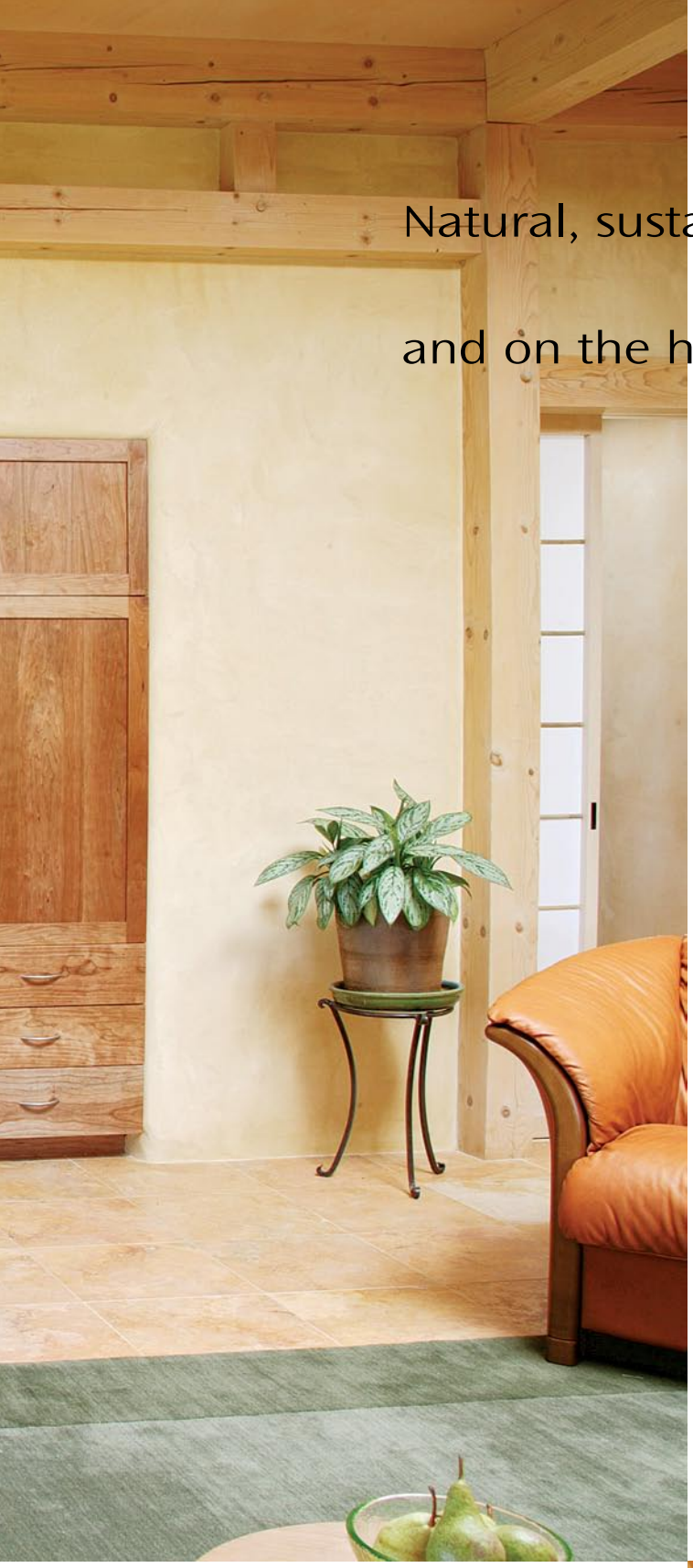
ORGANIC BEAUTY *After suffering chronic health problems brought on by the chemicals in modern building materials, the author, an architect, turned her attention to making healthful homes that use predominantly natural materials in beautiful and inviting ways. The white fir timber-frame house is surrounded by 12-inch-thick walls made from a mixture of clay and straw and covered with clay plasters.*

The Healthful H



Natural, sustainable materials are gentle on the environment and on the homeowners

BY PAULA BAKER-LAPORTE

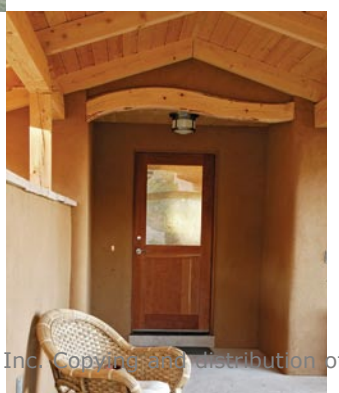
ouse

My husband, Robert Laporte, and I design and build healthful houses we call Econests. Our paths to the same ideal—a house that leaves a light footprint on the earth and is good for its occupants—were different, but they eventually converged.

Almost a quarter century ago, I was living in a mobile home when I developed flulike symptoms—fuzzy headedness, aching muscles—and a hypersensitive sense of smell. My environmental and food allergies got worse. At that time, there was very little information about multiple chemical sensitivities, and like most people with my condition, I went from doctor to doctor to find a solution for my general malaise.

Years later, my physician became ill from chemical and pesticide exposure at her clinic. While designing a home for her, we realized that we suffered from the same illness. During my research into the concept of the healthful home I realized what was going into standard home construction—xylene, formaldehyde, pesticides, and phenols, to name a few—and I decided to find a way to design more-healthful homes for my clients.

For Robert, the impetus to build in a natural, healthy way came not of illness but of inspiration. He loved his craft as a timberframer, but his joy ended when it came time to install the synthetic foam panels in the frame. He wanted a wall system that was as natural and handcrafted as his timberframes. His search led him to



HIGH-DESERT SERENITY *This single-story timber-frame home in the hills outside Santa Fe uses sustainable materials in a beautiful way. The bamboo and cedar gate leads to a covered entryway to the front door.*

ALL-NATURAL WALLS

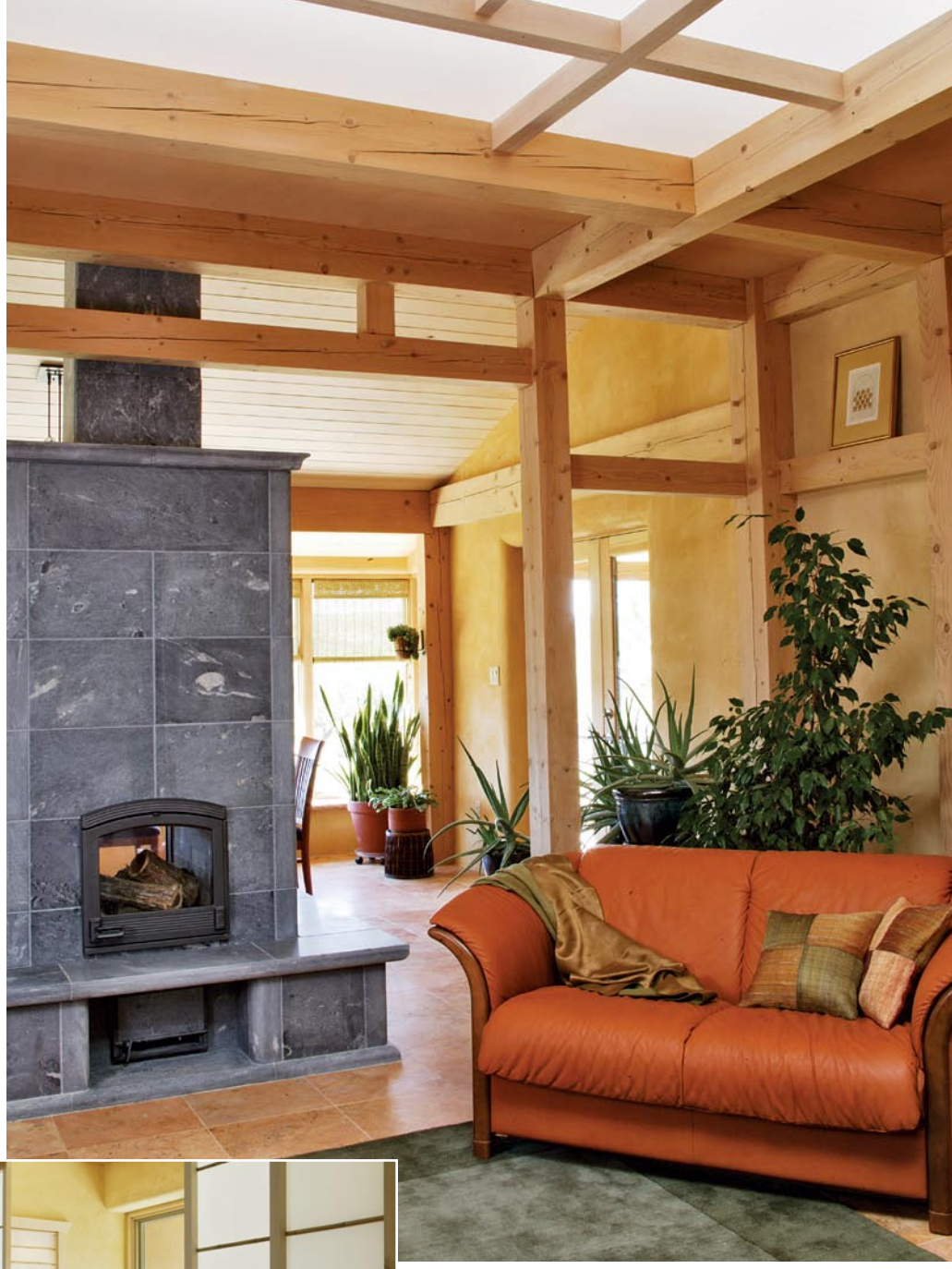
The walls of this New Mexico house are made from locally abundant straw and clay that are mixed and packed into wood forms. The 12-inch-thick walls have an R-value, or insulating rating, equivalent to about 6 inches of fiberglass insulation, the standard in most wood-framed houses. These walls, however, offer no potentially harmful chemicals. When the clay dries, coats of plaster are applied inside and out. Wide roof overhangs and stone wainscoting protect the walls from occasional driving rains.

visit the great natural builders of Europe, who had a rich pre-industrial history of timberframe building. In Germany, he learned about building walls from a mixture of straw and clay, then covering them with natural plasters. He brought the knowledge back to America and developed the construction techniques that we use for our houses.

I signed up for one of Robert's natural-building workshops, where I learned about building from nature's abundance with wood, straw, and lots of clay. Thus began a fruitful collaboration between builder and architect. Another wonderful collaboration is that several years later, we were married.

Robert and I have built several Econests for ourselves, refining the design each time and figuring out how to integrate lots of natural materials into a home that is both beautiful and a pleasure to live in. The materials in the walls and timberframe are completely free of the petrochemical toxins that are prevalent in manufactured building materials. Of course, we follow a strict standard

Photos except where noted: Karen Tanaka; bottom, Laurie E. Dickson



COMFORT AND LIGHT *Skylights in the roof are covered with rice-paper ceiling panels and cast diffuse light into the room. Interior elements of the structural timber frame suggest separate rooms without the use of walls.*

for the other materials in the house, too, because the wall system is only one of many important parts of the healthful house formula.

A house of straw and clay

Robert and I feel strongly about using as many locally available, unprocessed materials as possible in our houses. They come without wasteful packaging and use less fossil-fuel-consuming transportation. Leftover materials don't have to go into a landfill. In fact, many of them can go into the garden compost. So from the standpoint of the cost to the environment to produce these materials, a straw-and-clay wall is a sound choice.

In most timberframe construction, wall panels are installed between the posts and beams after the frame is raised. Aside from our unorthodox wall materials, another difference in our method is that the walls are built around the perimeter of the frame, instead of installed between its members. This has major advantages: It protects the structure and exposes all the beautiful wood joinery to the interior.

For our timberframes we like to use locally grown white fir. After the structural frame is complete, forms are built around it, into which we pack the mixture of clay and straw. When the walls dry—a process that takes about 12 weeks in our arid New Mexico climate—it's time for plaster, inside and out. On the exterior we use dark-brown clay, which is locally abundant (bottom photo, facing page). On the inside we apply a finish plaster consisting of kaolin clay, white sand, mica, and natural pigments to create the colors and textures we want.

A QUIET ROOM *Paula and Robert meditate and practice yoga in an area just off the living room. Translucent shoji screens delineate spaces in the open floor plan while letting light through.*

Our homes are built to last. The clay plaster handles the occasional driving rain nicely because of its ability to absorb then release large amounts of moisture. The large roof overhangs and stone wainscoting further protect the straw and clay walls. And when the home has

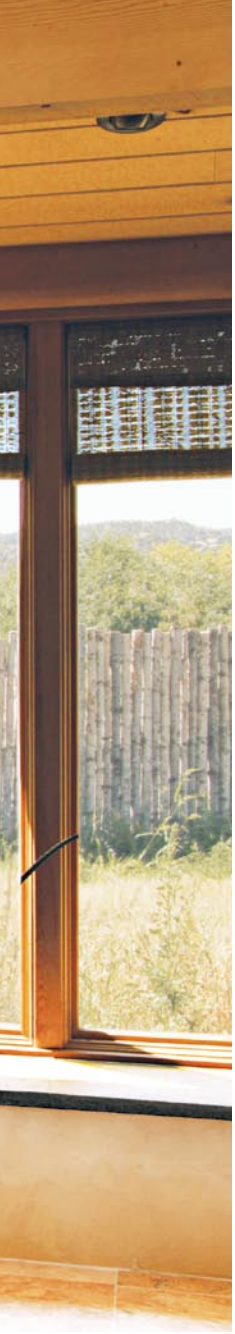
WIDE-OPEN KITCHEN *A 3-foot-wide L-shaped peninsula with 10-foot legs is made from honed green slate. The 12-inch-thick walls make for extra-wide windowsills in all the rooms.*

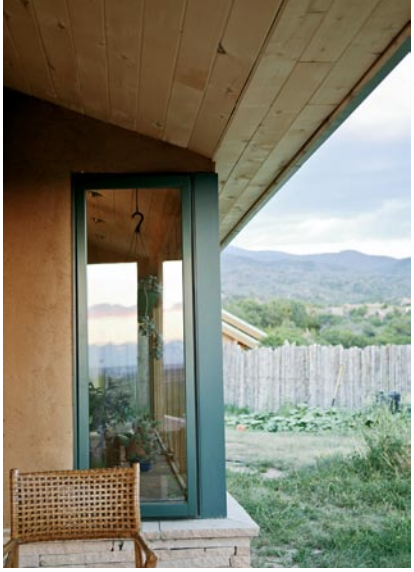
served its useful life, the frame can be taken down and reassembled elsewhere. Robert has built straw and clay structures in 17 states and 4 countries, so we know these methods work outside the arid Southwest.

Energy efficiency, healthful heating and cooling

The insulating value of a 12-inch-thick straw-and-clay wall is at least R-19, about the same as 6 inches of fiberglass batt insulation. And our subjective experience confirms that an Econest is warm in the winter, cool in the summer, and requires far less energy to run than its stick-frame, fiberglass-insulated counterpart.

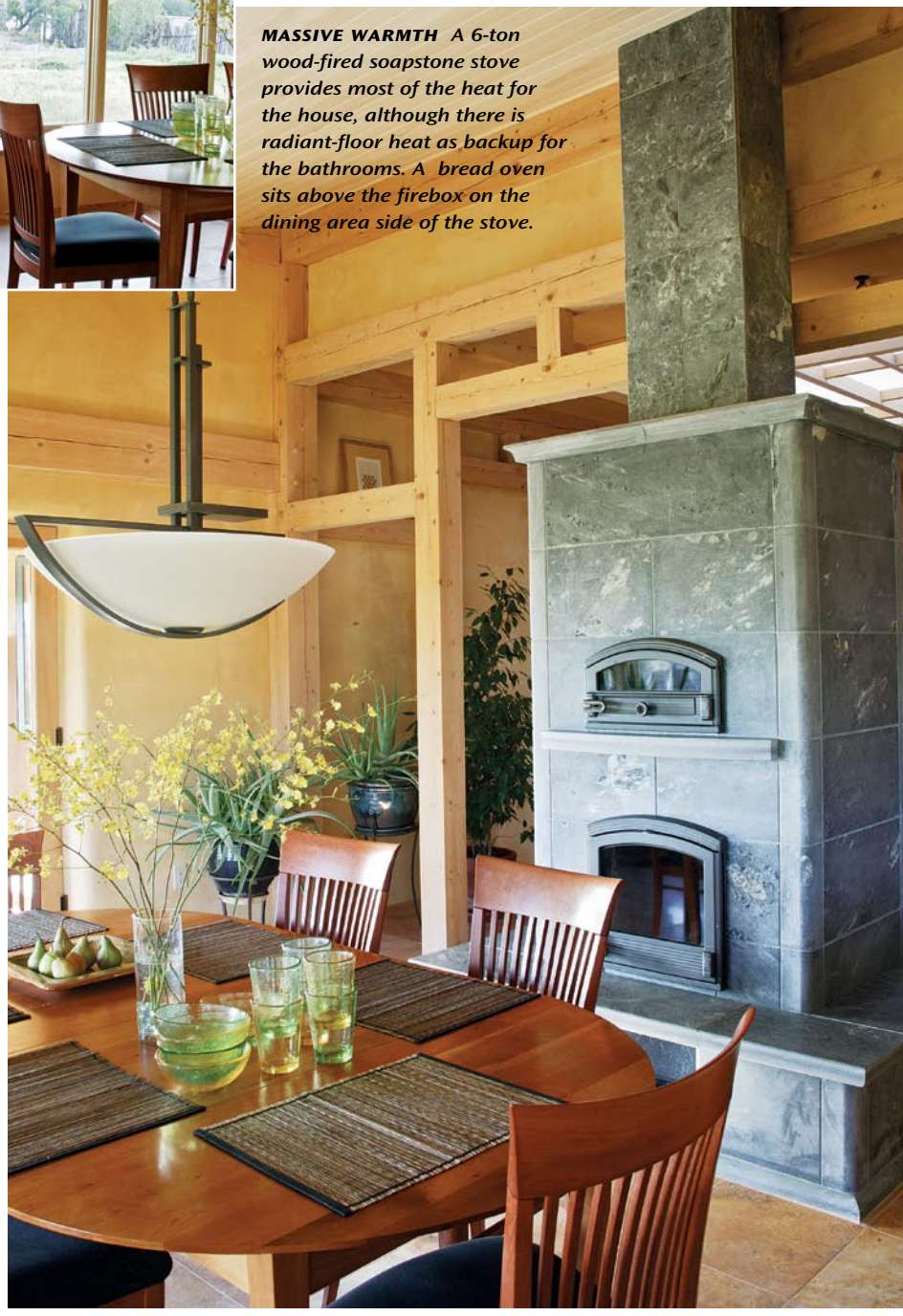
In past houses, we have insulated our ceilings with various least-toxic, high-performance products, such as formaldehyde-free fiberglass or cotton batts. In this house we used Icynene, an inert, energy-efficient spray-on foam insulation.





CATCHING—NOT DODGING—THE SUN *Unlike the rest of the windows in the house, which are set back under a 4-foot roof overhang, the 24-foot bank of windows in the south-facing dining room come to within 18 inches of the edge of the roof to catch the sun's warming rays. The stone floor in front of the window absorbs heat and radiates it back into the house.*

MASSIVE WARMTH *A 6-ton wood-fired soapstone stove provides most of the heat for the house, although there is radiant-floor heat as backup for the bathrooms. A bread oven sits above the firebox on the dining area side of the stove.*



Our house is oriented to the cardinal compass points with walls facing directly north, south, east, and west. On the south side we designed a glass-and-stone solar bump-out window that is only 18 inches back from the edge of the roof overhang (top photo). This allows warmth from the winter sun to flood the house but blocks the summer sun, which is at a higher angle. The mass of the walls, the thick masonry windowsills, and the stone floors all help store the heat that continues to radiate into the living space after the sun has set.

Although the house is equipped with in-floor radiant heat, we rarely use it. Along with the solar gain, we heat the house with a huge, wood-burning masonry stove located between the living room and dining area. Made in Finland by Tulikivi, the soapstone stove has baffles that circulate hot smoke through its 12,000-pound mass. A small fire for an hour or two on a cold night will continue to radiate heat for more than 24 hours, keeping us warm through the coldest parts of the winter at our altitude of 7,000 feet. The firebox opens to both rooms, and there's a bread oven facing the dining area.

During our high-desert summers, we have a large temperature differential; it might rise to the high 90s during the day but drop to the 60s at night. A 4-foot roof overhang does an excellent job of keeping summer sun off the walls while also protecting them from the elements. And we take advantage of the house's cross ventilation. We open the windows at night, and the cooler temperatures are

LESSONS WE'VE LEARNED FROM DESIGNING OUR OWN HOMES

Each time we build a new house for ourselves we refine as well as take more risks in the design and materials choices. Many of the features we first tried out on ourselves have now become standard in our clients' homes.

Our previous house was much smaller—1,400 square feet compared to 1,900 square feet (excluding the guest suite)—and for this house we carefully added space where we wanted it. We separated the shower from the tub, making the master bathroom larger. We created a little more distance between the master bedroom and the living room by adding a large walk-in closet. Most important, various ceiling heights and treatments in conjunction with the timber frame define the public spaces while allowing them to remain open to one another. This has allowed us to create a home that feels much more spacious than its 1,900 square feet.

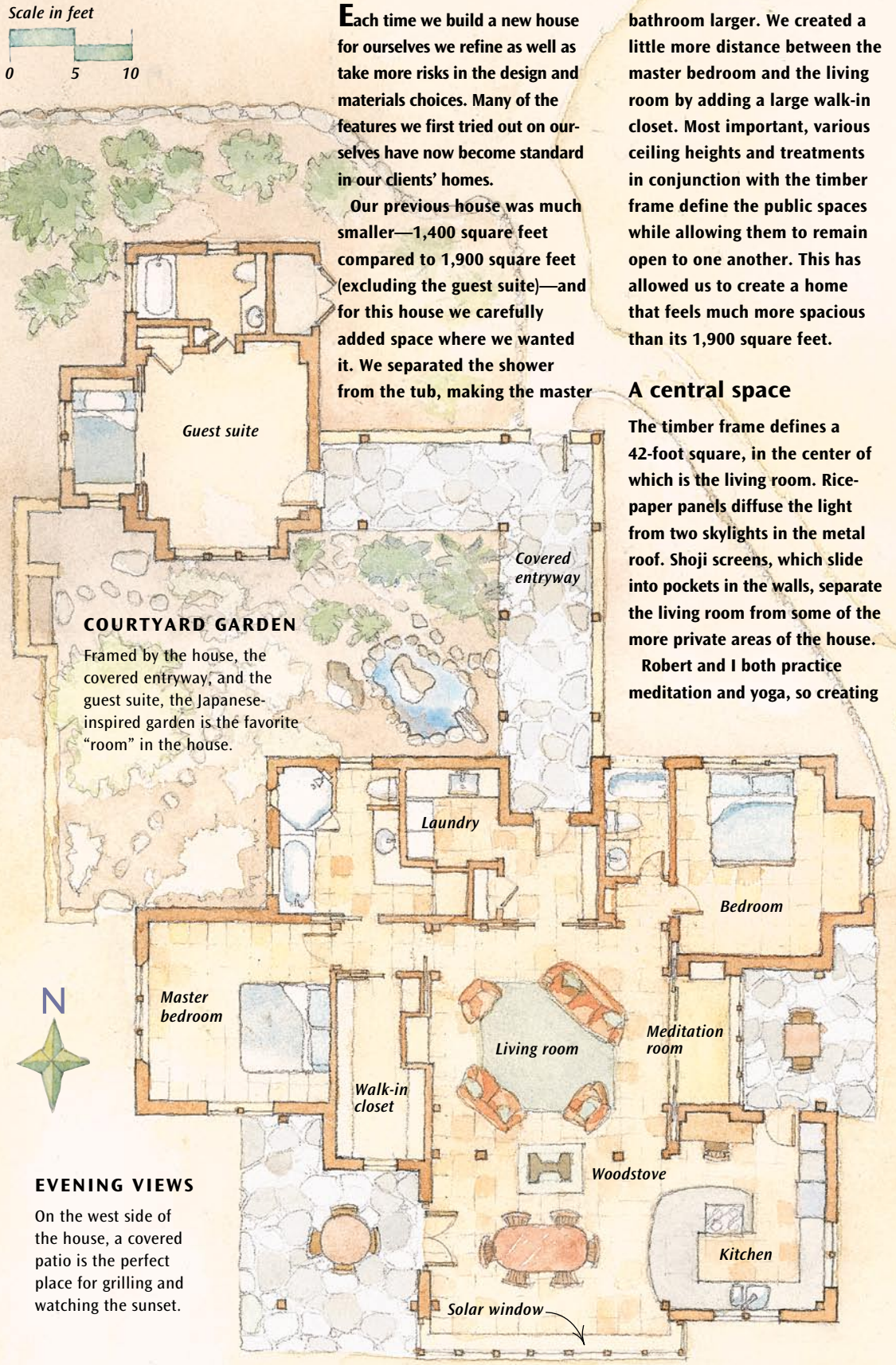
A central space

The timber frame defines a 42-foot square, in the center of which is the living room. Rice-paper panels diffuse the light from two skylights in the metal roof. Shoji screens, which slide into pockets in the walls, separate the living room from some of the more private areas of the house.

Robert and I both practice meditation and yoga, so creating a special place within our home just off the living room for this practice was important to us.

Outdoor rooms

Our greatest design innovation in this new home is in the integration of indoor and outdoor spaces. Rather than include a guest room in the main house, we decided to build a small separate structure for overnight visitors. The 22- by 25-foot building, known in the Southwest as a *casita*, or little house, has a 14-foot-square central room flanked by a built-in bed and a bathroom. The two structures—house and *casita*—define a Japanese-inspired entry courtyard. All of the outdoor areas have enhanced our experience of living in this beautiful location and strengthened our connection to the natural surroundings.

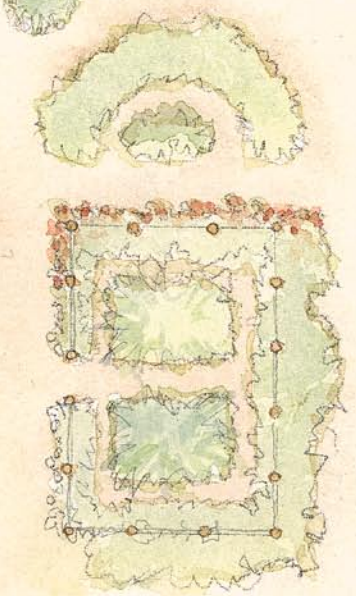


COURTYARD GARDEN

Framed by the house, the covered entryway, and the guest suite, the Japanese-inspired garden is the favorite "room" in the house.

EVENING VIEWS

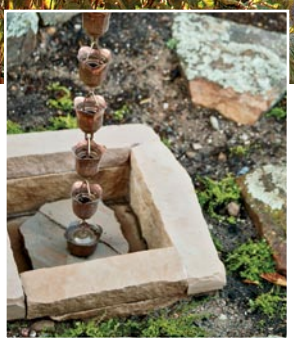
On the west side of the house, a covered patio is the perfect place for grilling and watching the sunset.



EARLY MORNING SUN

A kitchen garden of herbs, flowers, and vegetables sits on the east side of the house.

Floor plan: Joanne Bouknight



FAR-EASTERN INFLUENCE *A separate building for guests is attached to the main house by a walkway and defines the Japanese-inspired entry garden (top). Decorative copper rain chains (above) at the ends of the gutters direct rain into cisterns for plant watering. Just outside the kitchen door, a vegetable garden (right) provides food, flowers, and solace for the author.*

stored in the massive straw-and-clay walls and masonry floors. The building remains comfortable without any mechanical cooling all summer.

It's been six years now since I began living in a straw-and-clay house, and almost a year in the new home pictured here. Sometime during those years, almost imperceptibly, I have made the transition from illness, to wellness, to vitality—a state that I'm convinced is the result of living in a beautifully healthful house.

Paula Baker-Laporte and her husband, Robert Laporte, design and build houses in Tesuque, N.M., a small town near Santa Fe.

For more information, see Resources, page 84.