

# Hole in ground home down under

## Earth-sheltered structure reduces heat bills drastically

by Charles Aweeka  
 Times suburban staff

LAKE STEVENS — Dennis and Meri Scafe gradually are settling into their new house down under — down under the ground, that is.

Scafe, a former industrial-arts teacher and coach at Everett High School, is the West Coast director for Terra-Dome, a firm based in Independence, Mo., which builds earth-sheltered structures. The company has put in three houses in Snohomish County, starting with Scafe's near the north shore of Lake Stevens.

The Scafes also sell dealerships to people who want to sell Terra-Dome houses.

The two other houses are occupied by a United Air Lines navigator, John Farmer, in Stanwood, and watercolorist William Brooks in Monroe, and their wives. A fourth Terra-Dome house is scheduled for construction in the Redmond area later this month.

The Scafes and their two children started moving in last month. Some minor work remains to be done on the solar-heated house, which has a view of the lake.

"We're still just half in," said Ms. Scafe, who used to work as a personnel interviewer for General Telephone Co. and has an art background.

The two-story house consists of four modules sunk into a hillside. It has 3,555 square feet of space, including a 600-square-foot garage, three bedrooms and three bathrooms. There is an 8-foot-by-24-foot greenhouse with hot tub off the master bedroom. High ceilings add to a feeling of spaciousness.

Berm-like windows and a generous number of skylights allow plenty of natural light.

Scafe and a crew poured 250 yards of high-strength concrete to form the floors, walls and ceilings. The house, which has a southern exposure, is covered by about 3 million pounds of earth. In some places, the dirt is 9 feet deep.

On the roof there is a lawn and patio complete with barbecue pit, sprinkler and lighting system.

Doesn't all that weight put a strain on the structure?

Not according to Scafe. He said during construction a 52,000-pound front-loader and a bulldozer were on the roof at the same time. Nothing budged.

A large loft used for an office and topped by an octagon-shaped skylight looks out over the high-ceilinged dining room.

"I trained the crew in this house," said Scafe, who worked as a contractor during school breaks. One summer he built a condominium in Everett.

Warm air from the greenhouse

can be circulated through the house by a duct system. Surplus heated air goes into storage in 7 tons of rock under a circular stairway. The home has two fireplaces and a 5-kilowatt electric furnace for a backup heating system.

The living-room fireplace has an adjacent wood storage bin that can be filled from the garage by opening a rear door.

Scafe hopes to spend the price of a cord of wood each year to heat his house.

He noted that concrete will retain heat for long periods once it becomes acclimated; it also keeps structures cool during hot days. The temperature inside an unheated test house built by the firm in Kansas City decreased only 2 degrees a day even though the mercury plunged to 10 below zero outside, Scafe said.

Condensation can be a problem in some underground homes without good ventilation systems. Mrs. Scafe overcomes it by using the fan when taking a shower. Experts say that using a dehumidifier during part of the year still costs far less than heating and cooling an above-ground dwelling.

One unusual feature is a digital readout system that was installed so the Scafes could monitor temperatures within the home. The idea is to figure out heat loss in order to determine how much insulation will be needed.

A pesky water leak at the bottom of a vertical pipe through which the digital wires run has plagued Scafe, however.

Scafe keeps a log of the temperatures, which he reads on a living room gauge.

He said financing an earth-sheltered house is becoming easier as lending institutions become more aware of them. A feeling of wariness still prevails in the industry, however.

"They weren't willing to stick their necks out too far," he said of the bank that financed his home.

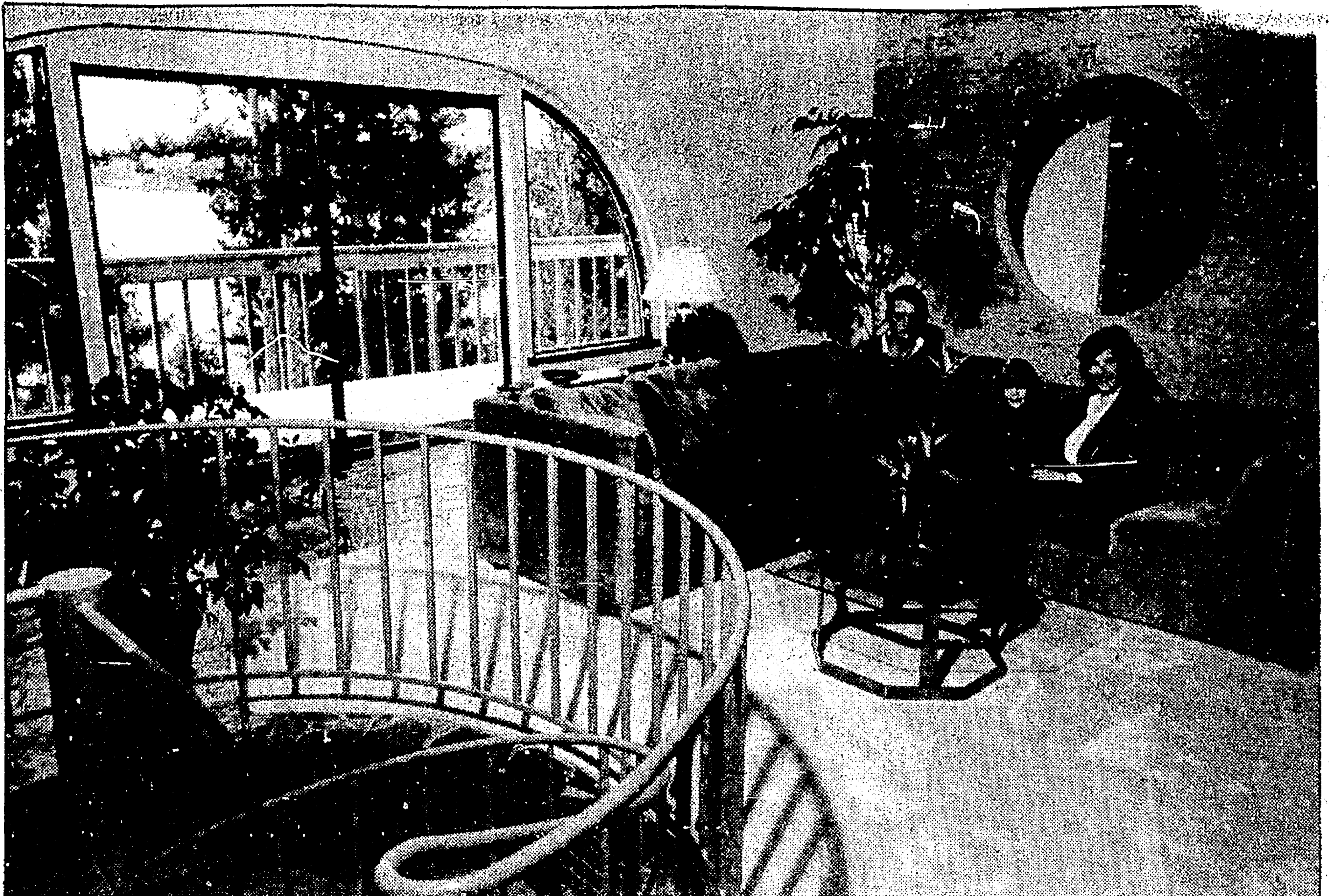
Mrs. Scafe plans an invitational showing of her home soon for bankers, appraisers, realtors and suppliers.

The Scafes say that \$30 a square foot is the "rock-bottom" cost for owners of the Terra-Dome houses they build. The high-water mark? Roughly \$50 a square foot.

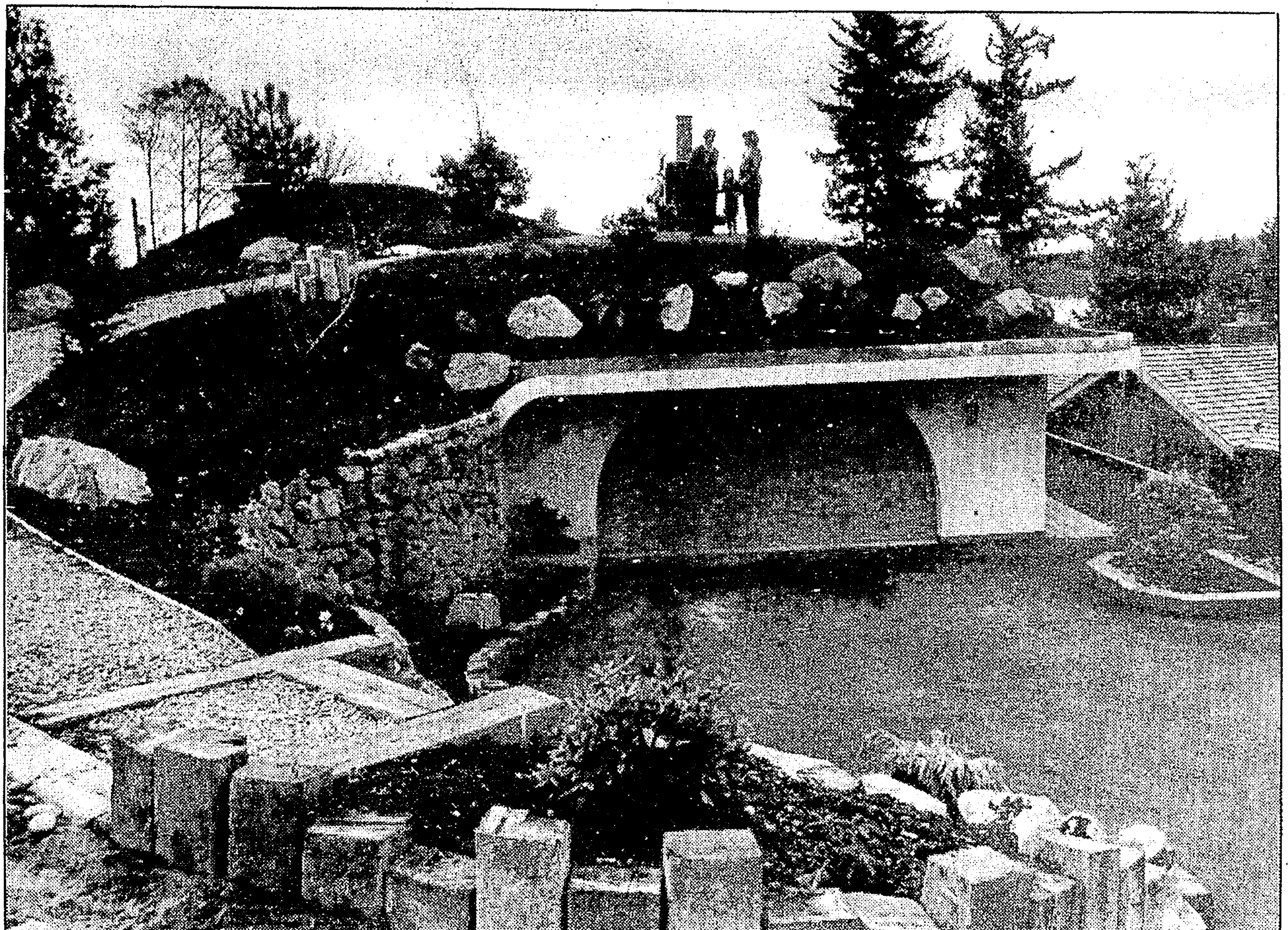
Most of the Terra-Dome dwellings are ramblers but a 3-story structure is possible on a 45-degree angle hill "with really hard, stable soil."

"Normally we design the house to fit the lot," said Scafe.

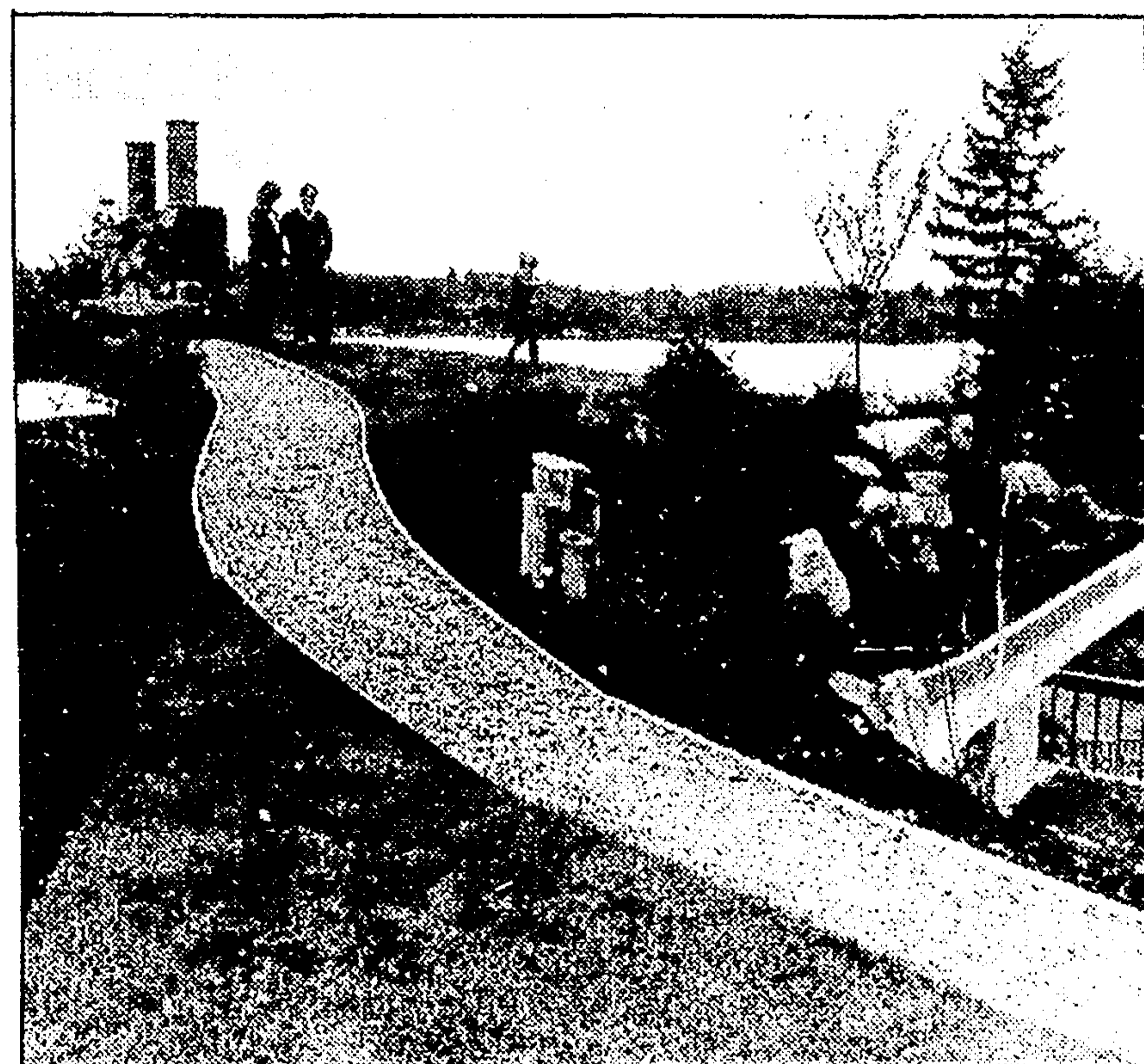
Linda Wilcox, a residential-plan checker in the Snohomish County Building Dept., said she knows of only three earth-sheltered houses



Dennis and Meri Scafe, and their daughter, Tasha, 4, in the living room of their home near Lake Stevens. The spiral staircase leads to a lower level. Staff photos by Peter Liddell.



The Scafes use an area on top of their home for a barbecue pit and play area.



The Scafes stand atop their garage.

### School chief selection due May 6

south Times bureau

HIGHLINE — The Highline School District's new superintendent will be introduced at a special school board meeting May 6.

The decision originally was to be announced no later than April 29. However, school district officials said the board has been

meeting "almost daily" to study numerous qualified candidates.

The original list of 39 candidates has been paired to seven semifinals, but the school board has decided to keep those names secret.

The new superintendent will replace Dr. Robert Sealey, who plans to step down in June.

### 'Funny Thing' to open 5-week run in Auburn

in the county. But she expects "considerably more" to be built.

"There's an awful lot of interest," she said. "We get calls every day. So many people are interested in a cheap way of heating their houses. I guess everyone is feeling the energy crunch."

Builders of earth-sheltered homes are required to have their plans verified by a state-licensed architect or engineer. That can be costly, explains Wilcox.

Another requirement is that bedrooms have a second exit, no matter how far underground they might be. That results in some windows opening into a sunken garden, tunnel, or even a pit.

Said Wilcox of the Scafe home, "I expected a cave-like atmosphere and it doesn't have that effect at all."

Scafe's brother, Gayle, who invented and designed the underground housing system, is president of Terra-Dome. Scafe used to be a masonry contractor and land developer in Puyallup.

Another brother, Ken, is comptroller and in charge of manufacturing.

The company has attracted interest as far away as Saudi Arabia and Australia. It built a doctors' clinic in Nebraska, has a 186-acre residential development underway in Wisconsin, and was just awarded a contract to build a private school. Other talks are brewing with shale-oil developers in Rifle, Colo.

The market is potentially strong for the homes in earthquake, landslide and brush-fire-prone areas of California, Scafe believes.

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