



Building with Whole Trees

The Forester-Architect

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article by Anne Raver, photos by Paul Kelley



STODDARD, Wis.

Mr. Gundersen grew up in nearby La Crosse, where his Norwegian great-grandfather, a doctor, founded a local institution, the Gundersen Clinic; he comes from a clan of doctors and tree lovers. “There are 23 doctors in the family,” he said, including his father and uncle and four great-uncles, but he seems to be wired more like his great-grandmother Helga, whose family still owns a tree farm in Norway. He and his grandmother would often picnic on this piece of wild land, where he remembers picking watercress and wildflowers and building tree forts. Now, to be in his buildings is to be among the trees.

According to research by the Forest Products Laboratory in Madison, run by the USDA, a whole, unmilled tree can support 50 percent more weight than the largest piece of lumber milled from the same tree. So Mr. Gundersen uses small-diameter trees as rafters and framing in his airy structures, and big trees felled by wind, disease or insects as powerful columns and curving beams.

Taking small trees from a crowded stand in the forest is much like thinning carrots in a row: the remaining plants get more light, air and nutrients. Carrots grow longer and straighter; trees get bigger and healthier.

And when the trees are left whole, they sequester carbon. “For every ton of wood, a ton and a half of carbon dioxide is locked up,” he said, whereas producing a ton of steel releases two to five tons of carbon. So the more whole wood is used in place of steel, the less carbon is pumped into the air.

These passive solar structures also need very little or no supplemental heat.

Tom Spaulding, the executive director of Angelic Organics Learning Center, near Rockford, IL, northwest of Chicago, knows



about this because he commissioned Mr. Gundersen to build a 1,600-square-foot training center in 2003. He said: “In the middle of winter, on a 20-below day, we’re in shorts, with the windows and doors open. And we don’t burn a bit of petroleum.”

“It’s eminently more frugal and sustainable than milling trees,” he added. “These are weed trees, so when you take them out, you improve the forest stand and get a building out of it. You haven’t stripped an entire hillside out west to build it, or used a lot of oil to transport the lumber.”

Mr. Gundersen had a rough feeling for all of this 16 years ago, when he started building a simple A-frame house here for his first wife and their son, Ian, now 15. He wanted to encourage local farmers to use materials like wood and straw from their own farms to build low-cost, energy-efficient structures. So he used small aspens that were crowding out young oaks nearby.

“I would just carry them home and peel them,” said Mr. Gundersen, who later realized he could peel them while they were standing, making them “a lot lighter to haul and not so dangerous to fell.”

Mr. Gundersen, who built most of the house singlehandedly, also recognized the beauty of large trees downed by disease or wind, and used the peeled trunks, shorn of

their central branches a few feet from the crook, as supporting columns in the house. “I thought they were beautiful, but I didn’t think how strong they were,” he said.

“In architecture, how materials come together and how they are connected is really the god in the details,” he continued. “The connection is where things will fall apart,” he said, adding that the crook of a



Roald Gundersen built his home and greenhouse (above) using whole trees for structure and support.

tree “has been time-tested by environmental conditions for 200 million years.”

He refers to that first house — which cost \$15,000 (for plumbing, electrical, septic and other basic amenities, as well as \$4,000 in paid labor) and a year of his own labor — as his master’s degree in architecture. Divorced in 1997, he now lives there with Ms. Baxter and their two children.

After finishing the A-frame, Mr. Gundersen built a 100-by-20-foot solar greenhouse next door with thick straw-bale walls on three sides, banked into the north slope. He used small-diameter, rot-resistant black locust trees for the timber framing.

But it is the Book End—the little house attached to the greenhouse, which is home to the firm’s project manager and his wife—that quietly vibrates with the spirit of the forest.

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