KEEPING THE HOME FIRES BURNING: From Prometheus to Central Heating

BY CHARLES CAPALDI

A sharp knock on the door jolted me out of my reverie. We live far enough off the beaten path that nobody up here bothers to install a doorbell, and it's relatively rare for a knock to be anyone other than the mail carrier, or a neighbor.

The heavy, two inch thick, oak door groaned on ancient hinges as it opened onto a fashionably dressed young woman in her mid-30's – high heels tottering dangerously on the uneven granite slab which serves as a threshold. Our house is built of cordwood, stacked over a course of masonry. The walls stand 22 inches thick, and the front door, with a lancet arch at the top, was scavenged from a Greek Orthodox Church in Montreal. Admittedly, the whole structure looks a bit like something out of "The Hobbit". I swung the door wide, and encouraged her to watch her step as she came in.

"*Hi. I'm Karen and I'm here to appraise the value of your property for tax purposes. I need to ask you a few questions, take a quick look around and I'll be out of your hair*." She said with a smile. Like so many rural municipalities in the northeast, our town hired a *professional* firm from further south to get the job done. I could already see the furrowed brow and the confused look on her face – although she managed a smile and said, "*What an interesting house you have*."

I should explain. I live in the house that Woody built. Little matter that I've never met him, or that I don't know his last name, Woody and I are related through his house. Perched on a small Vermont hill farm near the Canadian border, the town fathers, in their infinite wisdom, refer to it as "vernacular architecture" - their euphemism for anything other than standard wood frame construction. Here, property bears the name and reputation of its previous owner. My house suffers that fate, and worse. In the late 1970's, Woody was a notorious grower of marijuana on the town forest land, and in a country where the president is elected based on whether he claims to have "tried it but never inhaled," the association isn't necessarily a positive one. After years of living here, I still cringe a little bit when somebody explains: "Oh, he lives in Woody's house."

Luckily, our friendly tax appraiser didn't share any of the local bias, and she certainly didn't know any of the history. Her questions were direct, to-the-point, and clearly designed to get at the "true value" of our house. *How many acres do we have? How many working bathrooms? What kind of foundation is the house built on?* The conversation was going along swimmingly, until she asked, "*What kind of central heat do you have?*" When I answered, "*A 20 ton masonry heater, and a wood stove.*" she put down her pencil and looked up sharply.

"*A what?*" She stammered, clearly confused. *"I'm not talking about supplemental heat, I'm just interested in your PRIMARY heat source.*"

I nodded and clarified, "*So am I.*" The blank stare and vacuous smile that beamed back at me begged for more explanation.

From 1500 to 1800, Europe was experiencing what historians refer to as a "Little Ice Age." Wood was in extremely short supply. Oil, natural gas, and coal were not yet widely available. People, especially in the colder countries of northern Europe built masonry heaters that ranged from the simplest of white-washed clay stoves in the homes of peasants, to ornate, tile-covered works of art that decorated (and heated) the palaces of the nobility.

Masonry heaters rely on the fact that wood gives off a tremendous amount of heat, very quickly. The 20 ton mass of our masonry stove absorb this heat as it is liberated by the brightly burning fire, and slowly releases it over a 12 to 24 hour period. Each morning, we light a single fire in our masonry stove with an armload of wood. The small amount of wood burns full out for an hour, and leaves the stove blanketed in a 2-inch thick layer of red hot coals.

We close up the door and air intake, cutting off the oxygen to the fire, and allowing the heat to soak into the masonry. That alone is sufficient to keep our house comfortable, even when the

outside temperature dips into the single digits. During the change of seasons, where only a small amount of heat is needed to take the chill out of the air, we burn a proportionally smaller fire in the masonry stove – yet it still burns very quickly and very hot, which is a boon to the environment. When wood is rapidly burned, it acts as a clean fuel. But when it is burned too slowly, the fire smolders, the burn is incomplete, producing tar, creosote, and smoke, while dramatically increasing atmospheric pollution. Natural Resources Canada (the equivalent of the American DNR) says, "*Biomass combustion is considered CO_2 neutral, and therefore is not considered a major producer of greenhouse gas linked to climate change.*" This is not an inconsequential consideration when there is so much hoopla about global warming – and when President Bush is beginning to tout coal as the "new clean fuel of the future" while oil supplies dwindle and prices rise.

A properly managed wood supply is considered a renewable biomass, although it is often considered unsustainable due to its combustion emissions. The use of masonry stoves, cob ovens, or other "devices" which allow the fire to burn brightly, minimizing pollution, and yet retain its heat long after the flames have died out, remain viable alternatives.

To be sure, the woodstove provides a place to warm up after coming in from chores, generates enough heat for rising bread on baking day, and dries out shoes, boots and mittens that are covered in snow and ice. But it consumes a lot more wood than the masonry stove to generate the same amount of heat. True, the woodstove is quick heat – I can light a fire in it and be warming my toes before the flames within 15 minutes, so I consider the week's worth of cutting, splitting and stacking firewood each year, a price worth paying. As I write this, the outside temperature is hovering around 8 degrees, more than a foot of fresh fallen snow lays on the ground outside, and the orange flames dancing behind the glass doors of the woodstove are spilling a wave of heat over me and the dog nestled at my feet. Living in such a cold climate, fire is a beautiful thing and not something to be taken for granted – a lesson that has been echoed in human myth and history since the beginning of recorded civilization.

According to Greek legend, Zeus, the king of the gods, originally denied men the secret of fire. Prometheus felt sorry for the mortals who shivered with cold through the long winter nights. As the story goes, Prometheus gave humanity a gift that was both "a good servant, and a bad master". He stole fire from the hearth of the gods, concealed it in a hollow wand of fennel, and brought it down to earth for mankind – simultaneously beginning an age of enlightenment for men. Zeus was so angry that he ordered Prometheus to be chained to Mount Caucasus where an eagle came to tear

out and consume his liver, which grew back every night, only to be eaten again the next day. The mythical price of fire, heat, and enlightenment, didn't come cheaply for Prometheus. Scientists confirm that it didn't come easily to mankind either.

Neolithic man (Homo erectus) roamed the earth 500 million years ago during the last Ice Age. Archaeologists know that he couldn't create fire on his own, but he could capture it, even tame it, when it occurred naturally in a forest fire, or from a lightning strike. Letting the fire go out, during that period of human history, was probably tantamount to death. I can only imagine that getting more "fire" would have proven quite challenging. I can't think of a single instance where I could have "harvested" fire from nature in the 40 years I've been alive. Unfortunately, the folks at SFJ have had ample opportunities out in Oregon given their spate of wild fires this year alone!

500 million years later, the glaciers have receded, the climate has moderated, and despite the fact that we live in a technologically advanced civilization, modern man is hardly any better off. We've become so advanced that the vast majority of us never see an open flame, let alone have the skill to create and maintain one. The reality TV phenomenon "Survivor" illustrates this perfectly. The show plucks a select group of people from their lives as attorneys, teachers, baristas, and students, and deposits them in isolated locations in what we otherwise refer to as "the third world" or "under-developed countries" like Africa, Borneo, Panama, and Thailand, etc. Each location has been chosen because it was inhabited by an indigenous (read "primitive") population which was able to sustain itself without outside inputs from modern society. Each group of survivors must find a way to provide for their own basic needs, with more or less help from the show's producers. These basic needs include shelter, heat, purifying their own drinking water, and hunting/harvesting their own food. In thirteen seasons, only one group was able to produce fire using primitive tools or locally available materials, despite the fact that in almost every season, the participants struggled with issues of dehydration (because they were unable to purify the drinking water that was otherwise readily available) and hunger (since they couldn't cook any food they were able to catch). We can deduce from this that while they didn't lack the motivation to produce fire, they did lack the skills – and despite their efforts, fire-making is

not a skill that is easily acquired. In the modern era, mastery of fire is rapidly being relegated to one of the lost arts.

Fire and its ability to heat our homes, cook our food, or boil our water has become one of the many things that we take for granted in post-industrialized society. A huge percentage of Americans navigate their lives, leaving their climate-controlled homes each morning, only to spend the day in climate controlled offices or stores, with windows that neither open, nor close. Stovetops are made with ceramic burners that "glow" hot, instead of burning. Microwaves cook our food in a fraction of the time by accelerating the molecules in the food itself. Most furnaces are relegated to the basement, are not user serviceable, and automatically pump hot air throughout the house via metal ductwork under the control of microprocessors. We are capable of producing nuclear bombs that "burn" with a heat so intense that it sears the very shadows of its victims onto the concrete of Hiroshima and Nagasaki, and yet millions of North Americans would have to leave their homes in the event of a sustained midwinter blackout. With the price of fossil fuels higher than it has been in recent memory, people who live at or near the poverty line – the ubiquitous 'working poor' – are left with precious few alternatives if they can't afford to fill the heating oil tank.

I'm not suggesting that humankind is on the brink of a new dark age. I'm also not suggesting that the president's "No Child Left Behind Act" should rank fire-starting along with basic skills in reading and mathematics. And yet, I see signs that worry me. Man is the only animal that cannot build his own shelter. For the vast majority of us, if our homes weren't built by a builder, we wouldn't be living in them. We persist in looking at third world countries as if they are terribly behind the times, when in fact, people in developing countries have retained many of the skills we have lost after generations of plenty. Perhaps it's time we took a page from their book, something that my family did earlier this year when we decided to build a wood-fired, cob, bread oven.

Cob, which has been around for millennia, is nothing more than clay mixed with sand and straw. It has been used to build houses that are standing two hundred years later in Britain. Across the province of Quebec, hundreds of *fours d'habitants* (Quebecois bread ovens) have been built out of cob and used to bake bread for generations of farming families. In the Middle East and Africa, entire villages have been built out of cob since time immemorial. Of course, our goal was not to build anything as grandiose as a whole village. We just wanted to be able to bake bread for our family, friends and neighbors while reducing our reliance on fossil fuels, and minimizing our family's ecological footprint. Not only did we achieve that, but the bread

baked in our cob oven is infinitely superior to the results we can achieve in the house with a standard range and a pizza stone.

We collected the clay from the bank of the wetlands at the end of our pasture. The straw came right out of the barn. The kids took off their shoes, rolled up their pants and danced on a tarp, covered with clay, sand and straw, using their feet to mix the ingredients into a thick mass.

We built the dome of the oven using "loaves" of cob that were stacked, one on top of the other.

In "The Bread Ovens of Quebec" (Lisa Boily and Jean-François Blanchette), the authors liken the task of packing down the cob to "the work of swallows building their nest."

We spent two days building the oven, at a total cost of about $60 (for the recycled firebrick used as the floor of the oven, and the sand).

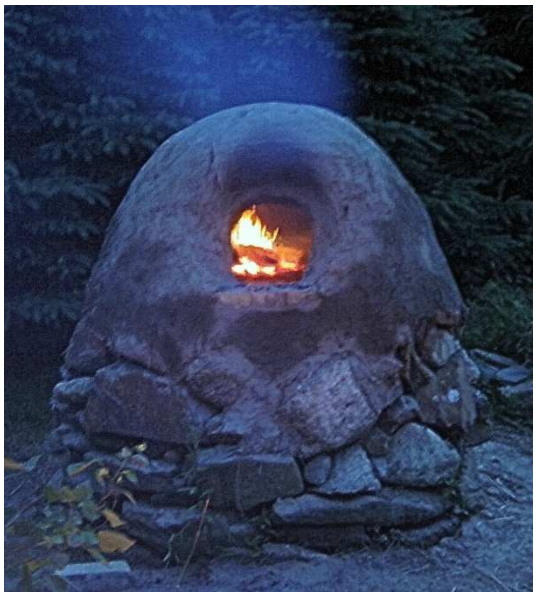
The principles at work in a cob oven are the same as for the masonry stove which heats our house. A fire is built inside the oven, right on the brick floor and allowed to burn at an extremely high temperature for an hour or two. Since the fire burns so brightly, what little smoke there is, escapes directly through the open mouth of the oven.

The oven consumes about two armloads of finely split wood (nothing thicker than a wrist) or branches from the tops of trees we've harvested for firewood or lumber. The heat is transferred from the burning fire to the floor and dome of the bread oven. After allowing the heat to soak into the oven from the embers for a period of time ranging from 30 minutes to an hour, the inside temperature of the oven is close to 700 degrees.

We rake out the coals and scuttle the oven floor with a wet rag attached to a long stick and the oven is perfect for pizza, pita, or Indian flat breads like na'an, or roti. After another half hour or so, the temperature (about 550-600 degrees) is ideal for baking sourdough loaves. We bake two oven loads of sourdough (20 pounds of bread each) which brings the temp down to the 450

degree range. The sourdough is followed by another two oven loads of yeasted bread (e.g. challah, 7 grain, and white bread, etc.), which in turn is followed by pan after pan of quick breads (e.g. banana bread, apple bread, carrot bread, honey cake). 24 hours after initially firing the oven and baking all this bread, the oven temperature is still usually hovering around the 250 degree mark – ideal for drying beans, or simply drying the next ovenload of wood, especially if its been out in the rain, or gotten covered in snow.

The appraiser remained unconvinced, although we sent her on her way with a 2 pound loaf of sourdough bread under her arm – bread that was baked in our cob bread oven from the residual heat of a fire kindled more than six hours earlier.



When I asked her if our property value had gone up since it was last assessed, her answer was clear. In her opinion, our house isn't really a house at all. Instead, it's a camp. Somehow, the lack of standard construction materials, central heating, central air, and a garbage disposal, coupled with the extensive use of recycled glass, doors, and old barn wood, just doesn't fit within the scope of the properties she was trained, or accustomed, to assessing. I didn't argue. We pay enough taxes for services we don't receive. She could have called it a shack for all I care. But something bothered me about her visit. I felt like she had judged us, as being backward, or too poor to afford a newer house, or a gas furnace. Had she asked, I would have told her that even if someone gave us a standard furnace, we wouldn't install it, that we chose this house specifically because of the masonry stove. Central heating is not something we want, or need. Is it really such a step backward to re-evaluate the kinds of housing and heating that we use and to use a "primitive" technology to fill in where modern technology falls short?

As she pulled out of the driveway, my six year old son came tearing out of the house, "Papa, Papa – we forgot to show her the composting potty." I had to smile. Poor Karen had probably seen enough for one day – we could save the composting toilet for the next appraisal!