When Daniel Camacho bought a diminutive plot of land in the town of Ojinaga, Chihuahua, along the US-Mexico border, in 1994, he had never heard of Hassan Fathy. Like others in town, he did daily battle against a local unemployment rate just shy of 50 percent, working when he could as a field hand or laborer and at odd jobs. He figured it would take a few years to save enough cash to build the walls of a two- or three-room home made of cinder blocks. Later, he hoped, he would find a way to buy adobe (unmilled timber rafters) to hold up a roof of corrugated metal.

One evening late that year, there was a neighborhood meeting at which a woman from “the other side”—the United States—showed pictures of adobe houses. She claimed they could be more comfortable, more spacious and yet less expensive than the cinder-block-and-sheet-metal houses ubiquitous in the poor sections of Ojinaga. She also claimed that the adobe homes might not need expensive air conditioning, even through the fierce Chihuahuan summer.

Camacho was intrigued. Adobe was nothing new to him, of course. It had lent architecture in northern Mexico and the southwestern US a distinctive look for nearly 500 years—until the cinder block came along in the 1950’s tagged as a “modern material.” But what made these adobe houses different from what he had seen was their catenary-vaulted ceilings that used no wood, and didn’t even require wooden forms to construct. Although it had never appeared in the western hemisphere, Camacho learned, the design, and the technique of building it, were more than 3000 years old. They came from Egypt, having been revived recently by Hassan Fathy.

Afterward, Camacho approached the presenter and told her, “I have some land. I need a house, but I don’t have a steady job. If you’ll give me the materials, I’ll help build the house. Then you’ll have a prototype, and you can have people visit it whenever you want.”

In November 1995, after building for eight months under the tutelage of a local adobe mason, Maria Jesus Jimenez, Camacho moved into his new house. Since then, he’s hosted dozens of visitors from around the town and, indeed, the world. Neighbors and housing administrators from both the US and Mexico, as well as architects, professors and reporters, have come to see the house. The four-room home’s plan is T-shaped, and two walled courtyards complete a rectangular compound.

Inside, on a hot May afternoon, it is comfortable. It smells of earth. Camacho says he doesn’t have an air conditioner, because the heavy walls and ceiling absorb heat in the daytime and radiate it at night, moderating indoor temperatures, much like a small cave. (See *Artes y contextos*, May/June 1995.) Although the kitchen measures only a bit

*Top and opposite:* After Daniel Camacho made the adobe blocks with which he built his own house in 1995, he became one of a handful of cottage-industry manufacturers in Ojinaga. *Center:* In his vaulted living room, three couches and a coffee table are built in. *Right:* Camacho’s bricks await buyers. Though the houses in the background are both less spacious and more expensive, they remain more popular because they can be purchased with generously subsidized loans from the Mexican government.
more than three by three meters (10x10'), its domed adobe ceiling not only increases the sensation of space but gracefully transforms the room into a simple shrine to the rituals of food. His vaulted living room, though narrower than a railroad car, is also deceptively spacious. Its three cushion-covered sofas, coffee table and bookshelves are all built in, made of the same plastered adobe as the walls. They all make the room appear sparser from above.

Only a few hundred meters away lies an assembly-line row of government-sponsored cinder-block houses, sobering reminders of how innovative Camacho's house really is. Each is half the size of his 50 square meters (550 sq ft), but cost roughly three times the $8000 that Camacho's did. However, the buyers of these homes benefited from government-backed, low-interest credit, something not generally available. Without such arrangements, lending rates in Mexico can run to 48 percent, and it is this that has so far prevented some 50 families who have expressed interest in Camacho's design from building.

From one of his built-in shelves, Camacho pulls a dusty, worn photocopy of Arquitectura para los Pobres, the Spanish-language edition of Hassan Fathy's 1969 Architecture for the Poor. "This book is something very important," Camacho says in a gentle voice. "Our population keeps growing and growing. We have to look for a solution, and it has to be something right here in front of us, in the natural resources that the poor can afford. I've read it all. I respect Hassan Fathy very much."

Camacho heats water to make instant coffee. Mud is embedded in the deep creases of his hands, and here in the desert the sweat dries before it can shimmer on his lithe neck and chest. He has spent the day spreading shovelfuls of dry earth and mixing it with water and straw. The mixture will sit until morning, when he'll add more water to it and, from that mud, form bricks. Since finishing his own house, Camacho has become one of several adobe-brick makers in Ojinaga. He employs two other men—when he has orders—and though they can each mold up to 250 bricks in a day, they sell only about 4000 to 5000 in an average month. He makes two sizes of brick, a large one for walls and a smaller one for roofs. The difference, he explains, is that lighter bricks are needed to form the vaults and domes. The proportions of the bricks he makes are similar to those used in ancient Egypt and in much of the Middle East, the same proportions introduced to the New World by the Spanish, who had learned to work with adobe during the centuries of Arab rule in al-Andalus.

Outside, he pours water onto the piles of earth and beats straw into the viscous mixture with his bare feet—about three bales per 1000 bricks, he says. The straw will reinforce the adobe internally, much as steel bars do when set within concrete. Tomorrow, one of his workers will help him mold the mixture by hand. He'll use one of two wooden forms, either the one that forms three wall bricks at a time, or the one that forms six roof bricks. They'll pour the mixture from a wheelbarrow into the mold and smooth it by hand; then they'll lift the mold away and rinse it for the next set of bricks. After two days the bricks will be propped up on one side to dry more evenly, and after four they will be stacked to await a buyer. A good

Above: Susana Susan's Texas-style house uses four Nubian-style Ceres vaulted vaults in an H-shaped plan. The crosser of the H has a flat observatory roof supported by unlined timber rafters. Right: of the house is a vaulted solar power-house and storage shed, the left is a domed guest room. Left: Camacho's house is entered through a stone gate and a small yard. Directly behind the gate is the vaulted living room. The domed kitchen is on the right. The dome's irregularity is similar to what Fathy often found in vernacular Nubian architecture. Opposite: One of the two bedrooms in Susan's house.
As Camacho treads straw and mud, he can look north across the Rio Bravo — called the Rio Grande in the US — to what his distance appears as no more than a smudge on a scrubby hill. This is the region's second Faith — style home. Camacho supplied 18,000 bricks to the masons who taught him, Maria Jesuina Jimenez, is working there now. The home's owner and resident is Simone Swan, whose presentation to Camacho's neighborhood group was an early program of the Swan Group, dedicated to introducing both Faith's philosophy and — as applicable — his techniques to the Rio Grande/Rio Bravo valley. A self-taught architect and lifelong student of the arts, Swan has been three years in Cairo as an assistant and student of Faith's. (See page 16.)

She recalls it was in 1990, during the memorial celebration for Faith and his wife, Alice, in New York, that she first met Swan, a man of significant experience. "The thought of the awards Faith had received and the countless articles, books and seminars his life's work had spawned," she says, "was enough to set my hands on. I resolved then, quite simply, to continue, to continue, to continue to do hands-on building, and to realize the material I was lecturing about.

But where to carry out such a mission? For Swan, raised in the US and Europe, a former director of the Liberal Foundation in Houston and a long-time resident of New York, it could have been anywhere — and that was part of her dilemma. The next fall she took a vacation to Big Bend National Park in Texas. En route through Presidio, Swan caught sight of the historic abode, Fort Leaton of the years, probably first no one did the aging of the building. At least, this is what she's calling "Prototype Two," some 25 kilometers (10 miles) outside Presidio on a rolling, cactus-strewn mesa of 175 hectares (430 acres) that she has bought, someday, to develop with more homes built on Faith's principles. But her sights are set on an old-income abode building. As her career lathers on her horse, she labors in her office opposite the kitchen, sketching plans, sending reports, soliciting testimonials from engineers and seeking contact with micro-credit lenders and philanthropic foundations. Over the past year, she has worked to convince the Rural Housing Agency (RHA) of the US Department of Agriculture to give the Nubian heritage a federal stamp of approval, and this bureaucratic foot promises to allow Presidio residents to receive low-interest mortgages to build all-income homes.

"Not many engineers have studied abode," says Demetrio Jimenez, director of the non-profit Greater El Paso Housing Development Corporation, which has helped Swan navigate the channels of the kiss. "Even fewer have heard of Hassan Faith or these penitent abodes." And low-income people, he explains, can't get government-backed loans without an engineer's approval of the house design. "When that engineer signs off, he has some big liabilities. Together, they've figured out a way to turn it wrong. They don't sign on something they don't know," he explains. "But from my experience along the border, there's a lot of families building their own homes anyway; that's just the way people do it here." Swan's ideas thus "lead themselves excellently" to existing local practices.

Swan's own house is now finished, although her artist's touch and commitment to locally produced materials put it about a year behind her original schedule. She added a freestanding, square guest room with an elegant dome, and a utility shed to house the batteries that power the home, recharged daily by a freestanding photovoltaic array. Recently she has spent more time than expected reporting on the Houston Chronicle, Texas Architect, Preservation and Texas Co-op Power have all produced features on her work, which has given her a much-needed publicity boost.

"Now I know I ought to dress up and go to some foundations to see if there's someone who can extend micro-credit to people, underwrite an office, help organize teams of abode-builders and so on," she says, "but I just haven't had the time. I'm just one person here. I don't have a staff. But now that the house is finished and we have prototypes on both sides, I can really concentrate on the low-income aspect, which of course is the heart of all this."
Swan may be working alone, but she has built up a reliable corps of local supporters, partly because, when she arrived, local interest in adobe was already rising.

"It's booming," says former Pueblo High School principal Teddy Pucill, who lent office space to Swan before her house was habitable. He hoped to add an adobe masonry curriculum to his school's vocational offerings. "She's a great resource and nobody else does those vaults," he says of Swan.

"We just have to unite the poor and marginal people—that's me, too, you know—show them the houses, and then maybe we could make some kind of cooperative," muses Karl Downing, who owns one of the town's few tourism-oriented businesses. "I'd love to see lots of adobe here. It would be great for tourism and it would be pretty."

City Manager Michael Kovacs points out that in the construction industry, Swan faces "a skepticism that she's helping move toward acceptance. Some of the brick and-wood building guys, of course they're skeptical, but then you get them out to see her place and they're sold. But anything new [in low-income housing] takes forever because it's public money and the taxpayers want something that will last. And I know by now that whenever someone says something like that when Simone's around, she'll pull out some picture of an adobe building in Egypt and say 'Look! This one lasted 3000 years.' So I think it will work in the long run, but it will take time to be accepted."

Meanwhile, Jimenez and her crew are up on Swan's roof applying the first of two coats of lime and sand plaster that will protect the adobe from rain. Although progress is slow, Swan takes some comfort in recalling the official resistance Fathy faced so consistently for a half century.

"If he could be here right now," she says, "I'd ask him first, 'Hassan, boy, do you find this architecture that I have built to be truly harmonious with the culture, with the environment and the climate?' Now, is it?" she asks, pausing to look about with a self-critical eye. "I hope he would agree. I really hope he would."

But as for community building and her role as a "barefoot architect," Swan says, "I know what he would say about that! He would say, 'Simone, you've already created a community link with your mason, plasterer and helper, with Daniel [Camacho] and many others. It takes time for the rest to come. To be authentic, to have real change, it takes a lot of time.'"

And over on the other side of the river, as he boats earth, water and straw each morning with his feet, Daniel Camacho is learning the same lesson.

Dick Doughty once spent much of a year carrying bricks and mixing mortar for a West Virginia chimney mason. He is now assistant editor of Aramco World.