



"Your heat goes right out the windows," says Mizzou's energy-efficient housing expert, Dr. Gordon Moore, posing in front of the shoji screen he made for his office window.

## How Not to Heat the Whole Outdoors

"**THE AVERAGE AMERICAN** home is an energy disaster — every bit of it," says Dr. Gordon Moore, professor of mechanical and aerospace engineering.

"People select their houses on appearance and status," he says. "This is a false, cosmetic approach." He admits that few houses currently being built are designed to conserve energy; so much of his work is with architects and builders, encouraging them to design and build "good houses."

About four years ago, Moore got interested in solar heating, natural cooling and designing and remodeling buildings for low energy use. He is the founder of the Missouri Solar Energy Associates, which has chapters in St. Louis, Kansas City, Springfield and Columbia, and edits the MSEA newsletter, appropriately titled "The Ray of Sunshine." He's given short courses in St. Louis and Columbia for homeowners and builders on low energy use buildings. The demand for this knowledge is so great that this fall he's doing follow up courses in St. Louis and Columbia, a course in Kansas City and a conference in Kansas City in late October on "Solar Energy in the Midwest."

Among the things Moore would like to see change is the orientation of houses. "Ninety-nine percent of the houses we have and the houses we are building have the broad face toward the road. This is ridicu-

lous. Anyone can see that as soon as he realizes that roads go all directions. Ideally, a new house should face south and most of the windows should be on the south side to minimize the heating and cooling load. In conventional houses, windows are about equally distributed on all sides. The garage or other unheated spaces should be on the north to provide a buffer from winter wind. A house with most of its windows on the west is bound to overheat in the summer and not get the best sun in the winter."

**HOUSES SHOULD BE COMPACT.** "Houses are sprawled out for reasons of status. They look bigger. Ideally, a house should be square or only slightly rectangular," More said.

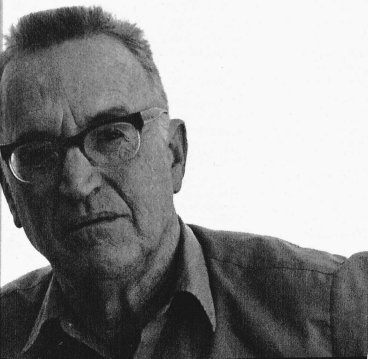
"Cheaper houses don't have much overhang. Eaves can channel the winter sun into the windows to help heat the house and can protect the house from summer sun. Cowboys wear Stetsons, not derbys. Houses should have eaves."

Moore admits that most people are stuck with their present homes. "It's just like owning a big car. You bought it, and now that gas has gone up, you're still stuck with it," he says. "You can't make a big car guzzle less gas, but you can do a lot to reduce your fuel bill this winter."

"Windows — that's where your heat goes — right out the windows," he says intensely. "You lose as much as 50 percent of the heat you are paying for out the windows."

"Storm windows are a big thermal joke," he says, without a glimmer of a smile. "Even with storm windows, you are still losing 40 percent of your heat. Oh, don't throw them out, but I wouldn't buy them," he says.

"Transparent curtains, heatwise, are worthless, I think curtains are on their way out. Most people think that drapes keep out the cold; however, they can increase the air flow down the cold glass in the winter. It helps a *little* bit to have "insulated drapes" — the plastic backed ones. Even better, though, would be to seal the drapes to the wall when they are pull-



ed shut by means of Velcro tape (a fabric zipper-like closing), or some other way.

**“EVEN A BETTER IDEA** is to make shoji screens.” He makes his own using thin strips of wood stapled together at the corners and painted black. He then glues on freezer paper. The white diffused light is aesthetically pleasing. These screens must fit over the window frame on the inside for maximum effect (more than another storm window).

“But the best idea is ‘insulated shutters,’ ” Moore says. In an experimental installation last winter, one homeowner covered all his windows with inside rigid styrofoam “shutters.” He used only 360 gallons of oil as opposed to 800 the year before when he did not have shutters. The cost for covering 138 square feet of windows was about \$20. (Rigid styrofoam in 4x8 sheets is available from many lumber companies for about 13¢ a square foot. It’s white, lightweight and easily handled, even by people with *no* carpentry skills.)

**INEXPENSIVE OR HOMEMADE** latches can hold the styrofoam in the window frame. It should be cut (with a sharp knife) to fit snugly. “A traditionalist can still draw the drapes over the styrofoam shutters if that’s more pleasing,” he says. For safety, the styrofoam should be covered with a flame retardant material,” he says. “You could cover it with paneling and hinge it to the sides of the windows so you can fold it back. This idea would be more expensive, but a good permanent solution. Or you could put the paneling-covered styrofoam on tracks so it can be pushed back off the window or door like a sliding glass door, for example. You’re only limited by your imagination.”

You could cover the foam with fabric, hinge the panels of foam together and set them down from the windows, when you want to see out, so they stand

like screens at either side of the windows. Or you could set the fabric-covered foam panels on a ledge that you could build out of molding and they would look like pictures. They could be put in a closet or under a bed, when not in use.

“Some people think they wouldn’t like to shut the world out. . . . that they want to look out their windows. Ask yourself just how often you look out the windows. Even if you just put the foam in when you went to bed, you’d save quite a bit. If you put it in, in the winter, when the sun goes down (that’s about five o’clock) you’d save a lot more. If you work all day and no one is home anyway, you can see that it wouldn’t matter. One man cut some windows in the foam so he could see a pretty tree. Cover any windows or peep holes with plastic film.

**“WELL, WINDOWS** are the worst problem, but let’s talk about doors. You can seal the cracks around your doors with weather-stripping—anybody can put that stuff on. The best thing you can do is buy insulated doors with magnetic weather stripping. And seal off any unused doors for the winter,” he advises.

“Don’t worry about your walls. Why worry about walls when half your heat is going out the windows? You lose only about 25 percent of your heat through walls and floors.” You lose about 10 percent of your heat through the floor if you have no basement. If that’s the case, get under the house and put in 3½ inches of rock wool insulation. Carpet helps about as much as drapes do — not much.

“Check your ceiling, your attic, to see if you have 12 inches of rock wool insulation. If not, put it in.

“You *can* quit heating the whole outdoors, this winter. But in the long run, you, the public, have got to demand better design and better building. It’s got to be a grass roots thing,” Moore says. “We’ve got to quit buying crap and insist on houses planned to use less energy.” — *Anne Baber*