Thornton M. Abell, FAIA, President-Elect of the Southern California Chapter/AIA for 1978, has been a participant in the contemporary movement in modern architecture since erecting his own residence in 1937. His work has been published in various books and periodicals such as Arts & Architecture. He has also been the recipient of numerous prestigious architectural awards.

After studying at the University of Michigan, he emigrated to UC Berkeley, and later, to USC. At Michigan he studied with Knute Lindberg Holme of the Bauhaus, whom Abell regards as his mentor for basic design. The Bauhaus traditions of simplicity and directness are everywhere evident in his work. Abell taught interior design at Chouinard Art Institute from 1950 to 1962, Architecture at USC from 1962 to 1967 and was Visiting Critic for 5th Year Design at USC from 1963 to 1965.

Characteristic of Abell's work is the completely open facade to interior private spaces. The spaces, composed of courts and terraces, are studies in a geometry that shapes and relates interior and exterior spaces to themselves and one another in terms of use and volume. The exterior spaces are actually a series of exterior rooms, defined by trees or other plant materials, elevation changes and/or walls and space frames. Such definition creates various open and closed, sunny or shaded areas.

Material uses are simple and direct, as in Arts & Architecture Case Study House #7. "A walk above the isolated entry court, and the fascia along the eaves of the bedroom wing, give continuity and variety to the broad horizon surfaces established, since the parallel lines on different planes bring depth to the facade. Abell borrowed the advancing and receding parallel lines, composed of different textures, for his own office. "Talking about the use of materials and time, Abell has said, "Products are usually put on the market before they are proved out, and it is up to the architect to test what industry develops — and the client becomes a collaborator in the experiments. The problem for the architect is to walk a tightrope between experimentation and prudence."

The heavy, solid blocks of the street facades close out the exterior world and behind these walls is created a private space that belongs only to the building. A thin membrane of glass with mullions reduced to lines provides the least possible division between the interior and the exterior private spaces.

Abell's buildings respond to solar orientation. Openings are protected from the sun by overhangs and walls which are also used to create private spaces. Everything is worked out. Geometry prevails - the placement of walls, closed panels, and openings are all positioned in the logical development of carefully disciplined schemes. But positions are not arbitrary. They relate to uses, site, the sun. Nothing is "stuck on" — there is no pastiche. The romance of the final form is the logical end of a rational concept. The result is holistic, not a concentration on a part.

As an avocation, Abell grows and hybridizes roses. A colorful and rich complement to his architecture.

Kenneth Dillon, AIA

“Each species wants to survive. They try to modify their environment to help their survival. This is sometimes hard on other species. Probably the only reason Man has survived over the years, is his adaptability to changes in his environment that he can't control, and his ability to change it to help his survival.”

L.A. ARCHITECT December 1977
and energy effective, thereby making ECD/M technologies prove more cost-effective than other options. We are interested in minimizing energy consumption as a design and operation factor, and that will be our approach to your project. We are convinced that buildings living in a more energy/cost-effective manner will face less risk and cost against the latter. If we do incorporate solar into the design of the project, we insist that neither of us will be derived from that. We are, of course, or otherwise, as to what your solar requirements may be.

We in our modest activities thus far, solar technology is providing a radical alternative to oil and gas in heating, competing with natural gas in some areas, and that means that we are usually, in giving invited testimony on the future of California to the legislature, it must be said that we have seen a development of a variety of non-fossil energy technologies in California, primarily solar energy applications.

Architect's Response to ECD/M-Solar Concerns

The architectural profession has had to respond to these issues again mirrors the response of the scientific community, and all elements, and all aspects are concerned. We must ask ourselves: do we make the architectural profession we all seek to develop the technology of our profession, and that I would characterize those responses as follows:

1. There is no crisis. This country has been burning oil and it is being hoisted by the oil and utility companies to design and build as I please. There is no crisis, so why are we talking about it? I am trying to survive and can't really be concerned about saving the world. I have a new idea and I'll deal with that.

2. This technology has interesting design possibilities and a future. We don't bother with how it works or why it will work. We don't really believe in crisis. This country has been burning oil and it is being hoisted by the oil and utility companies to design and build as I please. This is the first step of the process.

3. Where can I buy 1? Where can I sell it? It will depend on the availability of solar energy. This country has been burning oil and it is being hoisted by the oil and utility companies to design and build as I please. This is the first step of the process.

4. And a crisis? Why, I don't see one when combined with issues that we are trying to solve. This country has been burning oil and it is being hoisted by the oil and utility companies to design and build as I please. This is the first step of the process.

5. I don't see the potential for our attempts to create new architecture. This country has been burning oil and it is being hoisted by the oil and utility companies to design and build as I please. This is the first step of the process.

6. We in the architectural profession have been busy resurrecting the Masters and the craft of building and the ethos of architecture. This country has been burning oil and it is being hoisted by the oil and utility companies to design and build as I please. This is the first step of the process.

7. Armageddon is upon us. You must understand that the only way architecture will be integral with the technology. This country has been burning oil and it is being hoisted by the oil and utility companies to design and build as I please. This is the first step of the process.

8. Spacecraft earth has finite resources, in some cases a few more than in others. This country has been burning oil and it is being hoisted by the oil and utility companies to design and build as I please. This is the first step of the process.

9. The architect's role in the present is moving us among architects, but many others in the architectural community have worked closely over the past four years.

10. This appears to be an exceptionally pessimistic perception of our profession, and if this is the case, there are increasing numbers of new as well as old-term architects meeting the challenge and their expansion of their own resources in the present, and the future. This country has been burning oil and it is being hoisted by the oil and utility companies to design and build as I please. This is the first step of the process.

11. In other words, being clear in our professional or political goals. They typify the roles we play. This country has been burning oil and it is being hoisted by the oil and utility companies to design and build as I please. This is the first step of the process.

12. The potential of our profession to be integral with the technology. This country has been burning oil and it is being hoisted by the oil and utility companies to design and build as I please. This is the first step of the process.

13. And the present, the future, and the past four years of the project and then "delivered" it to our clients. This country has been burning oil and it is being hoisted by the oil and utility companies to design and build as I please. This is the first step of the process.

14. We need to think about the machines. This country has been burning oil and it is being hoisted by the oil and utility companies to design and build as I please. This is the first step of the process.

15. The machines are practical and cost-effective. This country has been burning oil and it is being hoisted by the oil and utility companies to design and build as I please. This is the first step of the process.

16. In our own experience, this notion that, for example, solar collectors are not really high enough to be worth putting in the solar system, and for the second time, and the third time, and the fourth time, and the fifth time, and the sixth time, and the seventh time, and the eighth time in the past decade. A phenomenon which is clearly a major factor, and a new building ethic arises.

17. The fact that we are working off the project. We are working on the project. This country has been burning oil and it is being hoisted by the oil and utility companies to design and build as I please. This is the first step of the process.

18. Our personal observations and first-hand experience are unique in their perspective. This country has been burning oil and it is being hoisted by the oil and utility companies to design and build as I please. This is the first step of the process.

19. Windy waves, for example, are not being heard on the project. This country has been burning oil and it is being hoisted by the oil and utility companies to design and build as I please. This is the first step of the process.

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21. In our own experience, this notion that, for example, solar collectors are not really high enough to be worth putting in the solar system, and for the second time, and the third time, and the fourth time, and the fifth time, and the sixth time, and the seventh time, and the eighth time in the past decade. A phenomenon which is clearly a major factor, and a new building ethic arises.

In order to determine the viability of a WECS for residential, business, or industrial use, or on the coast, the desert, the great rangeland, and the mountain terrain.

The machines are practical and cost-effective. This country has been burning oil and it is being hoisted by the oil and utility companies to design and build as I please. This is the first step of the process.

1. The Architect's Challenge for the Future of the California Architect - New working methodologies and design strategies will be required to make wind power available to the majority of its Wind Energy.

2. The Architect's Challenge for the Future of the California Architect - New working methodologies and design strategies will be required to make wind power available to the majority of its Wind Energy.

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PASSIVE SYSTEMS: Some local built examples

Preface

Passive energy design is a design response to the increasingly prohibitive cost of non-renewable sources of energy. It is a design that responds to the environment the way design did before complex heating and cooling systems evolved. Although current HVAC systems deliver exact heating and cooling needs, they also exact a toll on our finite sources of energy. Passive energy design is by no means limited to residential applications.

The benign climate of Southern California makes fewer demands on the climatic response of a structure than on those structures in regions of greater temperature extremes. The intent of Greene and Greene is remarkable in this regard, witness the long overhangs and sleeping porches — this is climatic response.

Responding to climatic conditions by automatically specifying large HVAC systems may not only increase the client's construction costs but will also increase his long-term costs. Passive energy design can reduce initial and long-term costs to the client.

The four designs illustrated here all rely on an active, non-solar system to some extent for those days when solar radiation is inadequate.

Michael 0. Sullivan, AIA
Terry Rainey

Barczewski House
Palisades Estates, CA
Gluth & Quigley Architecture, AIA, San Diego
Under construction

This four-bedroom speculation house incorporates ecological design in the context of traditional building techniques. The bulk of the space heating will be accomplished passively by using the house itself as a solar collector through an "Energy Sawtooth" concept. The "Sawtooth" architecturally integrates calculated overhangs, kinetic insulation, flexicon heat storage, and heat lag walls. The majority of the glass in the house faces southeast to take advantage of the warming morning sun. All windows will be double glazed and have insulated shutters to decrease night-time heat losses. The hot afternoon sun will be captured and saved for night illumination by massive heat lag walls. Further passive heating benefits will be gained from the aquatics. "Energy Nest" window seat in the master bedroom.

In addition to the space heating effects of the Sawtooth, an "off the shelf" active solar system will provide for domestic hot water needs. It will require only about fifty square feet of flat plate collectors which will be tucked into the roof forms like a skylight. Cooling will be accomplished naturally through architectural shapes and the stack effect. The house will use water conserving fixtures and fittings throughout. The fireplace (which is usually 90% inefficient) will become a viable heating source by introducing the concept of spatial volume manipulation through "kinetic sculpture" — the creative use of reflective (south/west walls) and absorptive (north/east walls) interior paint.

Black water-filled columns sit behind glass inside a well-insulated south wall. "The heat trapped by day is then contained by sliding an insulated "barn door" in front of the glass at night, and will be drawn into the house when needed via the fan/ducting of the gas back-up system.

For cooling, night air will be brought through a large rock bin, and a very attractive belvedere will help remove any excess heat from the living area below. When changing back to the heating mode the belvedere can be closed off by a moveable insulating partition, thus substantially reducing heating in the area.

Greenstein Residence
Woodland Hills, CA
Gluth & Quigley Architecture, AIA, San Diego
Under construction

This residence features a number of innovative design ideas in combining the concept of spatial volume manipulation through "kinetic sculpture" — with the creative use of reflective (south/west walls) and absorptive (north/east walls) interior paint.

Solar-heated air was combined with conventional system return air via forced-air unit blowers for distribution to rooms not contiguous below normal requirements. Because of this and other factors, the heat trap baffles will be tucked into the roof forms like a skylight. Cooling will be accomplished naturally through architectural shapes and the stack effect. The house will use water conserving fixtures and fittings throughout. The fireplace (which is usually 90% inefficient) will become a viable heating source by introducing the concept of spatial volume manipulation through "kinetic sculpture" — the creative use of reflective (south/west walls) and absorptive (north/east walls) interior paint.

The advantages include the elimination of costly heat storage systems to retain heat during cloudy weather. "Heat circulating" fireplaces and small unit heaters were planned as backup. In addition, the empty cavity between the glazing and surface of the wall allow for urethane beads to be blown into this space by a vacuum pump at night, thus insulating the wall as a potential heat radiator. This feature has not been included in the project at this time, but the house may be retrofitted at a later date using attic space for insulation storage.

The building form is compact for minimal surface area in relation to building volume. The value of glass was enhanced by horizontal partition, and corner locations to create a feeling of spaciousness. Title 25 requirements were closely followed. The use of north-facing windows was minimized, despite the prime mountain views. Trees have been planted to frame views and to lower winds velocities, thereby reducing heat loss.

Although calculations indicated no need for supplemental air conditioning, the County Building Department required installation of a conventional heating system. Reduced, however, 25% below normal requirements. Because of this and other factors, solar-heated air was combined with conventional system return air via forced-air unit blowers for distribution to rooms not contiguous with the collectors — an important modification of the still-experimental Trombe System.

The cost of the solar space and water heating, including the sixteen-inch concrete south wall, was $4,500. The total project cost was under $30 per square foot.

Relis Residence
Santa Barbara, CA
Lawrence E. Thompson, Architect, Santa Barbara
Completion Date: 1977

This home was conceived as a total-energy conservation system which can be built for modest cost. It utilizes an adaptation of the Trombe Wall System, developed in the early '50s by Frenchman Dr. Felic Trombe. The Trombe wall is a vertical masonry wall which, as a thermal mass, releases heat at night that it gained by direct solar radiation during the day. Interior glazing and a series of vents create a channel of air that can be directed across the wall and into a structure for heating. In warm regions, this channel of heated air (created between glazing and masonry) can siphon cool air through a structure from the cooler north elevation. The Relis house does.

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CONSERVING DESIGN

ACTIVE SYSTEMS: One architect’s experience

I believe that, as architects, should be taking the lead in producing buildings that reflect energy conservation measures. Twenty-five percent of all energy used in this country each year is for heating and cooling of buildings. It was, as architects, specified proper insulation techniques, oriented our buildings so as to benefit from passive solar energy and used partial solar power. Within a few years we could reduce energy use in our buildings 20-25%. Soon the entire country’s energy use in excess of 5% a year by intelligent design.

Some examples... Architects as designers of buildings have a tremendous affect on energy use and therefore have a social responsibility to the use of a practical measure of natural resources. Understanding the methods of using the sun’s power in providing energy for buildings is where I began a few years ago. These studies meant going back to basics in design. For me it also meant reaching far beyond to the practical as well as active solar systems. I meant trying to formulate a total approach to design of buildings that involved all aspects of energy conservation.

My first experience with a total energy conservation design began in 1974 with the design of a beach house in Malibu. (Fig. 1) The approach was theoretical; a solar energy consultant was hired and he prepared an energy design program. The first step was to integrate energy-design conservation features into the house. Going back to the basics, the house would have heavily insulated walls and roof to reduce heat loss or gain. The second step was the design of the residence. A large south-facing greenhouse window glass wall was used for passive heating. Low ventilating windows to capture the ocean breezes and high clerestory windows to exhaust the heat were incorporated. These passive solar techniques dictated the design of the house. The final step involved the design of the active solar system for space heating and domestic hot water heating. Flat plate solar collectors were integrated into the south-facing facade of the house.

Results of the analysis indicated that energy conservation features such as exterior insulation and double-glazing provided a faster payback on the original investment than the solar heating system itself. The analysis also indicated that the large south-facing glass wall created a potential overheating. However, ventilation by sea breezes mitigated this factor. A model of the house was tested on a heliodon in order to get an indication of the temperature of the elevations exposed to the sun. Overhangs and trellises were adjusted to provide the desired solar control.

The analysis further suggested that energy conserving features would reduce the heating costs by 40-45% and that the solar heating system would provide 75-80% of the remaining space and water heating. The analysis was in the long-term performance-type specifications on panel types. The active solar system was to be on a back-up system. Details of the mechanical system were to be worked out by the air conditioning subcontractor. All major appliances were rated for total energy use, and the most efficient were specified — such as a gas range with spark ignitors. Due to the 1974 recession, the client postponement of start of construction but is reactivating the project at this time.

The next solar project involved a retrofit; the client sought to incorporate a solar system in a major rebuilding of an existing beach house. The emphasis was on building a working, reliable active solar energy system. Since it was economically unfeasible to convert the existing space heating system of the house, the system was designed to provide only domestic hot water for the entire residence and an oversized ac unit.

A review of the various solar panels on the market and on the market and because of roof space constraints, a compact sun tracking collector was used, a gas fired boiler was provided back-up to the solar system. The system has been in operation for over one year and has worked out very well.

This retrofit project, as well as another similar installation done concurrently, reduce the electric costs of the house. The sun tracking collector requires periodic maintenance of its moving parts. Although the collection is not the direct heating, the maintenance aspect poses a practical disadvantage for the average installation. (Fig. 2)

The advantages of solar systems are: the use of a common basis components of an active solar system: solar collectors, a water storage tank and gas back-up system. (Fig. 3) Clearly an active solar project — now under construction — is a residence which replaces the water storage tank with a solar panel system. As the water in the reservoirs are heated by hot air circulated through the collectors and then heat is stored in the rocks within the basement.

Our most interesting current project is a thirty houses under construction in Rancho Mirage, Calif. The Southern California Edison Company has worked with the developers of this all-electric project and is providing the solar heating and cooling. This project is unique in that both space heating and cooling along with the domestic heating and cooling of water are part of the total system. The components of the system are:

1. Flat plate roof-mounted collectors made of aluminum with copper water lines and glass lens.
2. A water storage tank buried in the ground for heat storage.
3. An electric powered heat pump.
4. Heating and cooling distribution through conventional duct systems.

The electric heat pump as a component of the solar system has the advantage of producing heat as well as being able to cool by reversing the cycle. The heat pump uses 25% of the amount of electricity consumed by other electric power heating devices. The pump also air conditions without any contribution from the solar system. In the heating cycle the solar system assists the heat pump. This total system is very efficient in the extreme hot and cold desert environment.

The following are conclusions I have reached from the solar projects I have been involved with:

1. Good passive design, such as south facing double-glazed glass for winter-heating, good ventilation design to cool interiors, and good insulation provide the basic house with reduced energy requirements to begin with, and combined with energy conservation systems.

SOLAR ENERGY RESOURCE LIST

National Solar Heating and Cooling Information Center, toll-free number (800) 523-2929, P.O. Box 1807, Rockville, MD 20850.

California Solar Information Packet, available free from Publications Unit, California Energy Commission, 111 H Street, Sacramento, CA 95814. Inquire about recent publications.


Southern California Solar Energy Association, 2521 C Street, Suite 11B, San Diego, California 92101, (714) 252-3914. A non-profit educational organization to further awareness and application of solar related sciences and technologies through publications, meetings, workshops, and research library.

Conclusions: The use of solar energy systems is the first step to energy conservation. 2. Solar space heating and solar heating of domestic hot water use lighting systems are the first steps to energy conservation. 3. Space heating and solar heating of domestic hot water use lighting systems are the first steps to energy conservation.

Solar collectors are the major portion of an active solar system. Solar collectors, a water storage tank and gas back-up system. The sun tracking collector requires periodic maintenance of its moving parts. Although the collection is not the direct heating, the maintenance aspect poses a practical disadvantage for the average installation.

The future of our energy needs in buildings lies in practical development of the solar cell. Solar cells, made of silicon, have no moving parts and require no maintenance. They generate electric power which can be stored within batteries. Solar cells will eventually make buildings totally self sufficient in energy use. Requiring no outside source of power, the solar cell will heat and cool buildings and provide power for lighting systems...widespread implementation of such systems could reduce our nation’s energy use by 25%. Architects should lobby for federal support of solar development projects. It is in areas such as this that we, as architects, can assume leadership in energy conservation.

Michael E. Barocchi, AIA
the effects of climate.

The year 1984 is not far away. Energy

The Scheimer House carries these ideas to new heights — namely the creation of a "diatomic" interior environment more reminiscent of living with nature itself. In contrast to the classical "static" perfection of optimum temperature, lighting, and other conditions within building interiors. My theory is that Man — having been exposed to a natural habitat for one million years — has never properly adapted to a static interior environment, and may be responsible for many of his diseases. We therefore advocate any means available to create the "changes," and the interior, which can stimulate and refresh Man during the times he is under roof. Water, daylighting, and plants are materials we have used in ever-increasing intensity during the years. The Scheimer Residence represents the culmination of this tendency, with water on six different levels including an array of roofs, sky-lighting, interior gardens, a waterfall and flowing streams through the interior of the house — the greatest and most intimate contact between interior and exterior.

L.A. ARCHITECT December 1977
PHASE II: PROJECT START
Solar Energy Research & Educational Foundation and TRW who are responsible respectively for the National and California standards and tax accreditation will discuss the issues in a forum environment. The forum is funded by the Dept. of Energy and coordinated by Southern California Solar Association.

**SOLAR TRIAD SEMINAR & CLINIC**  
Lawrence Livermore Laboratories is funding a two day seminar directed toward the building professions on the state of the art in applied solar energy. There will also be an Installer's Clinic; 16 hour course in Solar Energy Installation.

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SOLAR CON EXHIBITION  
L.A. ARCHITECT December 1977
The 12th meeting of the SCC/AIA Board of Directors on October 4, 1977, officers, directors and guests gathered at the Chapter office to hear reports by the following officers: President, Immediate Past President, the membership of the Committee on County Agencies, reported that the County wants to make as much architectural work as possible in-house. As part of its community service program, the CCAIA Convention in Monterey last December 14th. For further details and additional information, contact Ralph Byars, Office Administrator for Alle Design, Inc.

CAROL D. CUSHING was elected president of the Southern California Chapter, Architectural Societies Association, Inc. at their annual business meeting on November 15 held at the offices of Maxwell Starkman, AIA & Associates. Mrs. Cushing is President of the Cultural Heritage Foundation, national nonprofit corporation dedicated to historic preservation.

Charles S. Huer, Vice President/Programs, for details and reservations at 621 South Westmoreland Avenue, Los Angeles, CA 90020. (213) 386-7070, during office hours.


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