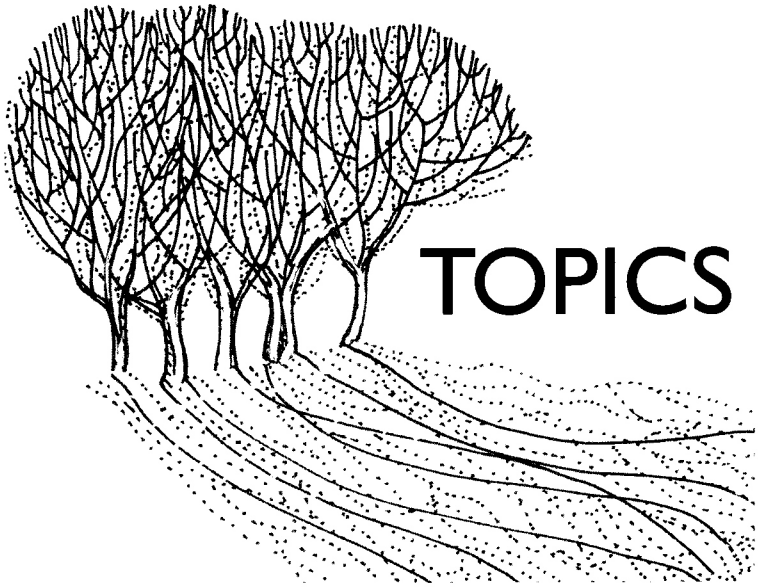
Hours of testimony, some awkward, some awesome, all in gratitude for this life. A hundred people gathered at the farm after the service for more stories, more music and more food, until dark. As in Bellingham, Guild members were the first to arrive and the last to leave, often not knowing what to do beyond sitting at the kitchen table, ready to listen or to run another errand. In Ohio, a band of members led by Michael Goldberg stuck around for yet another day to finish up a small job that had been hanging over Dave's head. So at least that small bit of tangible support was accomplished.

Our real test as friends and companions begins after the flowers are all distributed, those bleak Social Security forms completed, the black clothes packed away. Terry Clark, so overwrought that he couldn't bring himself to attend the services, says this is all too much, and so he is looking for younger friends. I disagree. This misery on the back end is the tuition for the great stuff on the front end: the equation is perfectly balanced. It's a deal I try to take every day.

—JOEL MCCARTY



Timber Frames and Fire

PICTURE this—you and your family are sleeping in the middle of the night in your stick-framed house. An electrical short in the attic causes a spark. That spark then ignites a splinter of one of the 2x6 prefabricated trusses comprising your roof support system. That's all that's needed to start a fire. The race is on. Ignition time: 00:00:01.

The fire climbs up the truss pulling oxygen from the gable end vents. The fire is now in the growth stage and doubles in size approximately every 30 seconds. Fire gases and heat are trapped under the roof assembly, and attic temperatures reach 500 degrees Fahrenheit. Eventually the attic is pressurized enough to force smoke down into the living compartments, and the smoke alarms begin sounding. Time from ignition: 00:01:56.

The temperatures in the attic keep climbing while carbon monoxide and other byproducts of incomplete combustion are trapped under the roof. The CO and miscellaneous fire gases reach their ignition temperature. Flashover (the simultaneous ignition of all combustible materials in the room) then occurs. Attic temperature: 1146 degrees. Time: 00:03:02.

The 2x6s in the truss system begin to char and the gusset plates used to hold them together lose purchase. As temperatures in the attic reach 1600 degrees, the weight of the air conditioner and roof assembly overcomes the trusses and the result is total roof failure and structural collapse. Time: 00:04:17. Time from warning to collapse: 2 minutes, 21 seconds. Did you get your family out in time?

The scenario above is not meant to frighten anyone into believing that they live in a firetrap, nor is it an exaggerated, melodramatic description of structure fire behavior. It is simply the reality of fire progression in modern houses that are built by the pound.

Timber-framed construction (or heavy timber as we call it in the fire service) is significantly more resistant to fire damage than common stick framing and considerably more fire resistant than construction using unprotected steel support members. Solid wood is very stable at high temperatures and creates its own insulation upon contact with fire. As a result, heavy timber construction is given a two-hour fire rating by the National Fire Protection Association (NFPA). The only construction method given a higher rating is so-called fire-resistive construction (structural members made of noncombustible materials).

Whereas a 50-ft. steel I-beam will elongate as much as 4 in. at 1000 degrees, forcing a collapse, a timber-framed bent will roughly retain its original dimensions. The beauty of timber frame joinery under fire load is that, as the outside of a beam chars, it turns mostly to carbon. Carbon is a great insulator, so the load-bearing portions of the joinery and members remain intact for much longer than in lightweight truss construction. Wood also conducts heat very poorly. Since most timber framers enthusiastically use traditional wood joinery techniques, there are no metal connectors to transfer heat to the inner load-bearing portions of the joint.

Modern stud framing techniques have no "fat" as traditional timber framing does. The gusset plates' staples typically only penetrate ⅜ of an inch. These connectors, which are adequate for their design load, will fail very quickly in a fire, causing failure of the entire truss. Engineered wooden I-beams such as TrussJoists will delaminate and collapse while the fire is still in the growth stages and temperatures are still relatively low. None of this is true for a building of heavy timber construction.

Heavy timber construction has many more benefits in the event of a fire, as well. The vaulted ceilings commonly used on the interiors provide much more warning if smoke detectors are placed at the highest point. Also, there are typically no void spaces like the ones hidden inside light-frame construction, where fire can travel undetected and unchecked.

These are issues that are absolutely vital to consider before building a house for your family or client. Modern fire codes are based on a time when furnishings produced a little more than one percent of the BTUs of today's polyurethane foam-based furniture, and none of the deadly fire gases such as hydrogen cyanide and phosgene. Firefighting techniques are quickly evolving to adapt to quick flashover times and even quicker collapses. I know that as a firefighter I always breathe a sigh of relief when arriving on the scene of a fire to find out that the building is of heavy timber construction. There is a much better chance of finding living occupants, and the officer in charge is considerably less hesitant to send in firefighters to search for victims.

If timber-framed houses are so overbuilt as to pose the threat that "the product might last too long," as Tedd Benson wrote tongue-in-cheek in *The Timber-Frame Home*, after fire involvement they are admirably so and might actually stand long enough for you and your family to escape that late-night fire.

—RYAN GILBERT

Ryan Gilbert has been a firefighter for four years and works for the City of Bellingham (Washington) Fire Department.