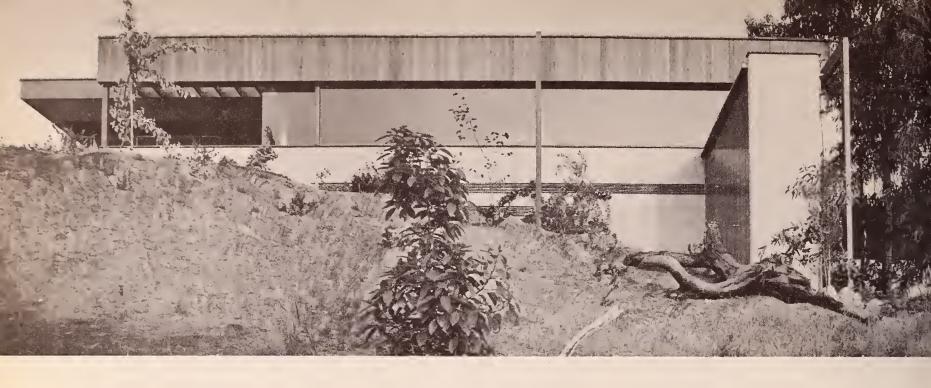
The simplicity of plan, the structural posts which frame the glass wall, the elimination of all but two interior partitions (which are used also as storage walls), and the unity of color throughout all make of this small house a dwelling place of unusual sophistication.

**ECONOMIES:** Compact heating unit centralized to all areas; all spaces opening into one another for greater flexibility in use; a minimum of partitions between spaces. The use of stock sizes and simple materials.

**BUDGET SUGGESTIONS:** Postponement of the detailed sun canopy to be built by owners.

The Shoor house, on these pages, is a wonderful example of the use of storage spaces as partitions. The plan is free and open; there are only two floor-to-ceiling partitions (with the exception of the bathroom enclosure) and both of these are storage walls. One is between the kitchen and living room area; the other is between living room and the hall to the bedroom wing.





LOCATION Los Angeles, California
ARCHITECT Richard J. Neutra
OWNER Mr. and Mrs. J. D. Hinds

COST FACTS: Under \$20,000 in 1950. 1000 square feet at \$12.25 per square foot.

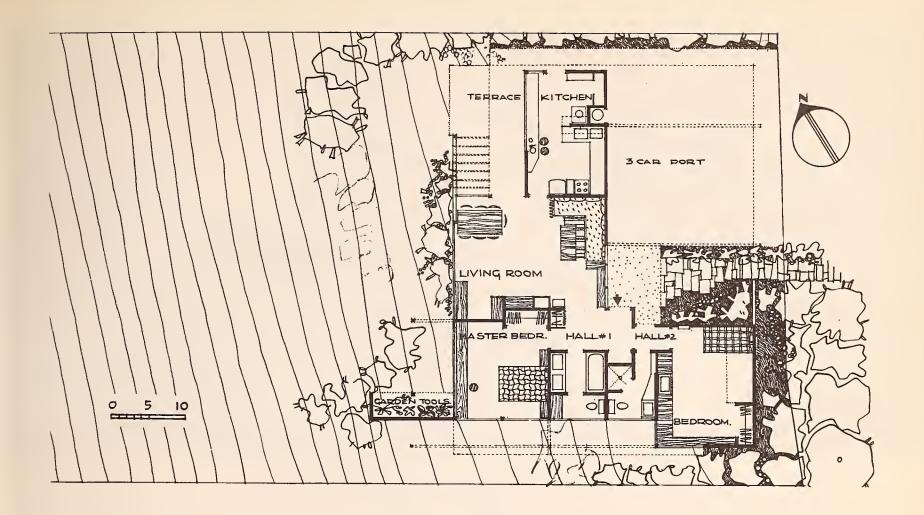
MATERIALS: Wood frame with concrete slab floor; flat composition roof. Exterior plaster with redwood tongue and groove siding.

PLAN FACTS: For a couple with a young baby, the architect's challenge was to obtain the greatest utility and feeling of spaciousness within a small square footage. The magnificent view site on Mt. Washington also made it necessary to plan for sufficient shelter from the sun and winds. Living quarters and the adjacent outer terrace are served by the kitchen. The entire living space and the master bedroom open to the northwest mountain view. Continuous low plate glass strips, almost uninterrupted, were designed for comfortable viewing height but do not admit excess sunlight; they also give increased illusion of spaciousness. Ventilation strips of lift-up vent panels near ceiling and floor are provided under and over these continuous glass strips. ECONOMIES: Through a careful study of traffic pattern, costly corridors and hallways were cut to the barest minimum. Vent sash was eliminated except for kitchen and baths.

BUDGET SUGGESTIONS: Built-in furniture and wainscoting could have been postponed.







Every architect designing small houses wants to eliminate corridors and hallways in so far as possible; they are a luxury which the low-budget house cannot afford. It is possible to devise a plan where one goes directly from the entrance to three points—living room, kitchen, and bedrooms. Sometimes, however, such a simple and direct scheme doesn't work well with the site and it may be necessary to go through the living room to get to either kitchen or bedrooms. This can be well planned, with the throughcirculation no annoyance at all, or it can be badly planned, with a "sitting" area constantly interrupted.

The house by Richard Neutra, here illustrated, almost completely eliminates corridors, and was an inexpensive plan for that reason. Bedrooms are entered directly from the entrance hall; the kitchen is separated, but passage to it is well planned, so as to lose no space from and interfere very little with activities in the living room.



ARCHITECTS Macon, Georgia
League, Warren and Riley
OWNERS Mr. & Mrs. Joseph C. League

COST FACTS: \$16,200 in 1950. 1766 square feet at \$9.17 per square foot.

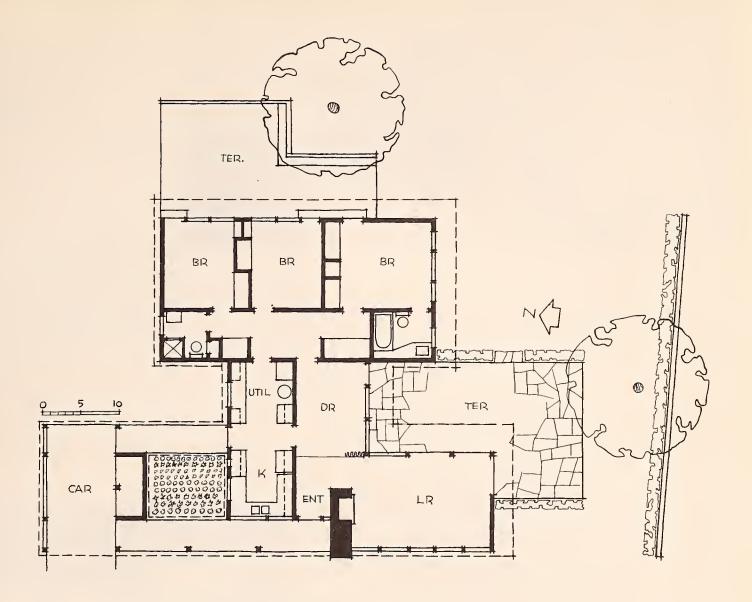
MATERIALS: Concrete floor slab over hollow tile on fill. Wood frame, with redwood siding, plate glass and jalousies.

PLAN FACTS: This home's modest appearance, as well as local materials, give it an indigenous quality characteristic of the simpler type of house in the South. The main problem was to arrange the important rooms and the terrace on the southern exposure, be-

cause this side of the property had privacy. The kitchen is accesible to bedrooms without going through the living area. The sleeping wing, containing three bedrooms and two baths, is nicely isolated from the living part of the house. Each bedroom has its own outside door, and is insulated from the neighboring room by closet walls. Adjacent to the kitchen and utility room, the carport and service patio give an open look to this side of the house. Six-foot high storage lockers and fence mask the service patio. The brick fire-place wall of the living room screens the main entrance hall, and has a wood storage box which may be filled from outside.







There is another point that might be made about corridors, and that is that they might be used for other purposes than just alleyways to walk through. In the house shown here, the bedroom "corridor" is widened so that it can be used as a children's play area. Thus, instead of building additional space for this purpose, a slight widening of space that had to be there anyway provided the playroom. In the Leagues' plan, this has an additional advantage in being directly off the kitchen, for supervision. This plan repays study for another reason: note how the living room, dining room and terrace (shown in the picture at lower left of opposite page) are all comparatively small spaces, but they are planned so that all three can be opened and used together for entertaining a large group.



LOCATION ARCHITECT

San Francisco, California

ITECT Mario Corbett

**OWNERS** Mr. & Mrs. W. J. Payne

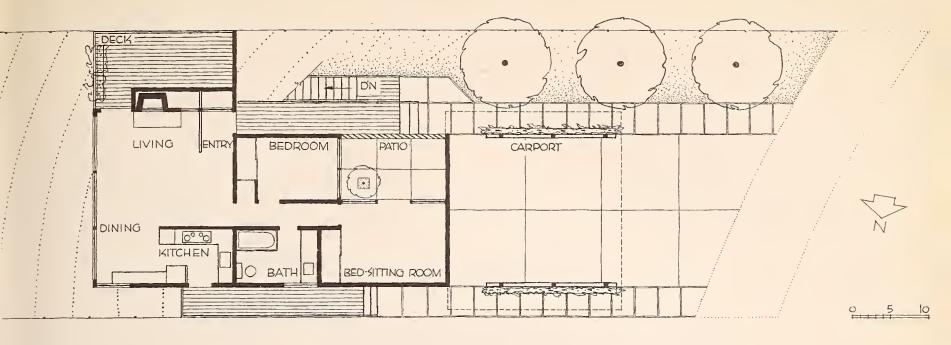
**COST FACTS:** \$18,551 in 1952. 1310 square feet on top floor at \$11.80 per square foot. 572 square feet in lower level.

MATERIALS: Typical carpenter-built frame, with redwood siding over sheathing. Sheetrock walls and ceilings throughout the house. PLAN FACTS: Given as a starting point a narrow (37-foot wide) steeply sloping city lot (the rear drops 35 feet on the total 157-foot length), plus the program of a young couple with limited funds, architect Mario Corbett was presented with a particularly difficult problem. The Paynes' program added up to a desire for sun and privacy, easy upkeep, minimum bedroom space for sleeping only. To create a sense of privacy and cut off street view, the living room faces east at the rear of the house. By virtue of the hillside, this lifts the living space 52 feet above the level of the rear street and gives a view of the city and bay area through house-wide window wall. The larger bedroom faces south, opens to a patio which is screened from the street and protected from the winds by redwood boards used as vertical louvers. The smaller bedroom is used by the owners. Carport fronts on the street at the highest level of the hill, thus affording additional privacy on the entrance side. Beneath the elevated living space is a spare room, with roughed-in plumbing for kitchen and bath, which the owners plan to finish themselves as a rental apartment or a separate studio.

**ECONOMIES:** Typical carpenter construction with a minimum of trades involved.







There is another way that you can economize on space, and that is to use one room for as many different purposes as possible. This idea is often used in the form of an "all-purpose room," which is sometimes added to builder houses as an extra selling point and as extra space. This is fine if you can afford to include a room which can be guest room, hobby room, children's play room, mama's sewing room, or papa's study — and nowadays as TV's first attractions wear thin, it is niee to have a room where the wrestling matches can be viewed privately without disturbing pleasant talk or relaxation with a good book. But we are talking about saving space, not adding extra rooms; in that sense also multiple-use or double-use of certain rooms is feasible. Think this through carefully, however; just because you label a room on the plans "dining space-children's play area" doesn't mean that you can use it for an adult luncheon party at the same time the children are romping there. Study when certain things are done; if they occur at different times of the day, then one room will serve for them all. The Payne house, by architect Mario Corbett (shown across page), has a double-use room — a bedroom planned as a sitting and TV space, which also serves as guest room.



LOCATION
ARCHITECTS
OWNERS

New Orleans, Louisiana Curtis & Davis Mr. and Mrs. Richard Page

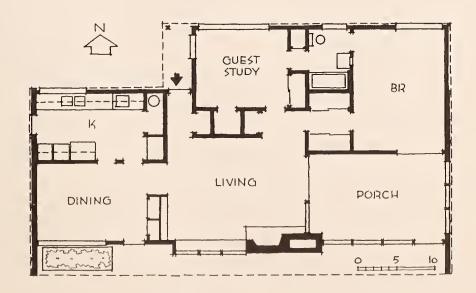
**COST FACTS:** \$17,000 in 1950. 1500 square feet at \$11.20 per square foot.

**MATERIALS**: Brick bearing walls (exposed on both sides) and 2 x 4 stud walls with plaster on interior, stucco on exterior.

PLAN FACTS: As the plan of the Page house (on facing page) so clearly indicates, the architects have met to a "T" the specific requirements of the owners—for "a one-bedroom house with the usual other rooms, plus

a study that could double as a guest room and a screened porch that could be used both as an entertaining area and as a summer sleeping porch." Located near the north side of the property, entrance may be had either from a pedestrian lane on the north or from the street on the south. The southern side is predominantly glass, but is shielded from the street by a fence along the south property line; this side is protected from the sun by an overhang. **ECONOMIES:** Dual or alternate use of screened porch for entertaining and summer sleeping; dual use of second bedroom as study-guest room.

Many house programs, like that for the Page family, shown on these two pages, state the need for a study or workroom as a prime necessity, and a guest room a desirable item if the budget allows. When the budget does not allow, the double-use of certain areas is a reasonable compromise. The Page house has another excellent example of planned double-use. A summer sleeping porch was considered most desirable; extra living-room space, for occasional large parties, was also a wished-for item. Within the budget, both requirements became available as one space (the room marked "porch" on the plan below) which is a most pleasant screened-in area. Double doors from the living room open up the porch for entertaining purposes; double doors open onto it from the master bedroom also.





LOCATION
ARCHITECT
OWNER

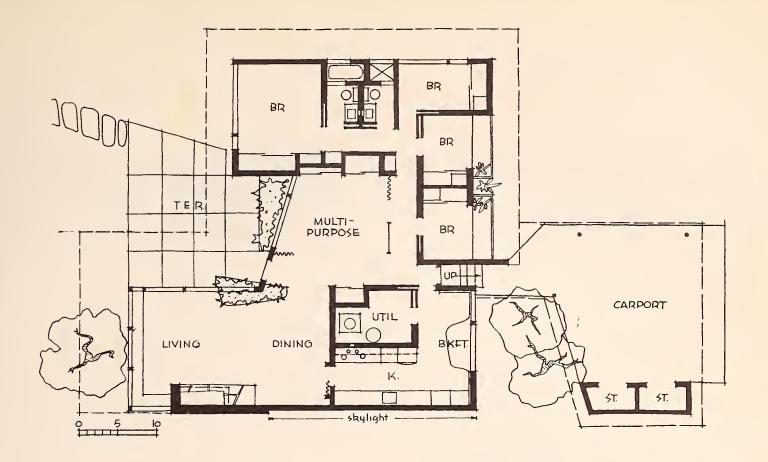
Seattle, Washington John Ridley Dwight H. Panchot

COST FACTS: Approximately \$20,000 in 1950 (not including special equipment). 1654 square feet at approximately \$12 per square foot.

MATERIALS: Frame, on concrete slab floor. Exterior walls of cedar; with grey stain. Interior walls: plaster and cedar in living-dining rooms and kitchen; ceramic tile in bathroom; plaster in bedrooms. Built-up roof protected by an asphalt aluminum flood-coat finish.

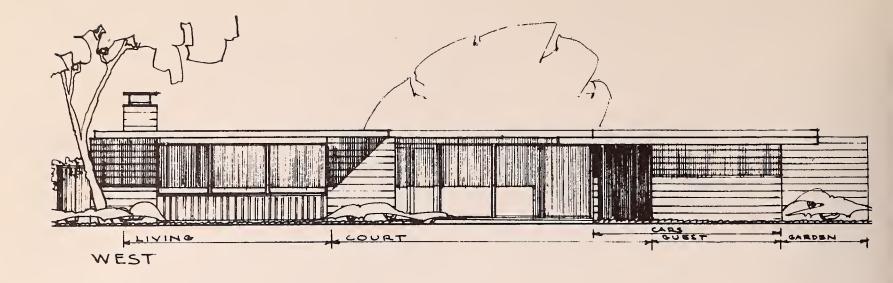
PLAN FACTS: This family of five—there are three daughters all interested in art and music—like informal living and enjoy working and playing together. They wanted space for painting and other hobbies to be right in the center of things, and also ample room for informal entertaining. A multi-purpose room was the logical answer. It is a sort of passage way normally open to the rest of the living area and giving a very spacious feeling to the house, but it is capable of being closed off by means of accordian doors to form a guest room or quiet study. The south side of this

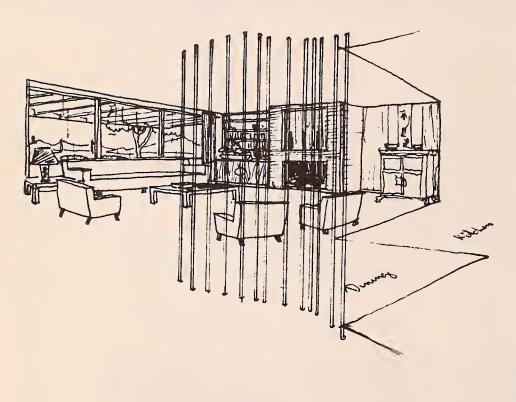
area is a storage wall (with built-in piano, shelves for records, books, art supplies and games). A free-standing cork wall, strategically placed between the two accordian walls, provides display space for art and screens the bedroom corridor. With this all-purpose room open to the living area and the outdoor terrace -which is shared by both-the actual and visual sense of spaciousness is greatly increased. The master bedroom shares the sweeping lake view with the multi-purpose and living areas, and is sound-insulated from the activity center. Each of the girls has a small bedroom, with built-in bunks and large drawer sections below; built-in desks under the width of the window wall face into private garden areas, opening these small rooms to a sense of space. ECONOMIES: The house is a simple shell; studs and siding are pre-cut to standard lengths. The use of plaster instead of more expensive finishes—with a minimum of wood trim and special details—held down the cost. The provision of three small built-in sleeping rooms gives large capacity without large area. BUDGET SUGGESTIONS: Dishwasher, Disposall, clothes dryer and mangle could be left for future installations. (Dryer and mangle were provided by the owner, but installation was in the general contract.)



A good example of an all-purpose use of space is the Panchot house (shown in the picture on opposite page and plan above). To meet the varied requirements of the Panchot family—who wanted a general family activity area—the architect, John Ridley, planned the multi-purpose room as the heart of the design.







LOCATION
ARCHITECT

Berkeley, California

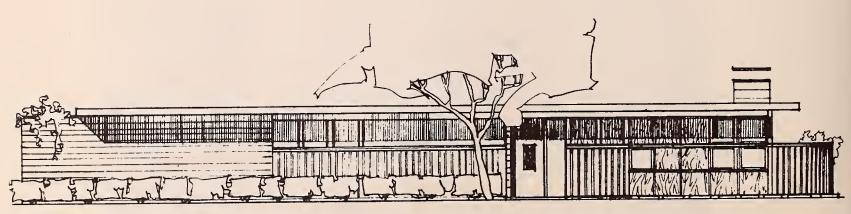
Henry Hill

OWNERS Mr. and Mrs. T. Blaisdell

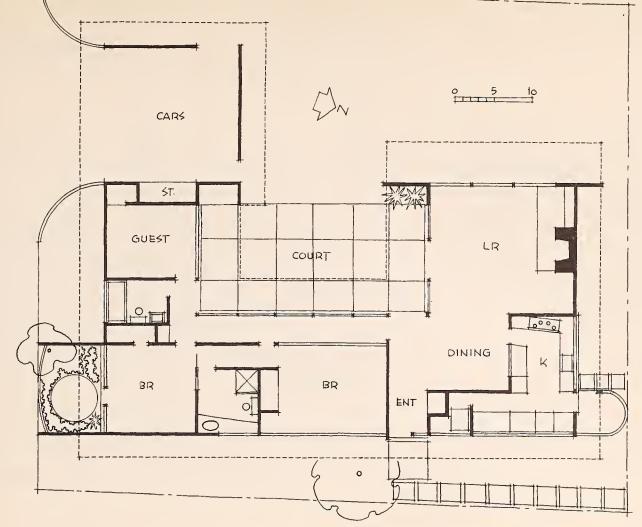
**COST FACTS:** Approximately \$20,000 in 1953 (excluding car shelter). 1560 square feet at approximately \$13 per square foot.

MATERIALS: Concrete slab with radiant heat. Exterior, vertical redwood siding stained gold; horizontal siding weathered brown.

PLAN FACTS: High up in the Berkeley hills, with a distant view of the Golden Gate, is the site for the Blaisdell house. It is one of twelve architect-designed houses in a small cooperative subdivision on a choice piece of property. Sites are individually owned, but the twelve families have completely cooperated on driveways, roof levels and maintaining the view for all concerned; all share in the use of the central "Common." A flexible study-bedroomguest area is well organized around the garden court and as a separate entity away from the living-dining room and kitchen. Sketch at left shows living-dining areas from entrance.



EAST



A common double-purpose arrangement is the studyguest room. While the room obviously cannot be used as a study by the master of the house when a guest is occupying it, the alternate use makes sense for a family which entertains house guests seldom. Still another double-use possibility is a study-bedroom. The house illustrated on the facing page is an example of this but with still a third use in mind for the study-bedroom. Mr. Blaisdell, the owner, is on a university faculty. He wanted a room which could be both bedroom and study for himself (perfectly feasible since it would not be used for the two purposes at the same time), and he wanted, in addition, a room which could be used for student seminars in the evenings. One room serves all these purposes, planned as it is with a separate entrance for the students, a snack bar for late refreshments, and sliding doors which can separate this room from the rest of the house during seminars. A further use of the room is contemplated, when the Blaisdell children come for visits. At that time, the study can be thrown together with the other guest room to form a two-bedroom and bath guest suite, and the sliding doors are again used to give privacy.



LOCATION
ARCHITECT
OWNERS

Berkeley, California Roger Lee Mr. and Mrs. C. H. McFarlan

**COST FACTS:** \$11,000 in 1948. 960 square feet, exclusive of carport and storage, at \$10 per square foot.

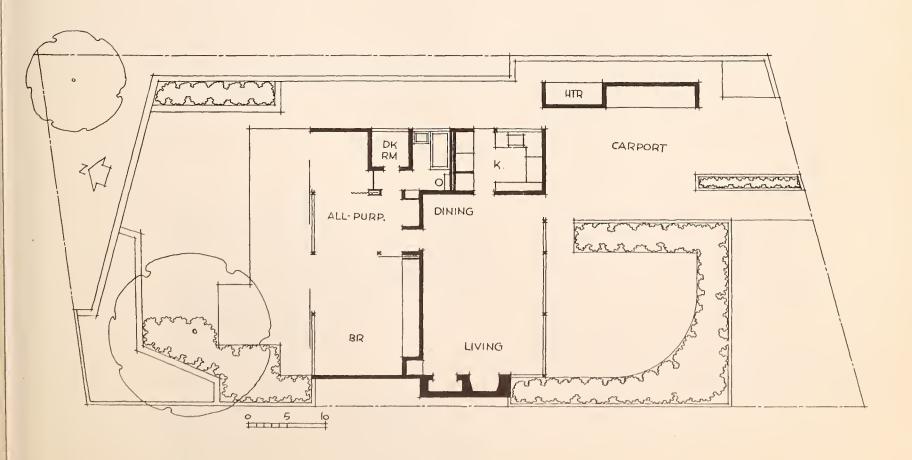
MATERIALS: Wood frame, redwood inside and out on walls. Fir plank ceiling.

PLAN FACTS: In addition to the common denominator of budget shared with other couples, the McFarlans, who are both employed in work where they meet the public constantly, wanted above everything else a dwelling where they could retire and be entirely secluded after working hours and on weekends. They also wished to have a maximum amount of outdoor living, as well as well-guarded privacy. The husband spends

most of his spare time on photography and the wife is a garden enthusiast. These hobbies made two major requirements evident: (1) a dark room and some place to hang varying plaques and prints as well as photographs; (2) a garden that may be enjoyed from a major portion of the house. The site presented its own problem, being a narrow interior city lot, 46 feet wide, with a gentle up-slope to the rear and south orientation to the front. The solution was to place the house in the middle of the property; and the architect, with landscape architects Osmundson & Staley, developed an enclosed garden to the south, service and potting area to the east and a garden to the north. The latter two areas are enclosed by means of fences, retaining walls and shrubs. ECONOMIES: Outside storage wall; multipurpose bedroom; simple, almost square, plan.



A more unusual arrangement for multi-use of space is the one planned by architect Roger Lee for his clients, the McFarlans. The house, astraddle the middle of a narrow lot, opens two big rooms two ways, each to a garden. Gardening is important; large living areas are important. Therefore in this house the kitchen and dining areas occupy little space, a fact which allows for more generous dimensions in the living room, and in the combined bedroom-all-purpose room. Note in the plan and the photographs how the bedroom can be subdivided by screens and by sliding partitions even now; in the future, or in case of sale of the house, a more conventional arrangement could be made by adding partitions and converting the one spacious bedroom into two or three smaller bedrooms, to meet the requirements of almost any family. This sort of planning ahead is very important, if for no other reason than to meet the prejudices and "standards" of lending agencies, if your combined or double-use plan results in an arrangement which is not the common, conventional one.





LOCATION
ARCHITECT
OWNERS

South Burlington, Vermont
W. Danforth Compton
Mr. and Mrs. Duncan F. Brown

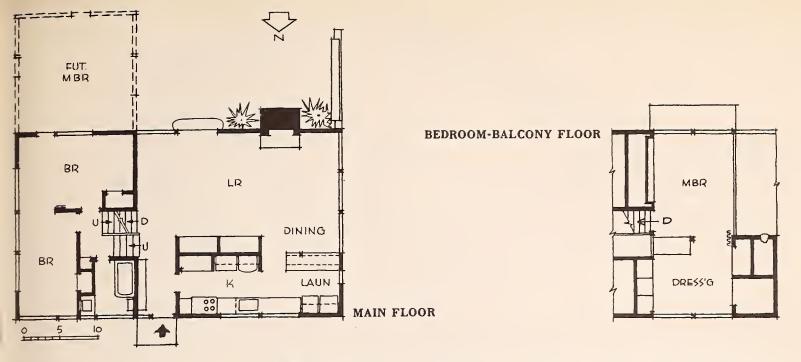
cost FACTS: \$20,000 in 1951. 1440 square feet at \$13.50 per square foot.

**MATERIALS:** Wood frame, plank and beam system of 4 x 10 beams. Sliding aluminum windows, set module size for house.

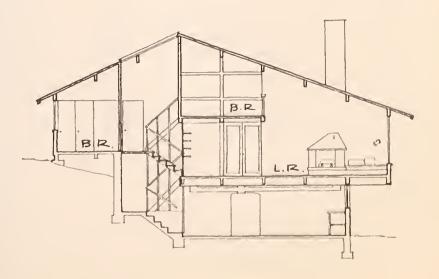
PLAN FACTS: The Duncan Browns, who have two small children, wanted a large, spacious master bedroom and a big, airy living room, but could not afford both. To solve this dilemma their architect came up with the solution of a master bedroom which opens out to the living room at the upper level. The sleeping area of this generous-sized room is curtained off, while the dressing end is completely private. When a future master bedroom is added, the present one will serve as a guest room. Mr. and Mrs. Brown also wanted the children's bedrooms opening to a playroom, but in the interests of economy settled for combinable children's rooms (folding doors close them off at bedtime) in their early years. When they grow older a permanent partition will separate them, so that each has a completely private bedroom.

ECONOMIES: Plank and beam construction, with planking serving as ceiling; painted concrete block chimney. Savings also effected by design solution of balcony-master bedroom to serve young-family years, guest room in future; and children's bedrooms combined to serve dual purpose of playroom. Also, Mr. Brown acted as his own general contractor, cutting down on the cost of such services. BUDGET SUGGESTIONS: If further savings had been necessary they could be achieved by certain changes in specifications, such as: eliminating rough plumbing to future shower and lavatory in basement; use of dry finish walls (such as sheetrock) instead of plaster; substitution of steel or wood windows for the aluminum sliding windows.





The house illustrated on these two pages makes a very important point about economical use of space: there can be great economy in a plan with various levels, as against a spreadout, more sprawling plan arrangement. There are many attractive features about the one-floor house—what has come to be known, with no accuracy whatsoever, as the "ranch house," — but it is often not an economical house plan. Architect Compton, comments, for instance; "There's no getting around it, the spread-out plan is not economical in New England. To get that spaciousness in a limited budget you've got to go up and down . . . in cold weather areas the split-level plan is the economical solution." To illustrate Mr. Compton's point, we show the section of this house for the Browns, indicating how his split-level arrangement "up and down" as he says, in a central stair hall, allows him to tuck a bedroom-balcony arrangement over part of the living room.





LOCATION
ARCHITECTS
OWNERS

Mill Valley, California Wurster, Bernardi & Emmons Mr. and Mrs. Donn Emmons

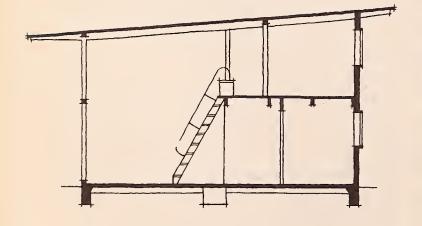
COST FACTS: Approximately \$12,500 in 1948. 1250 square feet at \$10 per square foot.

MATERIALS: Wood frame; exterior walls shingle over diagonal sheathing. Concrete floor with trowelled in color and hardener. Interior walls, cedar board.

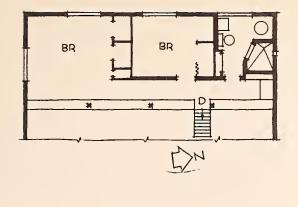
PLAN FACTS: When Donn Emmons built his own house he decided that it had to be small for a number of reasons: first, the site chosen had a magnificent view of the Bay Region but was a narrow ledge at the top of a hill which restricted the area upon which to build; second, it had to conform to a restricted budget; and third, Mrs. Emmons wanted no more space

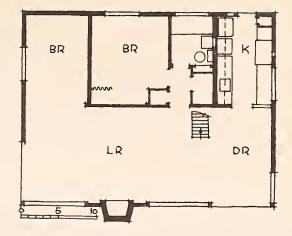
inside than could easily be cared for. In contrast to these restrictions, the Emmons wanted rooms that would look generous in size but give privacy, separate rooms for each child, space for guests. This seemingly conflicting program—of a small house versus a sense of space and privacy—was solved by the design of a "mezzanine" house. A two-story glass wall facing the view gives the spacious feeling desired, with all rooms opening toward it, including the two bedrooms on the mezzanine. In this compact plan the architects eliminated, as non-essentials, an entrance hall (gate in entrance fence serves as front door), a regular space-consuming staircase (ship's ladder is used instead).

**ECONOMIES**: Compactness of plan. Owner-architect did all interior finishing.









BEDROOM-BALCONY FLOOR

MAIN FLOOR

You don't have to be a New Englander, however, to find economies in this "extra" space that can be utilized by a balcony arrangement. An excellent example of it is this house designed by Donn Emmons for his own family in California. The living room was made high enough so that a mezzanine-balcony could be extended across the back of it, reached by a "ship's ladder." The upper-level rooms face the view and yet have complete privacy. The mezzanine rail was kept low enough so that someone lying in bed could still see the view; it was at the same time made safe by being wide — it is actually an 18-inch wide storage cabinet with sliding doors in the upper face. Under the bedroom balcony are the kitchen, a study, an additional bedroom, and a bath.

To sum up, what these houses have shown us about the use of space in a small budget is this: don't build any more space than you need (now and in the future); make the space seem as large as possible, so that you don't feel restricted; use your space as wisely and as often as you can, for various purposes that don't conflict; find ways to use extra space, by such devices as split levels and balconies. But above all, plan this space-use part of your program most carefully with your architect; the difference between unpleasantly small space and pleasant, small space is in good planning from the start.



## **EXPANSION**

## How to build a house that will expand

When your budget for a house is limited, you will want to make your original investment as small as possible. And yet you know, when you decide to build, that you will wish to have the house grow with your family in the years to come, as more money becomes available. If you plan to build at the outset to meet your current needs, how then can your house become elastic and expand to take care of anticipated future needs?

There are at least three general ready answers for foresighted people who decide to take advantage of them, and at the same time stay within the budget. One is planned expansion, which can be achieved over the years and which requires a total over-all plan to start with, as in the case of the house designed by Richard Neutra on the opposite page (described on pages 80-81). Another is the initial decision to pay for all the enclosed space likely to be needed, even with a growing family, by settling for finishing the rooms inside the space gradually. The third alternative is to plan for conversion of spaces from one use to another. Within these three solutions are a wide variety of possibilities.

Planned expansion means you will have the architect give you a complete set of drawings which will include the basic house to start with as well as the additions to be made later. The advantages are: best possible placement of the house on your property; protection for future appearance and use of your land; economy in the long run on architect's fee; exclusion of costly obstacles to future expansion. Such a specific plan takes into consideration the most economical means of adding more space. For

example: an adequate heating plant with easily accessible connections for the future addition; "roughed-in" plumbing (pipe installations in floors and walls for future fixtures) for additional bathrooms; planned passage or connection to the new space, such as a well-placed closet which may be converted into a doorway or connecting hall. A "workable" plan from the start is the secret to the success of expansion.

All-the-enclosed-space-built-at-once approach also insures the best possible orientation and use of the site. The point here is that a house "shell" with utilities built in but with no other partitions and few interior finishes costs much less to build per square foot than a finished house. Therefore your budget will buy more space. In this total space your architect will indicate on his plans how you may expand within the house over a period of time as the need develops and the budget allows. Here again, roughed-in plumbing (in addition to the basic utilities for bath and kitchen installation), and adequate heating provisions should be planned for. No ripping out of walls or floors for that added bathroom and additional heating units! How and when this roofed-over space will be divided by movable walls or construction of additional partitions, to enclose rooms, will be determined with your architect when the plan is drawn. Or, you may prefer, if the budget allows, to have all such partitions installed when the house is built but leave the *finishes* of certain rooms to be done gradually later, as you can afford it. Other possible economies at the start are postponement of finished closets and the installation of major equipment; and elimination of the garage, or the substitution of a carport in place of a closed garage.

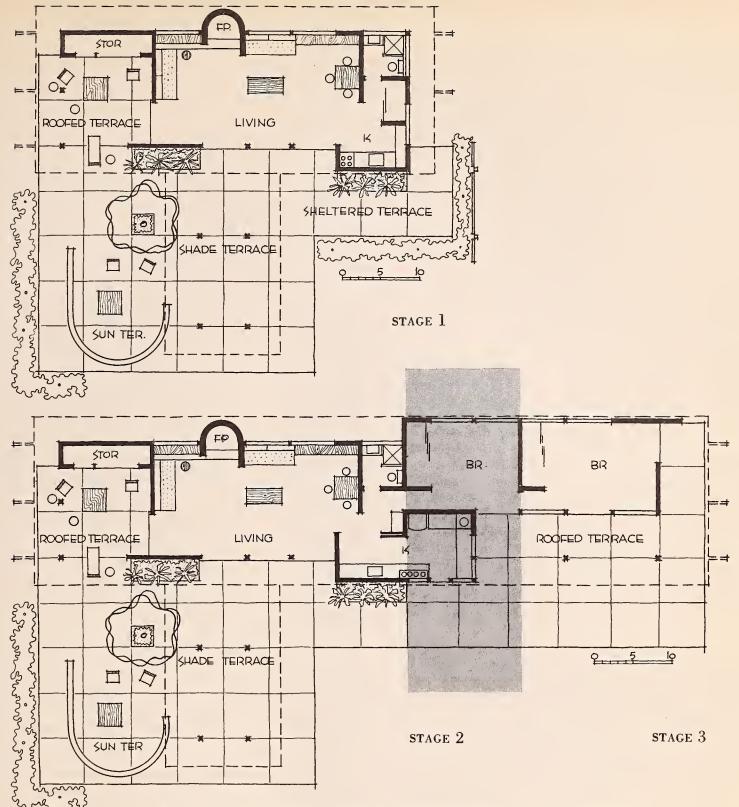
Expansion by conversion allows a wide variety of ways in which additional usable space may be found by changing

unfinished areas into finished rooms. Perhaps one of the most popular devices is the conversion of an attached garage to an additional bedroom and bath — or to a playroom, an office, a studio, or workshop. Sometimes, in a two-story plan space over the garage or carport may be so transformed. A sloping hillside site often offers a ready-made opportunity for expansion-conversion: for instance, a lower story, unfinished inside at first, may be tucked in under the main part of the house when it is erected, thus utilizing a natural slope and avoiding the expense of fill-in for foundation or bull-dozing for a level spot. The space thus created may be left unfinished inside to begin with and later used as a large playroom or divided into bedrooms with finished walls and floors.

Whichever of these methods you choose, the important thing to know is that the architect can give you a complete plan before the first shovelful of earth is lifted. If you decide that you would be content to start with the essentials — a large living room (living-dining-sleeping combination), bathroom-dressing room, and kitchen — but you intend to add bedrooms later (a master bedroom and one or two for children or guests) your first move is to give the architect a realistic program, based on immediate and future anticipated requirements. The basis for all of the planning — no matter which of these three expansion ideas you decide to use — will be your present actual budget and the additional expenditures which you believe it will be possible to make in the future.

On the following 26 pages 14 houses are illustrated, with plans, photographs and descriptions. These are actual examples showing how farsighted families have worked with their architects, in one way or another, to start in a small way with an expanding house in mind.





Among architects giving careful study to the step-bystep growth of a house was Gordon Drake. An excellent example of
his "Unit House" designed to grow with the family is shown here
in its various plan stages. The important fact is that each of the
three stages was planned for all at one time, to be gradually integrated as a total house. The top plan was the first stage. From
this first unit the house grew two appendages in an ordered fashion, shown in the lower plan: the first expansion added a bedroom
and expanded the kitchen; the second added another bedroom,
and a child's play terrace with supervision from kitchen.





ARCHITECT Henry Hebbeln

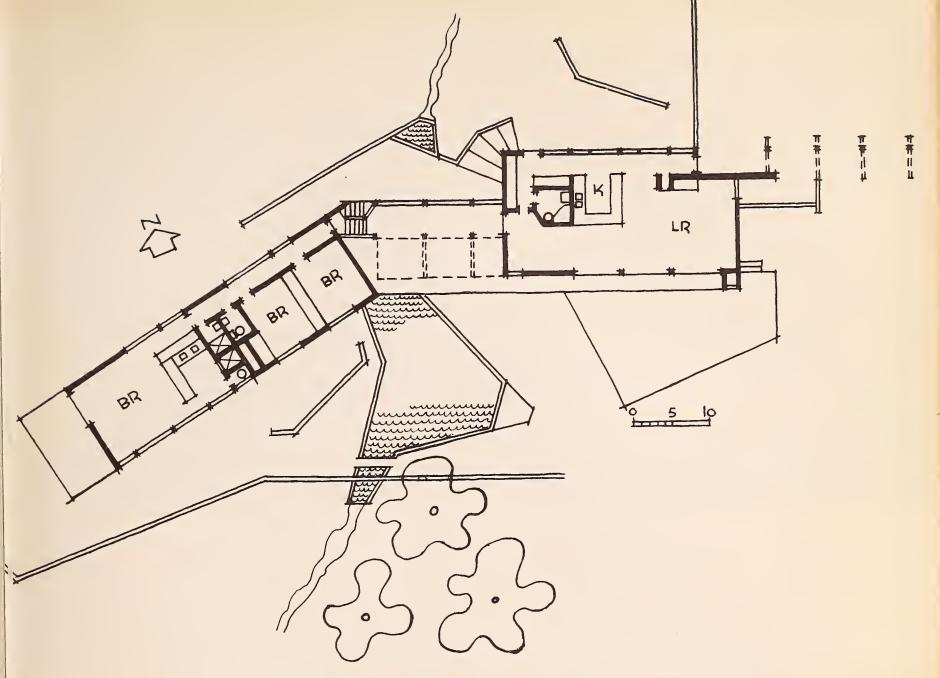
OWNER Charles Y. Dusenbury

cost facts: \$9,000 in 1949. 760 square feet at \$12 per square foot. Cost includes built-in furniture.

**MATERIALS**: Frame: vertical rough-sawn native pine walls; corrugated asbestos roof.

PLAN FACTS: The ultimate in simplicity plus the use of native materials was essential for this house in a mountainous region of North Carolina. These two factors were the dominative ones in designing the simple structure: (1) because of the remoteness of the location, and (2) because of the desirability of using native materials and craftsmen, both of which were available nearby. The construction is simply 4 x 4 posts which carry 4 x 8 beams which support the roof. Electric heating panels were attached to the underside of the roof, making this a year-round vacation house. Planned for an artist couple (sculptor and textile designer) with two children, it was designed to grow into a permanent home. The living unit built first, illustrated here, is in essence one large room divisible at night for two children in one section and parents in the other. Within this space is an enclosed bathroom and a kitchen with a 5-foot high dividing wall. Sliding glass doors extend the living space outdoors to a floating deck and a view of the Blue Ridge Mountains to the west. Two further construction stages are contemplated to expand this house into spacious year-round living: (a) a two-level studio, accessible from the drive and car shelter below, with sculpture work court and south balcony for weaving (to be used also for secluded sleeping for parents or guests); (b) a "bunk house" which will contain master bedroom-sitting room, luxury bath, and minimal children's rooms with divided bath.

**ECONOMIES:** Use of native materials and craftsmen to carry out simple construction.



On a site more open than the usual suburban plot, planned expansion can take place by the addition of totally separated units, as this house by architect Henry Hebbeln indicates. The Dusenburys plan to build a separate two-story studio on the eastern slope of their property (not shown on the plan above), as well as a "bunk house" which will contain family bedrooms and baths. This last unit to be built in their expansion plan will be connected to the original structure by a double-deck connecting link (which will have winter plastic screens to be removed in summer). The original budget allowed for the basic living unit (on opposite page); the other two units will be added as need and funds allow. This house makes another point about growing with needs and budget: often a simple vacation structure can be built, with plans to convert it by stages to a house for year-round living.



LOCATION
ARCHITECT
OWNERS

Paradise, California

Roger Lee

Mr. and Mrs. George Hersey

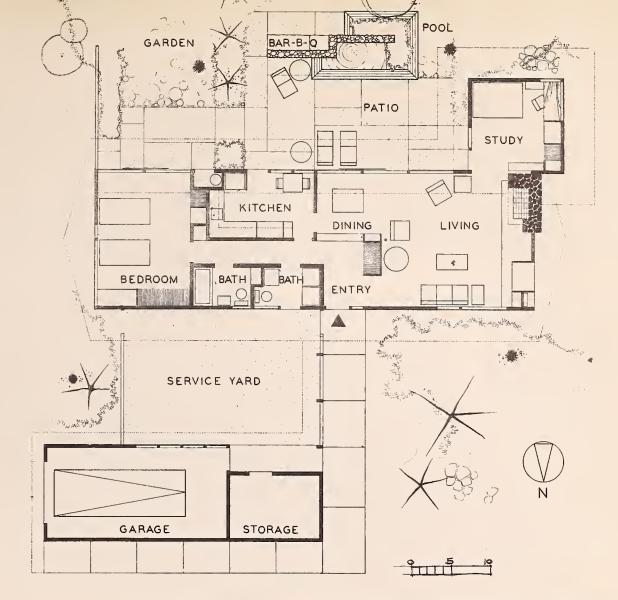
cost facts: \$18,000 in 1952. 1200 square feet plus garage-storage room at \$12 per square foot. Budget included built-in wardrobes, dresser, storage wall, etc.

MATERIALS: Wood frame, on concrete slab. Steel ridge beam. Redwood siding, paneling. PLAN FACTS: The goal of the Herseys was a house to be built around a patio, possible to expand in the future, and planned to make indoor-outdoor living easy. They wanted every

room to open to the patio, and above all they wanted an "inside-outside bath." This bath room makes it possible to wash up on the way into the house from outdoor chores, without tracking in the red dust of this particular Paradise. Other plan ideas: combined study-guest room; covered walk past the service yard into living room, keeping in and out traffic clear of this room.

**BUDGET SUGGESTIONS:** Architect Roger Lee suggests further savings might have been made by using a less expensive finish than redwood. Concrete blocks or brick might have been substituted for stone in fireplace.





Still another example of a house to be built in three stages is the Hersey residence. In contrast to the Drake "Unit House" (on page 64) which was designed to grow in one direction with the rooms all in a line, the Hersey house was planned around a patio. Three stages of construction were contemplated: (1) living, dining, kitchen and bath; (2) bedroom and second bath; and (3) study-guest room, jutting off the living room area and enclosing one side of the patio. However, the owners liked the entire scheme so much—and to their delight discovered that the whole project fit within their budget—that they proceeded to have all three stages built at once. Garage and storage space, separated from the main house by a service yard, were added later. With its back turned to the street, and with every room opening to the central patio with its pool and garden, the amount of living space seems to expand beyond the enclosed part of the house. In essence, the patio with its barbeque is an additional living-dining space.





LOCATION
ARCHITECT
OWNERS

Beatrice, Nebraska Burket E. Graf Judge & Mrs. O. L. Clarke, Jr.

cost facts: \$11,500 in 1948. 1235 square feet for house at \$9.30 per square foot, not including 370 square feet for carport and outside storage. Budget included some built-in items.

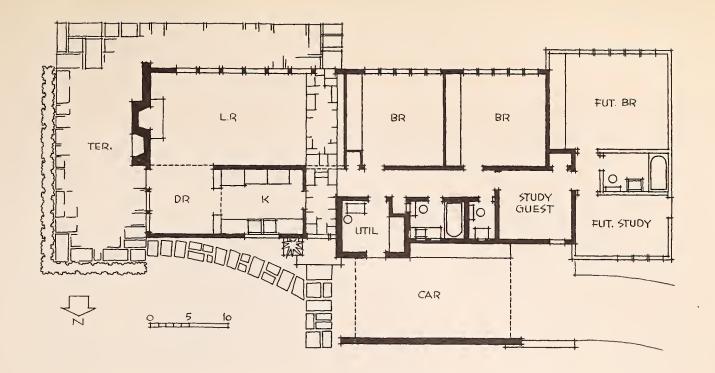
MATERIALS: Wood frame with vertical siding; concrete foundation and slab; solid stone masonry. Radiant heat.

PLAN FACTS: The Clarkes wanted within a strict budget as much house as possible for themselves and two small daughters; also planned expansion to include extra bedroom and storage space for additional children. Other needs skilfully met in the budget were a small study-guest room, environment for informal living, ease of housekeeping, provision for outdoor dining.

**ECONOMIES:** The study can double as a guest

room. The utility room (in addition to laundry, storage, boiler) has an open shower, making it a second bathroom. The architect studied materials and construction for savings: living and dining room windows are storm sash screwed to inner and outer faces of structural posts, providing double glazing at low cost; stock sizes of materials were used, and determined room sizes. But above all, growth was planned—some finishes omitted at first, curtains were used instead of closet doors, and the future bathroom (for the planned expansion) was roughed-in for plumbing.

BUDGET SUGGESTIONS: One or both fireplaces could have been omitted; carport roof area could have been reduced; warm air heating system could have been substituted for hot-water radiant heating; some equipment (such as dishwasher sink combination) and some additional finishes (such as slate floor in entry and living room) could have been postponed.



Not everyone is as fortunate as the Herseys (see page 68), to find that their whole program for planned expansion can be done at once within the budget. A two-stage program, with planned-for additional space which is not immediately needed is often sensible. Here it is true economy to have your architect include a specific plan for the addition. In this way you will be sure of good placement of the expanded house on your site, and a minimum of obstacles in building the addition. The Clarkes made such foresighted plans with their architect. Their expansion, as indicated on the plan above, provided for an additional bedroom and bath as well as a study for the Judge. By the simple device of opening a passage through the study-guest room in the original house this new wing is connected. The original study will then serve as additional storage space. To facilitate the construction of the expansion, plumbing was roughed-in for the future bath and pipes were run in the original construction from the boiler to the west end of the house for heating the future addition. When family space requirements are later reduced, the added wing will be leased separately as a small apartment. This is an important point to note, for the budget-minded, because it is just as true that family needs will shrink sometime in the future as that they will grow during an earlier period.



LOCATION
ARCHITECTS
OWNERS

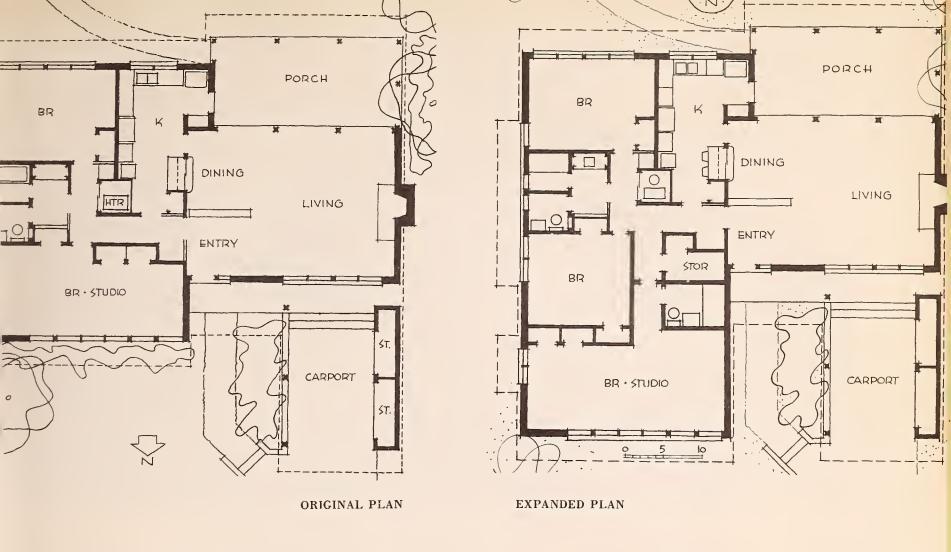
Dallas, Texas
DeWitt & Swank
Mr. and Mrs. Edward Bearden

COST FACTS: \$17,800 in 1950. Approximately 1780 square feet at \$10 per square foot. Budget included some built-in furniture. MATERIALS: Frame with brick veneer; west wall of brick cavity. Inside walls and ceilings of Sheetrock and gypsum board. Cork tile floor in living-dining room; asphalt tile elsewhere. Roof surfacing of 5-ply built-up pea gravel. PLAN FACTS: As an artist Mr. Bearden wanted two special things in his modest house, in addition to the best possible living environment for himself, wife and small daughter. One was a big living room with a good bare wall suitable for showing pictures, and the other was a north studio room for his career as a painter. The solution developed was a house with two shed roofs pitching in opposite directions: the west roof starts low over the carport in front of the house and pitches to the south, giving the living room added spaciousness of a sloping ceiling and rising over clerestory windows to give the absolute maximum of light and air; the east roof starts low over the south bedroom and pitches to the north over the master bedroom-studio. The west wall is windowless for protection from the fierce sun and is bare for the display of paintings. The south wall of the living room is entirely open to a screened porch, which also has access from the kitchen.

**ECONOMIES:** Most of the painting for exterior and interior was done by the Beardens with the help of friends. Postponement of extra bedroom and bath.

BUDGET SUGGESTIONS: Cork floor in living room might be omitted; automatic laundry and dishwasher could have been installed later; central heating plant and ventilating fan might have been installed later.





The Bearden family in Dallas adopted a different approach, to plan for an added bedroom and bath. A compartment bathroom, to serve the initial two bedrooms, was provided, and the studio-bedroom was set back partially from the house so that expansion to the north (studio lighting in mind) could be facilitated. The original studio-bedroom will be converted into a smaller bedroom, bath and storage space. The new studio-master bedroom will use the new bath and storage facilities.





LOCATION
ARCHITECTS
OWNERS

Wichita, Kansas Ramey and Himes Dale and Helen Wolff

**COST FACTS:** \$14,000 in 1951. 1300 square feet, exclusive of carport, at \$10.85 per square foot.

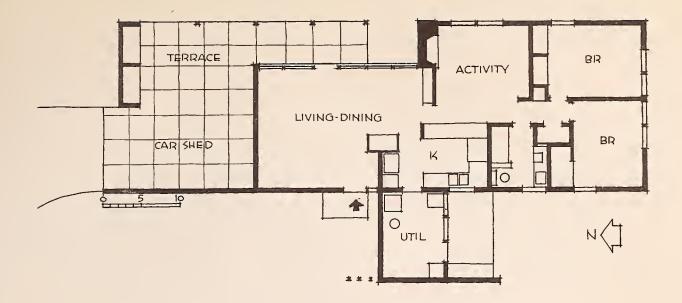
**MATERIALS:** Wood frame on reinforced concrete slab; tar and gravel roof. Exterior v-joint hemlock; interior gypsum board.

PLAN FACTS: Realizing that flexibility is one of the secrets to the success of a small house, the Wolff family, with a five-year old son, was primarily concerned with the inclusion of a "family" room. Such a room, centrally located

in the plan, may be adapted to many uses—a den or study, a playroom, occasional guest room, and for informal entertaining. Meal serving is made simple by having the kitchen adjacent, with a pass-through serving panel. The architects report that the major consideration was to create a feeling of spaciousness in a rather limited floor area.

**ECONOMIES:** Conventional construction was used throughout, utilizing stock items almost entirely, and inexpensive materials wherever possible. The architects state: "We have found our best approach to economy in this area is to make the most of every square inch of space without sacrificing the esthetic requirements."





It is not always possible to plan exactly for future expansion. Sometimes it is wise to allow several ways in which the house can grow. This may be advisable because new requirements or different ways of living may develop as the children grow up, and too rigid a plan for adding to the house (with no alternative) may be a hindrance rather than a help. Two choices for expansion were made available to the Wolffs by their architects. One would be enclosing the carport as a master bedroom; the other would be to extend the bedroom wing to the east. The choice would depend on whichever will seem most appropriate at the time of expansion.





LOCATION
ARCHITECT
OWNER

Lincoln, Massachusetts Hugh Stubbins, Jr. Henry Morgan

**COST FACTS:** \$19,600 in 1949-50. 1749 square feet (with basement figured at  $\frac{1}{2}$ ) at \$11.20 per square foot.

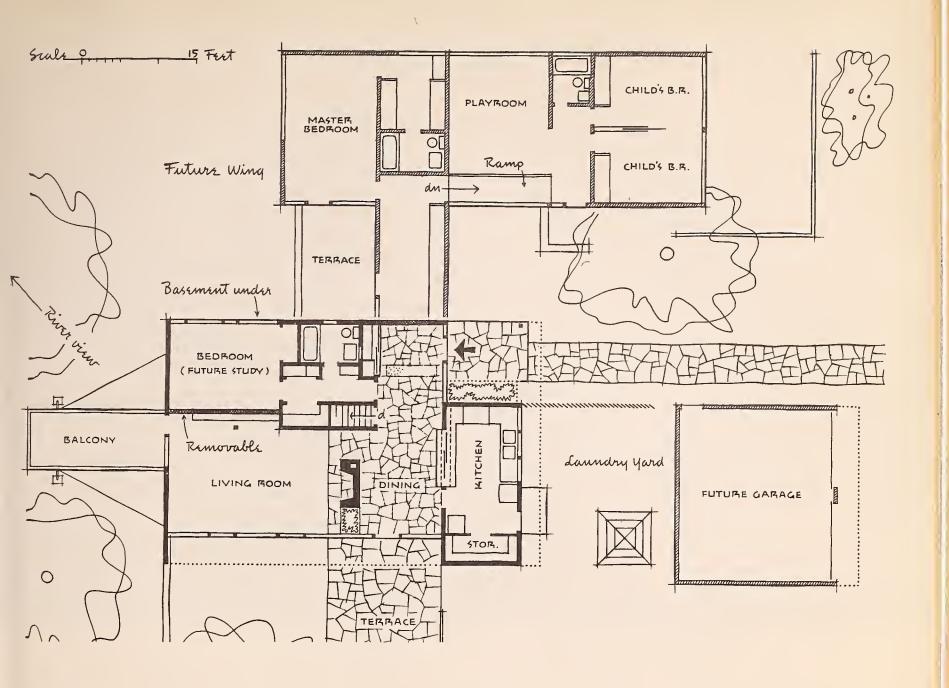
MATERIALS: Wood frame; post and beam structural system based on a 9-foot module, allowing use of standard 10 foot long joists. Exterior walls of redwood. Standard steel casement windows.

PLAN FACTS: Aside from giving the Morgan family a well-organized plan for the expansion of their house to almost double its original size, architect Stubbins created a sense of spaciousness in the first unit. The "openness" of the plan and the use of large areas of glass, visually joining the indoors with the

outdoors, are the extension-of-space elements. The entrance, living and dining spaces flow together as one big space but are subtly separated from each other for the desirable measure of privacy. The brick fireplace wall is so placed that the dining area is protected without being entirely enclosed. Between the dining space and kitchen is a pass-through counter with sliding panels. A slate floor extending from the entrance through the dining room to include the living room hearth acts as another visual link in the open plan. The up-sweep of the roof, heightening the walls to the main view, as well as the cantilevered balcony opening to the western river view, contribute to a feeling of space and extended horizons.

**ECONOMIES:** Simple shape and simple detailing of this house made it economical.





One means of doubling the size of your house is apparent in the skilfully organized plan for the Morgan family. By studying the plan, and its designations of space, you can see how the original concept allows the house to grow naturally with minimum changes in the expansion process. To start with is the area which includes living and dining rooms, bedroom, bath and kitchen. The future wing will have master bedroom and bath, as well as two children's rooms, their bath and playroom. When this wing is built, the bedroom in the original portion of the house can easily be incorporated as part of the living room or used as a study: the dividing partition was so installed that it may readily be removed. A two-car garage—also to be built later—was a part of the original plan.



LOCATION
ARCHITECTS
OWNER

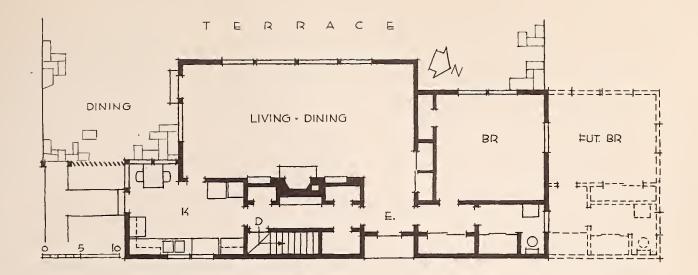
Shelburne, Vermont Freeman, French, Freeman Mrs. Carlton Ryan

**COST FACTS:** \$18,932 in 1951. 1260 square feet at \$15.02 per square foot

MATERIALS: Wood frame construction, with simple pitched roof. Exterior of v-grooved vertical redwood; asphalt strip shingle roofing; double insulating glazing combined with "awning-type" windows. Interiors of Sheetrock walls, except for fireplace wall. Resilient flooring. Door and window frames, cabinets and millwork were mill fabricated; stock sizes used where feasible.

PLAN FACTS: The character of this one-bedroom house is in keeping with its woody, suburban, lake shore setting. It was placed for best orientation and a full exploitation of a superb view of Lake Champlain. Designed for ease

of living for one person as a permanent home, it at present has only one bedroom. The house is so planned, however, that another bedroom and bath can be added at any time. As may be seen by the plan, this addition will expand the bedroom wing, fitting neatly on at the end of the plan. A most generous living-dining room (30 by 15 feet) has access to both a dining and living terrace. The clean, straightforward approach to the plan also takes into consideration the matter of good traffic circulation; from the entry one may go directly to the living area, the kitchen, or the bedroom. **ECONOMIES:** Simple lines with an economical A-roof. A low-cost structure to sustain the heavy snow loads of the Vermont climate. The architects say: with "a good plan properly expressed in elevations with simple construction of a type familiar to the area, builders will produce a successful and economical house."



There is a very practical reason for planning expansion of a small house, even though future needs of the family or of the owner may not seem to make additions desirable. That is the fact that very small houses are sometimes hard to sell; and possible future sales are part of the sad facts of life that all house owners must keep in mind. If it can be shown, as in the case of the Ryan house illustrated on these pages, that a reasonable addition of another bedroom to a one-bedroom house can be made, the house will be both easier to finance at the start, and easier to sell if that becomes necessary.





LOCATION
ARCHITECT
OWNERS

Pacific Palisades, California Richard J. Neutra Mr. and Mrs. Stuart G. Bailey

cost FACTS: Built in 1948. 1350 square feet at \$14.80 per square foot.

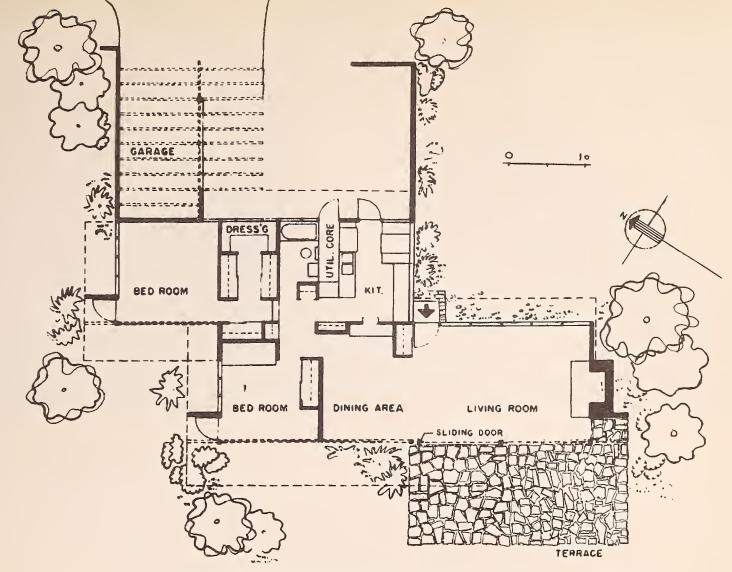
materials: Timber chassis. Interiors: natural Costa Rica mahogany in dining area; blond birchwood in bedrooms; walnut in hall, dressing room and certain areas of kitchen; elm on east wall of living room opposite west wall of continuous glass.

PLAN FACTS: This two-bedroom house is stretched in size by borrowing space from the outdoors in several directions; for instance, the living-dining room opens broadly onto a slate-paved living terrace and a lawn patio by means of an aluminum sliding door. Further, both bedrooms open to a more secluded terrace; and by using extensive panes of glass permitting visual expansion into the landscape, the square foot area of the bedrooms could be greatly reduced without a cramped feeling. Careful design of the built-in furniture further helped to reduce size and at the same time

greatly increased the area of livability. The owners of this little house asked architect Richard Neutra to keep in mind, in designing for them, that they would wish to expand at a later date, when their space requirements would be greater. The clever layout and slight stagger of plan allowed for easy expansion to the future additional bedroom wing consisting of two rooms and bath connected to the existing structure by a covered breezeway, and in close proximity to a future pool. Until the expansion takes place, the beds in this house of "space restrictions" were also planned to serve as day couches for every member of the family to rest and relax.

**ECONOMIES:** By using a special prefabricated "utility core" (a ready-delivered package of a mechanical unit, containing the centrally massed plumbing and heating installations) and placing the kitchen and bath adjacent to it, expensive run of soil pipe and other plumbing connections was greatly reduced.

**BUDGET SUGGESTIONS:** Built-in furniture, finished flooring and wall wainscoting could have been postponed.



Almost always the addition planned for a small house will consist of future bedrooms. It may be that conversion of space within the original unit can provide for more living space, but generally the important future need (because of a growing family, in most cases) is for more sleeping space. Hence it becomes most important to plan bedroom space in such a way that a corridor can be extended, a closet knocked out, or some other simple step taken to allow passage through to the new rooms. Even the location of the bedroom wing in relation to the site must be carefully studied, as it was in this house by architect Richard Neutra.







LOCATION
ARCHITECT
OWNERS

Washington County, Minn.
Norman C. Nagle
Mr. and Mrs. Jack Cedarleaf

**COST FACTS:** \$18,900 in 1951, including all built-in furniture. 1400 square feet at \$13.50 per square foot.

**MATERIALS:** Redwood frame exterior. Laminated plywood beam over fireplace. Skylight and power ventilation in bathroom.

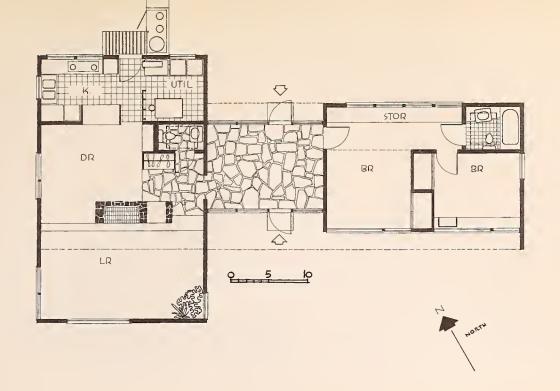
PLAN FACTS: The possibility of building in two stages was a first requirement of the Cedar-

leaf family. The second stage was to include an inside play area for children. This was created by a glass-enclosed link connecting the living area with the bedroom wing.

ECONOMIES: An outside storage wall to house well pump, hot water heater and water softener. Bedrooms divided by closets; use of bedroom corridor for extra storage. Lacquered plywood walls in bathroom.

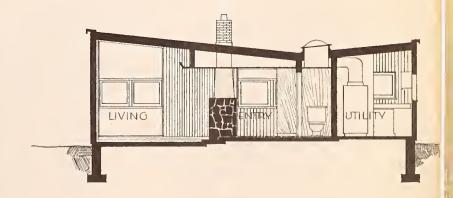
**BUDGET SUGGESTIONS:** To build only the living section until the bedroom area could be realized. Using less glass than at present.

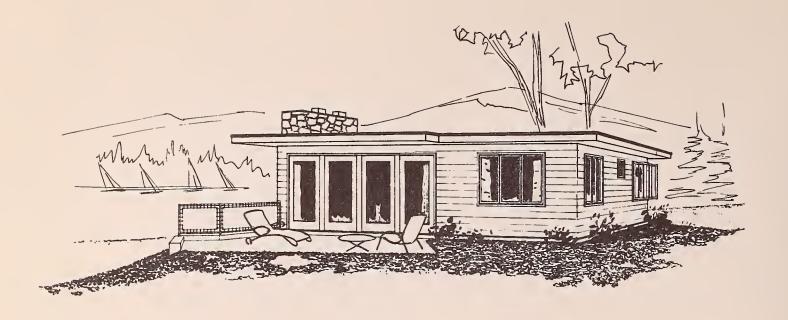




Still another version of building in two stages is the Cedarleaf house in Minnesota. In this case, however, two completely separate units were planned, to be connected by a glass-enclosed link which would serve as an inside play area for children. Although the two units were built at the same time, the architect Norman Nagle points out that the living section (consisting of two spacious rooms, bath, kitchen and utility area) could be the first stage of construction. The two-bedroom and bath unit could be added, together with the glass-enclosed connecting link, if the original budget was stringently limited. The central entrance, which serves also as a playroom, results in minimum circulation and creates a sound barrier between living area and bedroom wing.







LOCATION
ARCHITECT
OWNERS

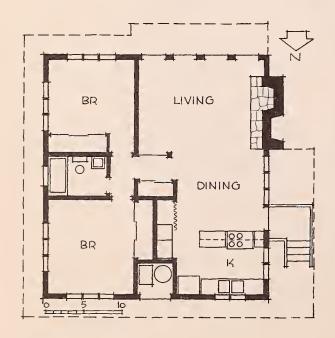
Kirkwood, Missouri Robert Elkington Mr. and Mrs. E. Koestering

COST FACTS: Construction bid \$13,000 in 1953. 868 square feet at \$15 per square foot.

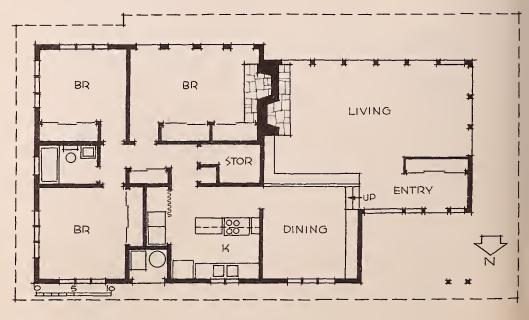
MATERIALS: Frame, redwood exterior.

want in your house is to list in detail for your architect your ideas of how you wish to live, what your preferences and prejudices are, what you expect your house to provide for, now and in the future. The Koesterings were most articulate in outlining what they wanted. "We like light and openness, fresh air, an uncluttered feeling — yet warmth and seclusion. We want our house to be informal and comfortable — but yet we want it to be impressive.

We want a house that isn't like Sam's or George's - one that could only be Ernie's and Dee's. Most of our entertaining will be informal . . . parties, bridge, or just chatting with our guests. Our evenings alone will be spent reading or just relaxing in front of the fire. We hate small cramped living rooms; like to feel that we have a lot of space to spread out in; would rather be able to convert a part of the living room into dining area than to cramp the living room; would prefer that the actual work area weren't too much in sight from the table. We would like a lot of storage space." Mr. Elkington took all of these things into careful consideration in designing the house; planned the conversion-expansion to take place when children are added to the family.

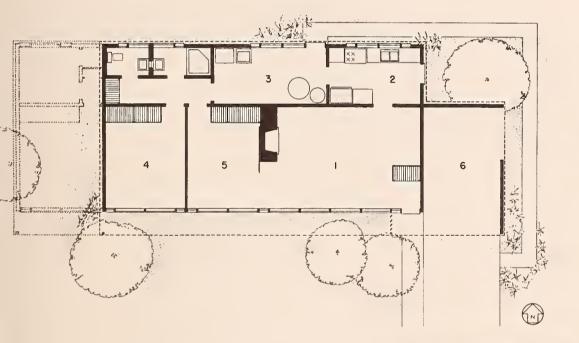


ORIGINAL PLAN



EXPANDED PLAN

A simple two-bedroom expansion was included in the original scheme for the Whitehorn house, plan below. This can be achieved by opening the hall through the linen closet to the new addition; the two-compartment bath arrangement would serve the new bedroom wing as well as the existing bedrooms. Expansion through conversion was decided on by Mr. and Mrs. Koestering for their house in Kirkwood, Missouri (shown and described on opposite page). The original structure consisted of a living room, dining space, kitchen, two bedrooms and a bath. When conversion-plus-expansion takes place, the living room will become a bedroom. On the west side of the house, extending from the original structure, will be the future living and dining rooms.



LEGEND
I LIVING - DINING
2 KITCHEN
3 UTILITY
4 BEDROOM
5 STUDY

6 CARPORT

LOCATION ARCHITECTS

Northville, Michigan George Fred Keck William Keck

OWNERS

Mr. and Mrs. G. Whitehorn

COST FACTS: \$14,000 in 1950-51. Approximately 1170 square feet at \$12 per square foot. MATERIALS: Wood frame, using stock sizes. PLAN FACTS: Definite plans for expandability were a basic part of the problem in designing this house to contain, in its initial stage, living-dining room, kitchen, utility room, bedroom, study and carport. A sliding panel closes off study for use as a guest room. ECONOMIES: Simplicity of construction and use of structural materials as finish.





LOCATION
ARCHITECTS
OWNERS

Little Farms, Louisiana Curtis & Davis Dr. and Mrs. Morris Shushan

**COST FACTS:** \$15,601 in 1951. 1120 square feet at \$13.90 per square foot.

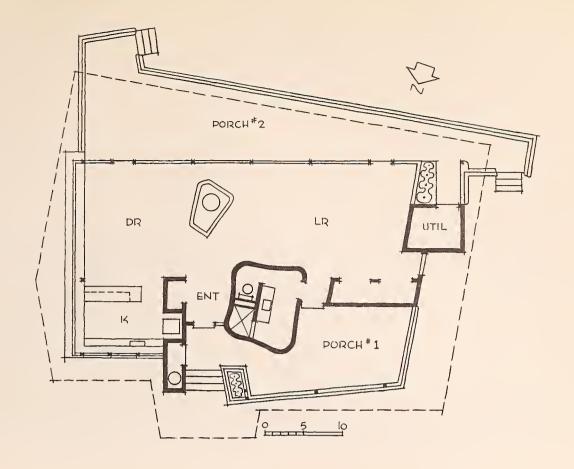
MATERIALS: Wood frame, with the structure exposed wherever possible. Natural textures were used to a large extent, including polished pecky cypress walls, flagstone floors, tongue and groove pine ceiling, exposed rafters, and glazed tile on the fireplace hearth. The mechanical room is provided for air-conditioning and the ducts now installed are insulated to receive such a system at a future date.

PLAN FACTS: The owner, Dr. Shushan, a practicing physician in New Orleans, wanted to have a week-end retreat where he and his wife could eventually live when he retires. He also wished to have as much spaciousness as possible in a limited area and wanted one large room, to be as flexible as possible, with

the necessary facilities and conveniences for entertaining. For the period while the house is used only for weekends it consists of the rooms shown in the plan — generous-sized living and dining areas (both served by the centrally located fireplace), kitchen, and threecompartment bath. Convertible sofas serve as beds at present. At a future date, when the house is used as a permanent residence, the Shushans plan to add a bedroom in the location adjoining the entrance and bathroom. Although the site is comparatively level, there was an existing group of very beautiful oak trees. The house nestles under the trees, using them as a frame for the building, and at the same time the exposures of the house take full advantage of the wonderful shade provided by the handsome old trees.

**ECONOMIES:** Postponement of the bedroom addition, and of the air-conditioning system for which the mechanical room and insulated ducts are already installed.





The last two houses in this section of the book—the one on these two pages, and the one on the two pages that follow—indicate two means of expanding within the boundaries of the original house structure. The plan above shows that there is available space in the Shushan's house to add another bedroom where there is now a porch (shown as porch #1 on the plan). This will involve additional cost at that time, but comparatively minor cost, in the building of two walls to enclose space already roofed over, and used as a terrace until the new bedroom is built.





LOCATION
ARCHITECT
OWNER

Vina, California Mario Corbett Moritz Thomsen

cost facts: \$16,500 in 1950. 1344 square feet at approximately \$12 per square foot.

MATERIALS: Natural fieldstone from the site.

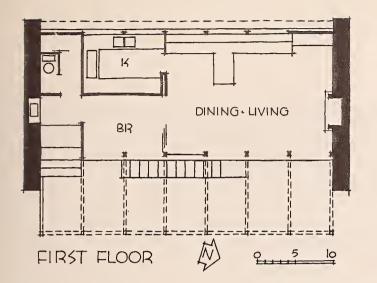
Redwood finishes, left unpainted or stained, inside and out.

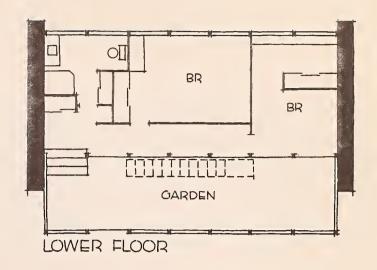
PLAN FACTS: A most unusual construction technique has been employed by architect Mario Corbett for this house designed for a bachelor-rancher in the fertile Sacramento Valley. Two huge end walls of local fieldstone seem to suspend the airy structure in between. The east wall is extended out beyond the actual enclosed living space to include a garden room

with a two-story high plastic screen wall on a redwood frame. The house is opened to this garden room (which acts as a "galleria" affording access to both levels) in the hot summer months. Redwood and glass enclose the western side of the house. All of the living arrangements are concentrated on the secondstory level, while the lower level at present serves as work space for the owner and will later be made into two bedrooms and a bath. The "cool" rooms at this lower level also act as a refuge during the hot season.

**ECONOMIES:** Space for rooms on the lower level enclosed within the original structure, but will be completed at a later time — thus saving approximately \$2,000 in original building budget.







No house could appear to be more rigidly fixed in its size than this prize-winning home of Mr. Thomsen in California. Architect Mario Corbett has indeed determined the amount of space, but its use and its future conversion is left flexible. Space on the lower floor, now left open, will become two bedrooms and another bath at some future time.

So you have seen, in a group of houses designed by outstanding architects for clients working with low budgets, various ways of postponing some of the work. Future additions, from new building to new rooms, conversion of porches and terraces to fully enclosed rooms, and changes within the structure such as we see here—all of these methods are practicable and will work—if they are planned in advance.







## **STRUCTURE**

## How to save on your construction system

The basic structure of a house will determine almost immediately whether that house is going to be reasonably inexpensive or fairly costly. We say basic structure because the skeleton of the house—the posts and beams and the foundation they rest on, and the roof they support—is basic to all other considerations. Structure must be tied in with and thought of at the same time as the plan, the materials, the finishes.

There are very few general rules about structure, because inexpensive construction can range from the most unconventional approach, such as the one illustrated across page (described on page 116) to the more standard system shown on the next page in the Clune house. The few rules are these: use standard lengths and sizes as much as possible, because they are cheaper than special sizes; use, if you can, a "modular" system—all distances between structural members the same throughout the house—so that your builder doesn't have lots of different sizes and left-over pieces to charge for; try to make the basic structural members as useful as possible—expose them, as finished surfaces, build shelves into them, let them act as casing and trim.

Cheaper industrialized steel construction for houses will come eventually; experimental concrete shapes will one day be practicable; plastic bubble houses may appear on the market. Right now, however, we recommend that you study advances that have already proven successful: heavy timber posts on 4-, 6-, 8- or even 12-foot spacings; mill-construction roof methods; steel posts, perhaps in combination with wood girders and beams. These methods and others are shown on the pages that follow.





LOCATION
ARCHITECT
OWNERS

Tarrytown, New York Robert A. Green Mr. and Mrs. W. H. Clune, Jr.

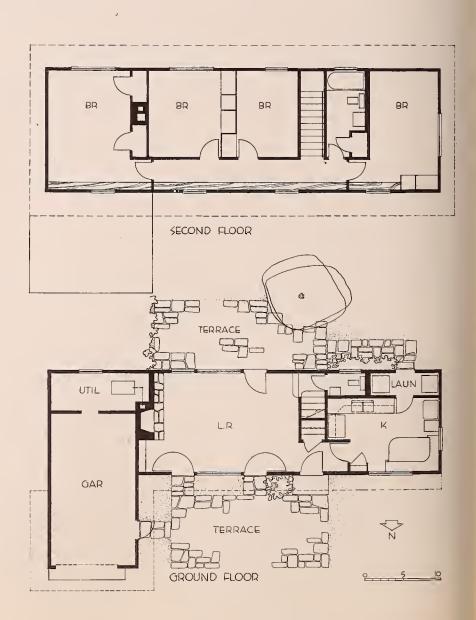
**COST FACTS:** \$18,000 in 1950. 1674 square feet at \$10.70 per square foot.

MATERIALS: Frame; block foundation; asbestos sidewall shingles; roof, asphalt shingles. Interior walls: mahogany plywood first floor, plaster board second floor. Floors: asphalt tile on radiant-heated slab, first floor; wood for second floor, with convector heating. Tile bathrooms. Flush mahogany doors. Natural birch kitchen cabinets.

PLAN FACTS: Simple local construction, designed from a small builder's point of view, was the key to the moderate square foot cost for this house in Tarrytown. Stock units, including prefabricated closets, and exposed framing at the overhangs also helped to keep the cost down. Inexpensive space was gained on the second floor by extending it beyond the line of the first floor as an overhang. For the Clune family, with four children, a simple plan was the solution. When the older children leave home the two middle bedrooms may be converted into one large room by the removal of the prefabricated closet units.

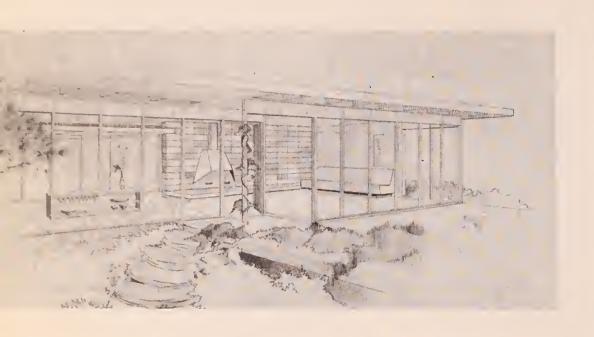
**ECONOMIES:** Simple construction system, stock sizes, and prefabricated closets.

**BUDGET SUGGESTIONS:** Substitute carport for garage. Install plywood wall finishes later.



In sharp contrast to the house shown on the opening page of this chapter, here on the facing page is a pleasantly conventional house—not stylized in any way at all; not copying any of the fake "period" approaches to design—but indicating very well in its appearance that there is nothing radical, nothing even experimental in its method of construction. Architect Robert Green says of this house for the Clunes: "It is simple, logical construction, designed from the small builder's point of view."

This emphasizes an important point: any construction system which should be cheap, theoretically, but which is strange to the builder who is going to erect it and uses construction techniques that his workmen are not familiar with, will probably not be cheap. It is wise to talk over possible structural savings with your builder, before you give him the contract. Architect Green found, in this case, that the least expensive approach to structure was the simple, usual method of carpenter building. You may find a builder who will agree with you and your architect that a modular, post-and-beam system (of which you will find a number illustrated in the following pages) can be put up more cheaply by his men, perhaps because they have already had experience in this type of construction and found that it goes fast, once they are used to it. You may have an architect who has worked with, and in a sense trained, a particular builder in your area to more unconventional, less expensive building methods. If your builder is not sure that a new system will cost him less, you might be willing to give him a cost-plus contract (pay his actual out-ofpocket costs, plus an agreed-on sum, or percentage, for profit and overhead). This might be dangerous when you are operating on a tight budget, however, and it should be discussed thoroughly with architect and builder before you take the chances it involves.



LOCATION
ARCHITECT
OWNER

The Uplands, Washington John Ridley Clifford J. Leisy

**COST FACTS:** \$19,075 in 1952-53. 1262 square feet at \$15.11 per square foot.

MATERIALS: Frame. Cedar; concrete block, used fire brick; plasterboard; "rockwood" ceilings with exposed battens under rockwood covering joints (lining up with the window mullions). Sliding closet doors are made of plastic sheets and thin wood strips. Where an

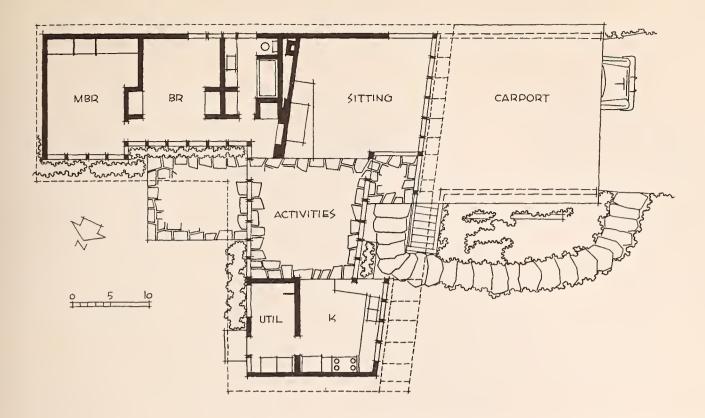
exterior glass panel can be opened as a "venting" panel, it is divided into horizontal divisions to match these Japanese-like doors.

PLAN FACTS: Both Mr. and Mrs. Leisy have a deep love for gardens and the enjoyment of out-of-doors; so when Mr. Ridley designed their house a garden room was made the center to be used for many family activities. Opening on one side from the sitting room, and on the other from the kitchen, this indoor garden area has two walls of floor-to-ceiling glass. From the entrance side the full-height glass wall commands a view to the east of Lake Washington, Mt. Ranier and the Cascade Range; the opposite glazed wall opens to the garden terrace (which will be covered with the same slate as the garden room at a later date). The cantilevered hearth is faced with slate, and when additional seating space is required will accommodate ten persons. The master bedroom, bedroom for college-age son, and bath form an L, which insures privacy for the terrace - and for the Japanese garden which the Leisys plan to develop. The gently sloping site has the carport and partial basement on the street level with living areas raised to catch

**ECONOMIES:** Modular construction system; simple materials.







In conventional house construction, the basic "module" is 16 inches. Carpenters are trained to nail up studs, floor beams, roof rafters, and all structural members at this spacing (many architects have been frustrated by the fact that a wider spacing, with larger members, which would seem to be economical, actually costs more because the carpenter is not used to it; it is not "normal") and, actually, it is not a bad module to start from. For one thing, by this time it fits, or accommodates, many stock windows, doors, wallboards, and other building items. For another, it is mathematically very flexible. Three of these 16-inch spacings add up to 4 feet, for instance, which is stock width for plywood and other wall-board sheets. Here, in the Leisy house shown on these pages, architect John Ridley used two standard 16-inch spacings as his module, primarily because that was the width of the material he used for exposed roofing. Where walls are solid, without window panels, he could go back to the standard 16-inch stud spacing; where window-walls occur, the 32-inch module, carried through from the ceiling, proved to be a practical —and good looking—width for mullion spacing to separate the panes of glass. The result is attractive, and was economical.



LOCATION
ARCHITECT
OWNER

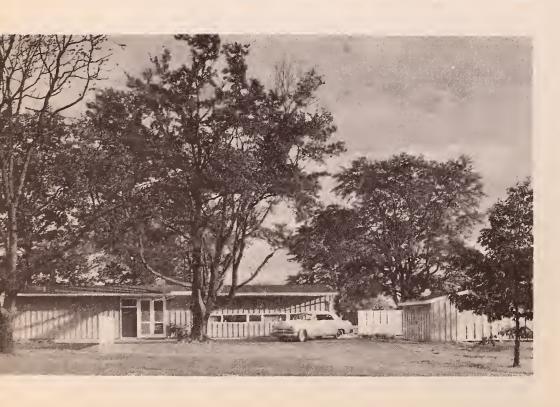
Fairfax, Virginia Nicholas Satterlee John G. Shaffer, Jr.

COST FACTS: \$15,400 in 1950. 1071 square feet at \$13 per square foot.

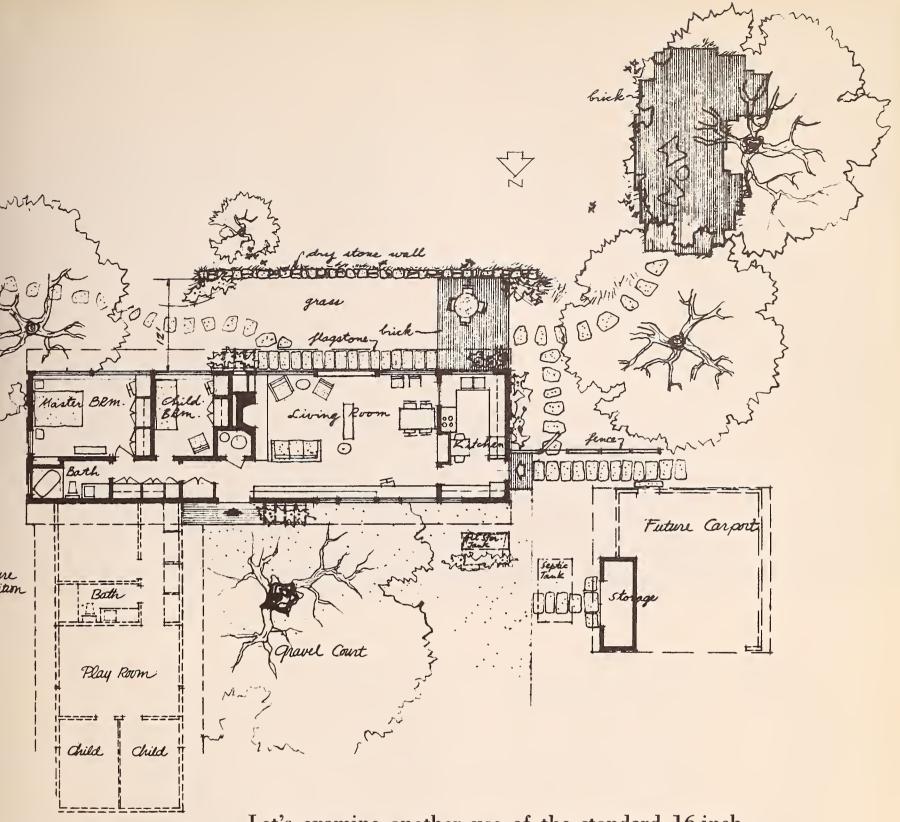
MATERIALS: Frame, board and batten exterior siding; gypsum board on interior. Built-up roof, slag top. Concrete slab, radiant heat. **PLAN FACTS:** Placement of this house on its site depended on the large surrounding trees. To start with, Mr. and Mrs. Shaffer, Jr., wanted a fairly minimum house, with a small bedroom for their infant child close to the master

bedroom. Later they plan to add a wing for growing children, and a guest bedroom which would also double as a study. As the plan across page indicates, this wing will have two child's rooms opening into a larger playroom, a bath, study-guest room and additional storage closets in the hallway. Break-through from the original house will be easily accomplished by opening up the closet just outside of the master bedroom. A carport, with storage space, was also planned for future expansion.

**ECONOMIES:** Depends entirely on simple structural system and, of course, postponement of future wing and carport.







Let's examine another use of the standard 16-inch stud spacing, used in multiples on certain walls to a wider spacing, in order to open up the house at those places. The Shaffers' residence is conventional 16-inch "framing" on all walls but the south, where a module equal to six such spacings allows an 8-foot post system. Rafters continue throughout the length of the house at 16-inch intervals; "collar beams" (connecting rafters across the house, visible in the picture of the living room) are at the 8-foot spacing. Thus an economical system combines the conventional framing with a wider "post-and-beam" framing.



LOCATION
ARCHITECTS
OWNERS

Sausalito, California Bolton White-Jack Hermann Mr. and Mrs. Sidney Ancker

cost FACTS: \$17,000 in 1950. House 1250 square feet (carport 400; stair, deck and storage 500; figured at one-half), at \$10 per square foot.

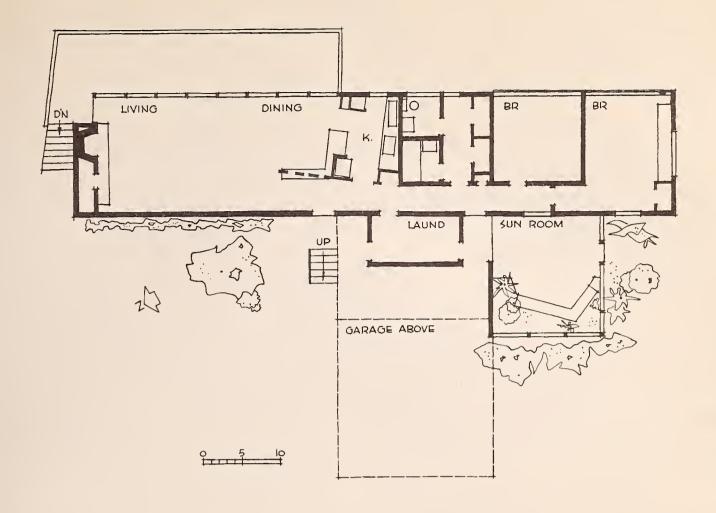
MATERIALS: Wood frame of fir with redwood siding; stock lumber dimensions were used.

PLAN FACTS: Mr. and Mrs. Ancker, whose joint interests are literature, music, the arts, gardening and informal entertaining, wanted "a pleasant environment" but for a fixed budget. To accomplish this for them, their architects depended on a choice of inexpensive but reliable materials, and stock sizes for labor-saving cost. The large living-dining room and the spacious deck running the whole length of it make an ideal setting for their many interests and for informal entertaining. Because both Mr. and Mrs. Ancker are univer-

sity teachers and have little time for kitchen activities, this space was made deliberately small but arranged for efficiency in use. A storage cabinet — counter height — opening to the dining space, performs as a bar, buffet and serving counter. Based on the premise that in these days of servantless living it is desirable to make work pleasant and easy, dining takes place at one location for all meals. The less open part of the house has two bedrooms, a bath-dressing room, and a sunroom.

ECONOMIES: Simple structural system.





The point is made many times in this book that the most economical plan is the one based on a simple square or rectangle. The Ancker house shown on these pages illustrates the economy of the rectangle—drawn out, in this case, so that it is long and thin—which gives proper exposure to all rooms, and at the same time provides an economical span (the distance across the house) for stock wood beams which stretch from wall to wall. The "module" here is four feet based on stock lumber dimensions. As in the case of the house on the preceding two pages, this allows the standard 16-inch spacing to be used (here the floor joists which rest on the foundations are on 16-inch centers) and then on every third 16-inch spacing posts and larger beams are used for the main floor structure. Roof planks are laid across these beams, as the living room photograph indicates.



LOCATION
ARCHITECT
OWNERS

Seattle, Washington
Paul Hayden Kirk
Mr. and Mrs. S. Blair Kirk

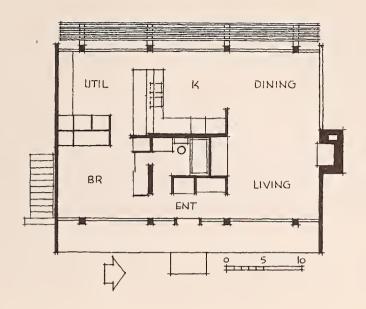
COST FACTS: \$10,500 in 1950. 825 square feet at \$12.75 per square foot.

MATERIALS: Frame, post and beam construction. Exterior, vertical fir siding. Interiors: plywood walls; fir ceilings; asphalt tile floors. PLAN FACTS: For this young couple the architect designed a minimum house, but succeeded in giving it a sense of much greater space than its 825 square feet. One thing he did to achieve this was to lift the main living space high in the air and give it two walls of glass. Also, to free space, he placed kitchen and bath in the middle of the plan. Storage closets on three sides of the bath form the partitions between rooms. On one side of this "core" is the livingdining space, with folding screen and built-in drawers and cabinets separating it from the kitchen. On the other side is the bedroom and

utility room (which opens from the kitchen but is separated from it by cabinet and counter space). Below this well-organized block of living areas, is a ground-floor level built into the hillside. At present it contains the furnace and laundry equipment; but at some future time it may be converted into additional bedrooms. This lower level opens to a garden court, protected overhead by the overhang above.

**ECONOMIES:** Use of central mechanical core in place of fixed partitions; no fixed doors.





An architect with economy in mind will plan a house so that the system of posts and beams can be as simple and as regular as possible. Simple spans for stock-length members; that is the basis of structural economy. One way to accomplish this is to narrow the house so that beams can span all the way across, as we have seen. Another is to split the house down the middle, so that just one series of intermediate supports are needed, as architect Paul Kirk did in this house for the Blair Kirks. Notice how the partition between kitchen and bathroom is halfway across the span from east to west walls, giving intermediate support to the girders which cross from window-wall to window-wall. This allows, then, a simple post structure on these open walls, as the photographs indicate. The structural system was further simplified by placing the mechanical core of kitchen and bathroom in the center of the plan, using its enclosures in place of fixed dividing partitions.



Austin, Texas
ARCHITECTS Fehr & Granger
OWNERS Mr. and Mrs. Joseph T. Sneed

**COST FACTS:** \$16,588 in 1952. 1500 square feet at \$11.05 per square foot.

MATERIALS: Wood frame, board and batten exterior. Built-up roof deck; ceiling and roof 4 x 8 beams exposed (3-inch insulrock). PLAN FACTS: To keep the cost of this house low, architects Fehr and Granger aimed at a simple shape and simple construction method. A part of this program included the use of prefabricated parts and standard stock-size materials; for instance, the "slide view" sliding glass doors are stock sizes, as well as the material for the roof deck. Mr. Sneed and his wife, who is a painter, wanted spacious living

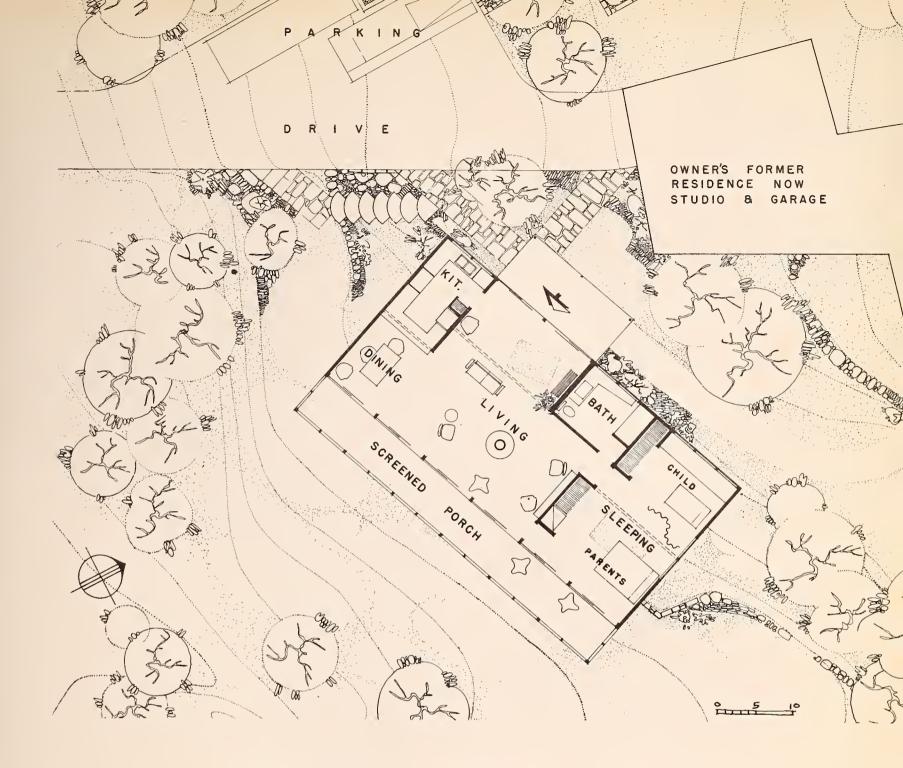
areas, openness to the southeast breeze, and view of the distant hills. Special interest requirements, such as Mrs. Sneed's painting, would be carried out in an existing studio building on the property. Within the simple rectangular plan (shown across page) is a generous living room, further extended by the screened porch opening off it. The two bedrooms shown on the plan were actually made into one room to be divided later by a floor-to-ceiling folding wall.

**ECONOMIES:** Roof deck system saved labor and materials, as compared to standard construction.

**BUDGET SUGGESTIONS:** Sliding doors could have been replaced by windows, louvers, and standard wood doors; Sheetrock in lieu of plywood for walls; oak instead of cork floors.







If one is going to depart from the truly conventional house-building method of stud walls pierced occasionally with windows, and use some sort of a wide-spaced post and beam structure, every possible advantage should be taken of that system; and money-saving materials that can be adapted to it should be explored. This house for the Sneeds capitalizes on the 8-foot module in its structural system. One way it does this is by the economical use of a product ("insulrock" in this case—there are other competitive materials) which is a good insulator, will support a built-up roof, and will span between the beams so that it can be left exposed as a finished ceiling—a system which saves in materials and labor.



LOCATION
ARCHITECTS
OWNER

Atlanta, Georgia Moscowitz, Willner & Millkey Herbert C. Millkey

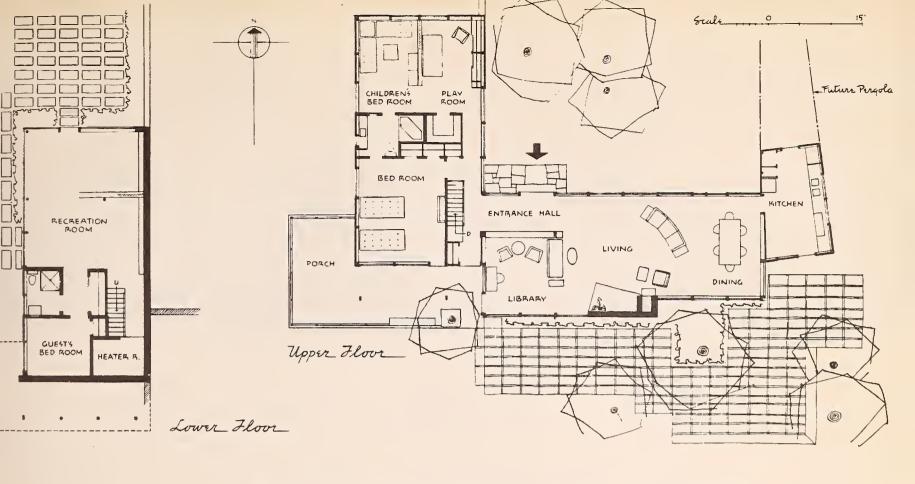
cost FACTS: \$18,200 in 1950. 2800 square feet at \$6.50 per square foot.

materials: Frame: 4 x 6 yellow pine posts spaced 5½ feet on center, with roof beams on same spacing covered with 2-inch tongue and groove exposed sheathing. Built-up roof has insulation board above sheathing. On exterior, within the framing, insulating fiberboard between layers of asbestos cement and fixed glass was used. Waxed brick floor in living-dining room; cork floors elsewhere. Forced warm air heat planned for future air conditioning.

PLAN FACTS: Aside from the fact that the architect-owner of this house in Atlanta needed the usual living areas and bedrooms for chil-

dren as well as for the parents, and desired in addition to have a separate living area both indoors and out for the children, he wished to build as inexpensively as possible. To keep costs down for the unusually large amount of space (2800 square feet) he adopted a simple structural system using inexpensive materials. Exterior panels of asbestos-cement fiberboard are colorfully painted red, green and blue. Interior wall surfaces are birch plywood or exposed asbestos panels painted Swedish red. Located on a beautifully wooded seven-acre site, the house is placed in such a way that adult living room and its southern living terraces are on ground level; the recreation room and guest room, under the bedroom wing, are above grade because of the slope of the site. A covered porch, opening from library and master bedroom, supplements the terrace.





House construction still has lots to learn from building methods in other fields. It has occurred to many architects that there is too wide a gap between the cost of building a small factory, which usually costs about half as much per square foot as a small house, and what the average family has to pay for its home. Typical wood "mill construction" is another inexpensive way of building that could be explored, as architect Herbert Millkey did here in his own house. Basically, mill construction is the use of big wood members, tied together by thick wood floors and roof. In the Millkey house, heavy wood posts and girders are placed on  $5\frac{1}{2}$ -foot centers, and the roof is of 2-inch thick tongue and groove planking. Although posts and girders are heavy members, they went up quickly under the architect's supervision; the resultant square-foot cost was low, and the exposed wood beams are very handsome.





LOCATION
ARCHITECT
OWNERS

East Hampton, New York Robert Hays Rosenberg Mr. and Mrs. R. H. Rosenberg

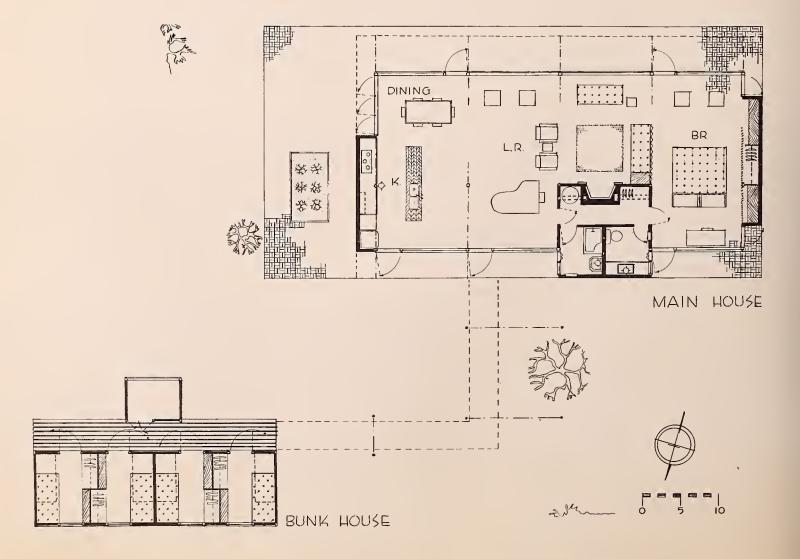
COST FACTS: Main house \$10,500 in 1950-51; bunk house \$1,850 in 1951-52. Main house 1235 square feet at \$8.50 per square foot; bunk house 479 square feet at \$3.98.

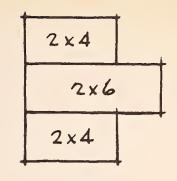
MATERIALS: Wood post and beam on concrete slab; cypress siding; brick floor.

PLAN FACTS: An open plan, with no partitions except those enclosing the bathrooms,

plus the wide horizons afforded by the glass walls, give a spacious, airy feeling. A full-length curtain separates the sleeping area and wood-woven curtain covers the storage wall. The only separation from the kitchen and living space is a free-standing 2-inch maple butcher block service counter, which has a double compartment set-in sink. For the children and guests a bunk house was erected later northeast of the house.

**ECONOMIES:** Structural system; simple construction details; no fixed partitions.





Still considering a structural system based on heavy posts, spaced far apart, an examination of the Rosenberg house (another designed by an architect for himself and his family) shows much wider spacing (12 feet in this case) and posts which are built up of three members (a 2 x 6 in the center, and 2 x 4's on the outsides). The advantage of a system like this is that natural "rabbets" are formed—recesses in the post to which windows, wood panels, or other wall members can be fastened. These posts are fastened to a concrete slab, and they in turn support girders which are built up of three 2 x 14 members. End walls are cypresssheathed on this house; fixed plate glass panels extend from floor to ceiling, and from column to column on the north and south elevations. These glass panels (protected by roof overhangs) are interrupted only by wood doors and the north bathroom extension. Since there are no opening windows the house is ventilated by ten solid wood doors (made on the job out of 1/4-inch fir plywood on fir frames) left open for cross currents of air as desired. Bathrooms are ventilated by fixed wood louvers with plywood closing panels, and are lighted by full length panels of translucent glass.





LOCATION
ARCHITECTS
OWNERS

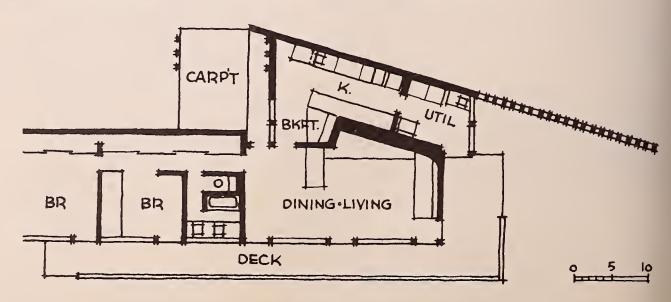
Highland Park, Illinois Schweikher and Elting Mr. and Mrs. R. Harring, Jr.

**COST FACTS:** Base estimate was \$19,000 in 1950. (Added items brought final price higher.) 1100 square feet plus carport.

MATERIALS: Timber construction; fir columns and beams and exposed mill roofing. Redwood exterior; red cedar plywood interior, birch plywood in kitchen.

PLAN FACTS: Heavy timber construction. with mill flooring and roofing, was used in this Illinois house for economy. For a minimum of maintenance exterior walls are of untreated redwood, interior of red cedar plywood. The small irregular piece of land on the edge of a ravine, together with building set-

back restrictions, dictated the wedge-shaped house and also largely controlled the plan arrangement. All rooms — with the exception of the kitchen-utility area - open to a southfacing balcony which is cantilevered over the edge of the ravine. Living-dining room and the two bedrooms have fixed glass walls, each with a sliding glass door for direct access to the balcony-deck. The wall of the kitchen-utility room, on the north, extends beyond the limits of the house as a fence to give privacy from the street side. The angular shape of the kitchen provides dining space immediately off the living room, divided from it by a sliding door. ECONOMIES: Mill construction; movable wardrobes for separation between bedrooms. BUDGET SUGGESTIONS: Omission of the builtin furniture. Use of less expensive woods.



Heavy timber construction, using "mill" methods of thick wood flooring and roofing to tie the timber posts and beams together, need not result in a "heavy" look. For the sake of economy, architects Schweikher and Elting used this system in the Harring house shown on these pages. Posts and columns are fir; the exposed wood ceilings, in combination with the cedar wall finishes, are pleasant and cool looking. In fact, the point cannot be made too often that exposed structural finishes—and even exposed structural members—not only may result in the saving of money, but a pleasant, intimate appearance as well.





LOCATION
ARCHITECT
OWNER

Raleigh, North Carolina George Matsumoto Dr. P. O. Richter

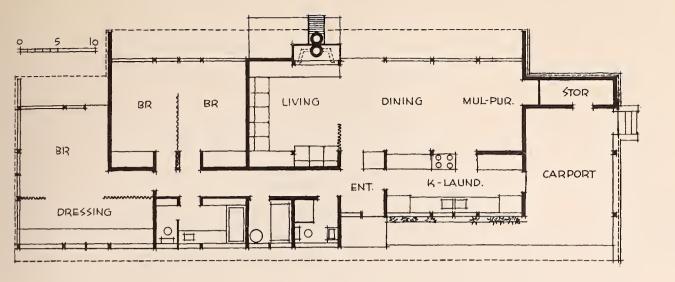
**COST FACTS:** \$19,145 in 1951, including all built-in items. 1824 square feet at \$10.40 per square foot.

materials: Wood frame, post and beam exposed; colored concrete floor; mill construction roof. Built on a six-foot module, with plank ceiling supported by heavy beams carried on posts set 6 feet apart. Redwood exterior. Interior throughout is (based on one-half the module) of 3 foot x 8 foot plywood panels.

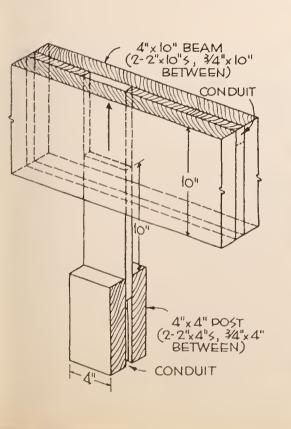
PLAN FACTS: To meet the general and more specifically personal requirements of the Richter family, architect George Matsumoto designed this simple rectangular shape for economical construction. Its success — both in appearance and in use — is due to the fine structural details and interesting use of materials, as well as to the well-organized space within the house. The simple structural system, based on a six-foot module and standardsize materials, is enhanced by the careful detailing of such things as the beauty of the exposed ceiling beams, the specially designed built-in cabinets and shelves. Among the personal requirements - perhaps a bit unusual for the average family - was a large living

room (with 100 square feet for book storage); a multi-purpose area, also with storage space; and convertible space for overnight guests. All of this has been provided for in the thirty-six foot long living space, which may be used as one large area or divided up into three separate zones. The fireplace end - with its book shelves, comfortable couches and radio-phonograph-record cabinet -- may be closed off by curtains for privacy for the occasional overnight guest or for a quiet reading-conversation area. At the other end of this large space is the multi-use area with storage space in the adjacent carport for hobby equipment and games. Between these two is the dining area, with a snack bar or serving counter opening from the kitchen. Master bedroom, at the far end of the house, and the two daughters' rooms (which open into one large play space by means of a folding wall) all have easy access to the two-compartment family bathroom. A smaller bath-powder room is conveniently located for family or guests. All three bedrooms have built-in desks, dressing tables and storage shelves and cabinets. To meet another special family requirement, the outdoor fireplace-cooking grill and barbeque pit is located on the terrace with the fireplace backing up to the indoor fireplace.

**ECONOMIES:** Simple structural system and adherence to standard size materials.



There are times when there is good reason to depart from the "modules" based on the conventional 16-inch stud spacing. In the Richter house shown here, architect George Matsumoto has used a 6-foot module, basing it on 3-foot widths of plywood which he wanted to use on the interior. Here again is a heavy-timber mill-roof construction system. Here also the posts and the beams are built up of smaller members, as the detail indicates. And here is further proof, in the photographs, that the use of heavy framing members, in the hands of an adroit architect, can result in a light-appearing house.





LOCATION
ARCHITECT
OWNERS

West Los Angeles, California Victor Gruen Mr. and Mrs. Edward Rubin

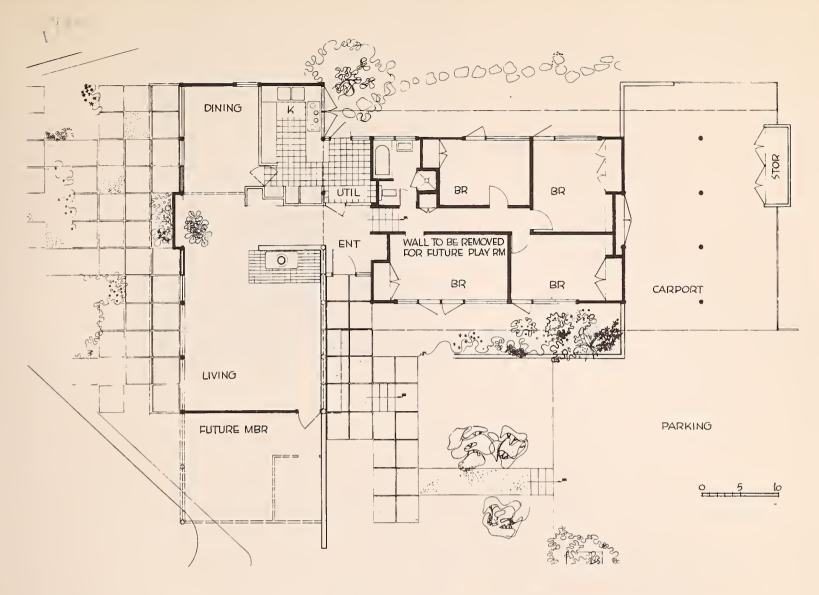
COST FACTS: \$19,300 in 1952. Square footage: 1650 for house, 400 carport, 35 for storage. About \$11 per square foot.

materials: Concrete slab on grade; timber post and beam with 2-inch roof sheathing. Material mainly wood, plus masonry accent. Limited use of plaster. Finish floors asphalt tile and carpet. Poured concrete fireplace and chimney (firebrick and terra-cotta lined). Ready-built metal shower.

PLAN FACTS: Architect Victor Gruen points out that for this house the framing system of post and beam construction proved to be both economical and flexible; also, it offers a pleasant architectural expression of wood construction. The Rubins, who have three children, wished to have a separation of parents' and children's activities but with a reasonable integration of the two for supervision. They also wanted a large living room for entertain-

ing, and a compact kitchen-utility area for servantless living. The plan (shown on opposite page) indicates how two units accomplish the separation of activities for adults and youngsters, and at the same time are closely related. The change in levels between the two wings, as the house steps upward and follows the natural inclination of the ground, emphasizes this division further (see photograph below). The present bedroom #1 will ultimately be combined with the bedroom hall (by removal of one partition wall) to become a play-recreation area for the three children whose bedrooms surround that space. When this change takes place, the parents will have their bedroom suite at the east end of the living room, as indicated by dotted lines on the plan. **ECONOMIES:** Durable and basic materials utilized throughout; equal spacing for structural framing members; roof plank exposed as finished ceiling. All materials and construction methods were economical. Deferment of parents' bedroom and bath until children are older saved original cost.





Here, on these two pages, is an instance of a house, designed by Victor Gruen, based on a post-and-beam system, with wood members exposed, and with two wings joining one another in such a way that the roof framing interlocks at the joining point and "stiffens" the entire structure of the house. The module here is 7 feet-6 inches. Roof planking gives additional bracing.



LOCATION
ARCHITECT

**OWNERS** 

No. Kingstown, Rhode Island

Conrad E. Green

Mr. and Mrs. E. G. Crosby

**COST FACTS:** \$4,000 in 1949, exclusive of water supply system, cesspool and plumbing fixtures. The pump pit with pressure tank and electrical pump and other plumbing items mentioned above came to about \$1,000.

plank roof; oak vertical boarding on exterior.

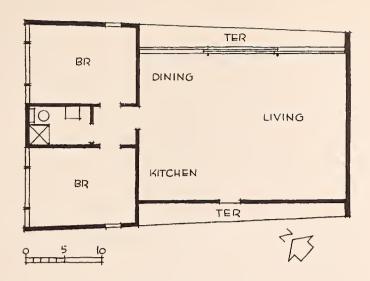
PLAN FACTS: Originally the Crosbys, who have two children, contemplated purchasing a small prefabricated house which they would assemble themselves and for which they would have to provide utilities. Instead, however, they turned to architect Conrad Green to design a summer cottage for them which would more adequately fill the space requirements but be sufficiently economical to compete in price with the prefabricated house; also they realized that a custom-designed house would better satisfy the dictates of the site. The resulting house compares favorably with the



prefabricated price which would have provided none of the amenities and would have had only about 75% of the floor area. The exposed framework leaves spaces which provide handy shelves, used to advantage primarily in the kitchen, bedrooms and bathroom. The house plan is as simple and direct as the construction system.

**ECONOMIES:** Panel wall construction; few partitions.





Prefabrication of houses has not reached the wide acceptance that many people expected some years ago-largely because of distribution problems—and although there are many companies making and selling "prefabs," their total number compared to the volume of house building in the United States each year is small. Aside from production and sales problems, prefabrication is up against another big fact—and that is that most people, even when they have a small budget, do not want a standard, stock plan, which is not designed to fit their own needs or their own site. The Crosby house on these two pages illustrates this fact. At first they had intended to buy a prefab; when they turned to architect Conrad Green, he worked out a semi-prefabrication system of their own, which resulted in a very economical house. The solid walls at the two ends of the living room, together with steel beams, carry the roof. These walls are "prefabricated" panels, about 4-feet wide, built up of 6-inch wide boards—one at each end, one in the center of each panel, and others nailed across horizontally. These panels are strong, were easily erected, and proved a very inexpensive construction system. The roof they support is 3-inch plank—strong, solid, and capable of spanning a long distance without supporting partitions.



LOCATION
ARCHITECTS
OWNER

Mill Valley, California Campbell & Wong John Garden Campbell

**COST FACTS:** \$5,000 (without architect's fee), in 1952. 540 square feet.

MATERIALS: Basic structure is a series of eleven equilateral triangles of Oregon fir, furnished pre-cut with holes already drilled to take bolts. Exterior panels are of water-

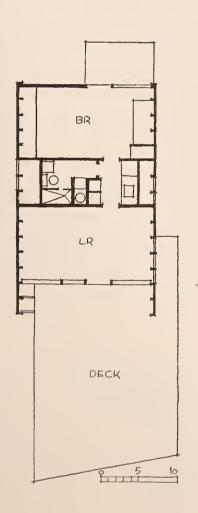
proof marine plywood secured by heavy battens. Plywood house flooring and plank porch flooring, applied to floor joists.

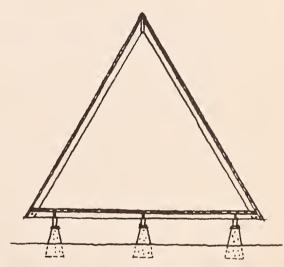
PLAN FACTS: For his own week-end house (to be used for relaxation, entertaining with ease of maintenance) John Campbell decided to erect one of the "Leisure Houses" which he and his partner Worley K. Wong had designed. Available for purchase as a "build-it-yourself" structure, this prefabricated assembly unit comes in two basic "packages": one with living room, kitchen, bath and sun deck; the other with the same space but a bedroom added. Mr. Campbell chose the unit with the bedroom for his week-end house. He of course added plumbing, electricity, glass to fit within the basic shell framework; but even so the completed ready-to-be-lived-in house cost only \$5,000 in all.

**ECONOMIES:** Prefabricated unit easily erected by two people, after foundation is laid.



Many economical ideas are possible in building a house if one dares to be completely unconventional. Publicity has been given in recent years to a number of ideas which would be practical if widely accepted—concrete domes, houses hung from central masts, and others—but none of these will yet save the individual home builder any money, because they are not actually in production. One of the most practical of the off-beat ideas is this "tent" scheme of architects Campbell & Wong. It is sold for vacation, week-end purposes as a knocked-down, prefabricated structure, but the idea behind it has wide possible application. The pre-built triangles of wood members are fastened up on 2-foot centers, and form the structure for floor, walls and roof. To them outside plywood panels are fastened, and between them glass panels can be placed.









LOCATION
DESIGNER
OWNERS

Beverly Hills, California Craig Ellwood Mr. and Mrs. Bryant Hale

cost FACTS: \$20,000 in 1951, including book-cases and divider cabinet. 1400 square feet at \$14.20 per square foot.

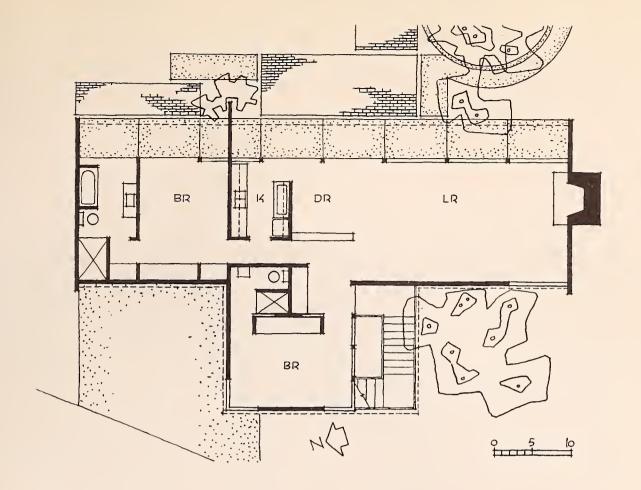
materials: Structural system of modular rigid frames: 4 x 10-inch horizontal wood beams frame into 4-inch vertical steel H-columns on 8-foot centers. Roof and deck: tongue and groove, select structural fir planking. Exterior walls and panels are plaster, except the 8-foot square sections of the den-bedroom, which are sheets of \(\frac{1}{4}\)-inch thick vermiculite, surfaced with a ground, polished, granite-like substance. Interior panels and walls are plaster, except for two panels of vertical grain fir

plywood in den-bedroom, and wall of fir siding between kitchen and bedroom.

PLAN FACTS: Because the site, located in a canyon, sloped upward from the street, the house was lifted up on 10-foot stilts to open it to view, light and air. This resulted in a two-level terrace in the rear, protected for privacy by the canyon walls. Carport and utility room fit under the uplifted one-level living space. The generously proportioned living-dining room experiences an even greater sense of space through the floor-to-ceiling glass wall opening to the terrace, and because of the free-standing panel partitions. In addition to the master bedroom and bath there is a study-bedroom, with its own bath, which is variously used as a studio, TV room, or guest room.

**ECONOMIES:** Simple plan; simple structure.





Not all houses designed to a budget must be built of wood. Many architects today are trying simple structural systems in steel, using the available structural shapes. Steel framing, unfortunately, usually costs more than wood; in some cases, however, a combination system can be used which retains the thin, elegant characteristics of a steel house and yet stays within the budget. Here Craig Ellwood has designed a house using a series of "rigid frames" which are composed of 4-inch steel H-shaped columns as posts, and 4 x 10 wood beams as roof members and floor members. Since these are bolted together, they are literally rigid, and when they are placed on 8-foot centers, they form the skeleton of a light, airy-looking house. Over the frame on the roof 2 x 6 wood planking is fastened; on the side walls, as the pictures indicate, the spaces between the framing members are filled with plaster, or with glass, or with a colorful, smooth-surfaced composition board. This is not as economical a system as some of the allwood houses you have seen; it gains a great deal for the construction dollar, however, in its ingenious use of steel and wood.



## MATERIALS AND EQUIPMENT

How to save on the building products you use

It seems like an obvious thing to say, that in a house where the budget must be watched at every step, materials should be chosen with care. It is astonishing, however, how many times this primary cost-saving approach to design is overlooked, or is misunderstood. Overlooked, perhaps, because you are used to certain materials and certain finishes, and it seems wrong to economize in that direction. Misunderstood, because so often the approach is to shop for cheap brands, rather than to look for totally different materials which would be less expensive than what you may have had in mind. The primary rules to remember when you are discussing materials with your architect are these:

Stick to stock sizes and standard materials. The exception to this would be the unusual case where a local dealer had an oversupply of some unusual material which you could use, and save money on by making a bargain buy. We know of one person acting as his own contractor who found a local supply house stuck with wood flush doors of an unpopular finish, which he happened to like and was able to buy cheaply. But in general the sizes and the products that are most in demand and most in supply are the least expensive ones; so curb your taste for the unusual when it is likely to be expensive.

See if there are any local materials available which will be less expensive than others because they do not have transportation costs tacked onto their price. There are many exceptions to this rule, because most building products cost about the same everywhere in the country today, but you may find a local concrete block or a locally burned brick which you can use to advantage.



LOCATION Fresno, California

ARCHITECTS Wurster, Bernardi & Emmons

OWNERS Mr. and Mrs. M. P. Davison

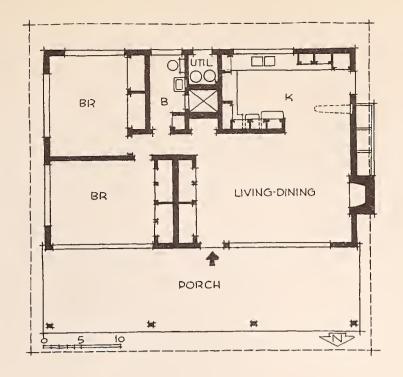
cost FACTS: \$11,400 in 1946. 1036 square feet at \$11 per square foot.

materials: Wood frame on reinforced concrete foundations. Exterior walls, redwood boards and battens; interior walls, slash-grain fir plywood. Floors, concrete with troweled-in color and hardener. Roof, cedar shingles. Windows, fixed and wood-sliding sash.

reliable materials and simplicity of details and over-all plan" were the base of the architects' thinking when they designed this compact but very livable house for the Davisons. Originally, when it was built, it was intended for occupancy by the owners pending the contruction of a larger house on the property—at which time this would become a guest house. However, when the Davisons, who have two sons, discovered that the completed small house was so well suited to their way of life and needs in general, they abandoned the

idea of a larger house and decided instead to build a smaller guest-house. That it should prove to be so eminently fitted to the family's year-round living attests to the architects' skill in the handling of inexpensive materials as well as in creating a satisfactory comfortable environment within a minimum space. Both the exterior walls of redwood and the interior walls of fir plywood, as well as the ventilating louvers under the roof pitch, are so carefully detailed that the entire structure has the appearance of fine craftsmanship, and ship-shape finish. The louvers extend the full length of the house to insure good through ventilation in the heat of Fresno's summers. With the climate factor in mind, the large windows (of the living-dining room and one bedroom) face north, and are shaded by the down-sweeping pitch of the roof which covers the generous porch. In the winter months, a hinged panel covers the louvers, and the house is heated by means of a radiant panel system embedded in the floor.

**ECONOMIES:** Use of inexpensive materials and simplicity of details.



The third thing to remember about materials is to use, as much as possible, those which have pleasant natural finishes and do not have to be covered up with other materials. Woods, bricks, sometimes pumice or concrete blocks, are examples. The cost advantage is that you can make use of them for structural purposes (a brick wall can support the roof; a concrete floor can rest right on grade, and so on) and at the same time you can take advantage of them as finishes. For interior finishes, plywood, hardboards, plaster boards, and many other products can be used to serve in the same way. You may have a strong preference for plaster walls and wallpaper, which you want to indulge at whatever blow to your budget. You will make the plasterers' unions and the wallpaper manufacturers very happy if you do, because they are truly worried about the trend to natural finishes—a trend which has been partly "stylish," but largely a matter of pleasant economy on the part of many home owners and their architects. Houses in California and the Northwest—by such architects as Pietro Belluschi and William Wilson Wurster—have set a trend toward natural finishes which is now widespread, and very sensible as well as very beautiful. The house by Wurster's firm, illustrated on the facing page, is a case in point.



LOCATION
ARCHITECT
OWNER

North Bennington, Vermont Bernard Kessler Mrs. Elsa Golbin

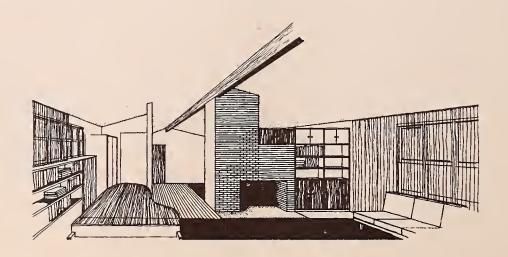
COST FACTS: Approximately \$19,000 in 1952-53. 1650 square feet at \$11 per square foot.

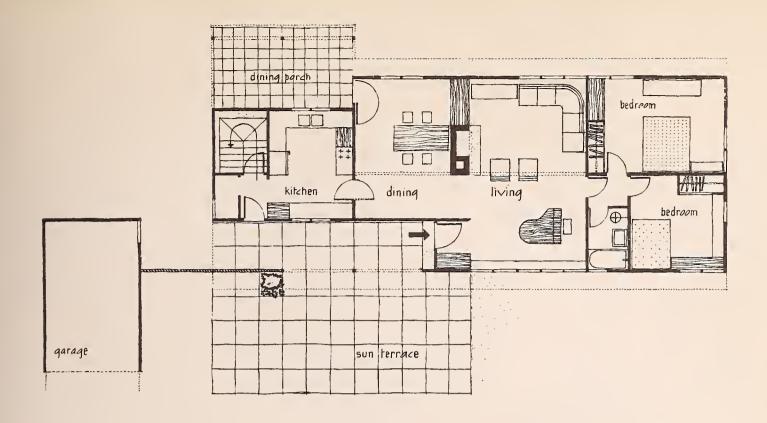
MATERIALS: Frame, using native pine board and batten; asphalt roof shingles; concrete block foundation. Standard doors, trim, and double-hung windows. Interior walls plaster throughout, except for two walls.

PLAN FACTS: A good example of a house which relies upon the use of native materials and simple straightforward detailing is the one in Vermont designed by Bernard Kessler.

Built for Mrs. Golbin, who is a composer, and her grown daughter, its uncomplicated rectangular roof (based on 16-inch on center dimensions) is frankly expressed in the pitched ceiling of the living and dining rooms by the elimination of a hung ceiling. Two bedrooms and bath form one end of the rectangular shape, and are nicely segregated from the living area. The pitched roof extends beyond the walls of the house on two sides to protect the main entrance (which opens to a sun terrace) as well as the dining terrace on the other side.

**ECONOMIES:** Use of local materials and traditional type of construction. Garage, indicated on the plan, will be built later.





Another admonition about the cost of materials is an equally simple one: examine materials which will do about the same job for you, and compare them in three respects—cost, of course, but also physical characteristics and durability. You will often find that the cheapest material of a group you are considering will have some unsatisfactory quality in its behavior. For instance, concrete block costs less laid up than brick; however, are you willing to accept its porosity and the way rain water stains, temporarily, its surface? Asphalt tile is the least expensive of the resilient flooring materials; cork is probably the most expensive; rubber tile and plastic tile come in between. Yet asphalt tile will probably show marks of furniture, especially in warm weather, more than the others. Which is more important to you cost or performance? The softboards, for use on ceilings and walls, are kinder to your budget than the pressed woods and the hardboards, but they may not stand up as well. As a result of such studies and discussion, architect Bernard Kessler used, in the Vermont house shown on the facing page, plaster interior walls and a native pine board and batten exterior finish. These are goodperformance, durable materials, perhaps not the least expensive that might have been specified, but well within the budget.



ARCHITECTS Minnetonka Mills, Minnesota
ARCHITECTS Thorshov & Cerny, Inc.
OWNERS Dr. & Mrs. Reynold A. Jensen

COST FACTS: Contract price under \$20,000. 3104 square feet.

MATERIALS: Wood, faced with brick and vertical redwood siding. Composition shingle roof.

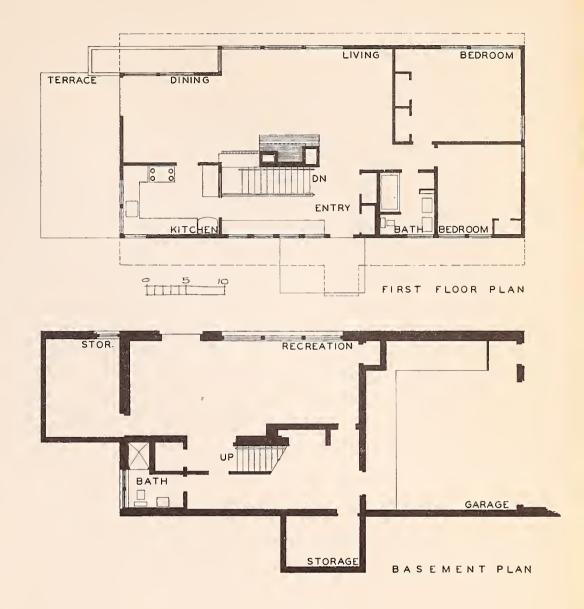
PLAN FACTS: Since both Dr. and Mrs. Jensen are very busy professional people, their main requirement was for ease of upkeep. Their architects, Thorshov and Cerny, therefore endeavored to use natural materials wherever possible so that finish and upkeep would be held to the lowest possible minimum. This was

managed by the use of exposed brick and plywood interiors. The plan is a simple rectangular shape with a simply framed gable roof. The well organized plan places two bedrooms and bath at one end of the rectangle, with living and dining spaces and kitchen devoted to the rest of the space. The basement was left unfinished at the time of construction in order to save money, but has subsequently been finished by the owner for use as multi-purpose entertaining and guest room. The garage, also on the lower level, tucks in under the bedroom wing.

**ECONOMIES:** Interior finishes were kept to an absolute minimum, and completion of the basement area was deferred.







One of the greatest mistakes that can be made in selecting inexpensive materials is to pick those with a low original price but a high maintenance cost. These factors have to be balanced. To tell someone who's building on a low budget that he should use expensive materials because they'll stand up better is like telling a man with a limited clothing budget that he should buy expensive suits because they won't get shabby so quickly. In building, fortunately, one can often specify materials that are not the most costly ones and that also are not expensive to maintain. The house illustrated on these pages is a good example: natural materials such as brick, natural-finish materials such as plywood, and finishes on outside and inside wood which allow it to weather naturally and with almost no maintenance — these things were carefully considered.



LOCATION ARCHITECTS Elmwood Park, Illinois Crombie Taylor & Robert Bruce Tague

OWNER

Irving Nuger

cost facts: \$19,500 in 1952. 1400 square feet at \$14 per square foot.

MATERIALS: Wood frame and brick, on concrete slab. Radiant heat in floor slab.

PLAN FACTS: By grouping the interior baths and kitchen around a central utility core, the other rooms of this house gain an openness



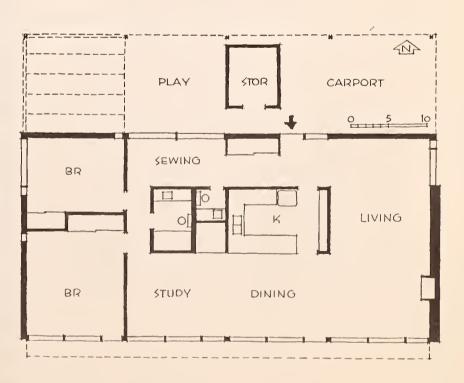
not only to each other but to the surrounding outdoors. Even the kitchen expands outward to the total vista of the south solar wall, by the use of a counter-high division between it and the dining space. A widened corridor on the north side of the centrally located utility core serves as a sewing room. This overlooks the covered play area for the two-year old daughter of the Nugers. Possible extension into another room is provided for in the heating layout for the area marked "play" in the plan. Because Mr. Nuger wanted a studio for painting, the space marked "study" on the plan was allocated to this purpose, but it is intended that it may also be used on occasion as a third bedroom. The two bedrooms are the only rooms in the house which have the complete privacy of enclosing walls. Ventilation is by means of adjustable wood louvers in doors and window panels, which are floor-toceiling height like the fixed glass areas.

ECONOMIES: Dual use of study as bedroom and wide corridor as sewing space. Central placement of utility core adjacent to baths and kitchen. Standardization of dimensions by use of stock-size material for module.

When the plan of a house has been simplified, for purposes of economy, and when the structural frame has been based on a modular system of equal spacings between supports, also for purposes of economy, it becomes more important than ever to work to stock sizes of materials. The reason for this is that there will be a repetition of parts—let's say window panels—and if every one is of standard manufacturers' sizes, there will be a repetition of economical sizes—and no waste in fitting. Waste in materials means waste of money.

In this simple little house designed by architects Crombie Taylor and Robert Bruce Tague for the Nuger family, the basic consideration was stock size of double-glazed window sections, shown in the photograph below. "Twindow," used here, and other similar products must be made and sealed in the factory; a stock width determined the module for this house so far as structural system was concerned. The architects kept the same principle in mind throughout the design, with regard to all materials that they used; to this they attribute the low cost.





LOCATION ARCHITECT

Somerset County, N. J.

Elroy Webber

OWNERS

Mr. and Mrs. G. P. Whitcomb

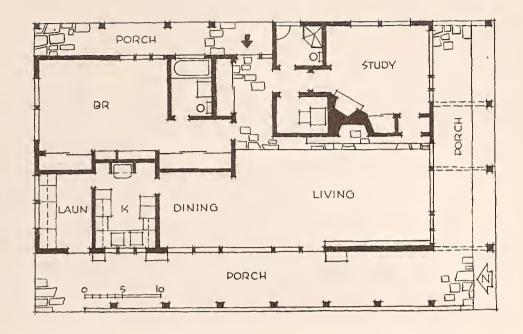
cost facts: \$19,800 in 1950. House 1460 square feet at approximately \$12.60 per square foot, including cost of garage.

MATERIALS: Concrete slab foundation. Conventional 2 x 4 studs, frame construction. Exterior, redwood random boards on wood sheathing. Interior walls and ceilings, plaster on rock lathe. Floors, asphalt and ceramic tile. PLAN FACTS: The rectangular plan, as well as the simple construction system and inexpensive materials which went hand-in-hand with it, was designed to avoid waste space inside (minimum of hallways) and to keep down labor costs (no complicated jogs or breaks in the plan—unbroken roof line). Within the compact plan, space is organized for utmost usability: living and dining rooms open to each other and to a flagstone terrace, giving a spacious feeling beyond actual dimensions; the study doubles as a guest room, has the guest bathroom next door. Master bedroom and bath, as well as the kitchen and laundry, are skillfully placed to afford privacy from the main living area. The only corridor space allocated is the entrance hall, which gives direct access either to the living area, the study-guest room, or the master bedroom. For the heavily wooded site (chosen because the owners dislike the maintenance of formal lawns and flower borders, but enjoy trees and wild flowers), the landscaping and outdoor living areas were an integrated part of the design. Three sides of the house are surrounded by flagstone terraces, each equipped with trellis or louvered wood-sliding sunshades. With the prevailing summer breeze from the west, this was the logical place to extend the living area beyond its walls. Here the horizontal louvered sunshades (at the outer edge of the terrace) are put to work to control the amount of western sun.









The house shown on these two pages is an excellent example of economies through the use of stock materials. Aside from its pleasant sun-control system, note that doors, windows, steel casements, even such items as a prefabricated shower pan, are all stock. The exterior sheathing of redwood random boards was also an economy, but a practical one both in initial expenditure and in low maintenance costs; natural stain was used to give it long life and durability. The single chimney serves two fireplaces—the living room and study—as well as the furnace in the heater room. Flagstone paving for the terraces was economically laid in sand and combined with white gravel to create mudfree areas around the outdoor living spaces. Also worthy of note is the floor—a concrete slab—which is natural finish flooring and at the same time has imbedded in it ducts for a forced warm-air perimeter heating system.



LOCATION
ARCHITECT
OWNER

Phoenix, Arizona Blaine Drake John F. Connor

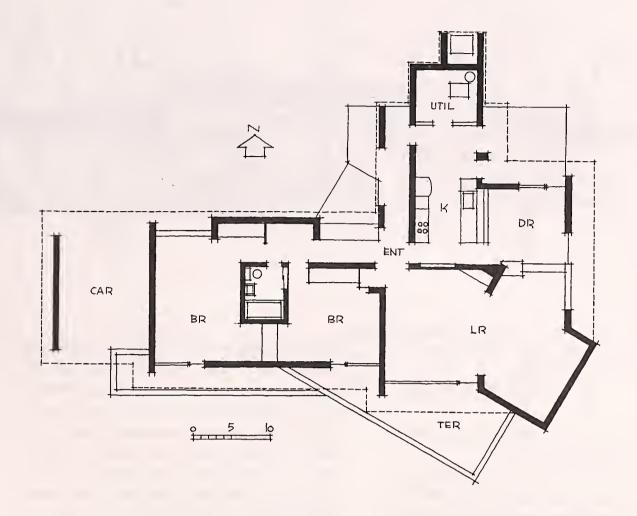
**COST FACTS:** \$14,000 in 1952. 1400 square feet at \$10 per square foot.

MATERIALS: Pumice blocks (8x8x16 inches); construction system based on the block size. PLAN FACTS: Since, for financing reasons, Mr. Connor and his architect, Blaine Drake, had to work under limited FHA regulations, the main problem was to get the maximum space with inexpensive materials. To give

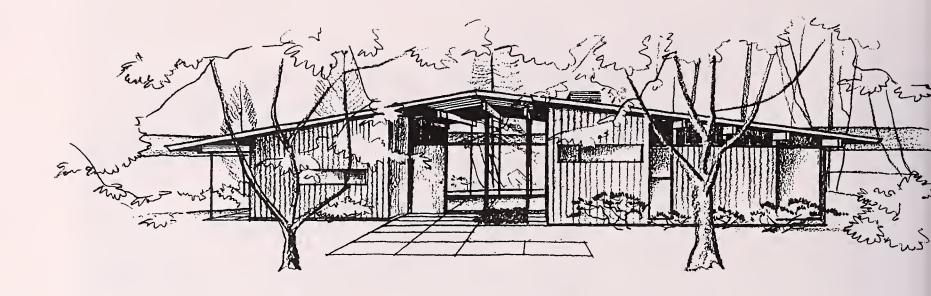
Mr. and Mrs. Connor their required two bedrooms and bath in addition to a living room (large enough for a piano for Mrs. Connor), separate dining room, kitchen and storage room, the most satisfactory inexpensive material proved to be pumice block. This was the basis for the construction system, using the blocks for the enclosing walls of the house as well as for the interior dividing walls between rooms. Because of its color and texture the pumice block was left natural, exposed both inside and out.

**ECONOMIES:** Use of exposed structural blocks.





The term "local materials" has lost much of its meaning in these days when easy transportation makes, for instance, redwood as inexpensive in the East as it is in its native California—and yet the smart shopper for building material will find certain products more readily available—and therefore, probably, less costly—in his own area. As an example, the house shown here is built of pumice block—a slightly porous but quite handsome product widely distributed in Colorado and Arizona. In the Arizona climate its porosity is no handicap, and its natural color and texture can be used to advantage (and at considerable saving over other materials) by a clever designer. Notice in this house for the Connor family how architect Blaine Drake has designed its use both on the outside and in the interiors in such a way as to enhance its natural qualities.



LOCATION ARCHITECT Bainbridge Island, Wash. John Ridley

OWNERS Mr. and Mrs. E. G. Brooks

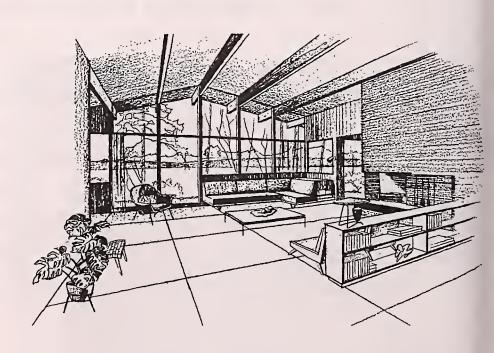
**COST FACTS:** \$19,425 in 1951-52. 1357 square feet at \$14.33 per square foot.

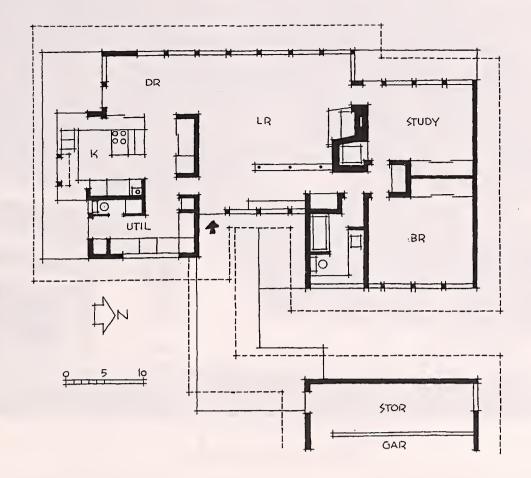
MATERIALS: Wood; exposed and stained post and beam, on concrete slab. Built-up roof. Exterior siding rough-sawn cedar vertical boards and battens, finished with redwood creosote stain. Interior walls: smooth cedar with sealer, and plasterboard. Birch cabinets. Concrete floor, stained and waxed. Radiant heat from warm air ducts under concrete slab.

PLAN FACTS: The materials and finishes for the Brooks' house represent their expressed preferences—natural wood, brown colors, and warm textures. The total appearence adds up to a house with delightfully informal character, which they desired. Also of prime importance to the Brooks—who had lived on this waterfront property on Puget Sound prior to building their new house—was a good view of the Olympic Mountains across the water to the west. To satisfy this wish, architect Ridley placed the living and dining rooms as well as the study on this side with large glass areas facing the view. The upsweep of the glass area in the living room, following the roof and ceiling pitch, adds enjoyment to the dramatic view.

ECONOMIES: Use of natural materials and local sandstone. Radiant warm air heat was efficient and economical installation, and according to the architect, about two-thirds the cost of hot water radiant heat.

**BUDGET SUGGESTIONS:** Cabinets could be varnished fir instead of natural birch.





In the use of inexpensive materials, virtue is often its own reward. We do not refer now to cheap materials, in the sense of inferior brands of products, but rather the choice of natural, earthy, unostentatious things like brick and natural wood finishes, exposed concrete, concrete block (when it is used well), and the like. These materials are good-looking, as well as being budgetsaving. We know an architect who lives in an old brownstone in New York, where his living room has a warm, mellow brick wall which everyone admires and envies. All he did was rip off the plaster and the wood furring behind it, which had covered the brick for many decades. Why not start out with a natural-finish material like that in the first place? In the house shown on these pages architect John Ridley had clients who wanted an informal, intimate character in their house, which he gained for them by using materials which also fitted the budget—natural wood in brown colors and warm textures (redwood on the outside, cedar inside), local sandstone for the fireplace, a waxed concrete floor.



LOCATION
ARCHITECTS
OWNERS

Hanover, New Hampshire E. H. and M. K. Hunter Mr. and Mrs. R. W. Moulton

**COST FACTS:** Cost withheld, but well under \$20,000, including built-in furniture. 1443 square feet. Built in 1952-53.

MATERIALS: Frame, with pine shiplap sheathing exterior walls; concrete block foundation. Fixed glass set in wood, and sliding aluminum sash. All floors of fir, except in entry, hallway, kitchen, bath which are asphalt tile.

PLAN FACTS: The Moultons, who have two children, were fortunate to have architects who believe (and put into practice) that "careful detailing and choice of materials can save on-the-job labor and provide reasonable quality for a lower price." Their attitude is evident

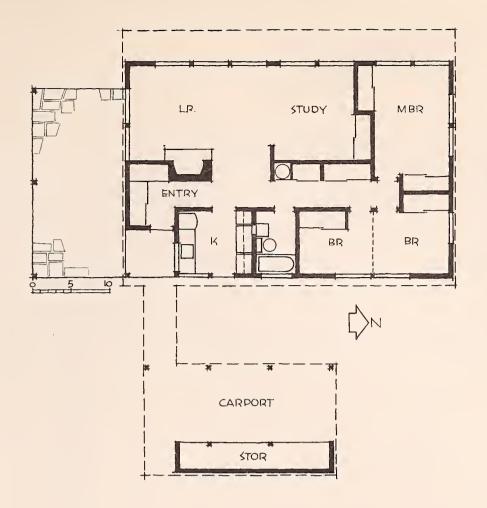
in the resulting house, both in planning and in use of materials. Expandable space in the children's rooms, as well as in the living room and study, was devised by means of curtains (on tracks provided by the owner) between these rooms; thus saving the cost of dividing walls or partitions (which could be installed later if desired, without cramping the spaces involved).

**ECONOMIES:** Choice of inexpensive materials which would require minimum labor-installation costs. Another saving is the plan of the owner to lay the flagstone terrace and entry walk himself.

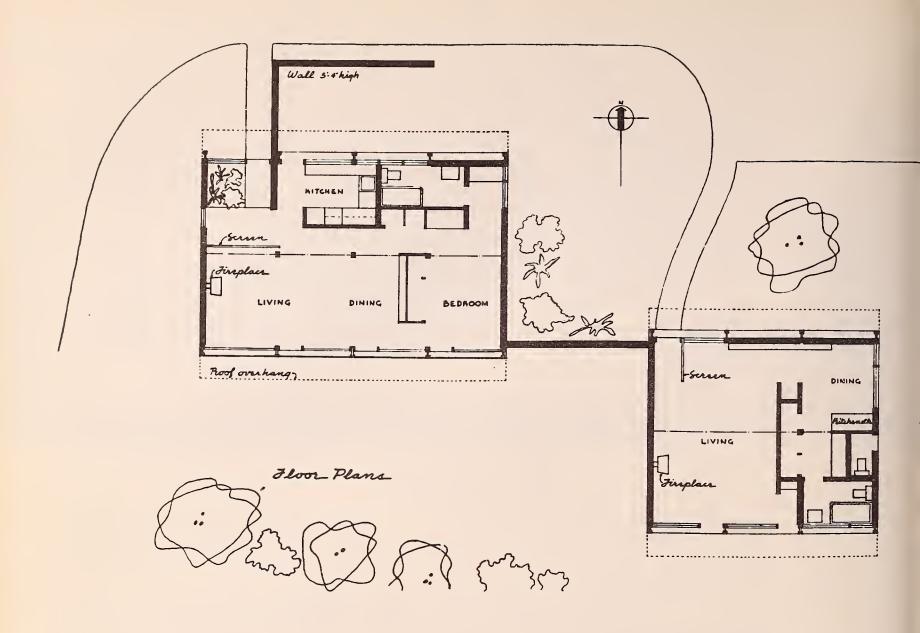
**BUDGET SUGGESTIONS:** Carport and storage space could have been omitted or postponed. Dishwashing machine, and clothes washer could have also been postponed.







As in every step in the design process, the services of a thoughtful and capable architect are worth many dollars in the choice and use of materials. Inexpensive finishes, inside and out, can look very shoddy in a short time if they are not used well. The detailing (the method of fastening materials together, flashing at exposed points, protection against weathering and natural deterioration—all these things) must be watched even more carefully than ever when cost is a prime consideration. In this house by the Hunters for the Moultons, there is a neatness to the shiplap siding which is no accident; it is the result of the way it is designed and the way it is detailed. The interior finishes here are all "dry" construction (wallboards of hardwood, plasterboard, plastic sheets, rather than plaster), resulting in cost-saving, but requiring most careful detailing and supervision of installation in order to achieve the permanent smoothness that is so apparent in the photographs.



LOCATION
ARCHITECTS
OWNER

Sarasota, Florida Twitchell & Rudolph Mrs. Kate Wheelan

**COST FACTS:** Larger guest cottage 792 square feet, small cottage 594 square feet; at \$15.60 per square foot.

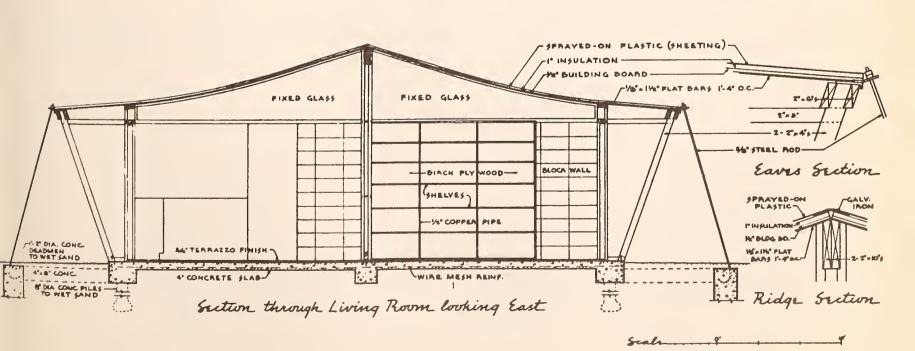
MATERIALS: Frame, post-and-lintel construction, built on reinforced concrete grade-beams on piles to wet sand stratum. Exterior masonry walls are of lime block; interior partitions are plywood on standard stud frame; terrazzo flooring. Sprayed-on plastic sheeting for roof.

PLAN FACTS: Built for rental on an estate on Siesta Key, these two small guest cottages have a new technique in building construction through the use of a new material — sprayed-on plastic sheeting. The tent-like roofs are formed of steel bars to which are clipped large

sheets of insulating building board, over which there is a one-inch layer of glass-fiber insulasulation, which in turn is surfaced with the sprayed-on plastic, 1/16" thick. The larger of the cottages contains a living-dining room and bedroom, all opening to the south to overlook a grove of oak trees; the kitchen, bathroom and storage space are in the rear portion of the cottage. The smaller unit, blended in exterior appearance by the same structural system, devotes the largest space to the living area, with dining space, kitchen, bath and lavatory (accessible from outside) separated from it by a storage wardrobe wall.

**ECONOMIES:** Lime block walls exposed inside and outside; the minimum material utilized in the roof structure; the prefabricated fireplace, and kitchen units; and the modular construction.

After considering all of the things that normally should be done, it is always wise to consider the exceptions. Much has been said in the preceding pages about studying availability of materials, and the proven characteristics as well as the market prices of building products. However, if you are the imaginative, experimental sort, you may want to throw all these rules overboard and try something brand new. Perhaps you will save money this way; perhaps you will discover new uses or new materials from which others as well as yourself may profit. Consider this pair of little houses in Florida, designed by architects Twitchell & Rudolph. For roofing they used what is almost a brand-new material—sprayed-on liquid plastic, which sets to an apparently permanent (or reasonably long) life as a finishing material tough, colorful, resilient, weather-resistant. For this sort of unusual material you may find distributors few, or non-existent, in your area. But it might be worth asking your architect, "What is there that is new that we might consider, that might make our house less expensive?"





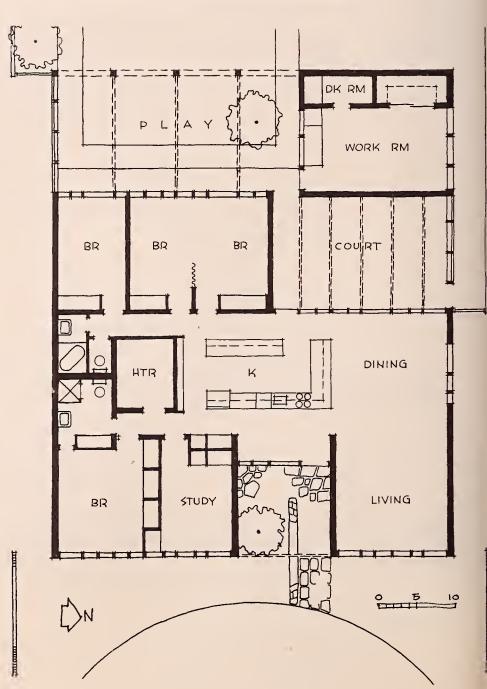
ARCHITECTS Albuquerque, New Mexico
Max Flatow-Jason Moore
Jason Moore

COST FACTS: \$19,000 in 1951. 2500 square feet at \$7.60 per square foot.

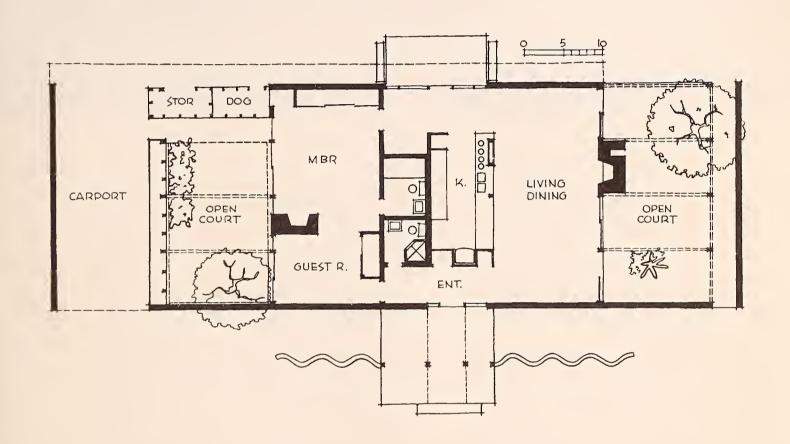
MATERIALS: Wood frame, using simplified framing system; concrete slab floor on fill. Steel casement windows, 4-foot module.

PLAN FACTS: To get eight rooms on a small city lot is no easy task for any architect. Here it has been done by the use of a compact plan which places kitchen, heater room and two bathrooms in the center of the house. Radiating from this "core" are: (1) living-dining space; (2) master bedroom, study, bath; (3) children's rooms and bath, with adjacent play court; and (4) a workroom with dark room and storage. This last caters to the family's interests in photography and home crafts. A garden court between the living area and workshop lends openness to this otherwise tight plan. The children's wing has one double bedroom which, by means of a movable division, serves as playroom by day.

**ECONOMIES:** Simplified framing system; drywall interiors; inexpensive rough-sawed vertical siding; central plumbing core.



The two houses shown on these pages, both designed by the same architects, make two important points. First, in the Moore house opposite, there is perfect illustration of the exposure and expression of natural materials (stone and wood) and fabricated materials (gypsum board). Here and in the plan of the Book house on this page, notice how all the plumbing facilities—two bathrooms and kitchen—have been brought together in a central "core."



LOCATION
ARCHITECTS
OWNER

Albuquerque, New Mexico Max Flatow-Jason Moore Robert L. Book

cost facts: \$16,000 in 1953. 1375 square feet at \$11.64 per square foot.

**MATERIALS:** Brick and frame, on a 7-foot modular system.

PLAN FACTS: In the plan of this house compactness is concentrated in the center with

plumbing and kitchen facilities grouped economicaly together. Such grouping gives more openness to the rest of the house, with the living-dining room taking up one side, and the master and guest bedrooms the other. Open garden courts at either end extend the living space to outdoors, increasing the feeling of spaciousness and openness.

ECONOMIES: Inexpensive materials; simplified construction; central plumbing facilities.



LOCATION
ARCHITECT
OWNER

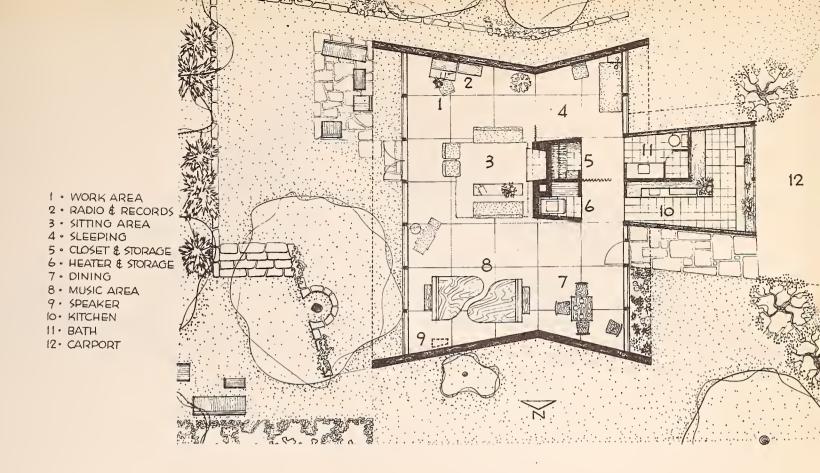
Birmingham, Michigan Edward Elliott Mrs. D. K. Roosevelt

**COST FACTS:** \$19,500 in 1951. 1490 square feet (counting carport, etc. as one-third) at \$13.10 per square foot, including storage cabinet, desk and radio units.

MATERIALS: Post and beam construction; plank roof; block core; concrete slab floor. Part radiant heat system around perimeter of slab, and baseboard heat under glass area. Interior and exterior walls of natural cedar. Double insulating glass panels set between simple post and beam construction. Central core containing the fireplace and heater room is white-painted concrete block.

PLAN FACTS: The owner of this house in Michigan is a concert pianist who lives by herself. The problem was to design a studio which would accommodate her simple living requirements and at the same time provide perfect acoustical conditions for two concert-grand pianos and recorded music. The space not only had to give the intimacy of character required

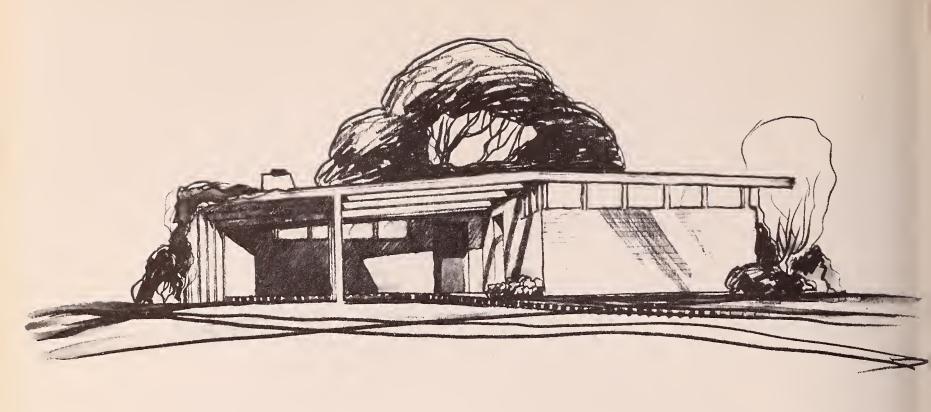
for a person living alone for the greater part of the time, but also had to allow for 75 guests at informal music concerts. From these controlling factors the design was developed, with the studio basically conceived as one large room to which as much space as possible was allotted (to give as much volume as possible). This was supplemented by an adjoining and compact unit containing kitchen, laundry, utilities and bathroom. The shape of the space was developed mainly through acoustical requirements — the roof and the two side walls being V-shaped to minimize the number of parallel surfaces, yet provide the correct resonance to the room. Location of solid walls and glass panels was also influenced by the lot, which is on a normal type of city street, narrow with adjoining houses. The back of the lot overlooks a wooded ravine, and to take advantage of this and at the same time gain complete privacy from neighbors, the side walls are solid, spreading out at an angle to the view. **ECONOMIES:** One large space, subdivided by screens; simplified construction system; simplified plumbing, heating, electrical system.



Concentration of all plumbing in one central area, so that economy in piping can be accomplished, is well worthwhile when the budget is tight. The actual saving of one plumbing "stack" over two is not great—a few hundred dollars at the most—but this is the sort of saving that the budget-minded must look for at every turn; there is less material involved and less labor required, when bathrooms and kitchen are backed up against one another as they are in this house designed by architect Edward Elliott. Notice how the entire house is divided into its parts by the central "core" of mechanical spaces.







ARCHITECT Arthur T. Brown

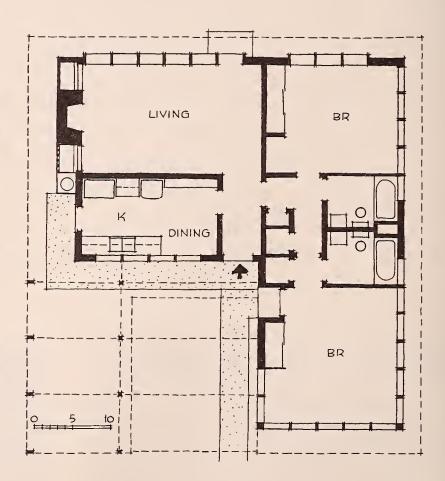
OWNER Miss Jessie Dow

**COST FACTS:** \$11,500 in 1952-53. 1520 square feet at \$7.37 per square foot.

**MATERIALS:** Brick veneer. Interior walls of Sheetrock on wood studs.

PLAN FACTS: One of the most unusual features in this moderate-cost house is the installation of "spot heating and cooling." In a climate which has extremes in temperatures, the installation of equipment which will insure comfort both in hot and cold weather is a real boon. Miss Dow, the owner, wanted a rental unit included in her house plans so that she could have a supplementary income when she retires in a few years. To make possible individual controls for the two parts of the house, two types of wall furnaces were installed one to heat the main part of the house and the other to heat the rental bedroom (on the front). For "spot" cooling, two on-the-roof trailer coolers were used, each with its own control for the two parts of the house. This eliminates the need for ducts which would have added about \$500 to the cost.

**ECONOMIES:** Open beam ceilings; cement floors; carport instead of garage; single construction for roof; simple heating and cooling systems; plaster board for interior walls.



The house shown on the opposite page is the last one in this section of the book, and it is a final excellent illustration of the frank use of good materials chosen to fit a moderate budget. It also incorporates an interesting heating and cooling system. Miss Dow's house is unusual in that she wanted it "zoned" for two separate purposes—her own living quarters, and a wing that might be rented in the future. The architect specified unusual and inexpensive units, one for each part of the house, which provide a simple, efficient system.

Not all heating problems are solved so easily, and you may be puzzled as to whether to consider full air-conditioning, which is growing more popular and less expensive for residential installations. No general rules can be laid down about heating methods, except perhaps that the old-fashioned forced warm-air system is still the cheapest, and in many cases completely satisfactory. If it is properly laid out in the beginning, with future cooling installation in mind, it can be converted to a pretty complete airconditioning system when the budget allows. Radiant heat is usually-not always-more expensive to install, but less expensive to operate than systems which require radiators or convectors or a duct system—and it is certainly the most pleasant to live with. Combinations of radiant and forced air systems are becoming popular, and have many advantages, which technical literature will make clear if you want to study the subject. Ask your architect to explain the advantages and disadvantages of the various means of heating, conditioning and cooling the air, and ask him to tell you in round figures the differences in cost for your particular house plan. Then, once more, stack these considerations up against your budget—and decide not by hunch or prejudice, but with all the facts in mind.



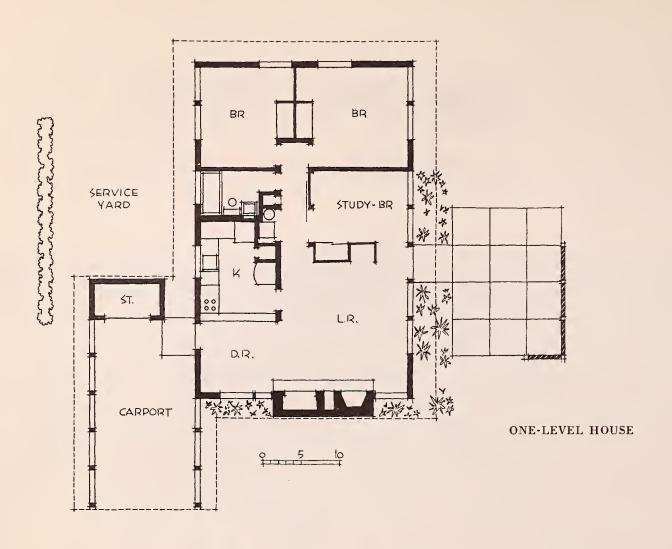
## **READY-BUILT HOUSES**

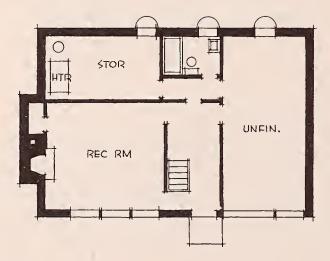
How to buy quality within your budget

Most of this book is written on the assumption that you are going to an architect with a building-budget problem, so that you can get a house suited to your own special needs. It has been pointed out that the right architect can save money in the use of space, in selection of materials, and in many other ways. However, a great many families with limited incomes turn for their houses to the operative builder, who has already built the house they might want. What are the advantages and disadvantages of this?

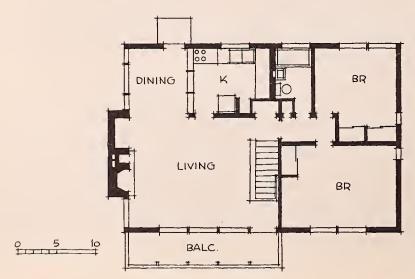
The big advantage is you can see the plan, the materials, the finishes. But will you save money? With the right builder-development, you may. A good builder operating intelligently can purchase materials and equipment in large lots, and schedule his operations so that there is no waste in the time of his crews of workmen. He should be able to plan in a community-wide sense, with a good relationship of houses and their land-scaping. And he can employ a good architect, who will make the plans of his houses workable, and see that the construction is well detailed, as in builder Eichler's house by architects Jones & Emmons, opposite.

If you have that sort of builder-developer in your community, you will certainly want to investigate carefully the product he has to offer. There are not very many of them. Although the average operative builder has improved the quality of his house in recent years, too many still are building so few houses at a time that there is no real saving involved; too many are skimping on hidden items that will cost you money in the long run. This chapter illustrates some good builder houses.

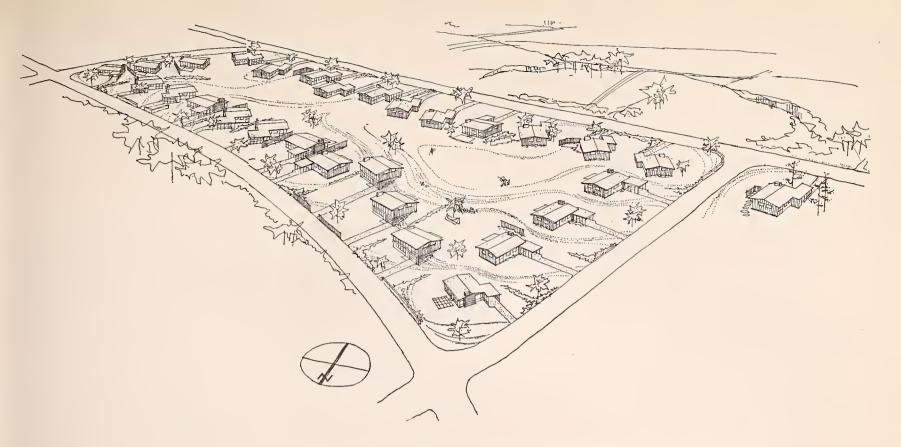




TWO-LEVEL HOUSE — LOWER LEVEL



TWO-LEVEL HOUSE — UPPER LEVEL



One way that a development builder can save money is in the purchase of large blocks of land. How he develops that land, however, is of prime importance to you, a potential purchaser of one of the houses. There is no excuse any longer (if there ever was) for a string of identical houses all in a row. The advantage of the *development*, as compared with the *house*, is that the relationship of houses can be planned, and a certain variety along with a certain unity can be achieved in the total community. If this is done well, as it is in the tract illustrated on this page and described on the two following pages, this can save money that you might have had to spend in planting to screen the neighbor's yard and in such things as fences and walls.

Here each house is located with regard to the contour of the land, the street layout, and its neighbors. Lots are generous (10,000 to 15,000 square feet) and by use of curving streets and taking advantage of sloping land, the architects achieved considerable variety. Houses are in different positions; locations of carports vary; and two-story houses are used on sloping sites. Plans of this Holmes Run development of Luria Brothers, in Arlington, Virginia, designed by the architectural firm of Keyes, Smith and Satterlee, are shown on the opposite page.



LOCATION
ARCHITECTS
OWNERS

Holmes Run, Arlington, Va. Keyes, Smith & Satterlee Luria Brothers

**COST FACTS:** For basic one-level house, the cost is \$11,350. 902 square feet at \$12.58 per square foot. (Two-level houses have 1804 square feet of enclosed space.)

MATERIALS: Frame, post and beam construction. Prefabricated and stock sizes of materials. Buyers are given a choice of glass or plywood in the smaller exterior panels, and selection from a range of colors.

developer and his architect can result in a community of good-quality, well-designed houses which are eagerly purchased and thoroughly enjoyed by families who want a readymade house. The Holmes Run community is a good example of such cooperative teamwork. The design of basic plans — for one-story and two-story houses — makes allowance for changes in interior spaces and rooms, to suit different family sizes and needs. The individual lots of different sizes and shapes were all

landscaped, have a concrete driveway, and sufficient space for gardens or play areas. The basic one-story house (shown here in photographs) has a well-thought-out plan containing living room (with adjoining terrace), dining room, kitchen, a study-bedroom in addition to the two main bedrooms and bath. There is also a carport with outdoor storage space. The study-bedroom may be flexible in use: it may be used as a part of the living room, to increase its size, by turning a storage wall on casters back against the inside partition (as it is in the photograph directly to the right); or, it may be used as a study or third bedroom by swinging the storage wall out to serve as a divider from the living space.

In the two-story version the upper floor is essentially the same as the one-story house, but without the study-bedroom. For these houses, the flexibility comes in the lower level: there may be two bedrooms plus a garage, or a recreation room plus a bedroom.

**ECONOMIES:** Pre-cut plywood wall panels, posts and beams; modular structure; stock sizes. Prefabricated storage units.

Savings that were made in the cost of the Holmes Run houses pictured on these pages came from selection of good, pleasant, but inexpensive materials, and a construction system that took full advantage of the large-scale building operation. Exterior plywood panels, as well as the posts and beams, were precut—a sort of prefabrication operation that is very sensible in a builder development. Stock sizes of standard materials were used, and a modular structural system worked out to accommodate them so that there was no waste in cutting and fitting. Yet within this cost-saving system of building a number of houses at once, variety is achieved, and a certain choice given the individual home owners; when you can decide whether you want a glass panel or a plywood panel in a certain place, and choose your own exterior colors from a wide range, you have much more freedom than you do in most repetitive developments.







LOCATION
ARCHITECTS

Mar Vista, California

Gregory Ain; Joseph Johnson, Alfred Day—Collaborating

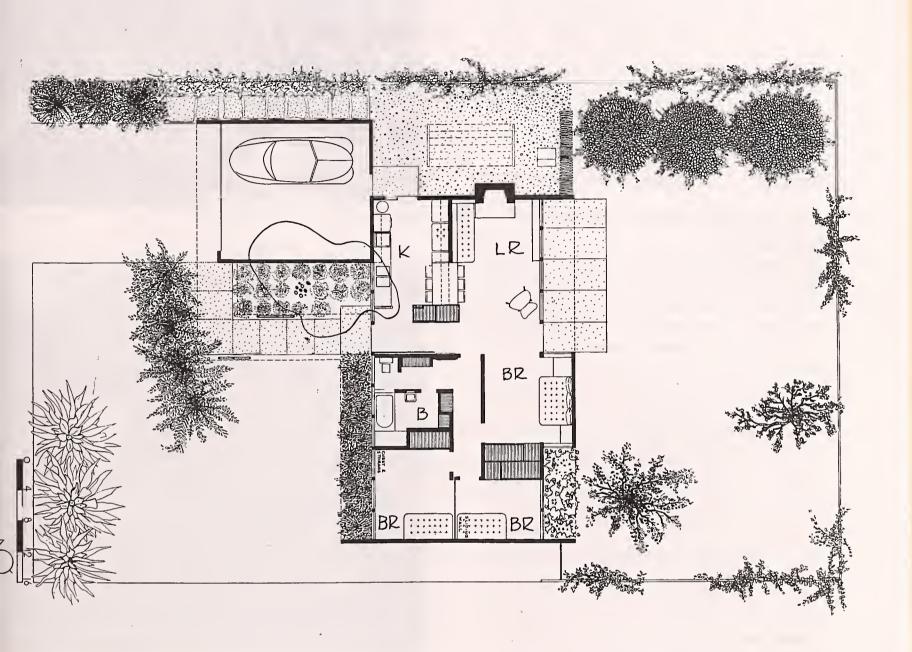
OWNERS

Avondale Development Co.

cost facts: Approximately \$10,000 in 1948 (and following years). 1030 square feet at approximately \$10 per square foot.

MATERIALS: Cement plaster exterior; plaster interior. Asphalt tile on concrete slab floor. Structural system 4-foot spacing; 3x4 posts. PLAN FACTS: Flexibility is one of the secrets of the success of the Mar Vista project: (1) monotony of appearance is avoided by placing the houses on the site, some in groups, others at irregular distances, and by variations in the plan and in location of the two-car garage in relation to the house; (2) adaptability to varying family needs by the use of adjustable interior partitions. For instance, the three sleeping rooms in the house shown here may be converted for different kinds of use; the two smaller bedrooms may be thrown together to make one large master bedroom by rolling the partition into a "pocket" in the hallway; or they may be separated into two children's bedrooms and converted into a playroom by day. Again, by means of a floor-to-ceiling sliding wall panel (which disappears against the wall of the entrance hall) the study may become the master bedroom (if the two smaller rooms are otherwise in use) or it may be made a part of the living room for added spaciousness. Another versatile feature is the built-in dining table between kitchen and living room. Aside from family meals, it may do duty as a serving buffet when entertaining or it may become a desk by lowering a dividing panel to close off the kitchen. Also to be commended in this welldefined plan is the fact that one may enter every room of the house from the entrance hall without going through other rooms.

**ECONOMIES:** Standardization of materials and over-all construction system.



Proof that a home buyer can sometimes get his money's worth—in quality of design, as well as in construction and in good livable space—is demonstrated in this "ready-made" house for Avondale Development Co., in California, designed by Gregory Ain and his collaborators. These architects have put into their designing and planning of the basic house (shown here in plan and photographs) as much care as they would for any client of a custom-designed house. A 4-foot modular structural system and standard materials have resulted in economies passed on to the buyer.

LOCATION
ARCHITECT

Denver, Colorado Eugene D. Sternberg

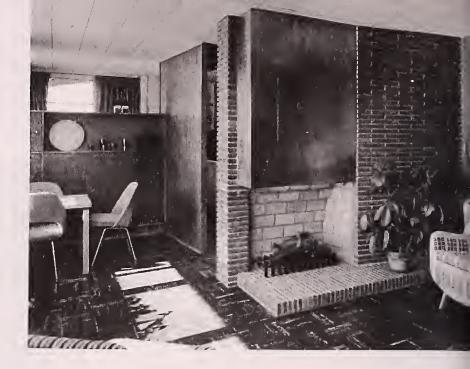
**OWNERS** 

Arapahoe Acres Development

COST FACTS: \$13,500 selling price in 1949-50, including land.

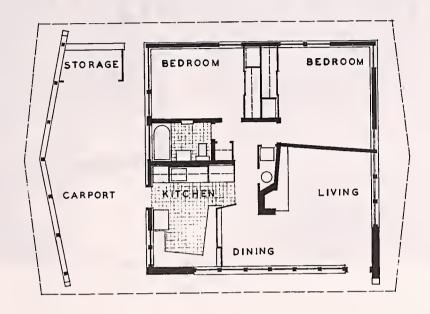
MATERIALS: Construction is brick, insulated, cavity wall to uniform sill height (with the inner brick wythe exposed as interior finish), and glass or insulated-core plywood panels above the sill. Aluminum casement windows; tar and gravel roofing; asphalt tile flooring; fiber insulating tile with integral finish for the ceilings. Heat is gas-fired hot air, fed through ducts to strip wall registers.

PLAN FACTS: Site planning was an important initial phase in this development. Factors which were carefully considered were (1) to keep the amount of land used by roads to a minimum; (2) to utilize southern exposure for solar heat and at the same time gain a view of the Rocky Mountains to the west; and (3) to group the houses for privacy. For such a large number of houses, variety in exterior appearance and interior plan was desirable. On the opposite page is shown one of the various basic plans for a two-bedroom house. Living and dining space (top photo shows one kind of treatment for the fireplace) have the larger square foot area, with the kitchen and utility room (back-to-back with the bathroom for economy in plumbing installation) compactly fitting in. The slightly pitched roof extends over the carport and gives overhangs for the protection of windows on the other three sides of the house.









Design distinction as well as economy was achieved in the Arapahoe Acres development in Denver, when a progressive builder turned to a good architect for services. A brick cavity-wall construction system (two walls of brick held together, with an air space between them) produced inexpensive houses which present great variety by their roof treatments, location of carports and main entrances, and use of colors and finishes.





LOCATION
ARCHITECTS
OWNERS

Palo Alto, California
A. Q. Jones & F. E. Emmons
Eichler Homes, Inc.

COST FACTS: \$12,000 in 1952-53, including some built-in items. 1400 square feet at \$8 per square foot.

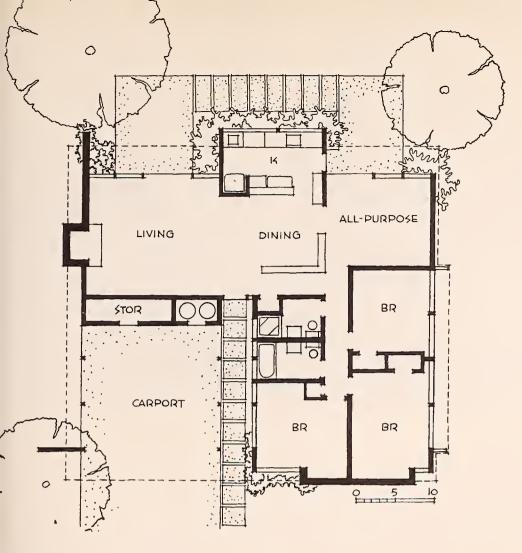
MATERIALS: Stud and wood siding with concrete block, using modular beam and framing. Tongue and groove (2-inch) roof framing. Redwood exterior; mahogany plywood and casework; cork floors.

PLAN FACTS: These houses were designed for families requiring three bedrooms, two baths, and an all-purpose area. The approach to the design considered adaptability to various lot sizes and shapes — reflected in an almost perfect square shape when carport is included. Major glass areas are on one side of the house to permit flexibility in adapting to sites with different orientations. Also, this places the outdoor living area normally to the rear of the property, affording maximum privacy. Another concept was to locate the kitchen in a different manner than has been normal in

builders' houses: that is, to easily serve four major living areas — dining, living room, all-purpose room and garden. Three bedrooms and two baths are concentrated in one part of the L-shaped plan, while the living, dining, all-purpose rooms are in the other portion with the kitchen jutting out from this area. If a fourth family bedroom or guest room is needed, the all-purpose room may be converted to such use. From the entrance one may reach all rooms directly, avoiding traffic through other rooms.

**ECONOMIES:** Framing system which permitted flexible planning.

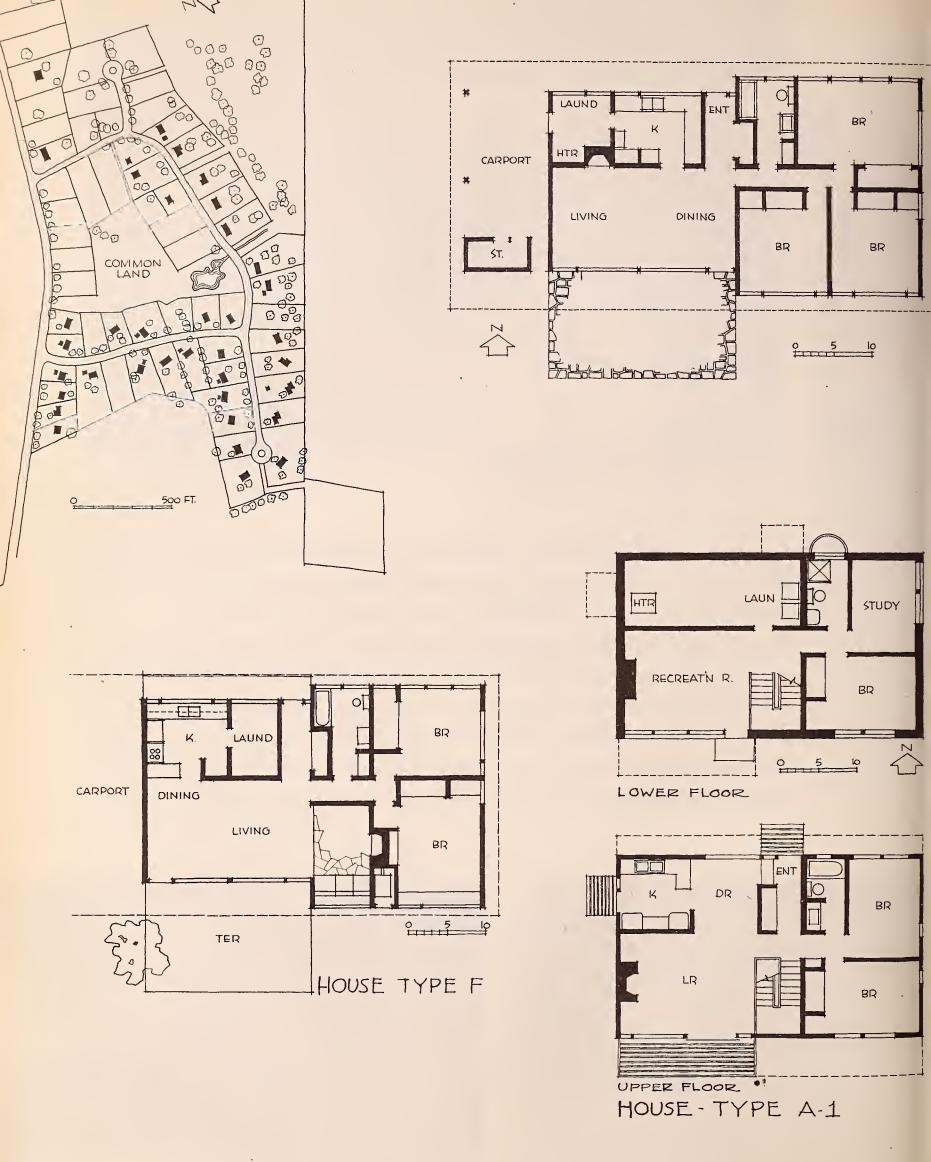




Builder Eichler has won many awards and commendations for the outstanding values and design qualities in his houses. He has used several of the best California architectural firms—in this development architects A. Quincy Jones and Frederick E. Emmons—to good advantage. About forty houses have been built, and more are going up—using the plan illustrated above, which is a slight variation from the original one shown in the photographs. The simple structure of post and exposed beams results in a beautiful, inexpensive house with great plan flexibility.









The development shown on these two pages, and described in detail on the two following pages, is a "builder" project in a different sense. Five Fields, in Lexington, Massachusetts, was designed and built by an architectural group—The Architects' Collaborative, known familiarly as TAC, composed of the internationally famous architect Walter Gropius and a group of young men and women working collaboratively. There are many advantages in the architect serving also as a builder. The owner is dealing with just one design and building agent; the architect is carrying out his own ideas, instead of explaining them to a contractor. The arguments against the practice (The American Institute of Architect frowns on it) is that the architect is no longer an impartial agent, protecting the interests of both owner and builder. He is the builder. (Compare the discussion of the owner acting as his own contractor, in Chapter IX). It is not very likely that you will find, in your neighborhood, an architect-builder. If you do, you might discuss with him very frankly the advantages and disadvantages of the system. Then see if he has produced a first-class, low-cost house, as the TAC group did at Five Fields. Notice the pleasant site arrangement and the variety of house plans on the opposite page, and the attractive result, above. Then turn the page to read details of this project.

LOCATION
ARCHITECTS
OWNERS

Lexington, Massachusetts
The Architects Collaborative
The Architects Collaborative

cost FACTS: Approximately \$15,000 purchase price in 1950-51, for a typical two-bedroom house (with unfinished basement). This typical "A" plan contains 960 square feet at \$15 per square foot. Other "typical plans" vary in cost up to a little over \$20,000; but as more rooms are added to the basic plan the cost per square foot comes down.

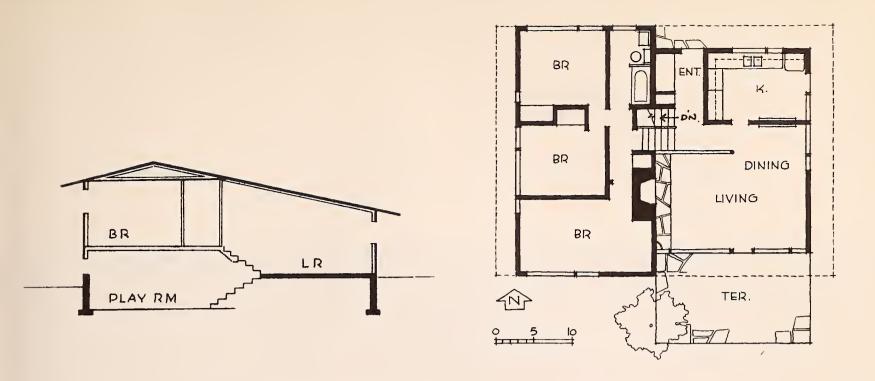
**MATERIALS:** Wood frame. Exterior, redwood siding, oiled; interiors, plaster walls and ceilings; oak floors; metal window sash.

PLAN FACTS: This Five Fields project indicates what happens when an architectural firm also becomes the merchant-builder. The 80-acre community was site-planned for 30 houses, with curving roads and culs-de-sac for traffic safety for children. Individual house sites vary in shape and in size from not less than one-third acre to over an acre. In addition to the individual house sites there is a 20-acre strip which is shared as common land by all the residents. A group of basic plans — each with possible variations to meet different family requirements — was developed by the architects. The basic one-story house was designed

to have two, three or four bedrooms according to choice or need. The two-level house (for steep hillside sites), similar in many respects to the one-story, also offers the possibility of two, three or four bedrooms, but may be expanded in two directions -- either to the side, or downwards by finishing the big area under the main living space. Still another plan variation is the split-level house, shown on these two pages, (for gently sloping sites) developed from the basic one-and two-level house types. The "split" places the bedrooms half a story higher than the main living areas, and provides a partial basement half a story below (see section). This lower space, with a wall of windows above grade, may be finished as a playroom, study, laundry, or spare bedroom. No matter which type of plan is chosen, they all have certain merits in common: each is tailored to the site; all are oriented for view and to the southern sun and breeze; smaller windows face the road, larger glazed areas open to the view and private side; all have entrance halls with quick access to all rooms from the center of the plan.

**ECONOMIES:** Standard construction system of studs on 16-inch centers; roof trusses prefabricated on site; savings in standard designs for a group of houses.





To summarize the savings you should get in a builder-development house: economies through mass purchasing of materials; advantages of site-prefabrication of parts, like roof trusses, posts and beams; house arrangement to save you landscape screening; perhaps a favorable, easy-to-handle financing arrangement. Things to watch out for are: shoddy workmanship and cheap materials; poor space planning (inadequate storage, poor circulation, and so on) due to lack of architectural advice; high costs hidden in monthly payments and concealed in a low down payment. In other words, if you can really save by buying such a house, by all means do; but remember you want a house not only to meet your budget requirements, but also to satisfy your family needs.



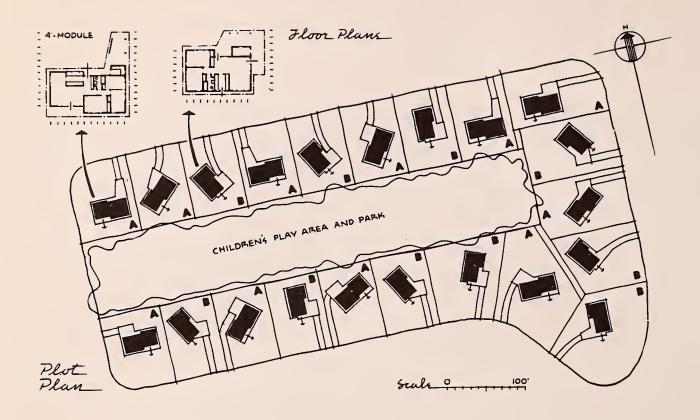


## **COOPERATIVES**

How to save by building with others

From time to time people who have wanted houses on limited budgets have said to themselves: "Why don't we get a group of like-minded families together and all build at once? In that way we can purchase in greater quantities, we can have the operative builder's advantage of using crews of workmen on one house after another, and we can buy a large block of land and develop it as a group enterprise." This sort of cooperative development has been tried many times, not always successfully. The dangers are that the group is usually inexperienced and sometimes too idealistic in the undertaking; tastes are not all the same, and conflicts develop when questions of standardizing materials and details are discussed. If it works well, it works beautifully.

A few years ago the government tried to stimulate and help cooperatives through a method of FHA financing, and some operative builders took advantage of these provisions of the housing law to build and sell on a cooperative basis. In the Scandinavian countries this type of government-aided cooperative has been highly successful. In this country, however, most of the successful—and attractive—ones have been privately financed, individually conceived and developed enterprises. The advantages are the obvious ones in group purchasing and standardized design with variations. If you should be tempted to try to organize a cooperative building effort, study the successful ones, try to avoid the pitfalls, organize carefully, get the best technical advice available, and make sure you are saving money in actuality, not just in theory. The cooperative on the facing page is by Eugene Sternberg in Denver, Colorado.



LOCATION
ARCHITECT
OWNERS

Colorado Springs, Colorado Jan Ruhtenberg

ADC Skyway Development

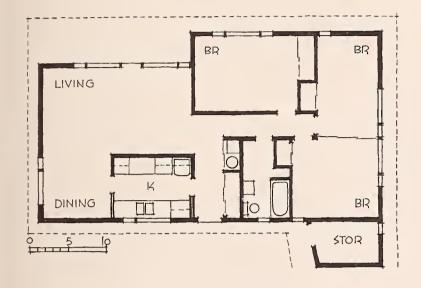
COST FACTS: Estimated costs (project scheduled to start in 1953): \$12,205 for house "A"; 1051 square feet at \$11.90 per square foot. \$11,585 for house "B"; 866 square feet at \$11.90 per square foot.

MATERIALS: Wood frame, using stock sizes. Production line type of construction.

PLAN FACTS: The ADC Development (also known as the Skyway Development) in Colorado Springs is a relatively small project of twenty houses, planned around a one-acre playground, and designed by Jan Ruhtenberg. The site plan (shown above) indicates how the generous play area for children, which is open to each individual house, is completely protected from traffic hazards. This same area, with each building site bordering on it, gives that all-too-rare green park space in the center of the project to be shared in common by all

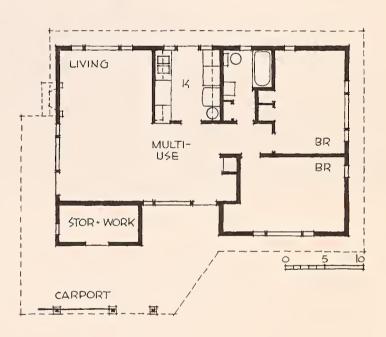
families. The eight different types of houses affording an unusually wide choice for different family sizes and needs in a small project of twenty houses — are skilfully placed on the individual sites both for privacy from neighboring houses and for variety in appearance. The house types (which are keyed to the site plan by the identifying symbols) indicate the variety that is possible with just two basic plans - a two-bedroom scheme, and a three-bedroom arrangement. Type A is the basic threebedroom plan; A-a is the same, with alternate exterior treatment; A-1 is the same without a carport; and A-la is the same without a carport but with variations in the elevations. Similarly, with the two-bedroom plan: B is the basic house with carport; B-1 is the basic house without carport; B-a and B-2a are these schemes treated differently on the outside.

**ECONOMIES:** For economy in all these various house types, with the choice of alternate arrangements, a production-line type of construction and stock sizes will be used.









The cooperative project shown on these pages was planned with FHA financing in mind and had not yet gone ahead when this book went to press. It indicates very well, however, how its designer, Jan Ruhtenberg, plans to achieve "variety within unity." All the advantages of standardized plans and construction methods are gained by changing slightly the two basic plans and by using or omitting carports on each of these plans.



LOCATION
DESIGNER
OWNERS

Pleasantville, New York
David T. Henken
Mr. and Mrs. John Masson

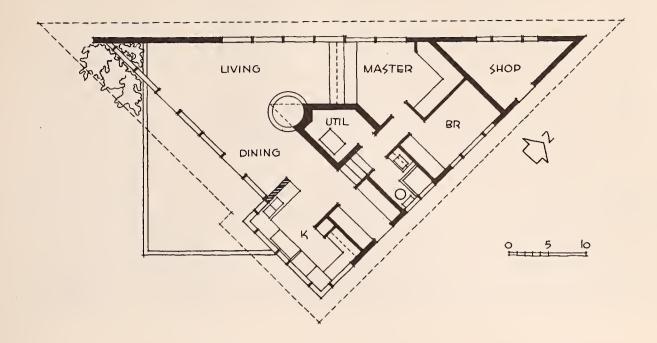
cost FACTS: \$13,000 in 1951-52. Square footage: house 1012, terrace 210 (figured at one-half) at \$11.50 per square foot.

MATERIALS: Frame and brick; cypress siding; integrally-colored troweled concrete floor; plank and spline ceiling and roof. Standardized sash and millwork sizes.

PLAN FACTS: A wedge-shaped house proved to be the solution for the Massons who wanted it built close to a ravine and flowing brook, and also wanted a maximum possible view to the northwest plus maximum southerly exposure.

In plan it also meets their special requirements for a bedroom for part-time use of a grown son as well as extra sleeping space for as many as three guests. Three sofa-beds in the living room takes care of the latter; also the living space is easily accessible to the bathroom as are the master and son's bedrooms. Centrally located utility boiler room, with masonry walls, is the only interior support: all other partitions between rooms are closets. Since the owner was interested in building as much as possible himself, construction was simplified by long straight runs, and simple details.

**ECONOMIES:** Minimum number of bearing partitions in interior; plank and spline ceiling. Work done by owner.



One of the most remarkable cooperative developments in recent years is the one in Pleasantville, New York, north of New York City, known as Usonia. "Usonia" is the word coined some years ago by Frank Lloyd Wright to mean an ideal, organically organized community in the United States. Wright was indeed consultant to the designers and builders of this growing project, and its principal designer and coordinator, David Henken, was a student of his. The houses, some of which were designed by other architects on a panel from which the owners might choose, are "organic" in the sense that they adapt themselves to the contours of the land and take irregular shapes in plan as the individual needs of the owners dictate. This cooperative went through all the difficulties that have been mentioned earlier. Although the structure of the houses is basically simple, builders were unaccustomed to their unconventional appearance, and at first costs were high. Now, however, with the owners doing much work themselves and with the designer handling much of the contracting, it is a successful community; many of the newer houses, as the one for the Massons (opposite) and the three that follow (one in nearby Thornwood), have been built for remarkably low prices.



LOCATION DESIGNER OWNERS Thornwood, New York David T. Henken Mr. and Mrs. Harold Hein

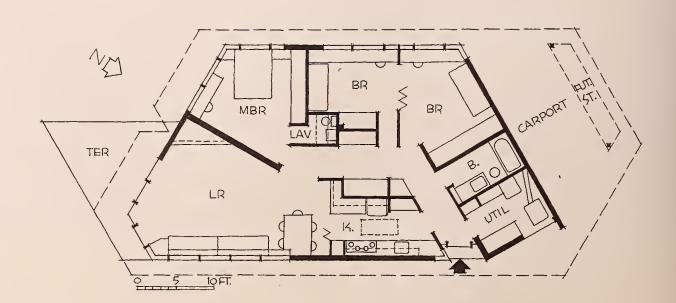
cost facts: \$19,650 in 1952-53, including built-in desk, chest of drawers, bunk beds, radio-phonograph, all kitchen cabinets, counters and equipment. Square footage: house 1248 (terrace 135, carport 350 at one-half) at approximately \$13 per square foot.

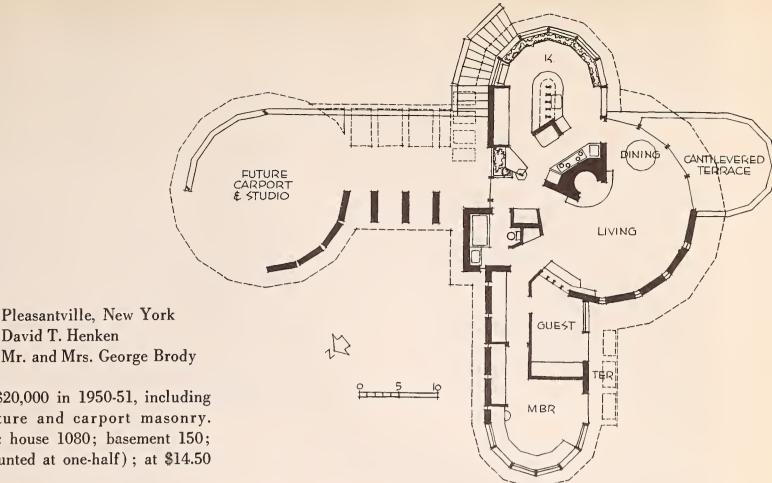
**MATERIALS:** Brick and frame; cypress siding on walls and ceilings; integrally-colored troweled concrete floor. Birch cabinets, closet and room doors.

PLAN FACTS: Although not located in the Usonia Homes group, this house was designed

on the same general principles. The owners were interested in Usonia, but since they already had land nearby they built there using similar details to those worked out in the Usonian houses. With four children in the family, one large area was given over to their use; this space has a folding partition which divides it into two bedrooms, each with double built-in bunks. Here, as well as in the master bedroom and central hall, closets have been used as partition walls. Brick masonry wall of the fireplace separates living-dining room from the master bedroom.

**ECONOMIES:** Ceiling boards not mitered; no toe spaces or raised platforms in closets; closets used as partitions.





COST FACTS: \$20,000 in 1950-51, including built-in furniture and carport masonry. Square footage: house 1080; basement 150; terrace 300 (counted at one-half); at \$14.50 per square foot.

David T. Henken

LOCATION

DESIGNER

OWNERS

MATERIALS: Concrete block, integrally colored; cement floors; fir plank and spline ceiling and roof; birch doors.

PLAN FACTS: With only two in the family, the Brodys wanted a minimum house to start but with provision for expansion. The plan which Mr. Henken developed for them has a circular living-dining room with fireplace. From this central space there are three extensions with curving ends: dining terrace, cantilevered over a brook, opening from one side of living room; kitchen; and a bedroom wing, with its own terrace, which contains master

bedroom and study-guest room. Curving window wall in the kitchen has indoor planting boxes, to meet a requirement of Mrs. Brody. Since the owners desired as many built-in items as possible, these include bed-sofas in the living room, a two-way desk between living room and study, beds, bookshelves, vanity and chest of drawers in master bedroom.

ECONOMIES: Single block wall thickness. Plank roof. Postponement of finishing extension, with heating, electrical and plumbing lines provided for easy hook-up later.





LOCATION DESIGNER OWNERS Pleasantville, New York
David T. Henken
Mr. & Mrs. Benjamin Henken

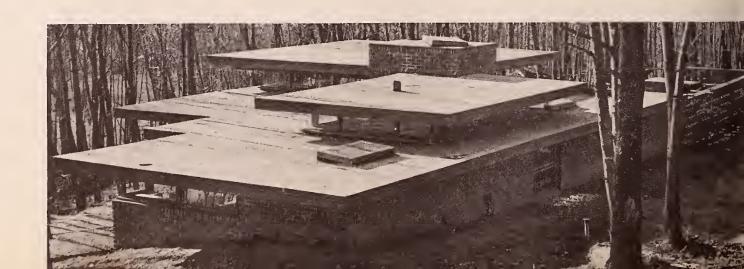
cost facts: \$20,000 in 1948-49, including some built-in furniture. Square footage: 970 house; terrace 300 (figured at one-half) at \$18 per square foot.

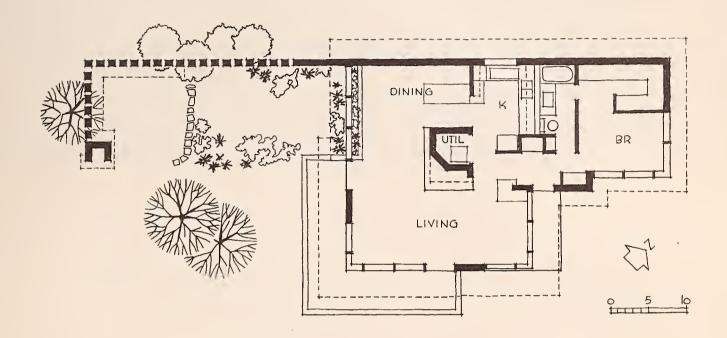
materials: Brick and frame; cypress ceilings and walls; integrally-colored concrete floors; birch and cypress cabinet, closet, and room doors. Standardized mill details.

PLAN FACTS: This was the first house—and as such the designer designates it as the "guinea pig house"—in the cooperative development at Usonia. Because of the experimentation with the techniques of building in-

volved and the training of workmen unfamiliar with this type of house, the costs were much higher in relation to the other houses built a month or two later. As for the personal requirements of the Benjamin Henkens, they were few but special: guest and study facilities to be combined; dining to be expandable for holidays and special gatherings. The openness between the living and dining spaces, plus the terrace and garden with its barbeque grill and table, gives expandable space for entertaining. An alcove off the living room, to the right of the entrance, may double as study and guest room..

**ECONOMIES:** Elimination of all interior bearing partitions with exception of central utility core. Double-use study and guest room.





As the designer of this last house shown from the Usonia group admits frankly, it was expensive in square foot cost, primarily because it was one of the first in the cooperative project and was experimental. Workmen were unprepared to take advantage of economies which they learned on this house, such as omission of all interior bearing walls, except for the masonry utilities stack, and elimination of almost all other interior partitions except when they were needed for privacy. Take warning, if you plan to get together a cooperative group, not to be misled by too great an idealism of purpose, and determine to be as hard-boiled in your approach to costs and the saving of waste as any builder-for-profit would be. On the next two pages is shown a much less ambitious and a much less costly cooperative enterprise.



LOCATION

Denver, Colorado;
Mile High Cooperative
Eugene D. Sternberg

Mr. & Mrs. E. D. Sternberg

ARCHITECT OWNERS

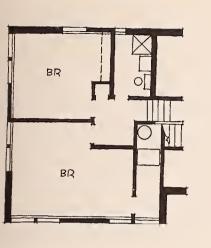
**COST FACTS:** \$12,890 in 1951. 1650 square feet at \$8.60 per square foot.

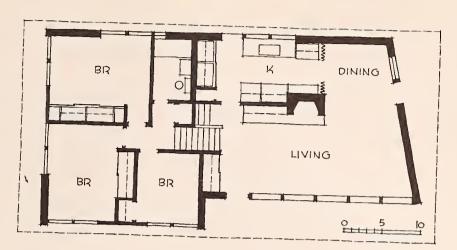
MATERIALS: Partially frame and partially brick, 10-inch cavity wall; concrete slab 2½ inches on hollow tiles throughout main floor for circulation of hot air system with continuous registers; exterior walls, 10-inch cavity roman brick with ½-inch insulating material on the 2-inch cavity; cedar siding where frame work is the structure; dry wall inside for all partitions and ceilings; 2 x 10 joists and 4 x 4 columns; all window frames and wall sections were prefabricated on the site. PLAN FACTS: In this cooperative development, Mr. Sternberg, with a family of three children, chose the largest basic unit, which has three levels and five bedrooms (as shown in the plans on the facing page.) He wanted "a home which fits into its environment with privacy and safety for children, simplicity of design and as economical in cost as possible."

He also wished to provide for the accommodation of frequent guests. Living and dining spaces with a compact kitchen are on one level; three bedrooms and bath on another; and two bedrooms and bath on a third,

ECONOMIES: Architect Sternberg lists the following factors: "Simplicity of design. The character of the design from inside and outside are identical." Variety in appearance comes from a variety of basic plans, reversal on the site of the same type of plan, a choice of one or two-car garages or a carport or even no garage space at all. "As little trimming as possible, using better selected structural members which can be exposed natural or painted. No wasteful spaces in the plan; no corridors whatsoever, and if any it would partially belong to one of the rooms or would house some storage areas." In addition to these general savings, further economy came from the prefabrication of window frames and wall sections on the site.

BUDGET SUGGESTIONS: If more limited budgets had been necessary, some partitions could have been left out. Houses could have been all frame or less expensive brick.



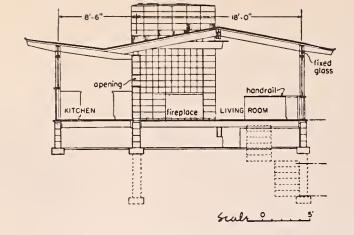




A five-bedroom house at the low cost of \$8.60 per square foot is news in this period of high building costs. Cooperative planning was the chief reason why this group of 32 houses, known as the Mile High Cooperative, could be built at this modest price. Architect Eugene Sternberg took advantage of every saving possible in building a group of custom-designed houses at the same time instead of designing and constructing them separately. Also he avoided the row-house look by fitting them into their environment and by finding many variations within a consistent structural arrangement. To demonstrate his faith in the project, he and his family occupy the house shown on these pages.







LOCATION
ARCHITECTS'
BOARD

Ardsley, N. Y.; 21 Acres Charles Bliss, Engineer Lionel Freedman,

Photographer-Designer Fred M. Ginsbern, Architect Martin Glaberson,

Industrial Designer
Roy S. Johnson, Architect
Irving Rubin, Designer
Stanley Torkelson, Architect
Cooperative Client Group

**OWNERS** 

cost facts: No individual house costs are given by this cooperative group, but the average cost was less than \$20,000. The Architects' Board, who jointly designed and supervised the houses in the group, had a Finance Committee which kept records and divided the cost of construction for each house. They report: "We estimate that the houses cost less to build by sub-contracting — as we did —

than would have been the case by general contracting because of the nature of our financing." Also some of the owners completed their houses with their own labor.

MATERIALS: With minor variations, a basic structural system was used for all of the houses. This consisted of a modular frame of select lumber: 3-inch by 6-inch fir posts placed four feet on centers; floor frame of 3-inch by 8-inch rafters (in some cases 3-inch by 10-inch) leading up to a double 3-inch by 12-inch ridge girder. Flooring and roof boarding is 2x6 tongue and groove planking.

system for all houses. Direct sub-contracting instead of using a general contractor. Forced warm-air heating was selected as most economical (the type that has an integral water-heating element, which saved the cost of both a separate water heater and its installation). Owners' own labor in many instances.



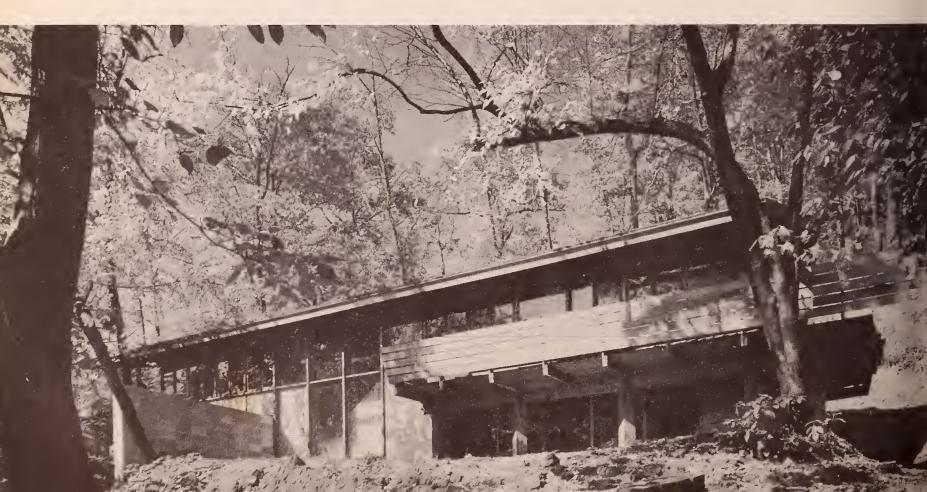
The final cooperative group shown in this chapter is an admirable illustration of the value of efficient business organization. A carefully financed corporation, 21 Acres has duly elected officers and a competent architectural board (all of whose members have houses in the group) with complete control over design and construction. The wishes of the individual owners (who include three doctors, a dental technician, a book distributor, an art director, and representatives of other businesses and professions) were studied and respected—but all the houses were built with the same post and beam system and similar wall and roof construction. Choices of materials were offered, but they all fit the basic scheme. Resources were pooled; financing was accomplished as a group; the board did its own general contracting, and it let sub-contracts; costs were watched carefully and allocated to the individual home owners; all joint decisions were democratically but realistically made. The site plan, showing how land in the 21 Acres was divided, is shown on the facing page; one of the houses (for Dr. Saul Fisher and his family) is shown below. On the next four pages other homes in this cooperative are illustrated and described.

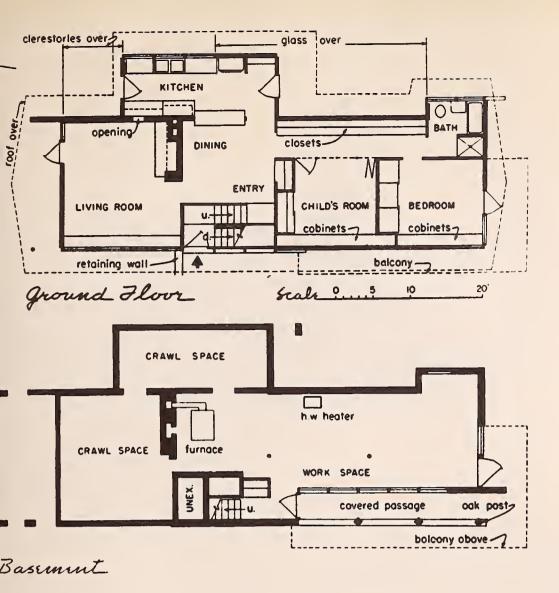




LOCATION OWNERS Ardsley, N. Y.; 21 Acres Mr. & Mrs. Lionel Freedman

PLAN FACTS: Designed for Lionel Freedman, architectural photographer, this house was planned with expansion space for a dark room, a work room, and possible future living quarters for a relative. These needs will be taken care of in the lower floor; at the time of construction the lower floor was partially enclosed and rough plumbing was installed for bathroom and dark room. Until time and budget permit the finishing of this area, it is being used as a storeroom for building materials. The living arrangements for the Freedmans and their young daughter are provided for in the upper floor. At one end is the living room, dining area, and kitchen (with entrance door at an intermediate level); at the other are two bedrooms, bath, and corridor storage space. A balcony stretches the length of the bedroom wing on the south side and most of the eastern side.

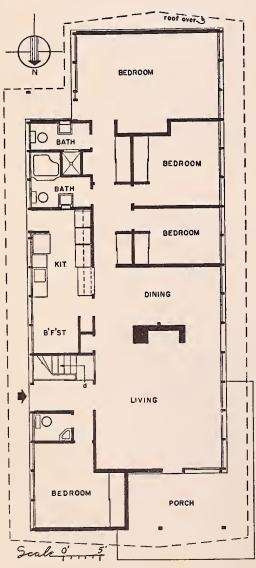




The home of Lionel Freedman, architectural photographer (who took these pictures of the cooperative development) is shown here. Freedman was one of the design board and is an enthusiastic supporter of the cooperative method of design and construction after the experience of building his own house. How his own special requirements fit into the standard construction system of 21 Acres is shown in the plans above.







Ardsley, N. Y.; 21 Acres
OWNER

Dr. Montague Ullman

PLAN FACTS: A rocky hillside, sloping away to the west, resulted in this house-perched on the crest of the hilly site—having only a partial basement, which houses the boiler room, a small cellar space, and the carport. In addition to the usual family requirements for Dr. and Mrs. Ullman and their two children, space for a father-in-law was needed. Privacy for his bedroom and bath as well as for the family's sleeping area was neatly accomplished by placing his quarters at the opposite end of the house to the family bedrooms. For economy on the rather extensive plumbing installations required, all piping was kept within a strip (eight feet-six inches wide) on one end of the house, with the wider portion of the house, facing west, devoted to family living and sleeping areas.

The Ullman house in 21 Acres again shows how the standard construction system, described on page 174, was adapted to particular plan needs. With the same care, organization, and architectural thought, other cooperative groups can undoubtedly accomplish the same things this one did. There are articles and books on the subject which go into the methods of organization in some detail; they should be studied carefully so that all of the advantages of community planning can be gained and none of the benefits lost.



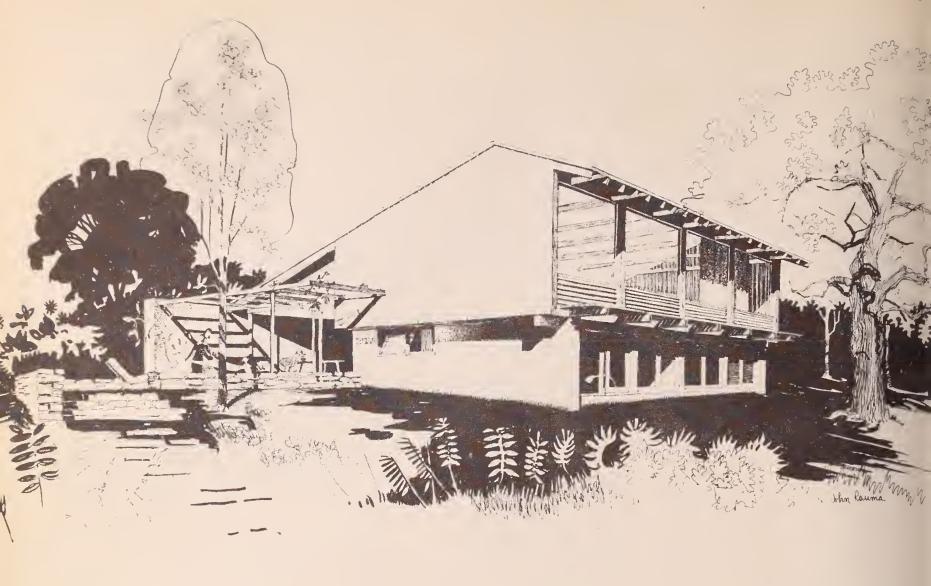


## THE OWNER AS A BUILDER

How to save through your own work

On no aspect of home building has there been more misleading nonsense written than on the do-it-yourself theme. Too many articles in too many home magazines have told how young Joan and Peter, in attractive bluejeans or even gabardine slacks, have built a very photogenic house in spare weekends, with the help of a few friends who are willing to drive nails between martinis.

You can do a great deal to save money by doing work yourself. You can build an entire house yourself if you are an extremely clever person with infinite time on your hands, if your local building codes permit this sort of semi-illegal operation, if you are willing to put up with some crudenesses that are bound to result in the realm of highly skilled building trade categories, and if you are willing to run the risk that in the long run (due to expensive mistakes) the house may cost you more than it would have cost if you had entrusted its building to professionals. Most of the truly successful owner-built houses are those built for themselves by professionals or semi-pros—builders or architects who are thoroughly familiar with construction processes and the use of materials. Carl Graffunder, a young Minneapolis architect, built a beautiful house for himself and his family which is illustrated on page 190. The photograph across-page shows him working on his own house. To make it as easy as possible for himself, Mr. Graffunder chose the simple construction system shown in his exterior perspective drawing on the following page. However, the question remains—how can the non-professional save on his own home-building operation by doing some work himself, or by undertaking the general contracting?



First, let's examine the stages of operation in building a house, in the course of which you might do some owner-labor and thus economize, as Carl Graffunder did in his house illustrated above. They are: design, contracting, excavation and grading, supervision of construction, construction itself, interior finishes and built-in items, and landscaping. Don't try to do the designing yourself, unless you are an architect. This is the key to the whole process and the place where you can't dispense with professional services. Your architect can, however, help you plan to do your own work. Some architects have worked out a regular system for letting the owners do their own contracting, and others will plan the house for finishing by the owner.

So your own contribution during the *design* phase is to work closely with your architect, explaining realistically what you can and cannot do later on yourself, so that he can make plans and details and can arrange the contracts which will be let to professional builders and mechanics in exactly the right way to make your own maximum contribution possible. For example, the construction photograph below shows the very simple "T-beam" system (built-up wood beams, with tongue and groove planks on top of them for roofs and ceilings) which architect Don Hershey worked out to allow a great deal of owner work by his clients the Browns on a house described on the next two pages.

The Browns did another thing themselves, which is possible only if you have the time and if you are a good business man—that is, they themselves acted as general contractors and let sub-contracts for the skilled trades. The letting of contracts is the second step in the construction process. The usual method is to let a general contract to a builder who undertakes to handle the entire operation for you, usually for a fixed sum. For this amount





LOCATION
ARCHITECT
OWNER

Pittsford, New York
Don Hershey
Robert Brown

cost facts: \$16,398 for house in 1950-51; garage-workshop and summer living room cost \$3,648. 1812 square feet in house at \$9 per square foot; 912 square feet in garage and summer living room at \$4 per square foot.

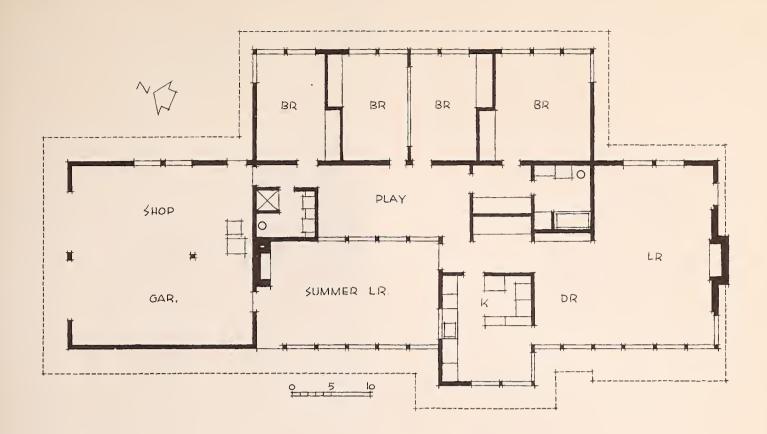
materials: Wood frame construction. Builtup wood beams and plank roof and ceilings. Floor slab (on concrete foundation with subfloor of crushed stone) of concrete poured and machine-troweled, reinforced with radiant ray-duct steel pipes, which allowed elimination of reinforcing mesh.

PLAN FACTS: In order to get much house (with a requirement of four bedrooms, two baths, a playroom, as well as a generous living-dining room and kitchen within the under \$20,000 budget limitation) the owner, Robert Brown, decided to do much of the building

himself under the architect's supervision. In addition to this amount of space for family living, Mr. Brown—whose hobby is cabinet work—also wanted a workshop, which has been combined with the garage. It developed that by screening roofed-over space between the house and the garage, a summer living room became possible. Opening from the playroom, which in turn opens from the three children's rooms, this arrangement allows generous space for both child and adult activities away from the living room.

ECONOMIES: In addition to the considerable saving through owner-building, there were carefully thought out economies, such as: use of a four-foot module construction system; all stock size of materials with minimum cutting and waste; T-beam roofing; and floor slab over crushed stone base.

**BUDGET SUGGESTIONS:** The garage-workshop and summer living room might have been omitted or postponed until a later date.



he then proceeds to let subcontracts (for such trades as plumbing, excavating, electrical work, and so on); to hire labor which will work under the direction of his own superintendents (for carpentry, masonry, and the like); to purchase materials; and, most important, to plan the sequence of work and the time at which men and materials will be needed. For all this he is entitled to, and receives, a decent profit and a payment for his own overhead costs. Sometimes the builder may provide "plans" by hiring a draftsman, or the architect may also do the sub-contracting and the purchasing of materials. The first process can mean unsatisfactory design; the second is frowned on by most architects as unethical. What can be done, however, with the ifs previously mentioned in mind, is that you yourself can act as general contractor—can let your own subcontracts, can hire the necessary labor, and can purchase your own materials. Some architects will arrange for this and make it possible; they are entitled to more than their own usual design fee because there is more work involved for them in the way of advice and help. An example of this—the Wollman house, for which Caleb Hornbostel was the architect—is described on page 218.

LOCATION

Wallingford, Pennsylvania

ARCHITECTS

Alfred Clauss and Jane West Clauss

OWNER

Peter Otto Clauss

**COST FACTS:** \$18,000 (not including architect's fee) in 1951-52. 1,400 square feet at \$13 per square foot. Budget included some built-in furniture.

**MATERIALS:** Brick and wood frame with mahogany siding. No plaster on interior.

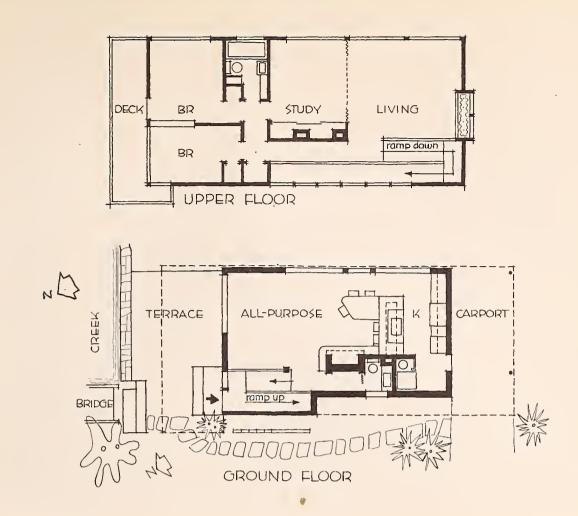
PLAN FACTS: With the chief requirement stated as "imaginative and joyful living," the ground floor is entirely devoted to an all-purpose room—a combination of recreation, dining, and kitchen. This is further extended by a living terrace. The upper floor, reached by means of a ramp, contains the living room and flexible bedroom space. A folding wall separates one area, which may be used either as study or bedroom, from the living room; a sliding door between the other two bedroom areas makes it possible to use it as one large room or two smaller sleeping spaces. The bathroom is easily accessible to all three.

**ECONOMIES:** The actual building was done by the architect and his sixteen-year-old son. Double brick cavity wall using grey exterior brick, and open joist ceilings on both floors.









The next step in the construction process is the actual, basic building of the structure. Here is where the amateur builder can go seriously wrong, and that is the reason many local building ordinances require licensed professionals to build even small houses. It requires experience to know how a plate fastens to a foundation and how studs fasten to the plate. Roof framing can be simplified, but it is still a tricky business. Even if you are adept with tools, can read blueprints and figure out construction details, you may still have trouble persuading a hard-boiled bank vicepresident that you are capable of building a house for which he is going to commit mortgage money. Alfred Clauss, architect of the house on these two pages, built most of it himself with the help of his son. But notice how, experienced as he is around a construction job, he chose simple construction systems and easyto-handle materials. An amateur builder usually can drive nails with gusto and some accuracy and can lay a masonry wall. But, unless you have had special training, it would be smart to think twice before you go much beyond that.



LOCATION
ARCHITECT
OWNER

New Hope, Pennsylvania George Nakashima Mr. and Mrs. G. Nakashima

**COST FACTS:** Approximately \$5,000 in 1948-52, including all hired labor but not including the owner's own work. 800 square feet.

MATERIALS: Oak frame and masonry exterterior; prefabricated sheets of corrugated asbestos cement for roof, flat sheets of same for outside finish of walls. Wide plank floors, oilrubbed; ceilings of matching wood.

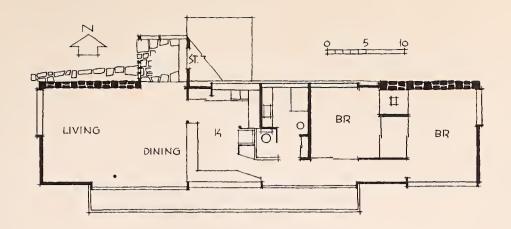
PLAN FACTS: A simple rectangular plan is

virtually divided in half: one half containing the living-dining room and kitchen, the other half two bedrooms and bath. The one-room wide rectangle allows every room in the house to open to the south, with wide overhangs for protection from the sun's summer rays. On the north, stone masonry walls enclose one side of the living room and the master bedroom; there are high windows provided on this side for the rooms in between (kitchen, bathroom, and daughter's room).

**ECONOMIES:** Mr. Nakashima, the architectowner, did practically all the work himself.







If you can do the total building yourself (if you have the ability, the time, and the right design, and you have no problems of building commissions or bank loans to restrain or prevent you) there are many plus values in store. You can, if you want, do a watchmaker job, finished with loving care, and the only extra cost is your own time. Perhaps it isn't fair to show, as an example of this, the house of one of the great craftsmen of our time-George Nakashima—whose own home is illustrated across the page. Nakashima is famous as a designer and maker of fine furniture, and he is a craftsman with an unusual sense of the value and the characteristics of woods. He has been awarded the Craftsmanship Medal of the American Institute of Architects, and his original pieces of furniture are true collectors' items. His exquisite craftsmanship in every detail of construction, finishes, and use of materials—as well as the honest and direct simplicity of the plan—are the factors which make this house appear to be much more costly than it was. It makes the point that money can be saved, and near-perfection can be obtained, by the owner himself expending countless hours of his own on his project. If man-hours, at some reasonable evaluation, were added to the cost of any such house, its actual cost would be far greater. But, after all, what else would you be doing with that time-reading Mickey Spillane; watching the television? If you would otherwise be using it for creative income-producing occupations, you would be wise to figure what your own time spent hanging joists would cost you, against a normal builder operation at this stage.



LOCATION
ARCHITECT
OWNERS

Minneapolis, Minnesota Carl Graffunder Mr. and Mrs. Carl Graffunder

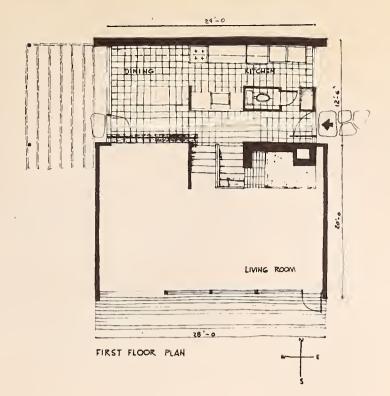
COST FACTS: \$8,280 in 1950-53, at approximately \$7 per square foot.

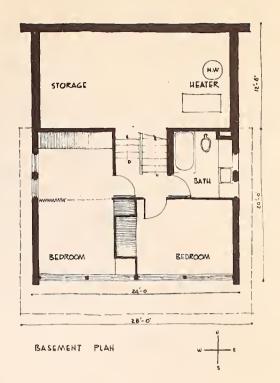
MATERIALS: Walls of lower level of concrete block, inside and out. Upper level is wood frame with cypress siding, left unfinished. For economy, the smallest possible sizes of joists and rafters are used, knowing that they will be "stressed" to the maximum possible amount. PLAN FACTS: Carl Graffunder, owner-architect of this house in Minneapolis, decided that the most practical, as well as most economical plan for his family of five, was a house on several levels, adapted to his hillside site. The enclosed space was then organized skillfully into four main areas, with short stairways leading to the various levels (five steps down from living room to kitchen, seven steps down to bedroom area, and four steps to the basement storage) all in a central stairway which acts as a separating device. Thus the living area has a degree of privacy from the kitchen

and dining space and from children's activities on the lower level. The bedroom level contains master bedroom, children's sleeping space with a dividing partition, and bathroom. Heater room and storage space are at the lowest level, under the kitchen. Living room and bedrooms, facing south, have fixed, double-glazed windows insuring views as well as insulation from severe winter winds. Ventilation is provided by louvers.

ECONOMIES: The cube-shaped plan with centrally located stairs and use of lower part for bedrooms; use of stock sizes in materials; and 2,000 hours of the architect-owner's own work in finishing and installation. Further economies were through the use of wood framing members to their greatest allowable capacity; home-made double glazing; no paint except on trim; gum plywood interior; and divingboard matting, an inexpensive material, used for floor covering.

**BUDGET SUGGESTIONS:** Only by building a smaller house could additional saving in the budget be effected. But, as the architect quite rightly says "It's pretty minimum now."

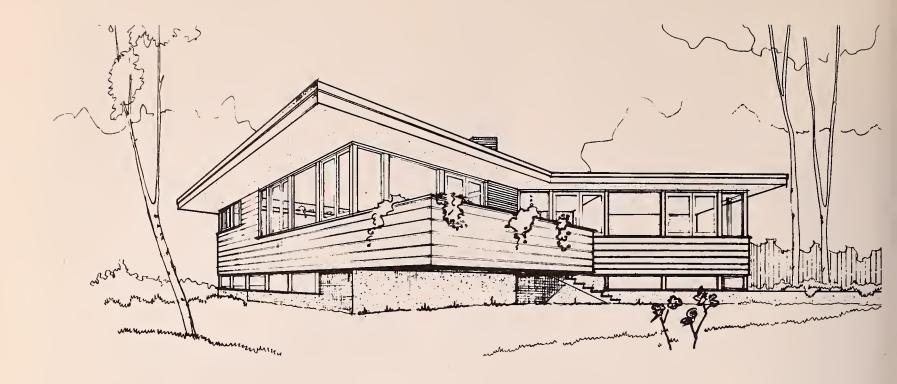




Through owner-building, economies can sometimes be made by unconventional construction methods or uses of materials that are not yet fully accepted by our rather slow-moving building industry. It takes many years before a new idea in design or construction is generally used by the building fraternity. The owner-builder, with his architect's assurance, can go ahead and try new or unusual methods at his own risk and maybe at his own saving. In the house illustrated here, Carl Graffunder (mentioned on the opening pages of this chapter) went beyond the conventional allowances for span and size of beams, joists, and rafters, relying on his knowledge of what wood will do under certain conditions. He did nothing unsafe, but he reduced costs.







ARCHITECT Edgar Tafel

OWNERS Mr. and Mrs. Benjamin Gaffin

cost FACTS: \$13,800 in 1950. House 1032 square feet, balcony 150 square feet (figured at one-half) at \$12 per square foot.

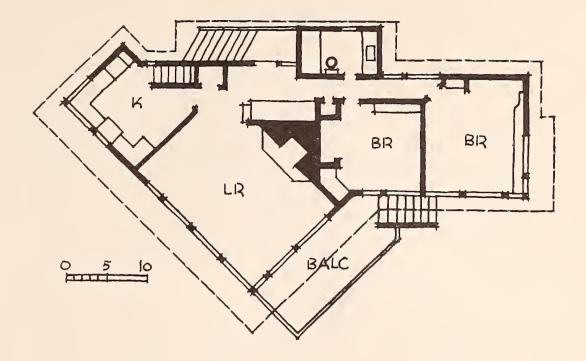
materials: Frame construction. Exterior and interior of unpainted cedar. Ceilings of fir plywood, cut in 16-inch squares.

PLAN FACTS: Situated on a peninsula jutting out into Buzzards Bay, the Gaffin house was oriented so that all main rooms face the sea view. A wide balcony opening off the living room also affords full enjoyment of the view and provides shade as well as sun by means of the wide roof overhang. The shape of the plan is a direct result of facing all rooms (with the exception of the bathroom in the rear) to the most desirable view. Placement of the fireplace wall is ideal for enjoyment in the living room and at the same time acts as a barrier to the bedroom wing for privacy. A partially-above-ground basement with strip windows all around duplicates the same space as the main floor. This doubles the usable space of the house and provides a playroom for the two sons, a workshop for Mr. Gaffin's woodworking and cabinet work, a second bathroom, and storage.

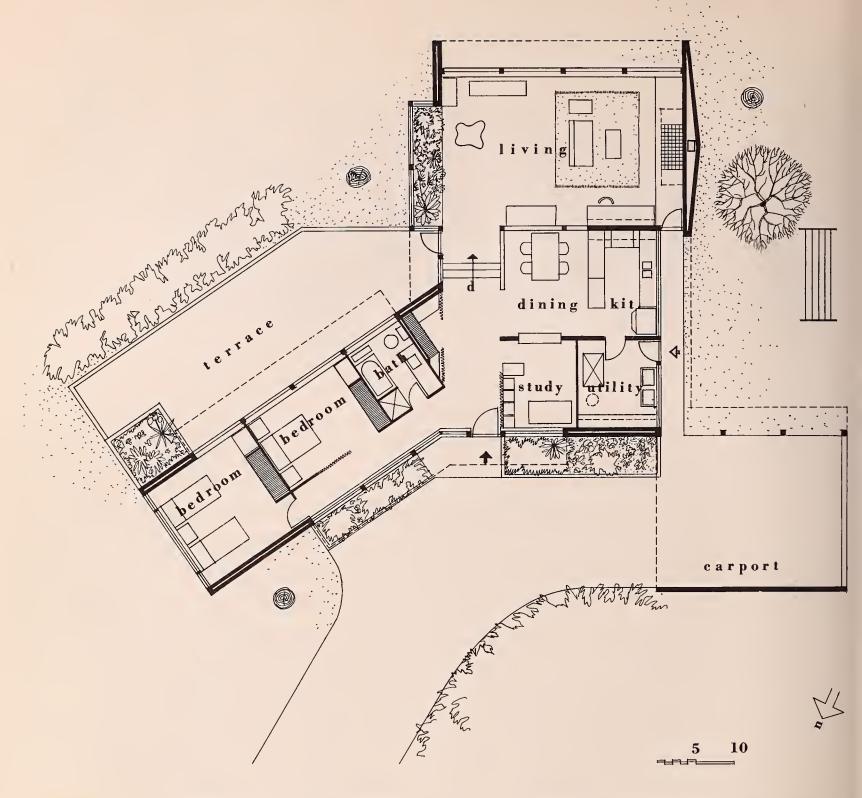
**ECONOMIES:** Owner acted as contractor and did all interior finishing and cabinet work.







Another example of an owner who acted as his own contractor, thereby saving the amount of the contractor-builder's fee and overhead, is the Gaffin house shown on these two pages. In addition Mr. Gaffin also did all of the interior work, including walls, ceilings, and cabinet work. With a knowledge of woods and how to use them, he worked closely with his architect, Edgar Tafel, who developed the detailing for him. For instance, the ceilings in the living room and kitchen were "detailed" as fir plywood cut in 16-inch squares, which were set to correspond with roof joists; size and placement of wall paneling was also carefully detailed to simplify Mr. Gaffin's installation. This collaborative effort shows the results in simplicity and good craftsmanship. One other fact, which Mr. Tafel points out as important if the owner is to do his own contracting and interior work, is that he must work and live near the construction job. In other words, to operate from a distance is both time-consuming and costly. Because of his close proximity to the building site, Mr. Gaffin could easily find time to supervise the construction and gradually finish the interior work after he had actually moved into the house with his family.



LOCATION
ARCHITECTS
OWNERS

Monticello, Illinois Luders & Sasaki Mr. and Mrs. Alex Vance

cost FACTS: \$15,466 in 1950. Square feet: house 2066; carport 480. \$7.25 per square foot.

MATERIALS: Mill construction; cavity walls of Indiana sawn limestone; plank partitions; based on an 8-foot module.

PLAN FACTS: Mr. Vance, a landscape architect, wanted his house to include an office. His only other stated requirement was that con-

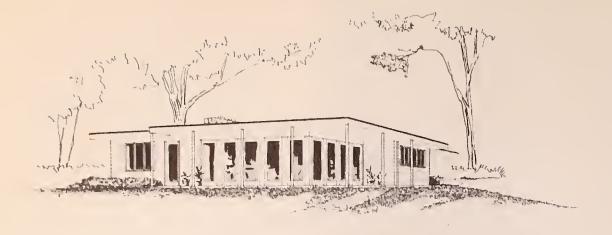
struction and materials have absolute simplicity so that he could build the entire house himself with minimum cost and help. Eighteen months of work, with only occasional help from two high-school boys and a few weekends of work given by friends (the architects), resulted in the finished house. The simplified plan was designed to give large, flexible areas. For instance, the study-office and one bedroom have movable curtain walls to open them up for more spaciousness.

**ECONOMIES:** Chiefly through the use of structural materials as finish; local materials.



The final example in this chapter of a truly owner-built house (the rest of them are owner-finished) was not done by an architect for himself but was built by the owners, who became so intrigued by the whole successful process that Mr. Vance has now gone into the building business. Here is an excellent example of the need for architect-owner collaboration in such a project. The design was very carefully conceived as one that could be built simply and by non-professionals. Construction system and materials were chosen with this in mind; details of construction (the way things go together; the way things are fastened) were devised with the same controlling thought. Everything here, except for such trades as plumbing and heating contractors, was owner-built.





LOCATION
ARCHITECT
OWNERS

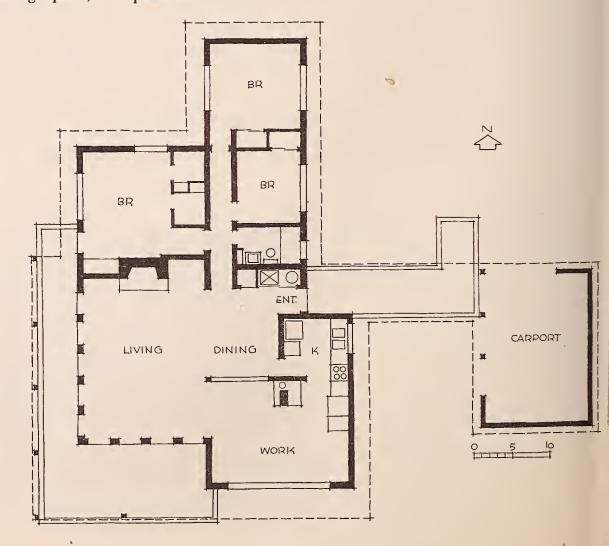
St. Charles, Missouri
Robert Elkington
Mr. and Mrs. W. S. Hedrick

COST FACTS: Based on construction bids in 1953; scheme A, with two bedrooms and no carport, to be finished by the owner, \$8,900—1268 square feet at \$7.02; scheme B, with three bedrooms and carport bid at \$14,535 (\$8.77 per square foot), with interior finish to be done by the owners for \$2,480.

MATERIALS: Frame, redwood exterior.

**PLAN FACTS:** Requirements were: pleasant living space, large enough for entertaining and enjoyment of music; ample cooking space;

and a shop for their activity in metal and woodworking. These activities are well planned for in the major block of the house; bedrooms are in a separate wing. To meet the absolutely fixed budget, their architect drew up two schemes upon which he secured construction bids. Scheme A (two bedrooms, no carport) and scheme B (three bedrooms, a carport). The bids were so low that it was decided to go ahead with the larger version. **ECONOMIES:** In addition to interior finishing by owners, the architect kept down costs by "mentally installing each piece of material and equipment" to make each as simple as possible.



The remaining houses in this chapter are all examples of the more usual methods by which reasonably handy people can economize in the building of their own houses, not by contracting or basic building, but by *finishing* the work. This can range all the way from applying all interior finishes from the bare studs out to such simple things as some interior or exterior painting, wall-papering, or staining of wood surfaces. There can be tremendous savings in contract cost of a house if merely the shell is built by professionals and all non-structural work done by the owners. Obviously, the extent to which this should be done will depend on the need (how much *must* you save); the program (how long can you wait for the long process of self-work to be finished); and your abilities (are you a cabinet-worker, a tile setter, a plasterer, or can you just slap paint on a wall).

The do-it-yourself idea has spread tremendously in recent years. Why not take advantage of whatever abilities you may have developed along these lines, and do some part of the finished construction on your new house? One advantage of doing some part of the finished construction as part of the complete home-building process, rather than doing it independently at a later time, is that the work can be planned by the architect along with the rest of the design. The cabinets, storage walls, wood paneling, hi-fi installation, or whatever you plan, can be integrated with the house design itself and can add to, rather than fight with or detract from, the total design concept. The Hedrick house designed by architect Robert Elkington, illustrated on the facing page, is an excellent example of a project, now underway, which will be largely finished by the owners, who have a more than amateur's knowledge of, and ability in, metal and woodworking. They recognize that there will be both pleasure and profit in this work.



LOCATION
ARCHITECT
OWNER

Phoenix, Arizona Blaine Drake Frank Neill

COST FACTS: Approximately \$12,000 in 1952. 1 250 square feet at \$10 per square foot.

**MATERIALS:** Pumice block; exposed beams; wood fiber plank roof and ceiling.

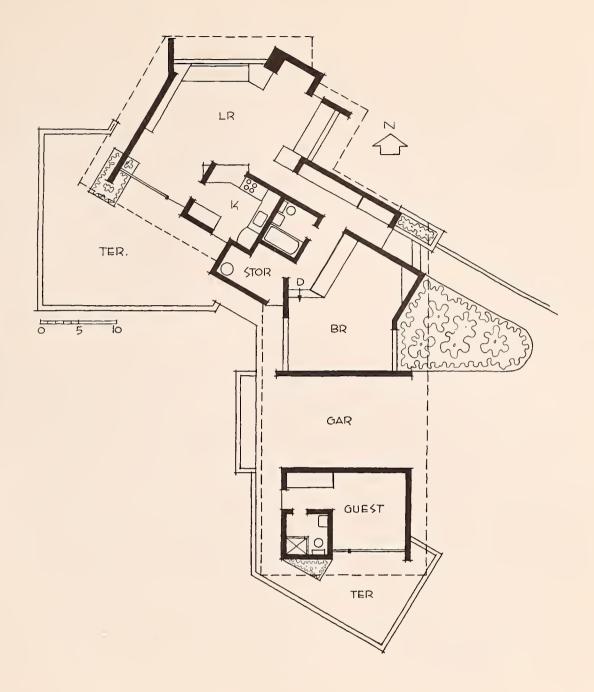
PLAN FACTS: Designed for a young couple with no children, this self-contained little house is very compact. Thoughtful provision for a guest is a bedroom and bath, with its

own private terrace, separated from the main house by means of a carport and storage space. The living-dining area, with its pitched roof and large window walls giving wide views of the desert growth, has a sense of spaciousness far beyond its actual dimensions.

ECONOMIES: Since Mr. Neill's hobby is woodworking, he wanted a house he could finish himself. The Neills moved into the house with one bath completed, but none of the other interior work finished. The owner did all built-in cabinet work and interior finishes.







In still another instance, the owner of this house in Arizona made use of his woodworking hobby to make all of the kitchen and bathroom cabinets, the wardrobes in master and guest bedrooms, storage wardrobe in hallway, counter pass-through from kitchen, and built-in furniture such as sofas and tables. In addition, he did all the finishing of interior surfaces. Since no financing was necessary, Mr. Neill had no regulations to interfere with his plan to do the complete finishing himself. Illustrations on the facing page show how he did a most professional-looking job on built-in furniture and kitchen counters and cabinets.

LOCATION
DESIGNER
OWNERS

Pleasantville, New York

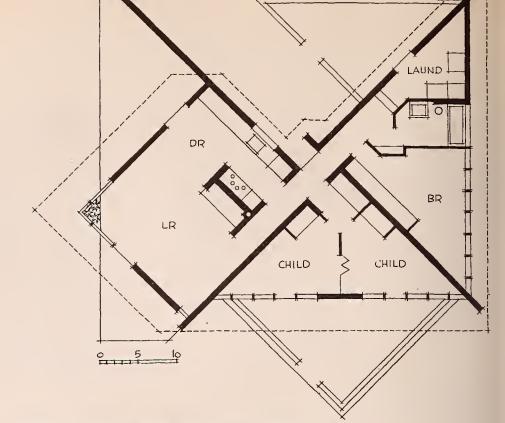
David T. Henken

Mr. and Mrs. James Anderson

cost facts: \$17,000 in 1952. 1490 square feet (terrace 550, counted at one-half) at \$9.50 per square foot.

MATERIALS: Masonry and frame, using integrally-colored concrete block filled with vermiculite; fir plank and rib ceiling, no joists; steel-troweled cement floors.

PLAN FACTS: The Andersons' requirements were: as compact a house as possible (with provision for a future study); separate bedrooms for their two children, with playroom, opening into each other; maximum utilization of their hillside site with views to the southwest, southeast and northeast. To achieve compactness and still meet the other seemingly conflicting requirements, Mr. Henken made three distinct elements to the plan but integrated them skilfully with a minimum of corridor space. In addition, he opened all three areas to the outdoors and the views. One block of the plan is the living-dining space and kitchen; another the two children's rooms,



which open to each other (by means of a folding partition) for indoor play space and to the outdoor play terrace; the third has master bedroom, bath, and a laundry room.

ECONOMIES: So that Mr. Anderson could do as much of the building as possible, construction and details were simplified: the easily erected masonry walls serve as the interior spine of the house, separating the areas for ease of construction and soundproofing; plank and rib ceiling could be put in with ease by the owner-builder and permitted a greater span with no joists in the entire house. Use of masonry walls minimized necessity for fine finishing.

LOCATION
DESIGNER
OWNERS

Pleasantville, New York

David T. Henken

Mr. and Mrs. Kenneth Silver

cost facts: \$19,324 in 1951 (for shell of house, terraces, carport and some appliances). Approximately \$3,000 of additional work done as owners' share. Square footage: house 1391, carport 144, terraces 359, at \$12 per square foot (\$14, with work by owners).

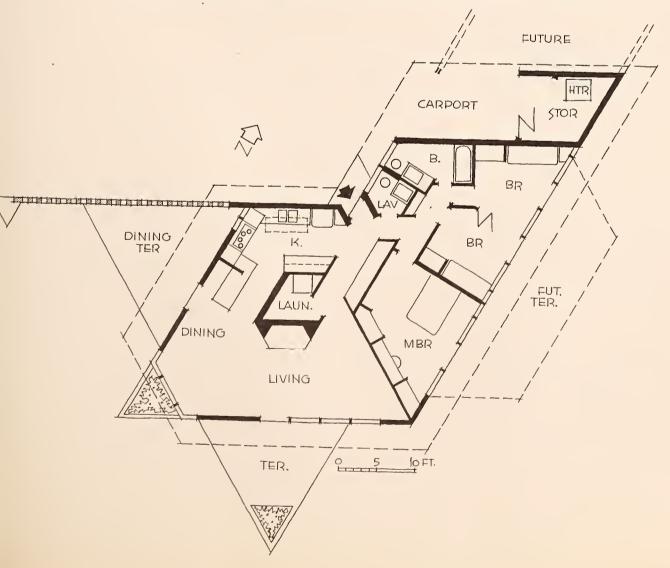
MATERIALS: Integrally colored block and frame; fir plank and spline one-piece ceiling and roof. Both surfaces of outer walls are cypress siding, partitions and closet doors of striated plywood.

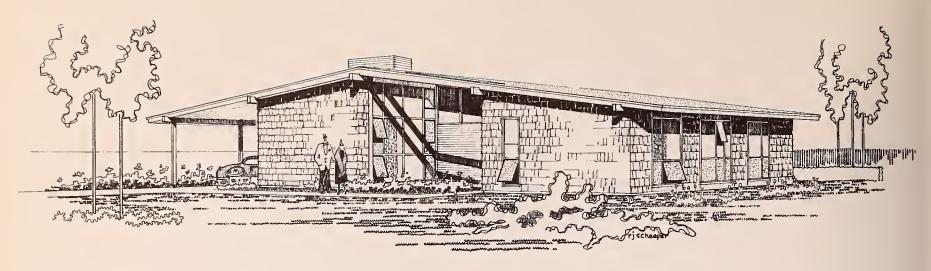
PLAN FACTS: In order to economize and get as much house as possible, the owner and his brother undertook the plumbing, heating, electrical, roofing and interior finish carpentry. Utility room and storage are located in central core between the living room and kitchen. Shape of the plan places the two bedrooms (one with a flexible dividing wall), bath and lavatory in almost a separate wing. The original design allowed for expansion to the north and on the east.

**ECONOMIES:** Use of plank roof which served as ceiling, rafters and sheathing; closets on partition walls; use of light-weight concrete block walls so as to give two surfaces at once.

The construction of what have come to be known as "built-ins" (what the carpentry trade used to call cabinet-work, such things as built-in-place furniture, desks, bookshelves and so on) is now a widespread hobby. Manufacturers of paint, wall-paper, tile and other products recognize the potentials of this market, and are assisting the home craftsman; how-to-do-it books are best sellers; home tools such as drills and power saws are being offered by many reliable companies, so that skilled work can be done at home.

The two houses illustrated in plan on these pages were schemed to leave a great deal of interior finishing work and furniture building by the owners. They are not conventional plans (although designer David Henken has arranged them so that the basic structure is simple and easily built); fitting built-in furniture into the corners and along the walls of the angular rooms in the Anderson house, and undertaking much of the actual interior work by the owner in the Silver house, effected considerable economies.





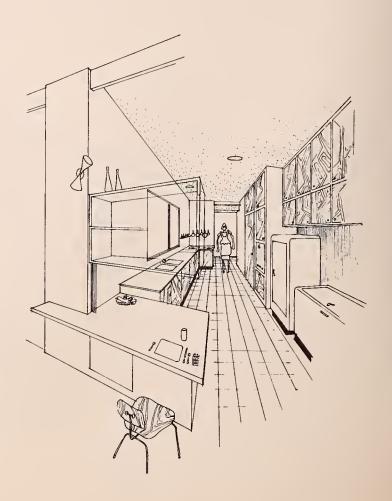
ARCHITECTS Ramey and Himes
OWNERS Harry and Pauline Buskirk

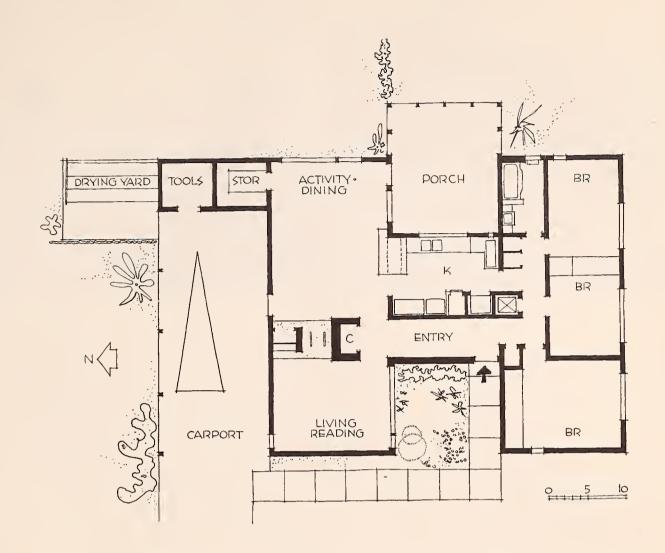
**COST FACTS:** \$15,000 in 1953, 1400 square feet, not including carport and screen porch, at approximately \$10.70 per square foot. MATERIALS: Frame construction, exterior surfacing of wood shingle; interior wall finish redwood; ceilings Sheetrock; concrete slab floor; built-up tar and gravel roof; steel sash. PLAN FACTS: Mr. and Mrs. Buskirk, with two small boys and the expectation of having additional children, had a precise knowledge of what they wanted in their house. Their well-defined program consisted of a kitchen or cooking area as the focal point; one space for family activities such as games, sewing, hobbies; and a quiet living area to supplement the activity room. They also wished to have the sleeping area isolated from the "active" part of the house, with one bedroom which could have dual use as guest room, sewing room, or a baby's room. The other requirement was that the house be so designed and detailed to allow the owner to do a certain amount of the work himself. All of these requirements have been admirably met by the architects. As the plan demonstrates, the kitchen as the focal center physically separates the sleeping wing from the activity wing. Fireplace and storage wall serves two areas the activity-dining room and the quiet living room—as well as separating them.

**ECONOMIES:** Simplified conventional construction, stock items throughout, inexpensive

but reliable materials, and a floor plan arranged for multi-use as well as to meet the requirements of a growing family with their changing needs; "an attempt to achieve spaciousness within a rather limited floor area."

BUDGET SUGGESTIONS: The architects state that "No further economies could be achieved without sacrificing quality. The biggest economy would be to eliminate definite sections of the house which could be added at a later date. Our first choice would be to eliminate one of the bedrooms in its entirety with the sitting area having a dual use for sleeping and sitting. We could also eliminate the screen porch, and if necessary the carport."





Architects Ramey and Himes, who designed the Buskirk house, under construction at the time we go to press (shown here and on the opposite page) informed us that "the one item which will allow us to get this house within the budget will be the labor of the owner." From the outset, before drawings were started on the drafting board, the precept was that the owner would do the majority of the interior finishing and painting, as well as all of the built-in cabinets and furniture. The simplified conventional structural system and choice of materials were consciously planned by the architects, not alone for economy, but to make it easy for Mr. Buskirk in his self-chosen task of doing the interiors. The rendering of the kitchen on the opposite page indicates some of the work which he plans to undertake when the house is turned over by the contractor.



LOCATION
ARCHITECT
OWNERS

Woodbridge, Connecticut Alexander S. Cochran John E. and Mary S. Ecklund

**COST FACTS:** \$19,937 in 1950. 2351 square feet at \$8.50 per square foot.

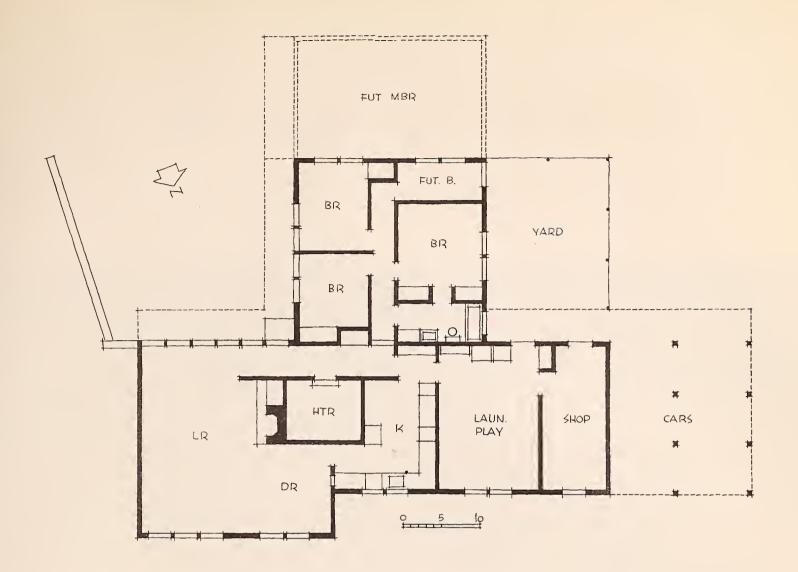
MATERIALS: Frame; stained vertical cedar siding on cinder block foundation walls. Interior, plywood and dry-wall finish.

PLAN FACTS: For Mr. and Mrs. Ecklund and their two children, architect Alexander Cochran compactly grouped the three major areas around the kitchen. Radiating from this central point of the plan are the living and dining rooms (with heater room backing up to the fireplace), the large playroom-work-

shop and its adjacent storage room, and the third wing for bedrooms and bath. A glass skylight over the eating area in the kitchen provides a bright spot at this family-gathering point. The slope of the roof conforms to the slope of the ground, which is up toward the south. Large fixed windows of the living room overlook the terrace. Small windows on the north side of the living, dining and kitchen afford a view of the lakes (of the New Haven water supply). The family having grown, the Ecklunds now plan to add another master bedroom and bath to the south.

**ECONOMIES:** The greatest economy was the personal supervision and foremanship of work by Mr. Ecklund, plus his own labor.





To build a house in these times of high-building costs for a figure of \$8.50 per square foot, especially in a climate where heating and good insulation are indispensable, is almost a unique accomplishment. John Ecklund, who has great interest in home carpentry work, achieved this in his house in Connecticut because he personally acted as foreman and supervisor of all the work during construction. He also did some of the rough carpentry, most of the finish carpentry and all the painting. Workmen were employed by Mr. Ecklund to build the foundation and erect the frame, and sub-contracts were let by him for plumbing and heating, electrical work, and the roof. According to the owner-builder, "the other essential ingredients in a project such as this are constant care in choice of economical materials and methods, a sympathetic architect and an understanding wife." No better summary could be made for this chapter.



## THE ARCHITECT-THE BUILDER

How to use fully the talents of each

In building yourself a house in which you want to make every possible economy, the relationship between the architect and the builder, and the relationship you have to each one may not be entirely normal in the traditional sense. These relationships may take any one of three forms:

You may retain an architect for full services, on the usual fee basis. For his fee he makes preliminary designs, draws final plans and specifications, assists in bidding and the letting of the contract, supervises construction, certifies the payments you make to the builder, and gives a final O.K. to the completed job before you accept it. The builder signs a contract to produce a house according to the architect's drawings and specifications, hires labor, lets sub-contracts for some of the work, purchases materials, and runs the job as efficiently as possible.

If you want to do some of the normal contracting and building yourself, you may take over many or all of the builder's functions described above. Your architect in that case would work on the design with you, and provide you instead of the builder with working drawings and specifications. His job is actually more difficult, because he will have to give you much more detailed drawings and building instructions than he would give to a professional builder. You may or may not want him to supervise the work you do, or the work you let out on direct sub-contract.

Finally, if you buy a builder's development house designed by an architect (as the one by architect Ernest Kump, opposite), the builder will have hired the architect. The builder himself will also have directed the building operation. You will be

presented with a description of what is in the house, rather than the other way around; where, in the "normal" job, you through your architect instruct the builder what to *put* in the house.

The important thing to remember about builder and architect, no matter which of the three relationships described on the preceding page you may find preferable in your case, is this:

Make use of the talents of each one, to the fullest extent of his abilities that you are able to contract for. Don't confuse the talents of each one; make use of the architect for his design ability; make use of the contractor for his building ability. (The exception to this would be the few architectural firms that are also builders. The advantages and disadvantages of this are discussed on pages 158-161.) Some architects think they know more about building procedures than a builder; in most cases they are wrong. Some builders think they can design their own houses without benefit of the education and experience of an architect; the faults in such houses are always obvious after any sort of a critical analysis. What are these abilities that you can expect in each—architect and builder?

For the architect: ability to study your individual problem and translate it into a building design; ability to place the house well on the site, and consider it in relationship to use of your property; ability to arrange space within the house, in plan and in three dimensions, to the best possible advantage as a solution to your problem; ability to advise and select construction method, materials and equipment, in a way to assure economies without sacrificing quality, and to supervise their installation; and finally, the design ability to tie all these things together into a pleasant, good-looking whole—to produce for you your own little architectural masterpiece, within your budget.

For the builder: ability to translate the drawings and specifications into a finished building; ability to shop cleverly for materials and labor so that he can bid lower than his competitors for your job; ability to organize the building operation in such a way that there is no waste of time or motion, so that materials come on the job at the right time, so that building mechanics come and do their jobs and leave without wasting time; ability to find inexpensive ways of accomplishing the results without sacrificing good workmanship; ability to handle sub-contracts (from excavation to installing lighting fixtures) in such a way that workmanship and coordination with other trades are both satisfactory; and, of course, financial responsibility which allows him to carry on the job efficiently and with no break in operations.

There are five houses shown in this chapter. All are, in a sense, case studies of the values you can expect from architect and from builder. One is an example of a house designed by an architect who has studied this problem of the low-budget house so thoroughly that he has many useful suggestions to make about the function of an architect. The next is a case study of an architectdesigned house compared with a builder-designed house, which pointed up the differences so sharply that the builder himself learned how he could benefit through an architect's design sense. The third is another architect-designed house that was built within a very low budget because of full cooperation by owner, architect and builder, after some vicissitudes. The fourth is a builder's development house, designed by an architect, in which each respected the other's knowledge and produced an outstanding result because of that. And finally, there is an excellent case study summary—told in the architect's own story, from its start to its finish —of a house which was built by the owner.



LOCATION
DESIGNER
OWNER

Los Angeles, California Craig Ellwood

Douglas Henry

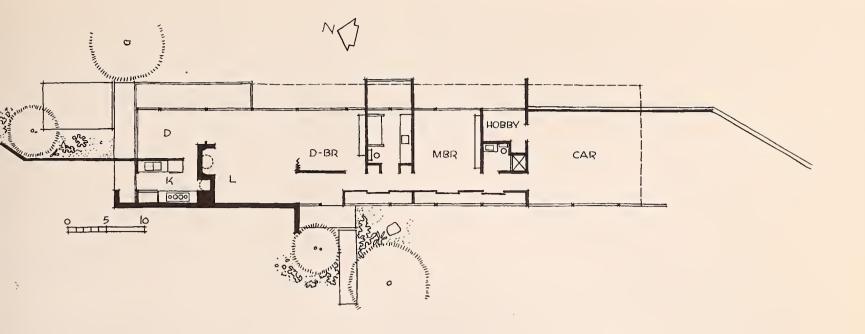
cost facts: \$16,280 in 1952. 1200 square feet at approximately \$13.50 per square foot. MATERIALS: Rigid frame modular structural system 4" x 10" horizontal wood beams which frame into 4-inch vertical steel H-columns. Exterior walls and panels plaster; clay block. PLAN FACTS: The versatility of Mr. Ell-

wood's unique structural system (compare with the Hale house on page 118) is shown here. All rooms face the view. For the bathroom, a projected baffle (see photograph above) provides privacy. Since the owner is a bachelor he desired only one bedroom. However, loan requisites called for two bedrooms for resale purposes—so a compromise solution allows the second bedroom to open to the living area with an accordian wall.

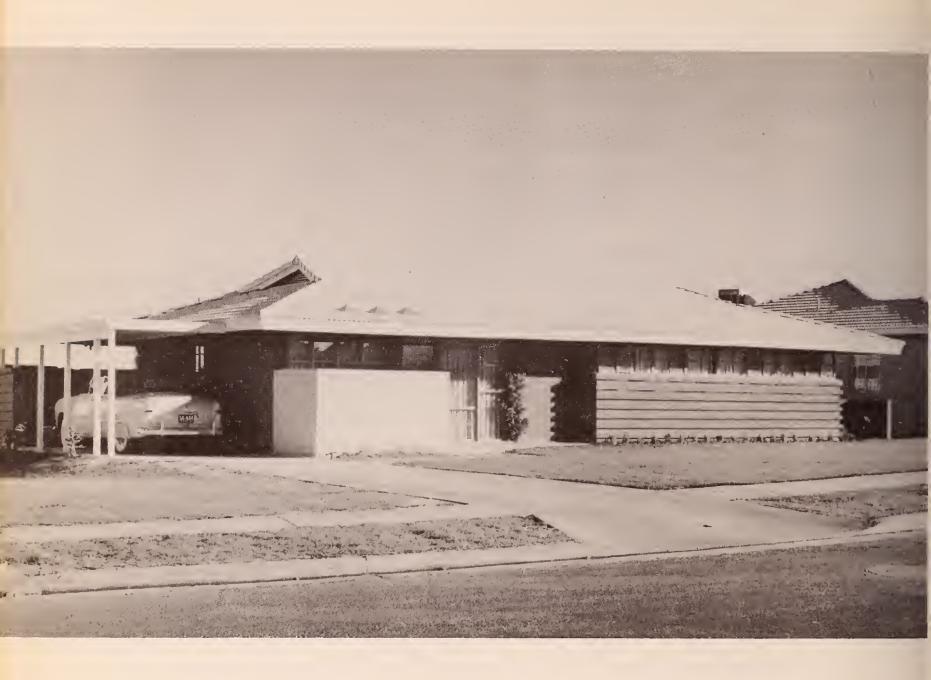
ECONOMIES: Structural system; clay block.







One of the problems that an owner faces in a building operation is the natural desire to know, early, what a project is going to cost; and, on the other hand, the inability to know this for sure until after final drawings have been made and bids taken. The architect will supply preliminary estimates, but he cannot guarantee them. Craig Ellwood, designer of the house shown here, believes he has an answer to this problem. Through his experience he can begin with a stated budget, and then "set forth the allowable total square footage for a given structural system," or conversely, "set forth the allowable structural system, materials and finishes for a given total square footage." This is commonly done by experienced designers, but Mr. Ellwood then goes a step further: "On completion of plans, but before specifications are written, I estimate cost of concrete, lumber, carpentry and cabinets, and draw subcontracts bids on all other items. On receipt of these bids, the client can be shown the itemized cost of his structure and, more important, we have in hand alternate prices for numerous substitutions, should they be required." This results, Mr. Ellwood has found, in firm, rock-bottom general-contract bids—and costs him about 40 hours of additional office work on each job he does.



LOCATION
ARCHITECT
OWNER

Las Vegas, Nevada Richard R. Stadelman Richard R. Stadelman

COST FACTS: \$10,000 in 1951 (excluding architect's fee, since this is architect-owned). 1152 square feet at \$9 per square foot.

MATERIALS: Cinder block walls; "bartile" roof; oak floors; plaster interiors.

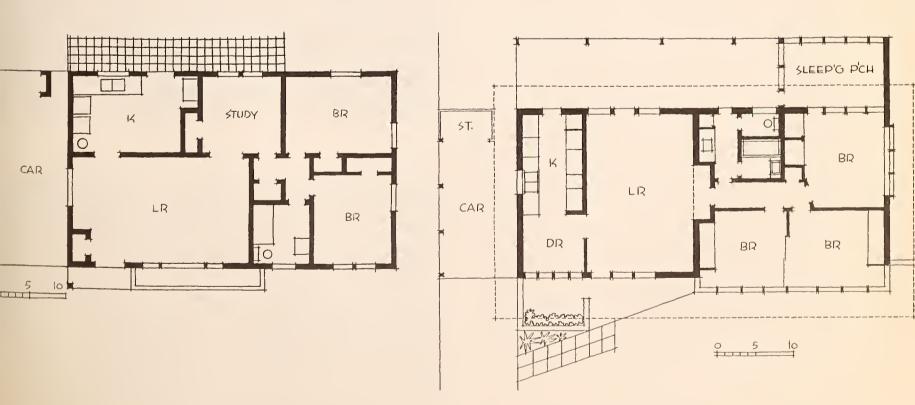
PLAN FACTS: This is a case history of how to add design quality without more cost—within the framework of the identical conditions—when an architect's training and experience are applied to a typical builder's house. Reorganization of the spaces within the same plan overall dimensions gained:

1. Living room opens to the east and west,

has direct access to terrace at rear

- 2. New position of the kitchen allows for a separate dining space
- 3. Three bedrooms replace space originally given to two bedrooms and a study
- 4. Two bedrooms for the children have a sliding door which creates play space.
- 5. A three-way bathroom serves better than the one-way arrangement.
- 6. Fifty percent more closet space
- 7. Glass areas increased by fifty percent
- 8. Built-in furniture wardrobes, desks, bookshelves make small rooms appear larger, simplify housekeeping.
- 9. Simplified exterior eliminates roof jogs, walls broken up by separate windows, needless shutters and trellises.

Architect Richard Stadelman, who built the house shown on the facing page for his own family, set out frankly to see what improvements he could make in a standard builder's product, working within the same limitations of size, price, materials and location. Professional planning definitely improved the layout, as the plan facts described on the opposite page indicate. Costs rose to a slight extent, but in a controlled fashion: Stadelman added \$143 in extras for cabinet work, which he believes added greatly to the feeling of space within the house. A screened porch was added to give more bedroom area, at an additional cost of \$300. This is an excellent example of the value of an architect's know-how, in comparison to a builder's know-how. Study the two plans and see how use of space has been improved—how much more spaciousness there is in the living room area, for instance. This case history has a happy ending in more ways than one; not only did the Stadelmans get a good house for comparatively little money; the builder of the project is now convinced that architectural advice makes his job "easier and better."





LOCATION

Oakland, California

ARCHITECT Henry Hill

owners Mr. and Mrs. L. Brennan

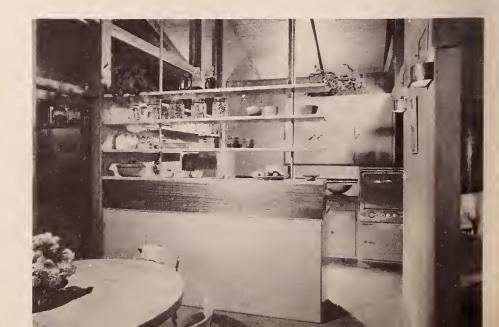
cost facts: \$13,200 in 1953, including built-in study desk, radio, TV and bookcases. 1000 square feet at \$12 per square foot.

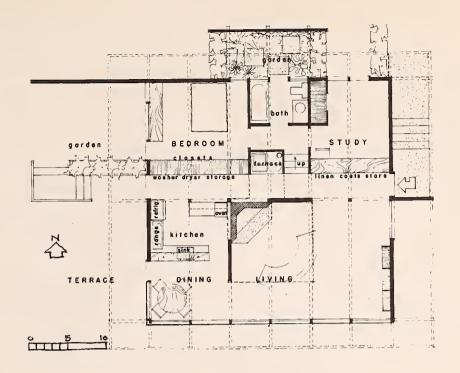
MATERIALS: Wood frame, post and beam; redwood siding.

PLAN FACTS: The house is an economical square form - really one large area, with the entire ceiling visible from anywhere inside the house, except the bathroom. Taking advantage of the fact that the site had a gentle slope, Mr. Hill lifted the bedroom-study portion of the house 21/2 feet above the livingdining-kitchen area. The study looks out over the living area, but due to the difference in levels, one cannot see into it from the living room. For privacy in the bedroom, closet walls are 6-feet-8 inches high (open above to the sloping ceiling); the difference between floor levels provides laundry equipment under these closets. Placement of the fireplace, with its two adjacent wood-sheathed walls extended to the ceiling height, adds privacy.

**ECONOMIES:** Owners laid the cork floors, did all the painting, saving approximately \$1,500.







As an illustration of what can happen when bids come in higher than client had hoped and architect had planned, this house for the Brennans by Henry Hill is a perfect case history. Since the Brennans had a strict budget beyond which they could not go if they wished to build at all, every square foot had to count as usable space. A scheme (not the one shown) was worked out within a long plan broken by an angle. It should have been within the budget, but it wasn't-bids were high. The builders were consulted, and revisions were made in plans and specifications based on the original scheme; still bids were too high. So the architect started all over again—this time working within the simple square that you see above. Primarily because of the economical shape and the few dividing partitions, the final contract was let well within the budget, and with some real gains in materials—redwood in place of plasterboard, and so on. Here the architect and the owner had to put their heads together, accept a basic change in concept, and work with the builder to find ways to economize in space. To obtain a house for this figure is not easy; it requires unusual devotion and concentration—and the fullest utilization of the skills that you can command.



LOCATION

Redwood City, California

ARCHITECT

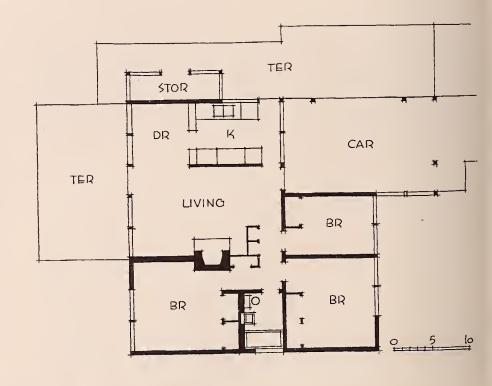
Ernest J. Kump

OWNERS

Barrett & Hilp, Builders

COST FACTS: Under \$20,000 in 1952.

MATERIALS: Wood frame, post and beam construction, modular system. Large units of walls and other parts assembled in shop, put together with simple connections on the job. PLAN FACTS: Basically this is a square plan, with the car shelter partially occupying one corner, and serving also as entrance. From the entrance, all parts of the house are easily reached. The living room, dining space and principal bedroom all look out on the terrace. ECONOMIES: Partial prefabrication, simple, modular plan, use of standard materials.







This case study of the roles of the architect and the builder is based on a bet: architect Ernest J. Kump bet Barrett & Hilp that he could design for their purchasers a house that would have everything their current houses had, be less costly, appeal to the buyer (and the lending agency) and "have good architectural quality to boot." These objectives were achieved in the house you see on these two pages. The architect gladly learned from the builder what he knew about construction methods and costs in tract houses, and what he knew of desires of buyers and biases of lending agencies. The builder learned from the architect values in space use and certain economies in planned construction methods. The two are now working on further shop-fabrication steps in wall and partition units. Kump and the associates in his office list these "limitations and objectives" in such a team effort:

- 1. House must fit on fifty-foot lot, with side-yard limitations.
- 2. Minimum of windows facing property lines; major outlook on own lot.
- 3. Minimum circulation through living and dining room.
- 4. Kitchen to supervise children's play area.
- 5. A semi-open kitchen, with space for eating within it.
- 6. Sense of roominess within minimum square footage.
- 7. A "substantial" look to the house—"an extroverted house."
- 8. No bizarre shapes, unusual functions, or odd relationships.
- 9. House plan should be a rectangle, as nearly square as possible.
- 10. As few interior "bearing" partitions and footings as possible.
- 11. House structure to be based on a module, to eliminate waste in materials and cutting of standard building products.

These criteria, it seems to us, are good ones for any person, builder or private individual, who is seeking ways to reduce costs in the planning, building and financing of a house.



ARCHITECT Caleb Hornbostel

OWNERS Mr. and Mrs. Milton Wollman

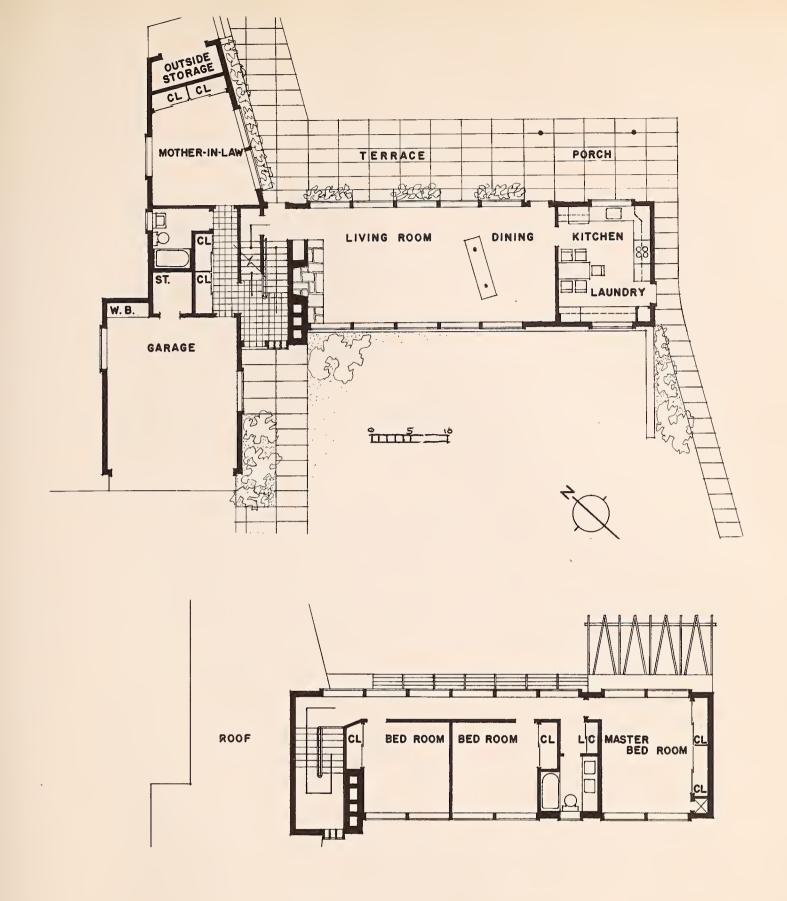
COST FACTS: \$20,000 in 1952-53. 2551 square feet at \$7.80 per square foot.

MATERIALS: Frame, with concrete block foundation. Exterior vertical cypress siding. Built-up roof. Interior walls and ceilings, Sheetrock; entrance and halls plywood.

PLAN FACTS: The split-level plan developed by architect Hornbostel for the Wollman family, is a logical solution to family needs now and in the future. The main floor contains living-dining room, kitchen and laundry, with a terrace and porch on the side away from the street. Three bedrooms and bath are on the upper level, above the main living floor, with Mrs. Wollman's mother's room and bath (to be used also as a guest bath) midway between the two floors and projecting beyond the main block of house. Eventually this bedroom will become the master bedroom and the present master bedroom will become the children's recreation or private entertaining area.

as a \$40,000 house, with only \$20,000 spent on the essential structure as a starting point. Over a period of time this would give the owner opportunity to improve, change space uses, and continue to build on to the original structure—this being his hobby.





Finally, there is the story of the Wollman house which was built by the owner with the sympathetic understanding of all problems involved and the full cooperation of his architect. Each stage in the process, including the mistakes as well as the many cost-saving procedures undertaken by Mr. Wollman, are described by Caleb Hornbostel, the architect, on the following pages.

"Mr. Wollman loves to build houses. When he came to our office, he was planning to build his fourth, and first modern, house. By now he felt experienced enough to be his own contractor and thus be able to get much more house for his money. His wife vowed it was to be the LAST house. Mr. Wollman actually started his house in September and moved in early in January. When he first came to the office he asked for a basic house which would answer all their needs now and be able to expand as the family pattern changed through the years, to cost not more than \$20,000 at the first stage of building.

"Once plans were drawn up and specifications written, he made up a list of all the materials needed and sent out plans to all proposed sub-contractors. Then he went over his list with a fine-tooth comb and began shopping around for good buys and good sub-contractors. Because Mr. Wollman is a very active member in community affairs and a prominent business man, he has an unusually wide circle of acquaintances and business contacts. All this served him well in purchasing most shrewdly such items as millwork, lumber, window frames, fixed glass, doors, hardware, lighting fixtures, etc.

"Two steps that he emphasizes in being his own contractor successfully are (1) working out a time schedule for the construction, and (2) determining what might be crucial items whose lack would mean serious work stoppage, ordering them first and expediting their delivery dates. The cypress siding was one such item. Because there was no quality siding to be obtained anywhere in the East, Mr. Wollman purchased the siding as logs from somewhere in the Southwest, had it shipped to a mill in upper New York State for finishing and finally had it delivered to New Jersey. Once the masonry contractor was chosen, work

began on footings and foundation walls. Temporary power was brought in by the owner for this. At this time the first mishap occurred: in their haste the surveyor's original stakes were not checked and it was only when the building inspector came by that they found one corner of the house protruding a few inches beyond the allowable setback. This was answered by a letter from the neighbor stating that he was aware of the projection and did not object to it. The only other mishap occurred when the mother's bedroom wing was back filled before the concrete wall was sufficiently cured. The damage was easily repaired.

"The design of the house is such that as soon as the mason had put in the footings and foundations in the main section he could go on to building the concrete block walls of the bedroomgarage wing while the plumber roughed in the plumbing and heating pipes in the main wing. At the same time the electrician put in the conduit and wire for any electrical work necessary in the slab for the main section. When this was done, the mason returned to put in the main slab while the plumber and electrician did the work in the garage-bedroom wing. While this construction was going on, Mr. Wollman saw to it that all the lumber was delivered and placed conveniently on the site. These are examples of what is meant by a carefully coordinated work schedule, where no one contractor is held up in his work by another."

The final story of the relationship of a home-owner and his architect summarizes many of the points made throughout this book: good use of site; space well planned and fully used; expansion arranged for; sub-contracts let by owner; materials and construction system carefully chosen. All these things should be considered if your house is going to fit your budget.

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