Arts &Architecture Case Study Houses
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Arts & Architecture Case Study Houses

There was the 1927 Weissenhof Settlement in Stuttgart and the 1930 Werkbundsiedlung in Vienna, but the only program of housebuilding in the U.S. before the general acceptance of the Modern style was *Arts & Architecture* magazine's Case Study houses, initiated in Los Angeles in 1945. Mexico's Jardines del Pedregal, of the same period, was also restricted to Contemporary design; Luis Barragàn, the architect who did the land and landscape planning of this dramatic development on a lava bed, further required the preservation of plants native to the volcanic terrain. The houses, large and elegant (except for Max Cetto's own), continued in modern dress the past way of life in the Spanish Colonial houses; the Case Studies opened a new chapter in the design of two-bedroom (with two baths) houses for servantless families with one or two children.

A five-acre piece of land was acquired for the program, a handsome site on the palisades above Santa Monica Canyon and overlooking the ocean. However, because of the expansion of the program, the majority of the Case Studies were built on sites scattered about greater Los Angeles. Like their European counterparts, the houses were opened to the public for inspection.

Certain concessions were made in price by manufacturers of materials and equipment in view of the notice they would receive: Sometimes with skepticism, because there was the general assumption that modern design would never have a broad appeal. But the popularity of the Case Studies exceeded all expectations. The first six houses to be opened received 368,554 visitors. The lag between the assumptions of manufacturers and the tastes of the public was responsible for manufacturers flooding the market at the end of the war with tired "traditional" designs; it was not only that shortages had been so great during the war that the public would take anything but rather that the manufacturers thought they were in tune with the taste. They did, however, test out a few products of contemporary design, and it was these that were seized on. The architectural and shelter magazines' advertising pages were showing traditional products and the editorial pages were weighted to modern. Surveys by manufacturers confirmed their misjudgment; they hastily revived some of the zigzag modernistic designs of the 30's (as unacceptable as traditional designs) rather than hiring fresh designers. This opened the field to new small companies, in many cases small production shops started by designers themselves. Los Angeles had its full share of these. Many of their products were used in Case Studies. The end result was a proliferation of retail outlets to sell an unexpected wealth of well designed products.

If the manufacturers misread the mood of the public, so in a sense did *Arts & Architecture*, because the Case Study House program was based on an assumption (in this case a fear) that architecture would at the end of the war fall back into its eclectic rut. The purpose of the program was to provide a forum for talented architects, and it was reasoned that their work would be best served by showing it in context with furniture, floor coverings, lamps, textiles, flatware, pots and pans, even napery.

Kitchens were fitted with the best of the new designs in ranges and refrigerators; the mechanical systems were innovative —many introduced heating systems in the slab. In heavy equipment more than in accessories there was a wider choice because the old dies had been broken up and industry had retooled.

Some good contemporary furniture already existed in Los Angeles. The lightweight and sleek aluminum tubing and string chairs and chaises designed by Hendrick Van Keppel were in production in the 30's; their low scale and linear character blended well with the Case Study houses, as did Van Keppel's furniture of the 40's—long, low slat benches for living rooms, outdoor dining furniture (seen in the patio of Soriano's 1950 Case Study).

Eames also had a head start. He and Eero Saarinen while at Cranbrook had won several of the Museum of Modern Art awards for new furniture in 1938, and during the war Eames formed a company with John Entenza to produce furniture and also plywood war products. By 1945 Eames was ready to produce lightweight plywood cabinets and molded plywood chairs and tables, all of which were featured in Case Studies. By 1949 when his own Case Study was exhibited, and the one for Entenza which he designed with Eero Saarinen, his new metal cabinets were ready.

A new direction in landscape design was an important part of the Case Studies. This also was heartening to landscape architects breaking away from a romantic tradition which blended with the Spanish Colonial and other eclectic styles of the 30's. What was exciting about the landscaping, as I recall it 30 years later, was that it *looked* designed. The spaces were fragmented, with a variety of textured surfaces in walks, walls and patios. Angles and diagonal lines occurred frequently in rather small spaces—quite a change from the flow and curve of the romantics. Another important change was the wide use of low maintenance plant material, a prediction of the servantless days to come. Many ground covers were combined in small spaces; ajuga might flow into an adjoining patch of festuca, the red-green into a yellow-green, then in the shade a black-green of lirope grass, with red flax introducing tall strap-leaf verticals. The Chinese elm was a favorite, the podocarpus; broad-leaved philodendrons were indispensable. Garrett Eckbo was the most important landscape architect to design for Case Studies; as an architect might design social housing, Eckbo designed social landscaping, for a group of houses in Laurel Canyon, etc. He was characterized in the 40's as "socially responsible", which describes well the idealism in all the arts of the 30's and 40's. His counterpart in architecture was Gregory Ain, designer of much social housing, and in the 30's a Guggenheim Fellow for the study of lowcost housing.

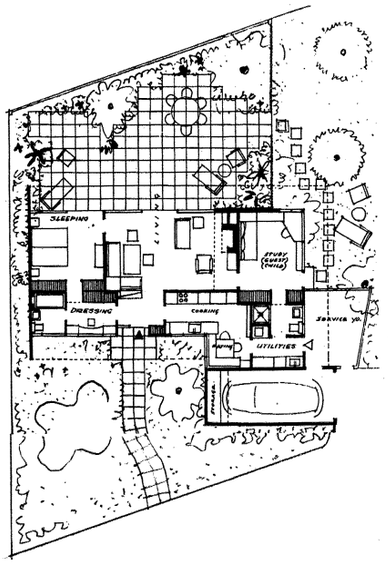
One of the by-products of landscaping was new containers for plants, such as those produced by Max and Rita Lawrence's Architectural Pottery; one of their designers was John Follis who became better known as a graphics designer and put together many of the issues of A & A.

The houses themselves were an idealized mirror of an age, an age in which an emerging pragmatism veiled the Rooseveltian idealism. Conceived as lowcost, prices soared as inflation grew. Standardized elements were generally used, often imaginatively, but did not bring down costs; nevertheless there was an effort to arrive at the prototypical if only in floor planning or detailing. The first house to be completed, by J. R. Davidson, had a floor plan without halls, much copied by developers in the 50's. The open floor plans of all the houses was one of the few borrowings from Wright; the designs looked more to Europe than inward toward Wright. Nearly all of the houses were on flat pads, giving little opportunity for a Wrightian integration into a site.

The service the houses rendered went beyond any experimentation embodied in any of the first eight. It was rather a service to a time and a place.

During the 30's the Great Depression severely curtailed building, and when practice wanes, theory flourishes; a major theme of study was lowcost housing, a critical need because of the antiquated and unsanitary quarters generally available to low and lower-middle income families.

Architects who matured in the 30's were dedicated to the ideal of architecture as a social art. Wright was dandy but the true path was through standardization. Two battles were being waged simultaneously, one for the facade, one for the structure.



1 Case Study House, J.R. Davidson 1946, plan.

2 J.R. Davidson, entry.

3 J.R. Davidson, view from entry.

The late 30's held out little promise that architects would be permitted to develop many of their ideas. *Residential Architecture in Southern California,* published in 1938 by the local AIA, relegated modern to the back of the book and featured eclectic at the front. R. M. Schindler's Buck house was on page 106, and Richard Neutra and Harwell Harris followed. Nor did the modern style offer hope to a young architect who wanted a comfortable practice, which was why architects who lived solely by work in the modern idiom were much revered: Wright, Lloyd Wright, Schindler, Neutra, Davidson beginning in the 20's; Harwell Harris, Gregory Ain, Raphael Soriano and others beginning in the 30's. There was an extraordinary amount of provocative architecture within easy reach. Some of its specific lessons were that a good house could be of cheap materials; outdoor living was as valued as enclosed spaces; a dining room was less necessary than two baths and glass walls, and other things now so commonplace that it is hard to believe they were ever thought innovative enough for lending agencies to object to. (Banks, for instance, deplored a kitchen at the front of the house, on the grounds that the house would have no resale value.)

The clients who commissioned modern houses were most often professional people with moderate incomes—progressives, they were called. Because they saw the need for change in their own fields of education, law, medicine, politics, the arts, they were receptive to change in architecture. (Schindler's 1924 Packard house was for a liberal attorney; at the same time he designed a project for Clore Warne, a civil liberties attorney. Much of Ain's work in social housing was for political leftwing clients.) One cheerful prospect was that while the work of Schindler, Neutra, etc. was educating the student it was also educating the laymen. The other great source of hope came from the assertive new direction of *Arts & Architecture* magazine.

By the time peace came talents had lain idle too long; architects were bursting with energy. This was the climate in which the Case Study House program budded.

Back of it was an extraordinary man, John Entenza. Although he had not studied architecture he became intensely aware of it when young, acquired a broad knowledge of the modern movement especially, and developed a sensitivity to form. He could easily have turned designer himself except for his modesty about his own talent, quickened by his easy recognition of talent in others. This has served him well for 37 years, years in which he has become a bridge between the creative person and the act, as editor, then director of the Graham Foundation, now professor of architecture and advisor to the chancellor, University of Illinois, and consultant, board member or commissioner for city and national governments, universities and museums.

In 1937 he commissioned Harwell Harris to design a small house, one totally different from Harris' usual wood houses with inspired borrowings from the Japanese. It had certain memories of Neutra's Von Sternberg house with the circular form and the absence of texture; a certain flavor of the early Le Corbusier. The following year Entenza bought the magazine *Arts & Architecture;* it was two years, however, before he assumed the full task of editing. At that point he threw out the eclectic work and dropped the regional bias along with the word California from the title. With the redesign of the magazine by Herbert Matter (and others) the transformation was complete. Because of its receptivity to the work of the young, local architects had a rallying point; even a school of graphic designers sprang up in the city as *A & A* welcomed contributions from young designers. No one single event raised the level of taste in Los Angeles as did the magazine; certainly nothing could have put the city on the international scene as quickly. Entenza's assistant, Susan Jonas, born in

4 J.R. Davidson, patio.

France, carried on correspondence in three languages with foreign editors who wanted permission to reprint a story, sometimes a whole issue. Eastern European, Latin American and Japanese magazines soon began publishing work of architects who first appeared in *A & A*. A slim magazine with little advertising and no outside financial backing became the greatest force in the dissemination of information, architectural and cultural, about California.

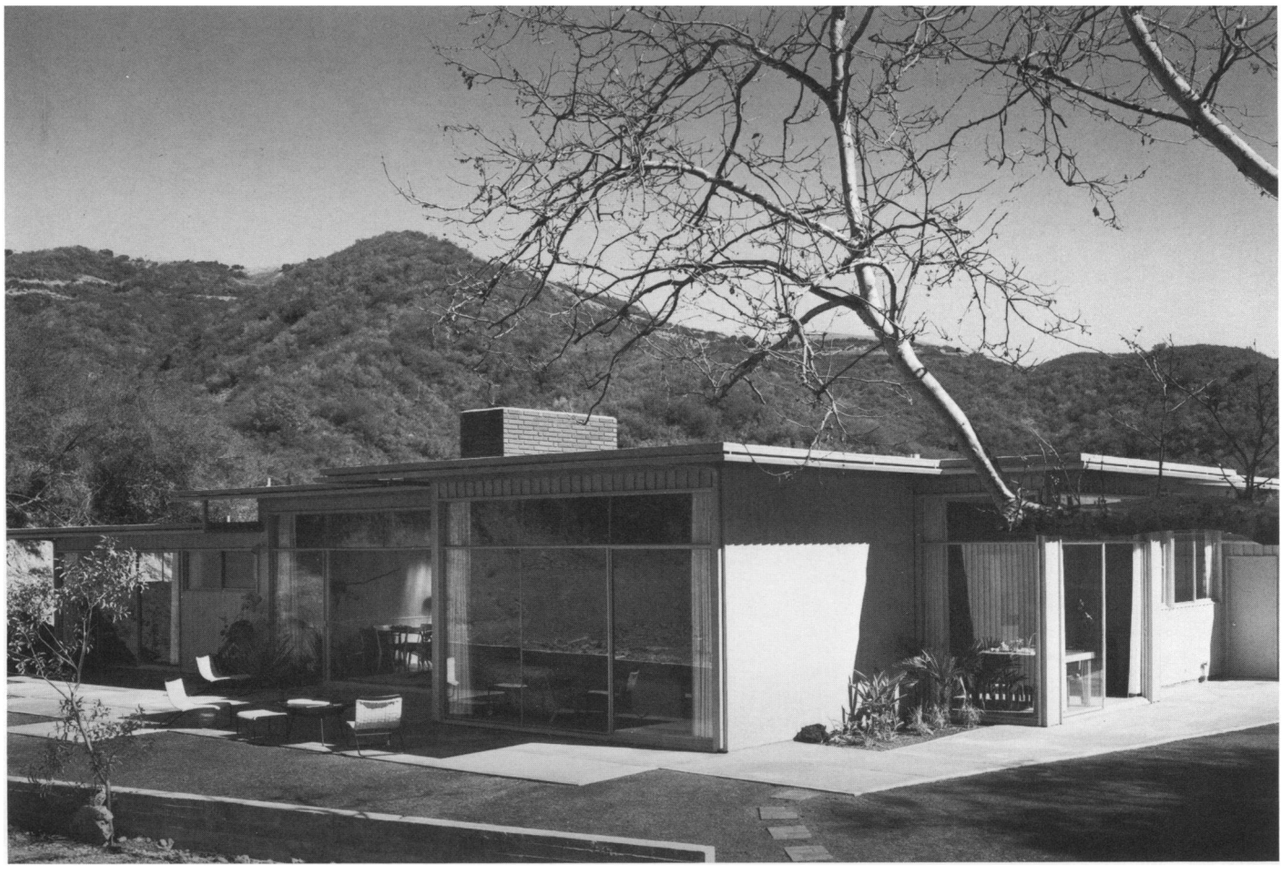
The very looseness of the Case Study House program, as announced in 1945, was responsible in a way for its survival; in the first place it was obviously written not by a committee but by one man, and that man one who understood the chaotic period after the war ended. The goal of the program was simply "good environment," and to achieve this the eight architects asked to participate were invited to experiment in form or materials. If they liked—there were no restrictions on what they designed. But half of the eight, being over fifty, were accustomed to working in a style that was still unacceptable to most clients, to lending agencies, to craftsmen and to the neighbors. They were all in the habit of reviewing and redesigning; there had been time in the 30's for the architect to proceed slowly, to consider each work as if his reputation depended on it.

In the first group were three Californians with a national reputation: Richard Neutra, J. R. Davidson and William Wurster (then Wurster and Bernardi); less known outside California was Sumner Spaulding (Spaulding and Rex—Rex was then only 22).

Davidson and Neutra each did three designs; two of Davidson's were built from the same hall-less plan, one in West Los Angeles, one in La Canada. The only Neutra completed was on the Pacific Palisades property acquired for the program. Other Case Studies built on the five-acre property were the 1949 Eames house (1½ acres), the 1949 Entenza house (1½-acre site) and one by Rodney Walker on a smaller site.

All of the early houses were more or less rectangular in plan except for the Wurster, in which two wings were connected by a "porch". I think it was called a lanai room, producing a U-plan. The social and work spaces were arranged on one side of the porch, and three bedrooms on the other. The entrance was through the porch, which was solid on the street side and had sliding glass toward a garden; it was a porch only in the sense that part of the roof could be opened by louvres. It reminded me a little of a 30's house of Wurster's in Pasatiempo in which the entrance was through a porch walled on the street side and entirely open on the other to the breezes and a view of a valley, like some of the vernacular Cuernavaca houses.

5 Case Study House, Wurster & Bernardi, 1948.



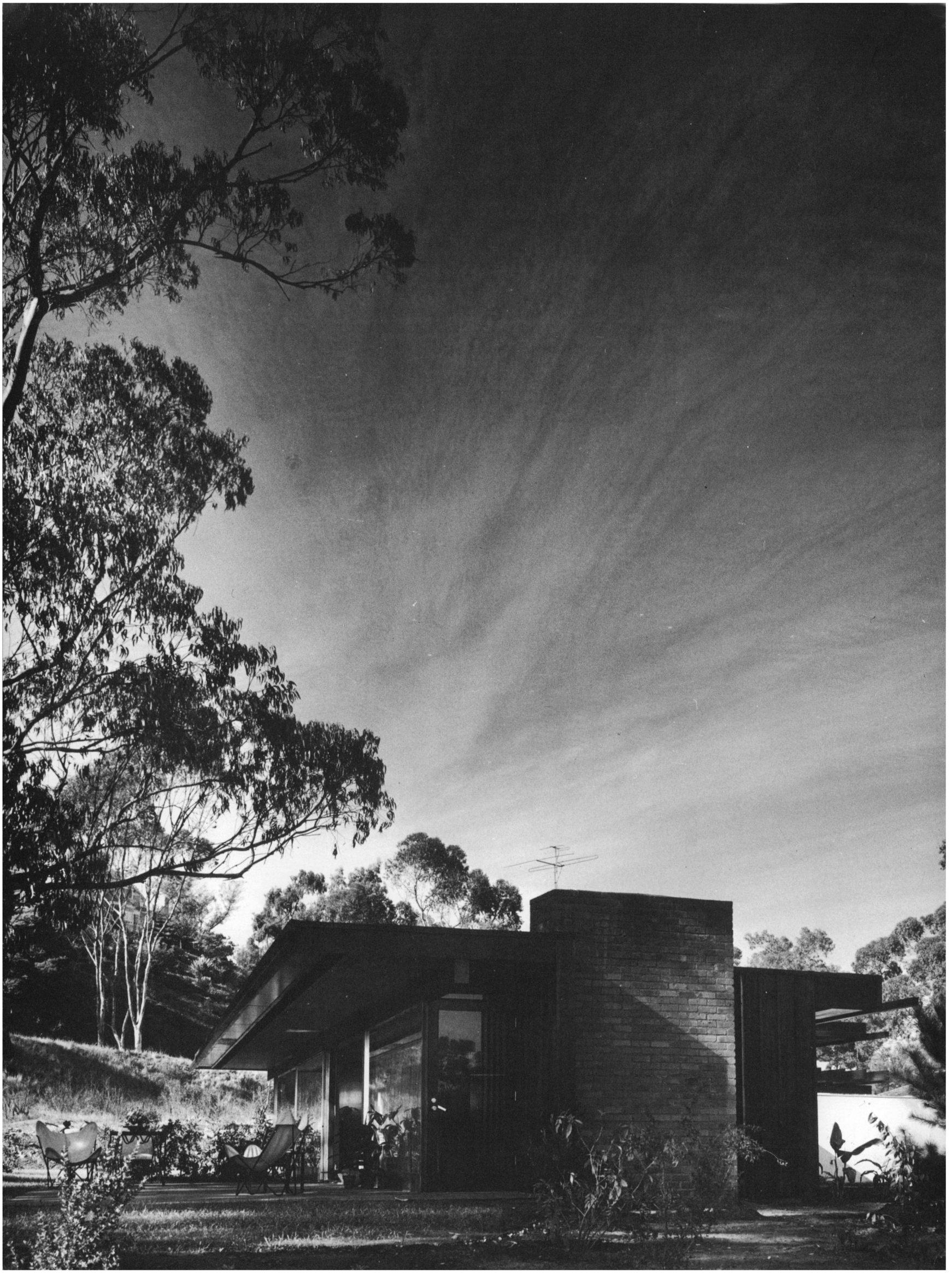
By contrast, the Davidson house was compact. You couldn't read the plan from the street, although the street side was cottagy compared with Davidson's usual urbanity. The traffic pattern of the plan was a series of overlapping ovals, which made it possible to move freely through the house without ever crossing the social area of the living room, which was close to the glass wall on the south. A broad aisle along the north wall (lined with low book cases) led to bedroom # 2, with its own outside entrance through a patio.

Davidson and Neutra used standard wood framing with stucco and wood siding, but Wurster experimented with aluminum siding; used vertically, it read as wood. The Spaulding and Rex Case Study in Chapman Woods was sheathed in plywood panels. Seasonal rains were recognized in the wide eaves which kept water off the walls and glass. There was little experimentation in fenestration; sliding glass was still mainly custom made at that time and considered a mark of the "modern" house. Spaulding and Rex, however, used awning-type factory sash for some glazed areas, much the same as that used in the Eames house.

The Neutra house, finished in 1948, was in the vein of his Nesbitt house, which, bowing to the war scarcities of 1942, made a virtue of redwood—even brick—and opened up for him a period which you might call elegant vernacular.* The Case Study—the client was Dr. Stuart Bailey who still lives there and has added two wings designed by Neutra—is more interesting for relaxed style and poetic siting, although not a milestone in his work. The one innovation was mechanical core at the center of the house for plumbing and heating. The serpentine brick wall, used at the Nesbitt house, was repeated in the Bailey house at the owner's request.

The group of younger architects who were invited to particiapte were Eames and Thornton Abell (both just under 40), and Eero Saarinen, Whitney Smith and Ralph Rapson, aged 35, 34 and 30 respectively. In 1937 Abell had designed his own house in Santa Monica Canyon, which stands today, furniture and all, as an excellent example of the International Style; his Case Study of 1948 in

*Since writing that sentence Harwell Harris has told me that Frank Lloyd Wright, who had designed a house for Nesbitt in Pebble Beach, was asked first to design the house, then because of what was said to be outstanding fees on the first house, Wright declined to design it. Harris was then asked to design it, in brick and redwood, already agreed on by Nesbitt and Wright, but at the request of John Lautner, formerly with the Wright office, he also declined. Then Neutra was asked, and accepted along with the commission the redwood and brick, according to Harris.



6 Case Study House, Richard Neutra, 1946.

7 Richard Neutra, 1946.

San Gabriel is a composition of Barcelona pavilion planes of wood (high louvred fence screening the bedroom patio facing the street) and of concrete block. In scale if not in area, it was a first study for a 1954 small low building which houses his office.

Two Whitney Smith projects, one steel framed with adobe brick infilling, the other wood and plaster, broke from the rectangular plan; the adobe house, planned around loggias, and the other with entrance through a lath house, an idea not abandoned as Smith incorporated lath houses into many of his later plans. Indeed, entry gardens became very popular in the 50's.

The most innovative of the unbuilt projects was Ralph Rapson's, for what he called a "greenbelt house." A 12-ft wide glass-roofed aisle cut the rectangular house in two; three bedrooms on one side, living, kitchen and dining on the other, faced the trees and other planting of the interior garden. The community space was expanded by using folding doors to close off the sleeping areas at the end of each bedroom. Rapson said of the plan: "For once the complete integration of inside and outside will have been accomplished." The plan, which remained a project, and Rapson's comment, describe well the yearnings of the mid-40's; so does the helicopter hovering above the roof in the sketches.

The popularity of the program, and delays in construction, brought in two houses not originally planned for: one by Kemper Nomland and Kemper Nomland, Jr. in Pasadena, one by Rodney Walker in Beverly Hills, and both finished in 1947. (Later Walker did another for the Pacific Palisades property.) Both were sheathed in plywood panels which had a grooved profile (it was called "striated"), and was popular as an exterior material because it was waterproof and to an untrained eye it might be mistaken for grooved siding. Later, it was considered an abomination, along with colored corrugated plastic. Plywood was still an exciting material in the 40's; Neutra had designed an all-plywood exhibition house in 1936; Schindler's 1938 Southall house was of plywood. The material lent itself to modular design and eliminated fussy detailing. A comment of Wurster's points up the cult of the lowcost house of the 30's and 40's: "Although plywood costs more than plaster, we like it better because it looks cheaper."

Walker spent some months in Schindler's office in the 30's, then began building lowcost houses which were little text books for cutting costs. His success was based on an uncanny total recall of the stock sizes of everything and the comparative costs of all materials; he knew the closeout market and bought up and stockpiled bargains. Once he had mastered cost, he turned around and spent some of the savings on such dramatic features as garden rooms, some with 10-ft high walls of rough cork panels, out of which exotic plants seemed to sprout. Like Schindler, he had a running battle with the elements. He would set the largest standard size sheets of glass between plaster guard stops; he did not match the spatial refinement of Schindler but he understood drama. His first Case Study had a high entrance hall with splended waste space.

Eames' own house, and the one he designed with Eero Saarinen for Entenza on adjoining property, were completed in 1949, and one by Raphael Soriano, a mile to the north of the Case Study house land, in 1950. Soriano had become interested in steel when he worked in the early 30's in Neutra's office; Neutra used it rarely after his 1929 Lovell house, but Soriano took it up from there and made it a life pursuit. From junior I-beams in a plaster house in 1936, he went on to expanded steel studs, then shop-welded light steel frame. Beginning with the 1942 building in San Francisco for Hollowell Seed Co., he worked almost entirely in pavilion type structures of which his Case Study was an example. His framing was 3½ in. pipe columns on

8 Case Study House, Charles Eames, 1949.

a 10 ft by 20 ft grid, spanned by 6-in. wide flange beams, roofed with steel decking. This solution varied little in his one-story structures of the 40's and 50's: the 1949 Noyes house, Bel Air, the 1950 Shulman house, Laurel Canyon (the most intact and handsomest example of Soriano's houses of this period), and the 1953 Adolph office building, Burbank.

Eames, Ellwood and Koenig were influenced by Soriano's experiments, each finding different solutions in steel. An essential difference between the Eames and Soriano houses was that the latter was planned for an average family, and the former, with its detached studio, was planned for special needs. This was pointed out by *Arts & Architecture* in introducing the Eames house (it was just as true of the Entenza house); the statement was less a criticism of the Eames house than a reiteration of the creed that models of well-designed houses for an average family benefitted architecture and filled a social need.

Social needs are always in flux. It appears now that the steel-framed house answered no long-lived social need because the average family sooner or later found its wood-framed tract house. The steel frame was too strict to lend itself to mass production; the margin for error was too narrow, no scheduling procedure which mixed the wood carpenter and steel carpenter was ever devised. For these reasons the steel house never became a common type as did the Greenes' bungalow and Gill's cubic house of concrete (which was easily translated into plaster). Nor did the steel-framed house stand outside architecture; as the Miesian principle caught the imagination in the late 50's and the 60's, the influence of the steel-framed house grew among architects, usually young ones, and a number of good examples do exist. They are not confiend to California; the excellent Rogers house by Piano and Rogers near London is an indication of the renewed interest among English architects in steel-framing. Now that the single family house is a luxury in itself, the greater cost of the steel-framed makes it more prestigious.

The Eames house is still intact as designed while the Soriano for the typical family underwent changes, among them a pierced concrete block screen at the entrance to "bring it up to date." Other Case Studies have been remodeled: an addition added to the Entenza house, a Craig Ellwood sentimentalized and published in *House Beautiful* as an example of how to inject life into an old house.

Eames' previous work in architecture had been mainly in collaboration with others for churches, etc., around St. Louis (he had usually designed furniture and other interiors for all buildings); from that he went eventually to instruct at Cranbrook, then in its golden period. His contact with the Saarinens led to design in many fields, among them furniture design with Eero Saarinen. His first

9 Charles Eames, living room from balcony.

10 Charles Eames, balcony and entrance from living room.

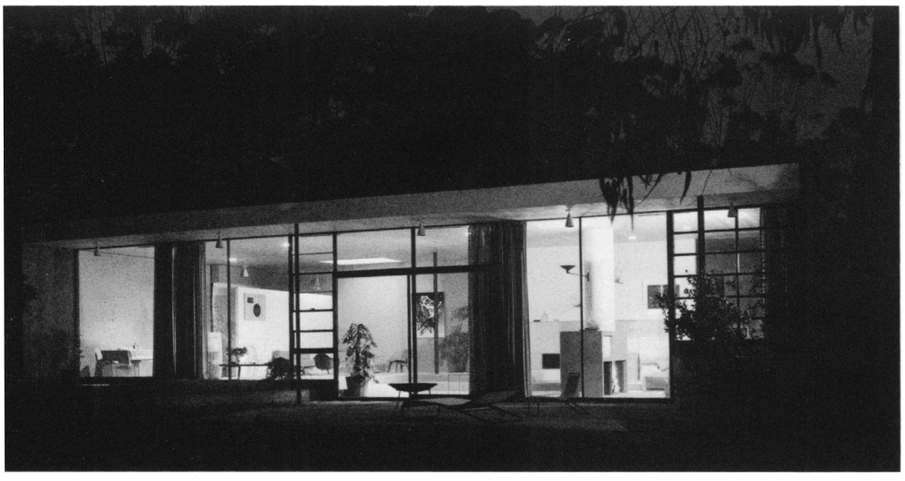
and only buildings in steel and glass were his own house and the Herman Miller showroom in Los Angeles, also 1949. He thinks of his major discipline as architecture, but after 1949 he concentrated on films and furniture, and now on exhibitions.

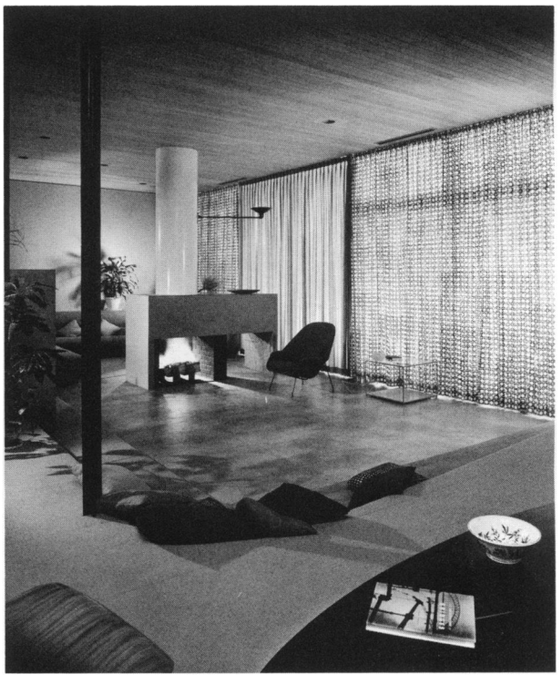
The Eames house is a steel and glass cage, as lightweight as an Eames chair, which lends itself admirably to an exhibition space for a changing collection of art, toys and crafts of all kinds. The dramatic quality comes from its situation among eucalyptus trees and from the double height of the living room; this is enhanced by the sensitive land-planning of the 2½ acres shared by the Entenza and Eames houses, the uninterrupted flow of meadow between them and beyond them to the edge of the palisade, with long views across it to the sea and coastline. Entrance to the Eames house from the parking space passes first the detached studio, which also helps to isolate the house. Neither studio nor house has overhangs, projections or recesses; the structure is composed of 4 in. H-columns spaced at 20-ft intervals and spanned by 12 in. open web bar joists. A 7 ft 6 in. module is compatible with the steel decking and the two ceiling heights. The illustration of the east wall shows the eight bays; the composition of rectangular surfaces is composed of sliding or fixed factory sash and solid wall. The interior is three-dimensional in comparison: the exposed steel decking, the open web joists, the sculptural mass of the balcony (where the two bedrooms are placed) and the recessed seating area below. The room is alive with colliding reflected images on the glass and walls, changing with the sun and the season.

11 Charles Eames.

12 Entenza House, Saarinen and Eames, 1949.

13 Entenza House, living room.





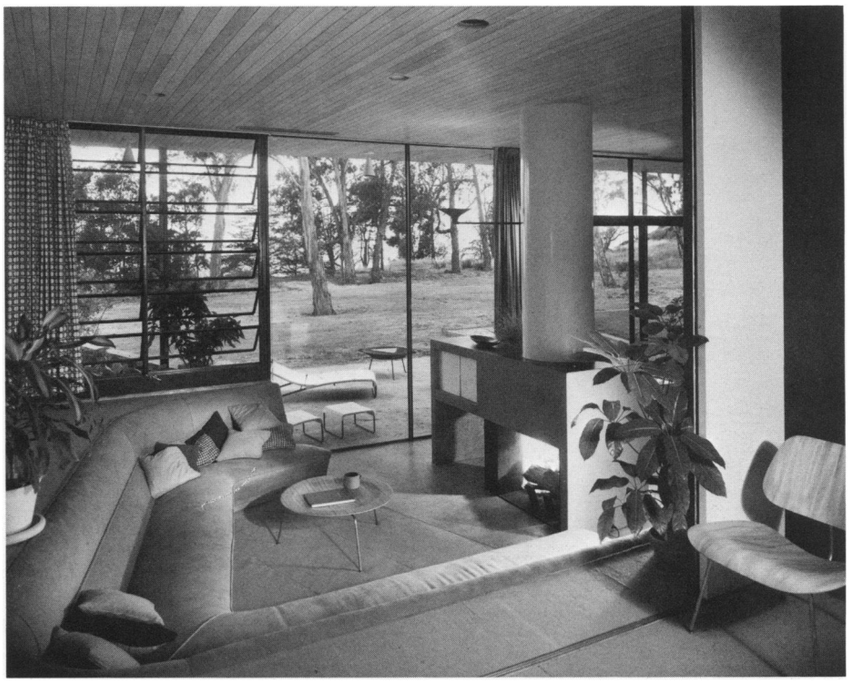
14 Entenza House, view from bedroom.

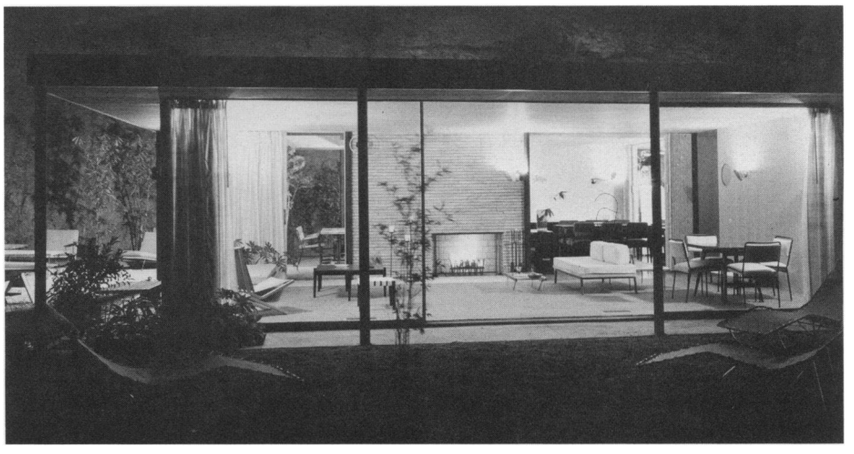
15 Case Study House, Raphael Soriano 1950, garden face.

16 Raphael Soriano, entry.

The same module was used for the Entenza house, essentially a 42 by 42 ft box, pierced lightly on three sides and opened wholly on the south. Except for one lone column, the structure is not expressed; walls are plastered, ceilings covered with wood. The cylindrical chimney, the curve of step to the dining-kitchen level, the curve of the built-in sofa evoke an image of the Saarinen womb chair. An interruption in the flow of space became a sculptural statement, especially the freestanding kitchen wall containing the mechanical equipment.

The Soriano house is sober in contrast to the Entenza, and appears less machined than the Eames. It was, however, one step in a long exploration of steel. It is closer to a Koenig house in the feeling that it was a problem solved, an intellectual exercise. Soriano was by force sensitive to the amount of exposed steel a client would accept, and in the 40's and 50's that was not very much. His ceilings were plastered, walls were usually a dark hardwood plywood; in the Noyes house he used rough dark brown cork panels for some exterior walls (they disintegrated) and in the Case Study there were a few masonite panels turned with the rough side out; fireplaces were red brick, standard size or a Roman split: to give a greater feeling of space to the small Case Study he made two walls of obscure corrugated wire glass panels, one of which was lighted from behind to illuminate the entrance. But as for steel, the columns were minimized by butting them against a wall and the steel decking was visible only in the carport and entry. However, his habit of recessing his exterior glass four feet emphasized the rhythm of perimeter columns. Thus steel was prominent only where visible through glass. His ceilings were the standard 8 ft, and glass and doors reached the full height; the soffit of his 4 ft overhangs was continuous with the ceilings, the material the same for both.





17 Raphael Soriano, living room.

18 Raphael Soriano, garden room.

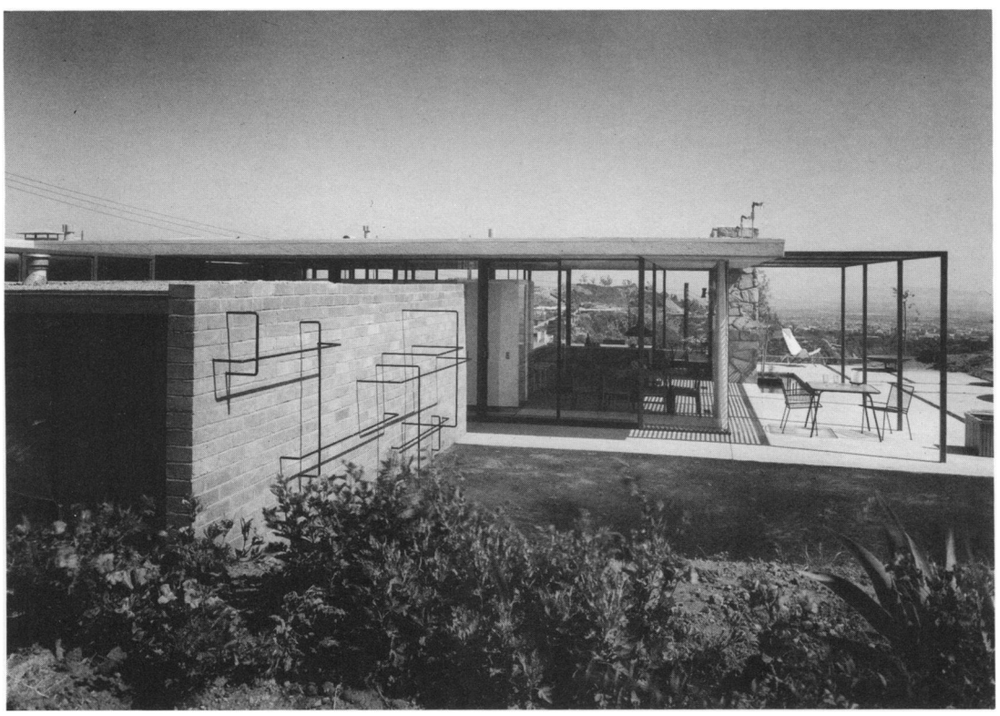
19 Raphael Soriano.

The columns for the Case Study were spaced on a 10 by 20 ft grid, and the house was four bays wide by two bays deep. As noted earlier, 6 in. wide flange beams spanned the 3½ in. pipe columns.

Late in the 50's Soriano moved his office to Tiburon, a steel man in what was at that time wood country; his commissions were never numerous but always enough to keep his small office busy. He was eager to work in lighter weight metals and succeeded in doing several pilots for a series of aluminum-framed houses for the Bay Area and Hawaii. His hope of designing frames of plastic is still a hope. A project for a 1300 ft tower of aluminum tubes for San Francisco did not materialize.

20 Case Study House, Craig Ellwood 1951, carport and entry.

21 Craig Ellwood, view toward living room and terrace.



There was a generation between Soriano and the two younger men upon whom he exerted an influence, Craig Ellwood and Pierre Koenig, who between them designed five Case Studies. The Eames house was less an influence because the typical family preferred a house on one level; but of more importance is the fact that the eye of the steel men was on the developing technology. A new joint, a new steel section, larger standard sizes of steel decking and glass, all affected their design more than any one completed house. They were researchers.

Craig Ellwood, who designed Case Study House #16, was the first among the postwar designers to complete a house, and the first architect under 30 to participate. He was 29 when he built his first steel-framed house, and 31 in 1953 when he completed a four-unit apartment house framed in steel; the latter won a first award at Sao Paulo. He had bypassed architecture school at the end of the war to go into the office of a contractor as an estimator (some of the buildings were by Neutra and Soriano); his formal education was courses in engineering.

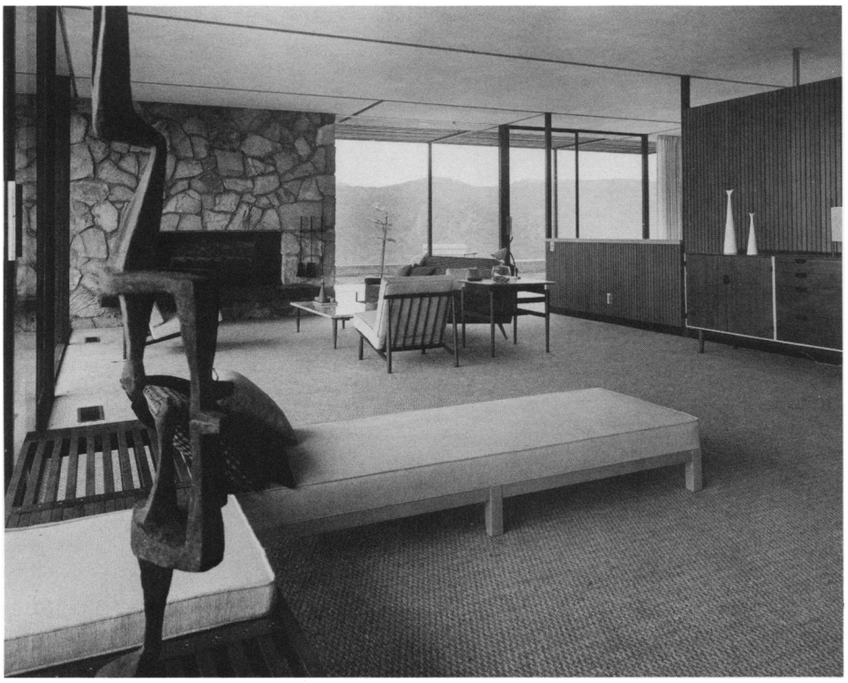
Ellwood was not the first of the CSH architects to chart his own course of education. Soriano left USC to continue his studies as an apprentice in Neutra's office; Koenig's first steel-framed building ended as an extracurricular study during his last year at USC, indicative of the lack of interest of the schools in steel technology.

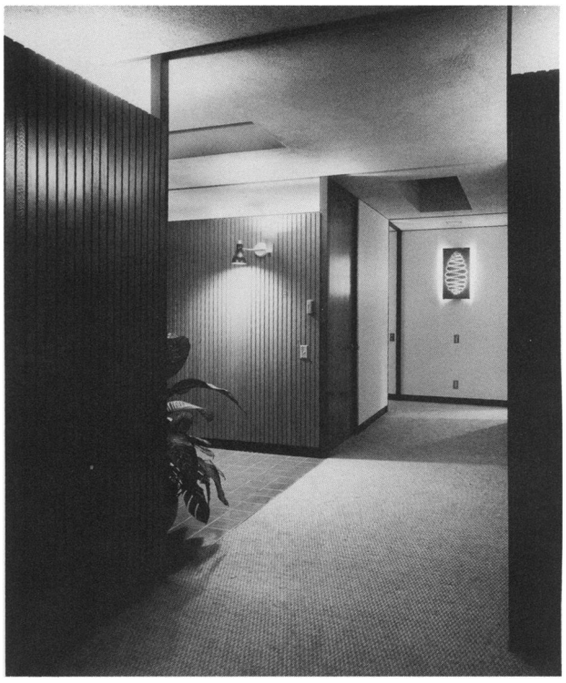
Ellwood worked mainly in panel systems, to which he brought such ingratiating materials as wood and brick for infilling of the steel frames. Also, his use of 2½ in. square tubing for framing did much to domesticate steel; however, it was the panel aesthetic which made his early buildings agreeable. The square steel section was no more than a shadow line and no plates or angles were required as fasteners. The 6 in. I-beams were suppressed and the ceiling sandwich panels were delineated by a metal trim carried

22 Craig Ellwood, living room.

23 Craig Ellwood, hall.

24 Craig Ellwood, bedroom and enclosed court.





25 Craig Ellwood, terrace.

from column to column. By many devices the panel was stated as panel; the wood of the wall sandwich panels reached below ceiling height, the base was recessed and was black to emphasize the change of plane. The 4 by 8 in. module was one that was reassuring to the eye accustomed to standard sizes: the random masonry of the fire established friendly associations which a modular material would not.

Two things were at work in all the Ellwood houses: the perfection of a body of detailing that was both handy and elegant, and the adjustment of steel to meet public acceptance. It was Ellwood's ability to deal with both that carried him into commercial buildings where he had greater scope. To continue to refine in small scale buildings could have been self defeating if his talents hadn't been called to new areas. The fact that he could later design the first SDS (now Xerox) building in a matter of weeks at and unusually low cost per square foot was proof that he had outgrown the house. (SDS was designed in such a way that structure and walls could be built independently.)

Ellwood continued in Case Studies #17 and #18 to use brick and wood in panels, and wood ceilings, but in #17 he departed from the steel tubing and went to 4-in. H-columns, only to return to the tubing for #18, this time a 2 by 5½-in. rectangular tubing; the beams were of the same section, the first time such a thin walled section was tried as a beam. It minimized detailing because one connection applied to all exterior wall conditions; panels, glass, sash and sliding door units could all be attached in the same manner.

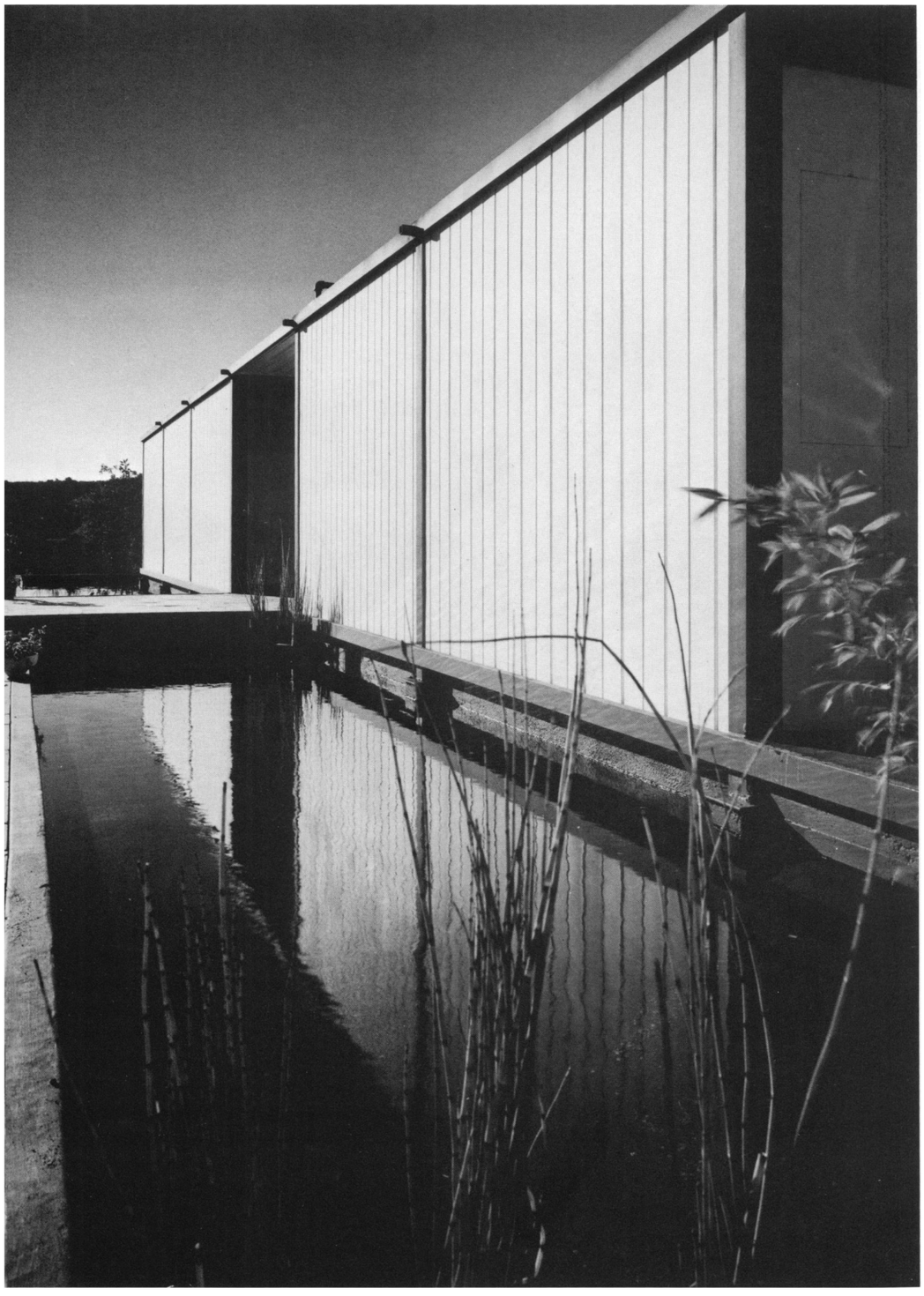
In #18, there is a greater awareness of Mies. It has been hard for easterners, who live closer to history, to believe that Mies's influence on Ellwood had come second and third hand; anyway, by 1956 Ellwood discovered his master, but by then he was already secure in his own habits with steel.

One difference in #18 was that for the first time in a Case Study shop-fabricated bents were used. The 16-ft bents were delivered to the site and erected in a day, then immediately roofed.

The most uncompromising use of steel was in the two Case Studies by Pierre Koenig in 1958 and 1959, both of them little portraits of the state of the art of the period. Koenig's interest in the monoplanar wall led to a plan innovation which is still valid but did not enter the common language. Far from it. What Koenig did was to locate two bathrooms in a court at the core of CSH #21, thus satisfying the code concerning ventilation for baths and at the same time freeing the exterior walls from the tyranny of the small bathroom window. The idea of detaching the baths and facing them into a ventilated court produced a plan unique for the steel-frame. In floor planning, Ellwood had adapted freely; for all the strictness of the square plan of the Rosen house, he avoided the features of the Farnsworth and Johnson houses which conflicted with privacy for families with children. Soriano, the most dogmatic of the three, had an old-fashioned idea of plan. It was one that protected the adult (male) from the smells of the kitchen and the frettings of infants.

CSH #21 is a series of 10 by 22 ft bays 9 ft high; each frame is composed of 8-in. I-beam floor channel and three 4-in. wide flange columns. The two exterior bays came shop-equipped with a 4-in. channel to tie into the columns at sill height. The curtain walls of steel decking and the sliding glass were inserted into the 22-ft openings between columns. Some of the exterior walls are of gypsum board, these exposed for interior walls.

26 Case Study House 21, Pierre Koenig 1958, street face.



Koenig moved away from panel aesthetics, and in exploiting the larger standard sizes of the late 50's of steel decking and glass, he arrived at a skin aesthetic. He gave economy as his reason for abandoning panels but added, "Expense is inevitable while experimenting, but unless there is a goal it is wasted." The spartan character of the house was relieved nevertheless by rather costly reflecting pools. Today the pools are filled in, trees have grown, the hillsides are strewn with houses, interior changes have been made, but the crispness of the steel frame is unchanged. What still gives the plan its special character is the buffer between living and bedrooms set up by the island core.

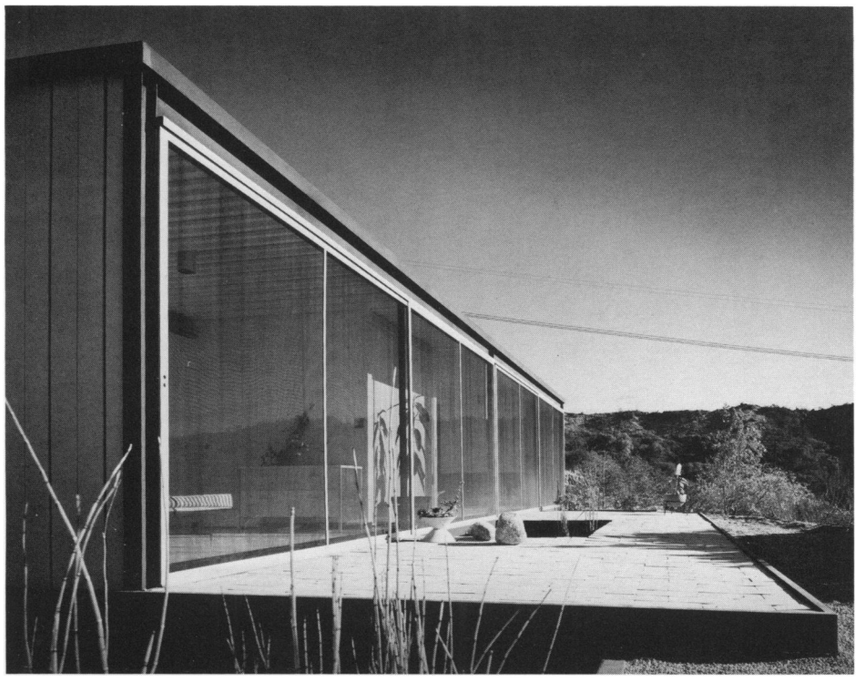
His second Case Study the following year was for a site on a canyon edge, and a factor in the design was a 10-ft cantilever to extend the living space and allow a swimming pool on the same level. Here it was an L-shaped plan around a pool; as in most Koenig houses, water becomes a part of the floor plan. Another design characteristic is the horizontal plane floating above water, repeated in both Case Studies and continued in his later houses. In CSH # 21 it is a terrace raised above the pool on the street side and another off a bedroom which is separated from the carport by a pool. In CSH # 22, a platform hovering above the swimming pool extends out from the living room. These horizontal planes, complementary to the size of openings, are vertical planes tipped to a horizontal position. With the disappearance of both the Koenig houses into nature, they have become pavilions glimpsed, CSH # 21 the purer because of the compact mass.

Only two steel sections were used in CSH # 22, 12-in. I-beams and 4-in. columns, to form 20 by 20-ft bays; the house is three bays wide by four bays long, ten feet of the latter in cantilever.

27 Pierre Koenig, terrace.

28 Pierre Koenig, entry from living room.

29 Pierre Koenig, kitchen and living room from central court.



30 Case Study House 22, living room from pool terrace.

Now two decades later, the Case Study House Style refers only to the work of Soriano, Eames, Ellwood and Koenig; but during the time their houses were being built another type quickly gained a name: the Pasadena or USC Style. The houses were based on a panel system and framed with 4 by 4-in. posts 4 feet on center. Roofs were gabled and low pitched, and glass often followed the gable line. Decks and porches were oriented to the mature trees of Pasadena. They were influenced by Greene and Greene and earlier cottages, which Randell Makinson calls the Brown and Browns, and by Harwell Harris; in turn the Pasadena Style exerted an influence on tract builders. Several members of the USC school designed Case Studies, two projects by Whitney Smith (later as Smith and Williams, the firm built many 4x4, 4 o.c. houses); and Buff, Straub and Hensman designed a Case Study for Pasadena with roof of plywood barrel vaults.

Between 1959 and 1961 there was the Buff, Straub and Hensman Case Study, already mentioned, and aside from a Don Knorr project in which adobe brick was the infilling for a steel frame, the only four completed houses were by Killingsworth, Brady and Smith. (An abandoned project by that firm was a prototype for houses in South America which would try out a new structural system in concrete.)

By the 60's, architects had lost the battle for the tract house to the developers; the involvement of the architect was minimal, confined often to what details the developer could borrow and hand over to Bill Ding to draw up. The high production of developers and the rising cost of land and construction made the custom-built house anachronistic. Two Case Studies between 1959 and 1961 for cluster housing were timely. First there was Killingsworth, Brady and Smith's group of three houses for a small tract in LaJolla, designed for a cul de sac street and placed to complement one another. The idiom was the same for all: a plan around interior courts and a framing system which was a variation of the 4-4-4 wood frame. However, for the sake of

privacy there were a number of long walls with continuous wood skin formed of sheets of rough-sawn redwood panels.

A prophetic project was one by A. Quincy Jones of Jones and Emmons. Jones, with Whitney Smith and Edgardo Contini, had in 1949 planned an idealistic development of 100 houses on hillside land in Brentwood. Concrete block and redwood houses, all variations of the same theme, were handsomely fitted to the natural contours. Almost intact today, the development stands as a model for good land use. During the 60's, Jones planned a number of tracts for Eichler Homes which represent a high point in good siting, preservation of land, communal spaces and floor planning; one of his models was a steel-framed house with walls of glass and wood, and roof openings to light interior planting areas. A sensuous use of plants was characteristic of all his domestic work.

What he proposed for a Case Study was 260 houses on a 140-acre tract in San Fernando Valley; building pads were below grade, and the earth thrown up to create the flat pads was mounded into barriers between house and street and between neighbors. The houses were isolated visually and sound transmission was low. Rather than houses which he called "bumps along a road waiting for trees to grow," he planned "earth sculpture in which houses and land blend." The size of the lots was to be trimmed and the square footage saved thrown into a park, an idea he had already carried out in a Palo Alto tract but was not permitted in the south. It should be remarked that in institutional buildings and in offices, Jones developed a plan in some ways similar to the Case Study tract: entrance is by way of the middle level, and the first level, below grade, opens onto planting courts and landscaped banks. In this way, buildings are kept low and there is only one flight down or up from the main middle level. The kindest feature is the creation of good work space below grade.

Although the Case Study program continued bravely, if sporadically, in the 60's after David Travers took over the magazine, the interest in the single house as a type was waning. The reason for the existence of the program had passed: the establishing of a forum for Modern (as opposed to the prevailing eclectic) and the production of new prototypes for the two-bedroom house.