# Indoor pollution: hidden dangers

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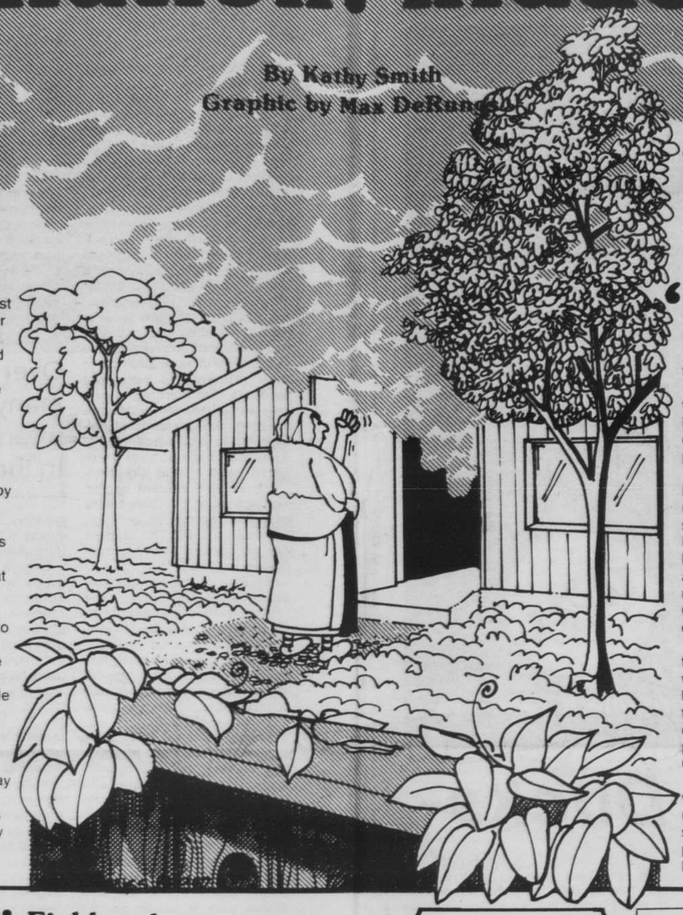

## Weatherization poses threat

### Lack of ventilation could create home hazard

Wind slipping through the frames of uncaulked windows, heat leaking out the bottom of the front door, or a cool breeze in the bedroom may be healthier than a completely weatherized home, according to recent reports.

The trend toward energy-efficient, weatherized homes may be leading to a new environmental problem called "indoor pollution," reports the December, 1981 issue of "Consumer's Research" magazine. As homes are sealed by various weatherization methods, air pollutants may be trapped inside, causing health problems — severe in some cases.

Too much insulation can cause an environment that may be more polluted than outside air, the magazine says.

"Indoor air, it is now known, may have worse effects on one's health than does the open air of a populous city or a locality close to a mine, mill, or factory," according to the December issue. Problems with indoor pollution may be compounded by the fact that Americans spend 70 to 90 percent of their time at home, the article says.

Indoor pollution is considered "an immediate and great concern" by the National Academy of Sciences because "in some cases it exceeds outdoor air pollution limits set by the Clean Air Act."

However, test results are not always conclusive, say some sources. While some researchers are finding high levels of indoor pollution, others are not.

"We have some of the same concerns," says Matt Northway, conservation engineer for the Eugene Water and Electric Board.

In the spring of 1981, EWEB participated in a study sponsored by the Bonneville Power Administration and conducted by the Lawrence Berkeley Laboratory of the University of California at Berkeley. The study measured the air tightness and air infiltration rate of 12 Eugene homes and, in four of the 12 homes, conducted studies of indoor air quality. Two of the homes were EWEB energy-efficient homes, built to EWEB weatherization standards, and the other two homes were passive solar houses.

Measuring for levels of nitrogen dioxide, formaldehyde and radon gas, the researchers found that levels of nitrogen dioxide were low and radon gas was low enough to be unmeasurable. Levels of formaldehyde were somewhat higher, ranging from half of the most stringent standards of 100 parts per billion in the EWEB homes to equal to the 100 parts per billion standard in the solar homes.

The higher level of formaldehyde measured in those solar homes probably was due to new furniture that can emit formaldehyde, Northway says.

Health problems induced by indoor pollution are compounded by the fact that doctors often don't detect environmental causes of symptoms when examining patients in the office. The elderly, children, and others who spend much time at home are most susceptible to problems.

The air exchange rate is critical to clean indoor environments. In an average home, air is replaced once an hour or more. A new, tightly sealed home may replace air as little as once every 10 hours. Some new homes combine triple-paned windows, vapor barriers built into ceilings, walls and floors, and magnetically-sealed doors. This may create a "thermos-bottle effect."

A conventional home stands less of a chance of this effect, Northway says. "It is impossible to make an existing home totally air-tight."

## Wood stoves pollute heavily

### Home heaters add to smog pall over Oregon

"I can still fondly remember my grandmother's old wood stove and the smell of wood smoke. How can that possibly be harmful to my health?"

This is a common question, says the Oregon Department of Environmental Quality. Even more common, they say, is the air pollution caused by wood stoves.

Wood stove smoke is the second largest source of air pollution in many parts of Oregon. It ranks second to soil and road dust in Portland and Eugene. And in the Medford-Ashland area, wood smoke and soil and road dust tie as the number one air polluter, says Janet Gillaspie, public involvement coordinator for DEQ.

None of the three areas meet federal standards for clean air. The worst of the three, the Medford-Ashland area, is "one of the two areas in the United States characterized as having the worst potential for serious air pollution," Gillaspie says.

There are an estimated 250,000 wood stoves and 332,000 fireplaces used in Oregon for primary or secondary heating or aesthetic purposes, says Barbara Tombleson, DEQ environmental protection specialist. This represents 54 to 60 percent of Oregon households, she says. The combination of heavy use of wood stoves, ill-use of the stoves, and valley locations which can trap air in an area, leads to deteriorating air quality and subsequent health problems.

Use of wood stoves increases the number of particulates in the air. As wood burns, it produces potentially carcinogenic compounds and toxic gases such as carbon monoxide. At least six chemicals in wood smoke have been found — in Environmental Protection Agency tests — to cause cancer in laboratory animals. Wood smoke particles are particularly dangerous because they are small and can settle in the lungs.

While no Oregon cities have legal restrictions on the use of wood stoves, other cities in the United States are taking steps to curb wood smoke pollution, says Gillaspie. In 1978, Vail, Colo., passed legislation which restricted each home to one wood stove or fireplace.

Missoula, Mont. is another city with air quality problems caused by wood stove pollution. Missoula is geographically similar to Medford, and Missoula's leaders are watching Oregon for guidance on wood stove pollution issues, says Gillaspie.

Missoula's approach in the past has been extensive public education, says Scott Church, air pollution control specialist for the city and county of Missoula. Roughly 60 percent, or 3,000 homes, burn wood for heat or aesthetic purposes.

Missoula now implements air stagnation plans when pollution levels are high, requiring homes with heating alternatives to wood stoves to use them instead. Violators are warned and, after three hours, given citations if emissions are still visible from the chimney.

In Eugene, the Lane Regional Air Pollution Authority is focusing on informational programs, says Marty Douglass, LRAPA public information officer. "We are also in the process of trying to gather more data on particulate and carbon monoxide emissions from wood stoves."

The focus of DEQ is also on education. The state agency spends approximately $10,000 per year to educate stove owners about the proper use and maintenance. State and regional agencies are prohibited by Oregon statutes from regulating home heating devices.