THE CASE FOR SOLAR RIGHTS

Solar energy can be inexpensive and without deleterious environmental effects associated with energy sources now in use. Although many people think use of the sun's energy is not feasible until higher efficiency solar cells are developed, they neglect the existing, potentially greater use of direct sun for space heating and hot water heating.

Our research in Davis with apartment houses[1] demonstrates clearly that a properly oriented conventional unit would not require supplemental heating on sunny winter days. With a properly designed house, such as the Sherwood house we designed in Winters[2], supplemental heating would be required less than one week a year. Inadvertent use of solar energy to help heat buildings is left out of current energy use calculations.

It is difficult to calculate the total use but it is certainly measured in gigawatts per day in winter. For our purpose in validating the concept of solar rights, a look at potential value in a well designed house will suffice. Assuming no change in building practice except proper orientation with south facing glass, a house would require only about 50 percent as much energy for space heating. This is equivalent to a yearly saving of about $200 at current electrical costs—which does not include the external costs of attributable to environmental effects of power generation from coal mining, air pollution, etc. This economic benefit is enough to justify establishing solar rights.

For a house with passive or active solar systems costing $2000 and up, more than 90 percent of space heating needs can be met. A homeowner who has installed such a system will recover his investment over a 5 to 10 year period and will be extremely sensitive to enchroachment on his "sun." Litigation will almost certainly result if a solar house is shaded by buildings or vegetation to the South. Before this occurs legislation to clarify the right to sun should be enacted.

An explanation of sun exposure is thus in order. The sun's position varies both seasonally and from day to day. The elevation of the sun is known as the altitude and the direction of the sun is the azimuth. The critical day is commonly December 21, and on that day in Davis (Lat 38°) the maximum elevation of 30° occurs at noon and the sun moves through an arc of 120° from the Southeast to Southwest. Evergreen trees and buildings to the south may block this low angle sun.

"Solar rights" as discussed here today have no exact legal precedent. They fall somewhere between the established concept of "lights," riparian rights, and mineral rights. It is very important for us to establish legal standing for "solar rights." The most logical basis apears to be from the concept of "lights" and in most states this could probably be done relatively easily.

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California is unique in that the concept of "lights" was invalidated in a California appellate case in 1913. The language of the decision is instructive:

> Amoung the reasons assigned for this view are that this rule (right to light) is not considered to be adapted to the existing condition of things in the United States and could not be applied to rapidly growing communities without working mischievous consequences to property owners, and also that in the nature of things there can be no adverse user of light or air....

Rapid growth is no longer prevalent and as we have already demonstrated with home heating the actions of one property owner may indeed be adverse to another. Our best course is that prescribed by Civil Code 3510, "When the reason for a law ceases, so too should the law."

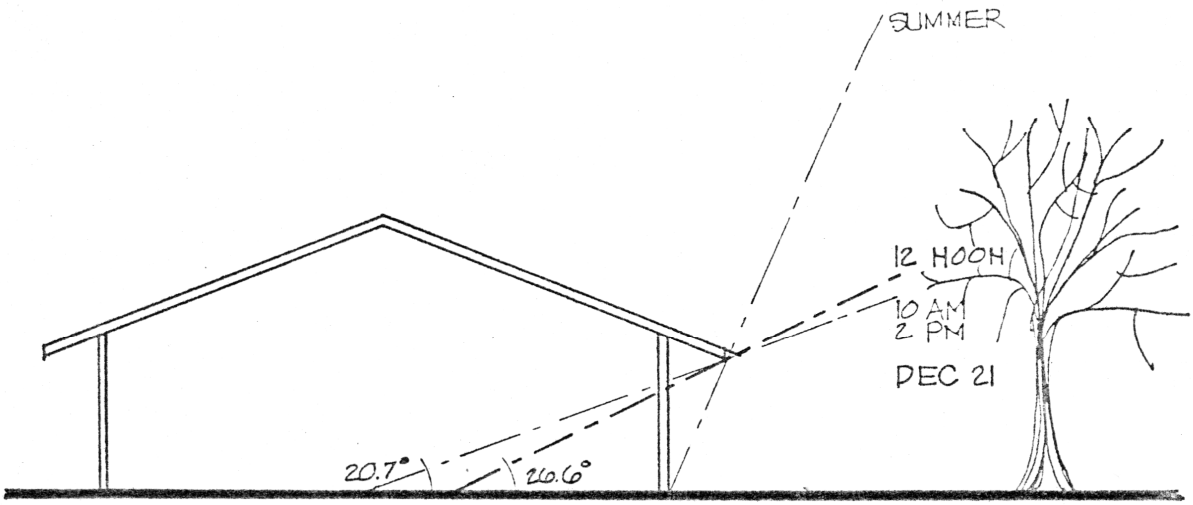
Our next concern then is how to establish the concept of solar rights. In Davis, where our Energy Conservation Ordinance was enacted in October of this year, most development occurs in planned unit development and solar rights could most easily be established through covenants. It would be much simpler if we could use easements that pass from owner to owner with the deed to the property. This would require enabling legislation.

In existing developments the problem is more difficult because buildings and evergreens may already block the sun. The most reasonable approach here may be simply to carefully review future changes in landscaping and stuctures in order to determine the best ways to use the sun. Davis has already included sun exposures as an element in its Environmental Impact Reviews (attachment) and this might be properly extended to other areas.

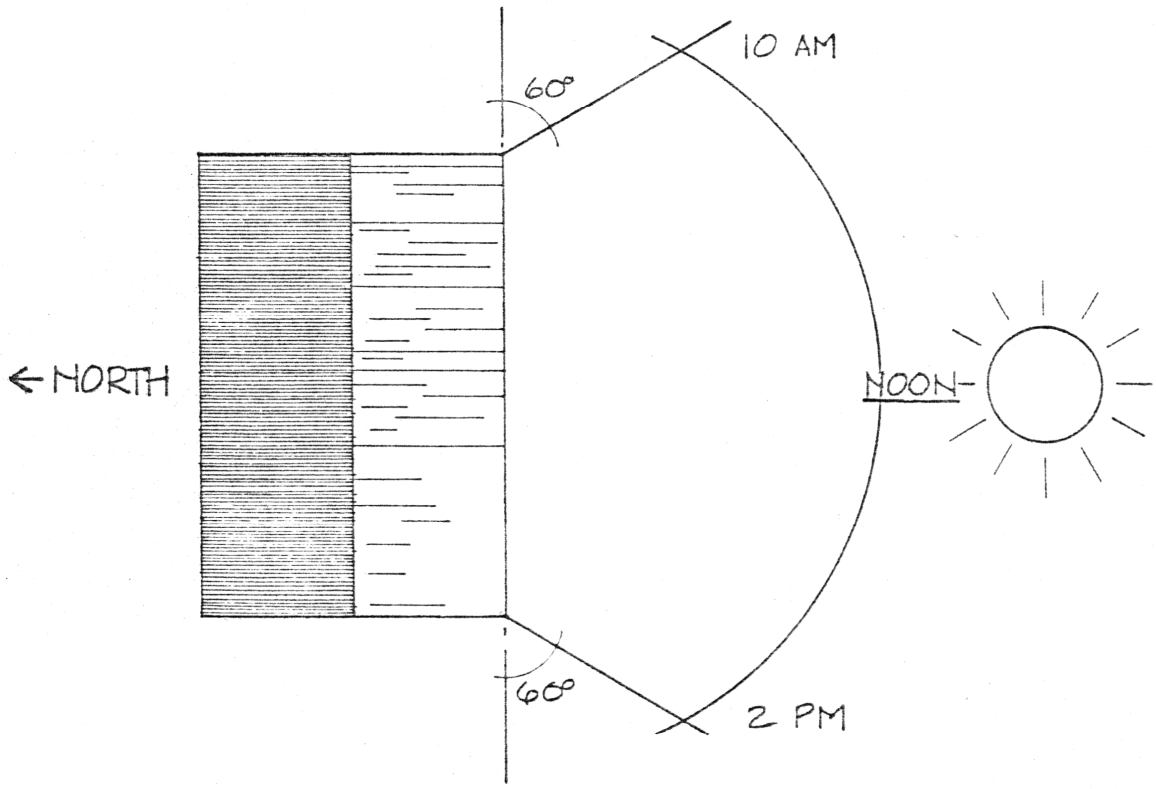
Another concept which may be worth exploring is the concept of envelope zoning. This would change the concept of zoning from two dimensions to three dimensions and would describe a volume of space that would protect solar exposure. An example for Davis is shown below.

In closing, use of the sun is widespread and increasingly valuable, not only for people with solar houses but also for existing buildings with good orientation. As energy prices continue to rise "solar rights" will be increasingly important and considerable litigation may ensue. We can forestall some of the problems by enacting legislation now. These hearings are a welcome and much needed beginning.

SOLAR RIGHTS- THE WINTER SUN



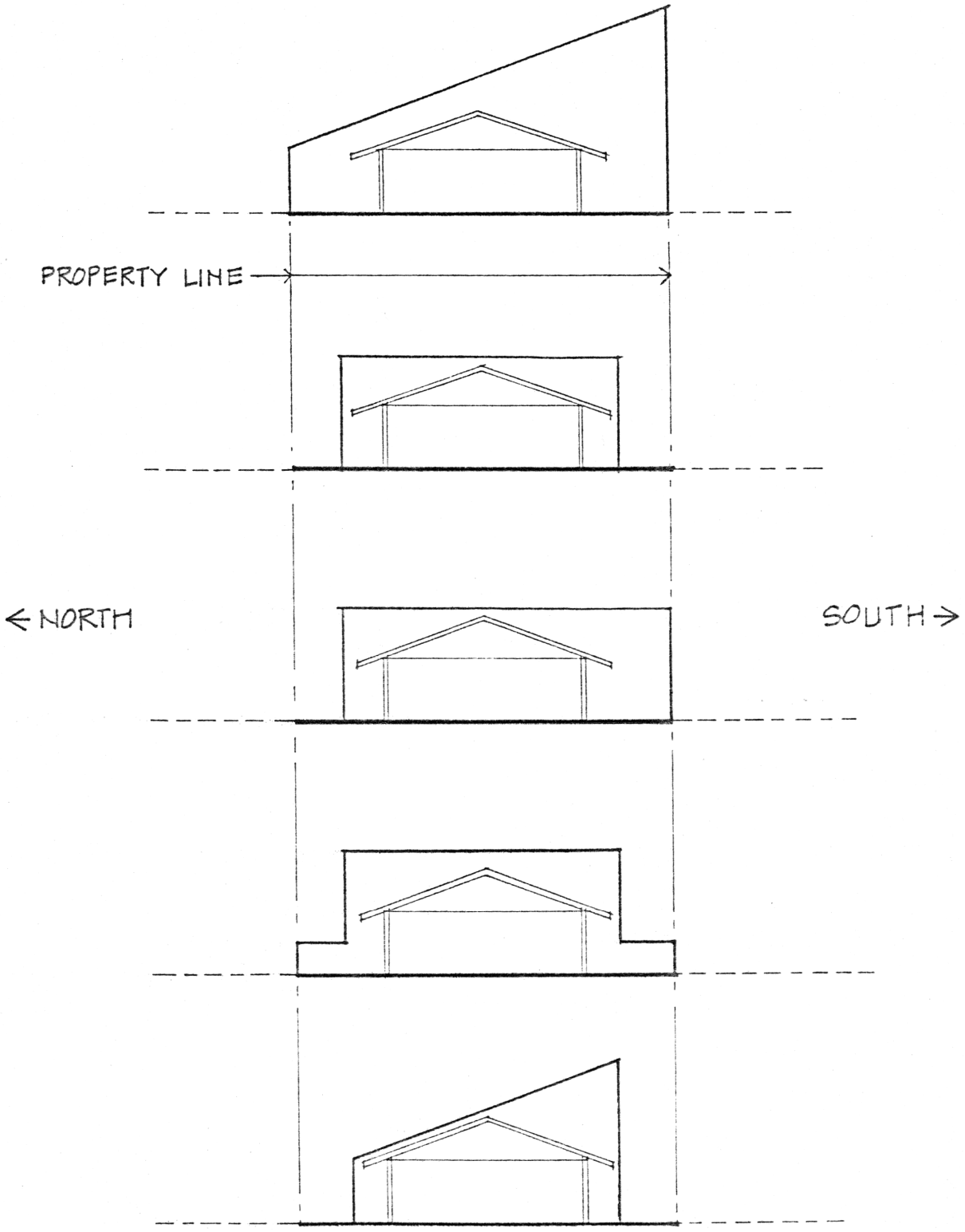
SUN ALTITUDE



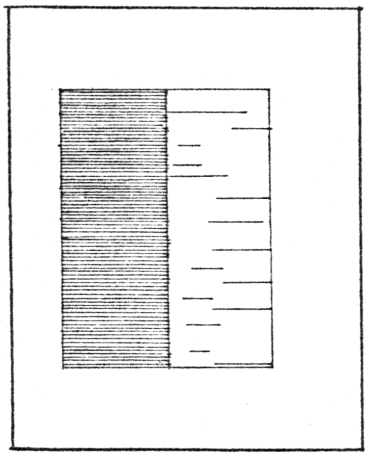
SUN AZIMUTH

Davis 40°N

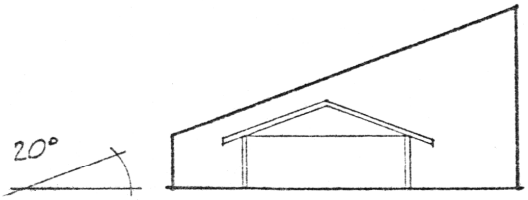
POSSIBLE SHAPES FOR ENVELOPE ZONING



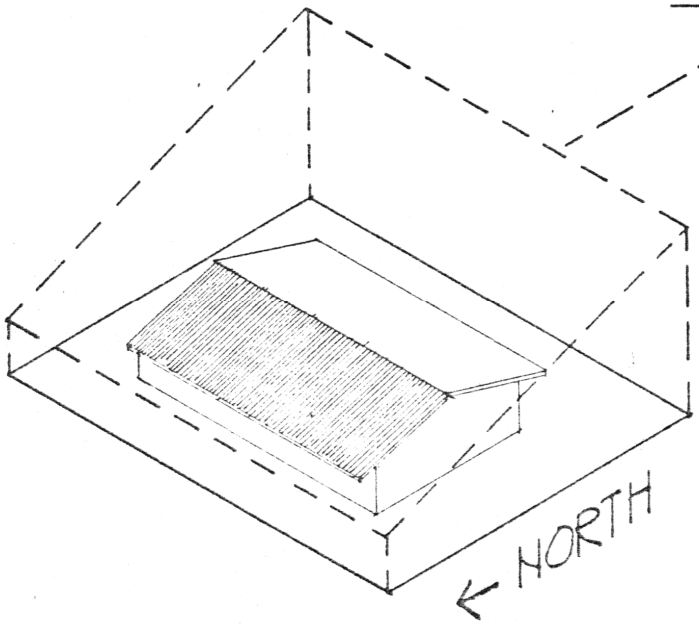
ENVELOPE ZONING: AN ILLUSTRATION



PLAN



ELEVATION



ISOMETRIC

References

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2 Bainbridge, D.A. (1975) "The Hammond Solar Heated House", Mother Earth News, N. 36, November.

3 Yuba Consolidated Goldfields Vs. Hilton (1911) 16 CA 228

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THE VALUE OF THE SUN

Flat plate collecter for hot water heating

assumed efficiency 50%

Each square foot delivers 1000 BTU/day summer
560 BTU/day winter
1560/2 yearly average=780BTU

780BTU/day x 365days/year=284,700 BTU/yr/square foot

Compared with electric hot water heater

284,700BTU/3413=83.42Kilowatts
83kw x $.025kw=$2.09

Compared with natural gas hot water heater

assumed efficiency 70%

284,700BTU/.70 = 406,714BTU
406,714BTU/100,000= 4.067therms
4.067 x $0.13 = $0.53