

# RAIN

\$1.50

Journal of Appropriate Technology

Volume VI No.1

October 1979



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**REDEFINING LOCALITY, p. 6**

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**Resources**

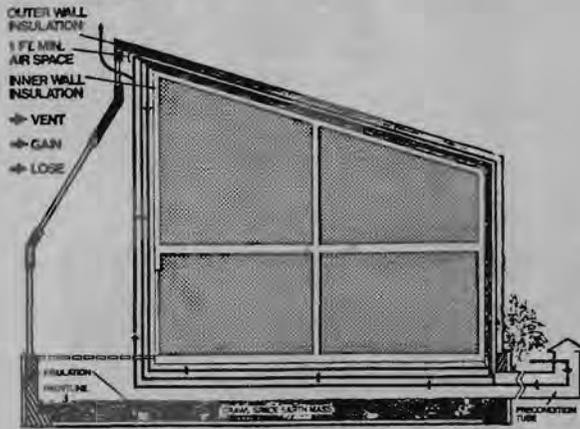
It probably takes someone pretty familiar with natural climate design to separate the wheat from the chaff in Ekose'a publications. If you want general information on the designs, go to the CQ and BH&G articles. If you want to build one of their designs, find out their total charges for all parts of the services they provide. If you want to use the ideas—beg, borrow or xerox a copy of their publications or wait until someone distills it all into an affordable and sensible form.

"Don't Build a House till You've Looked at This," Michael Phillips, *Co-Evolution Quarterly*, Summer 1978, p. 100-102.

"A Step Ahead in Solar Living," Cheryl Scott, *Better Homes and Gardens*, March 1979, p. 50-55.

"The Ekose'a House," Lee Porter Butler, *Co-Evolution Quarterly*, Winter 1978-79, p. 33-34.

*Ekose'a Homes*, 88 pp., \$24.95, and *The Energy Producing House*, \$18.95. Both from Ekose'a, 573 Mission St., San Francisco, CA 94105. □□□



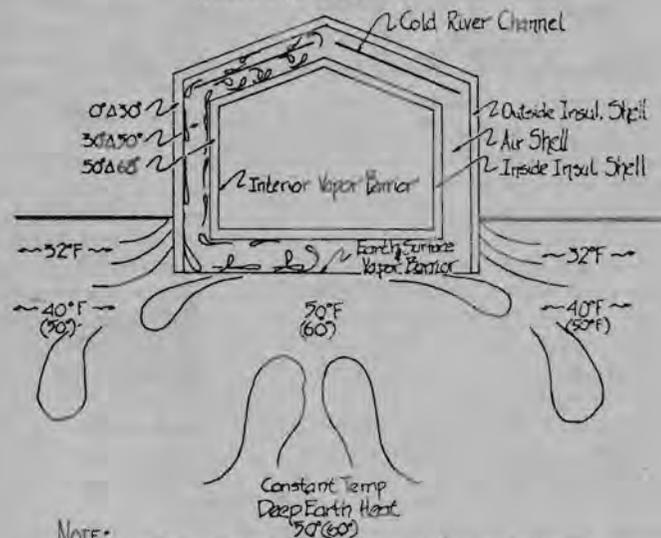
**Double-Shelled Houses**  
Phil Henshaw

In my developing of an understanding of the micro-structure of passive thermal events built upon thousands of direct observations, I have yet to observe a warm air current dig down through a cool air layer to rest in contact with a cooler surface below. This means, conclusively to me, that no energy is ever transferred directly from air to ground, only the other direction. Yet the darned things work, in the situations so far considered, *as if* heat were transferred from air to ground. Because essential parts of the behavior description are strongly contradictory, and because there is a feeling of "looseness" to it all where not every event is quite linked to each other, it seems to me that the actual energy pathways have probably never been mapped.

So who cares if you're using the wrong formula and somehow get the right answer? Anyone who wants real design and related freedom!

My Double Shell Building sketch is of behaviors I would postulate to be found essential to the actual behavior of double shell houses. Notice the sleeve of earth temperature air which is pictured sliding up adjacent to the inner shell. That earth temperature air is what I suggest constitutes the important contact environment of the inner shell. The outer sleeve of colder than earth heat is shown slipping down to rest on and be warmed by the earth. Deep earth heat is shown welling up under the building by internal earth fluid circulation which necessarily exists (at some scale) because soil is permeable and the earth at a depth under the house is warmer than earth at the same depth around the house.

**DOUBLE SHELL BUILDING - WINTER**  
(Conceptual)



**NOTE:**  
- No careful observation of these particular behaviors has yet been made.  
- The quantity of earth heat available is unknown, though probably large & varies with soil permeability etc.  
- The trick is (and only 30°(60°) air touches the outside of the inner shell.

Notice that no glazing of any sort is shown taking part in these cycles. A house in central New York (the Howells' house, a super-insulated ceiling wall and foundation house over a slab on grade with a vapor barrier and limited windows) during a week of 0 degree and clouds held a temperature never below deep earth temperatures of 47 degrees, with no internal gains. Though it would cool directly to 47 degrees, it would refuse to go below. It thus appeared to have the behavior of the Ekose'a air shell I'm suggesting. One interesting twist is that the Howells' slab on grade house design seems more appropriate for southern climates with warmer deep earth temperatures and the double shell more appropriate for northern climates with colder earth temperatures. This is just the opposite of where the two concepts were developed.

Also of interest in this frame of things is that over-the-top air passage in the double shell house isn't necessary and that the air conduction to and from the earth for conditioning the roof could be boxed separately from the wall air space. Experiments with these and other arrangements will be part of the substantive study needed to develop real design confidence with this approach. Solar gain might serve significantly in interrupting the use of earth heat by a sequence of steps resulting in cool air currents warmer than the earth and in being absorbed to linger in the large wood, or other, mass of the structure. If the bottom of the bottom floor were (a sample) ten degrees warmer than the earth all 24 hours of the day, then energy equal to a full hour of bright sun a day would be transferred to the earth by heat radiation. For heat from around the circle air currents in the day to contribute the same it would have to be 30 degrees warmer (50 + 30 = 80) and the underside not foil surfaced. Inviting large amounts of condensation anywhere in a construction is generally a hazard to be avoided or very specially allowed for. Also, design for air currents can simultaneously be design for the worst possible fire trap. Fire dampers can be simply installed if someone puts them in.

So, where to from here? Somebody ought to study the darn things. Other than carefully observing air currents, anyone with access to a double shell, or otherwise earth couple house could check the fluctuations in the deep earth temperature and how severe a climate condition causes it to fall below. Pay special attention to how long it holds what temperature. We'll all be listening to hear what you find. □□□