

local Refrigerator?

through other people, machinery or prices, then eventually we become bitter about our own species. If it appears as an unavoidable part of reality, a result of the weather, we do not have others to blame.

Such enterprises as an ice ranch, specifically if the activities were visible to passers-by, are interesting. Cold weather is then useful to someone in a productive way.

SOLAR HEATING

I would count Harold Hay's experiment with a styrofoam ice chest as among the most most exciting and illuminating ever done. In Phoenix, Hay filled one of the insulated chests one sees in super markets with water. During the summer he put the lid on during the day and took it off during the night - the water stayed cool for it was protected from the sun during the day, and at night radiated heat to the night sky. During the cool months of the winter, Hay reversed it - he opened the lid during the day and closed it during the night. The water stayed warm. Hay later built a small house in Phoenix with a pond of water on the roof, and an insulating cover which could be moved on or off the pond by means of a rope. The house stayed comfortable all year. This is so simple a child can understand everything about it. Hay reported on his work at the 1968 Solar Energy Convention. I was surprised it caused so little excitement. Hay was asked how people would know when to cover and uncover the pond on the roof during different times of the year. His answer was that people learn when to put on and take off their coats.

This method of heating and cooling is not suitable for all climates, but Hay's approach can inspire simple solutions to heating and cooling in most climates.

At Zomeworks we have developed a very simple engine that opens and closes insulated shutters in response to the warmth of the sun. This allows one to flood rooms with winter sunshine during the day while protecting them from heat losses through uncovered windows or skylights at night. If the rooms in which such skylights shine contain materials of great heat capacity such as adobe walls, the heat gained during the day lasts into the night. The judgement of the engine, guardian and collector of warmth, is interesting to watch as it opens and closes the lid at different times in response to different weather.

Peter van Dresser, a pioneer in solar heating, has stressed that "sun tempered" rather than solar heated is a more sensible goal in the design of a house. Solar heating versus gas, oil, coal or electricity leads people to expect the same kind of performance from the sun as from a tank of oil or bin of coal. The sun is an unsatisfactory commodity seen along side tanks of butane or oil, or bins of coal. We know that clouds interrupt the sun. During bad weather the sun tempered house grows cool unless other sources of heat such as wood stoves are used. How warm do we need to keep our houses? Sometimes we see ourselves as a brood of prize pigs that we want to feed faster and faster and keep more and more comfortable.

The storage of solar heat is a difficult problem. A 55 gallon drum filled with water can comfortably store about three kilowatt hours of heat or 10,000 BTUs. There are materials which promise to provide much greater thermal storage for an equal volume by using the heat of fusion which is given off as a liquid freezes.

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* EXPLANATION

*INTERLUDE: We're human - so is Steve. We changed the week we publish, and that interfered with Steve's writing schedule. Last week we ran Chapter Two actually, and next issue we will publish Chapter Three. What else could we call this issue's contribution?

- L.K.

- Experiment for Upland school