

TIMBER FRAMING

JOURNAL OF THE TIMBER FRAMERS GUILD

Number 116, June 2015



Quaker Barns

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On the front cover, forebay wall of large stone-built, Quaker-style bank barn, 45x60 ft., near New Hope, Bucks County, Pa., 1853. Uppermost double doors open to loft, middle doors to threshing floor and lower set to granary. Sheathing conceals 50-ft. queenpost truss built into wall. On the back cover, one upper chord (or main brace) of queenpost truss visible from threshing floor inside. Photos Alex Greenwood.

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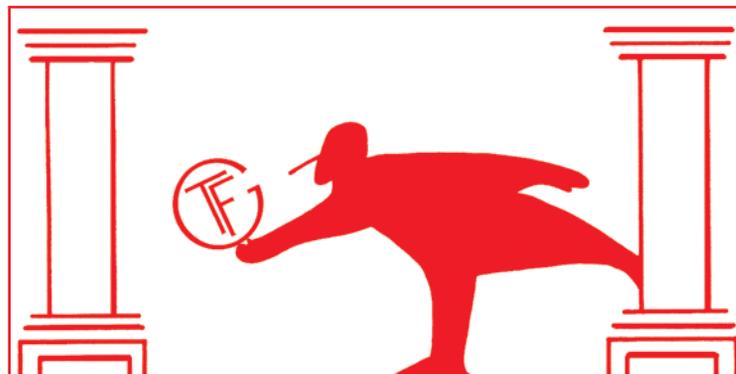
Printed on Anthem Plus, a FSC® certified paper

TIMBER FRAMING (ISSN 1061-9860) is published quarterly by the Timber Framers Guild, PO Box 60, Becket, MA 01223. Subscription \$45 annually or by membership in the Guild. Periodicals postage paid at Becket, MA, and additional mailing offices. POSTMASTER: Send address changes to Timber Framers Guild, PO Box 60, Becket, MA 01223.

TIMBER FRAMING, Journal of the Timber Framers Guild, appears in March, June, September and December. The journal is written by its readers and pays for interesting articles by experienced and novice writers alike.



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Notes & Comment

The TFG-TFBC Merger, A Virtual Roundtable

[A merger between the Timber Framers Guild and the Timber Frame Business Council, which had split off from the Guild in 1995 to pursue a commercial agenda, was approved on April 29 by the memberships of both the Business Council and the Guild. The Guild already subsumes three councils, the Timber Frame Engineering Council, the Apprenticeship Training Committee, and the Traditional Timberframe Research and Advisory Group. Revised Guild bylaws preserve the Guild as a 501(c)(3) educational nonprofit; incorporate the Business Council as a fourth council within the Guild; specify a Guild board of twelve (rather than the previous nine); and provide for any of the Guild constituencies to do business as a 501(c)(6) commercial nonprofit through a new subsidiary called the Timber Framing Network Center. Below, some history and commentary by those who negotiated the merger, and further commentary from Guild officers. —Ed.]

Mack Magee: They say a good idea has a thousand authors. In this case, although there might not be a thousand authors, many people suggested that the Timber Frame Business Council rejoin the Guild after a separation of 20 years, to improve the effectiveness of both organizations.

After the annual face-to-face meeting of the Guild board in February 2014, it was clear to us that we needed to develop a business model that did not rely solely on current member dues. We had agreed to raise the dues, but we could not raise them high enough to support the office manager, our periodical publications (the monthly newsletter *Scantlings*, the quarterly *Timber Framing* and the annual Membership Directory) and an executive director. We also needed an operational cushion for dips in income or overruns on projects, conferences and other Guild efforts.

As the Guild's liaison to the Business Council, I was aware that it was funding the latter's executive director Pam Hinton but otherwise starved of funds for any significant program beyond those which she could execute herself. Our calculus was that by reuniting Guild and Council, company memberships could generate consistent long-term funding for roughly half to two-thirds the cost of an executive director for both organizations. The balance of funds that the Business Council might bring in could be used for actual programming to advance its mission. After several conversations, Business Council president Paul Freeman and I proposed to our

respective boards that we establish a committee made up from both boards to explore whether and how to rejoin the two groups.

As the director responsible for community-building, I was also interested to find a way to engage businesses in Guild efforts to promote the Guild community and its education mission, by helping communities around the continent and the world build public-use timber frames. People assembling from all over North America to build something for a local community is catnip for local and regional media. Timber frame businesses do project delivery well, and they stand to benefit from a broader knowledge of our craft and industry.

Additionally, the Apprenticeship Training Program is a Guild effort that presumably benefits businesses. Of course, businesses are involved, but not to the extent that they could be. Apprenticeship programs are supported all over this country by associations of business contractors so that the cost of educating potential craftspeople is shared by the industry. That there is relatively little support for our own program is an opportunity for greater Guild engagement by businesses.

Paul Freeman: The first time we discussed this was in a joint board meeting at Burlington 2013. Pam Hinton, Amy Good and Bob Best were there along with Al Wallace, Gabel Holder, Andy Roeper, Jonathan Orpin, Mike Beganyi and a number of others. Amy, Business Council president at the time, put out a feeler to Guild president John Miller later that year and then Mack called me in February 2014 to consider ways to share administrative costs. We decided to put together an exploratory committee to brainstorm ideas and then analyze and eliminate. It didn't take long to recognize that the more difficult task but greater overall good would be to consider merging the organizations.

Jonathan Orpin: I remember all of us wondering how we could serve timber framing better, how to do a better job than the difficult ride of the previous few years. When I was asked to come back on the Guild board for an interim appointment sometime in early 2014, it was primarily to help with this effort. I shared the feeling that there were too many fractures, disconnects and inefficiencies. The word *community* was bandied about with honest fervor.

By the time the Manchester 2014 conference rolled around in August, the original idea of shared resources and efficient use of funds had morphed into the idea of one organization to share the interests and benefits of our craft cross-culturally, so to speak, among all the groups practicing timber framing. We imagined one hand with five fingers, or one organization with five constituency groups—craft, commerce, engineering, tradition and apprenticeship. It seemed clear that these groups were already interlinked in a thousand ways. At the members meeting there was broad support for the initiative, with my favorite comment offered by Marcus Brandt: “Hey, isn't there any way we could roll up this cooperation and bring it down to Washington?”

Paul: We had called the Burlington 2013 meeting in August to include the Guild, the Business Council, the Timber Frame Engineering Council, the Traditional Timberframing Research and Advisory Group, and the Apprenticeship Training Committee. We formed the task force in April 2014—Bob Best, Gabel Holder, Mack Magee, Jonathan Orpin, Stephen Morrison and myself. We called ourselves the Rose Committee (Review of Operations for Structural Effectiveness).

We brainstormed at the end of the month and met a week later for evaluation and analysis, setting a goal for task-force consensus in July, in time for an announcement at the 2014 conference. The

Guild was committed to accepting company memberships as a means to resolve recent revenue deficiencies. Over the next few weeks the Business Council evaluated its options, including to continue independently but now in competition with the Guild (ourselves!), to merge with another organization, or to rejoin the Guild. Consensus opinion drifted. But it became clear that we had to rejoin. In our limited negotiating position we checked our enthusiasm and delivered a list of Assurances (as we titled them) that if not met would hamstring our mission.

At a Rose meeting on June 11, it was agreed, in a watershed moment, that multiple directors from the Business Council board would be on the first merged Guild board. By June 19 the Business Council board was predominantly in favor, contingent upon acceptance of the Assurances and the constitution of the merged board.

On June 27 we agreed to a final version of the Rose proposal including the Assurances required by the Business Council, and it was submitted for approval to both boards. Shortly after, the two boards met at the Manchester 2014 conference and formed the Development Committee and a slew of subcommittees. We all rolled up our sleeves and got to work while Jonathan went on a multiweek vacation!

Jonathan: Guilty as charged.

[Mack Magee's response was to pose 12 questions about the merger, (printed below in italics), which were answered in succession by Stephen Morrison (SM) and Paul Freeman (PF) of the Rose Committee.—Ed.]

SM: In thinking about Mack's 12 questions, every one of them brought me back to the same place and the same conclusions: it's all about the community and the teamwork. We are too small a community and industry to do anything but work together. We all differ in background and in details, but in the big picture we are all the same and stand to gain much more as a cohesive group. Ultimately, that is the message we need. It is the feeling we all walk away with at the end of a Guild project or conference. I have more to say but it starts to get mushy.

PF: Stephen has great answers to Mack's questions, and I have added my own answers. The Business Council is the Guild and the Guild is the Business Council, we are the same people. I frequently pictured Ed [the late Ed Levin] smiling benevolently in the back of the room and quoting one of his favorite philosophers, Pogo: “We have met the enemy and he is us.”

1. What is the Business Council mission now that it is part of the Guild? Is it the same or will it adapt?

SM: The Business Council's mission is to expand the demand for timber framing. I would say that it stays the same but will evolve as needed. A lot of discussion led us to that mission. The Business Council wants to grow the industry so that we grow opportunities for our member businesses (or at least have more diverse opportunities, as many of our members do not want to grow their business). In talking to members we found that they mostly saw membership dues as part of their marketing budget. We also need to continue to provide business support to our members. I think that the Business Council mission also strongly supports the craft and the Guild mission. Most of us agree that without strong businesses, there is little opportunity for the professional craftspeople.

PF: Same, but as the organization is freed from administrative and membership renewal efforts we will better be able to grow our business, educational and support services. We should continue

the conference business track and business boot camps. Curriculum should include workshops on OSHA compliance and safety procedures as well as accounting, job estimating, forecasting and budgeting, workers compensation, labor laws, insurance, bidding on commercial work, and so on.

2. *Are there two missions?*

SM: I think the two have specialized missions, but ultimately they are very close.

PF: There are as many missions as there are constituencies, all supporting the overall mission of the Guild.

3. *What, if anything, changes in the way the Guild goes about pursuing those missions?*

SM: I think this will depend on the evolving leadership of the Business Council and the feedback from membership. Many programs will continue—website development, AIA programs, business track at the conferences, etc.—but we also need fresh ideas and enthusiasm. The Business Council has in the past spent a lot of time and energy worrying about money and membership. I hope that now we focus primarily on program development and teamwork with the rest of our groups in an effort to serve all.

PF: I think the biggest change is that rather than having an executive director budgetarily limited to office and administrative functions, our shared director will be able to travel to home shows, conferences and projects promoting timber framing and timber frame companies.

4. *How are the financial and human resources leveraged?*

SM: Sharing administrative costs and not duplicating work will leverage financial resources. One executive director for all constituency groups will promote teamwork on all fronts: using Business Council members to help with project planning and implementation, for example, or conference planning or promoting the Apprenticeship Training Program. Having board members involved in multiple groups will keep everyone apprised of what is going on in other groups and keep us all going in a similar direction.

PF: The Rose Committee proposal and the Development Committee agreed that a percentage of each Business Council member's dues be assigned by the Guild board to the Business Council budget. The balance will be used in the general Guild operating budget to support the executive director and administrative assistance required to run the Business Council. It was felt this was the best way to motivate efforts to grow membership and to be sure that the Business Council would continue to get the significant administrative support necessary to execute its mission.

5. *How can these resources be brought to bear on mutual Guild and Business Council goals such as the Apprenticeship Training Program and projects? In other words, how can the Business Council work to support the Guild's mission as it supports its own mission?*

SM: Again, our goals, wants and needs are too intermingled to be separated. If the Business Council can find ways to support and grow the Apprenticeship Training Program, then our businesses will benefit from access to more talented and trained craftspeople. The craft and business issue is a bit of a chicken-and-egg question. Of course it all takes creative brainstorming to find the right ways for us to work together, but no doubt the merger is the first great step.

PF: Some of the ideas floated around during our exploration of the benefits of the merger were suggestions like marketing apprentices to the business community, or participating in projects with simultaneous consumer demonstrations, and builder and

AIA presentations. Projects are a great opportunity to educate and demonstrate what timber framing is.

6. *How can and should the Business Council use its new status to become more representative of the businesses and the people who support the industry—the community, the craftspeople and the craft of timber framing?*

SM: Hopefully the merger will bring us together in such a way that more small businesses will see the benefit of growing and strengthening the Business Council. The more it can grow, the more it can be truly representative. There are definitely some barriers and attitudes to overcome here.

PF: There was resistance to the appearance of the Business Council being absorbed by the Guild. But Jeff Arvin [the newly appointed Guild executive director] and the current Guild board are committed to the relevance and importance of the Business Council's work. If anything, the Business Council's status is elevated. As companies better understand the Business Council mission and Business Council services become more robust, I anticipate significant growth in membership and programming.

7. *Given that many professional members of the Guild work for their own or other small businesses, why should those businesses that are not currently members of the Business Council now reconsider being part of this new council?*

SM: They can easily ride on the coattails of others, but the more we can encourage them to join and be active, the more we can fulfill the missions.

PF: I think they will be more open-minded to the Business Council work as it has now been embraced and supported by the Guild. The revised organization is better situated to support and expand Business Council services, and as these small businesses understand how their business will benefit from membership they will join up.

8. *Why should Guild members not worry that the Guild's mission will be subsumed to the Business Council's mission? Or, vice versa?*

SM: There just has to be some trust here. Also, involvement. If no craftspeople want to run for the boards and join committees, then the Guild will slide in the direction of businesses. It takes involvement. If all you do is pay your dues and occasionally read *Scantlings*, then you won't get much out of any of it anyway! You have to go to projects, conferences, regional meetings and be a part of it.

PF: Because the Business Council is quite small at this point. However, if the merged organization is successful, then financial support of the Guild will increase from the Business Council and the Visionary Partners program [company sponsorships of the Guild in exchange for web advertising and other benefits]. I would expect the influence of business will start to become an increasing concern. However, if members remain informed, proactive and involved in governance, they can play a role in controlling the influence of business and money on the Guild.

9. *How do company members know that their contributed funds will be used to pursue the Business Council's mission and not just to support the Guild's mission?*

SM: Again, the missions are very intertwined. But I suppose this matter is primarily in the executive director's hands, subject to careful documentation and bookkeeping. I'm not opposed to the sharing of some funds when the use is mutually beneficial.

PF: This is addressed in question 4.

10. *How do company members know that their voices will be heard and that their own council will remain viable in pursuing pre-merger Business Council objectives?*

SM: By paying their dues. Payment of dues to the new Business Council will be the strongest vote you can cast in support of the Business Council mission.

PF: The nominating committee has been charged with maintaining at least three Business Council directors on the Guild board by making sure that strong candidates stand for election. In addition, it's clear to most professionals in the Guild that strong businesses support strong craftspeople and vice versa.

11. Company members will be bringing in a substantial percentage of Guild income. Will the Business Council have a seat at the table in how the Guild is managed?

SM: The Business Council should have strong representation on the Guild board. I believe that part of the governance manual will suggest representation of all constituency groups on the Guild board whenever possible. We suggested a minimum of three Business Council members, I believe.

PF: Yes, see question 10.

12. How do differences between the Business Council and the Guild's board of directors get resolved?

SM: Fist-fighting, arm-wrestling, axe-throwing, joint-busting, spitting contest, beauty contest, duel. I'm sure we will find good ways to resolve disputes.

PF: Communication and strong leadership. We will be serving on the same board and the executive director has been charged with growing the Business Council by spending significant time traveling and promoting timber framing and membership in the council by timber framers and vendors.

Commentary

John Miller: As retiring Guild president, a former president of the Business Council, a member of the Engineering Council and a participating Journeyworker in the Apprenticeship Training Program, I am intimately familiar with the overlapping areas of interest shared among the constituent groups in our community. I don't think I am unique in having interests in all these areas. My responsibilities to the Guild are specifically to protect the long-term interests of membership and ensure that we effectively act on our mission of education. While I take no credit for either initiating the merger or bringing it to fruition, I am pleased to see us all working together again. I have long thought that our community would be best served by this kind of arrangement. It is clear from the results of the voting that this feeling is shared by most members. It has taken the work of a dedicated and committed few to make it so. I felt that my role in the process was to hold the Guild's interests in the front of my mind and make sure that those actually doing the work of negotiating and drafting agreements always heard what I believed was best for the Guild. They listened, and not only to me but to many others. I think we have created a framework that will allow the Guild to do more going forward—more community outreach, more trade education, more historical research and more promotion of the craft to the public at large. I am proud of what we have accomplished and optimistic that the future holds good things for a new and revitalized Guild.

Brenda Baker: This past year serving as executive director of the Guild gave me a unique perspective. This time, as well as time spent on both Guild board and Business Council boards in the past, has allowed me to experience firsthand the dedication that

members of both the Guild and the Business Council feel toward timber framing and the organizations they care so much about. The last few years have been unusual. After a considerable string of successful years of increasing membership, well-attended events and expanding bank accounts, both organizations came upon challenging times and faced decisions on how best to continue their purposes. There is no doubt that the Great Recession had a major impact. Almost all nonprofits were affected during recent years.

The Guild and the Business Council share many of the same members, even if Guild members must be individuals and Business Council members companies. But we also share many of the same goals and aspirations. We all want to "increase the demand for timber framing" and be the educational group that "serves as a general center of timber framing information for the professional and general public alike." These are the missions of the Business Council and the Guild, respectively.

Coming together under one umbrella may actually achieve more than if we continue as separate organizations. I personally think that the merger will allow those dedicated to preserving the craft of timber framing and those committed to growing the business of timber framing the chance to collaborate and work together more than ever.

Jonathan Orpin: I felt it important to compile the thoughts of others who worked on the merger and asked colleagues for the preceding discussion and commentary. Communicating isn't easy, and we need to communicate better. Over two years, founding Guild member Joel McCarty was terminated as executive director, to the consternation of many; professional outsiders were hired as administrators, to complete disaster and costly embarrassment; board members resigned, citing burnout; relationships were strained to breaking; and membership plummeted from 1500 to under 900. I wasn't on the board then. It must have been very difficult for everyone. But recently I had the pleasure of viewing *Raise the Roof*, the remarkable film about Rick and Laura Brown's sustained 10-year effort to reproduce the incomparable polychrome ceiling of an 18th-century Polish synagogue, inside correct period roof and short-wall framing. The working drawings were produced from archival images by Guild designers and the timber and log work was executed by Guild members and an international crew. The project is now a permanent centerpiece exhibition in a new major museum in Warsaw. It developed and unfolded in a model collaboration of extraordinary effort and skill. In watching the film, I was renewed and inspired, as I have been so many times over the last 30 years, by the work of the Timber Framers Guild.

The merger now has been consummated, with around half of our current members voting and more than nine-tenths of those votes positive. Perhaps there's some deeper understanding of the whys and hows to be found in the preceding discussion. But the concerns, goals and visions of each of our constituency councils must now be focused, heard and, by golly, achieved. We can do this, as well as or better than we ever have.



Musée Gadagne, Lyon

1 Carpenter *compagnon* from Lyon, 1843, with dog at feet holding his bag, symbol of Tour de France journey, colors atop his hat and carrying cane decorated with ribbons wrapped around seven times. Above him in centerpiece, a stylized carpentry masterpiece with vignettes of patron saint Joseph with Jesus and, at top, Solomon directing construction of temple. Surrounding images depict stages of journey and key components of *compagnonnage*. Spiral staircases rise punctuated by cities along Tour de France. Cherubs above staircase domes respectively wield, from left, adz, axe, *bisaiguë* (twibil) and dividers. Classical figures symbolizing Love, Architecture, Truth, Wisdom, Fame and Justice border scene. Letters representing *compagnon* values appear throughout, in particular U.V. and G.T. at the top, for *Union, Valeur, Génie, Travail*, or Unity, Bravery, Genius, Work.

Symbolism and Ritual in *Compagnonnage*

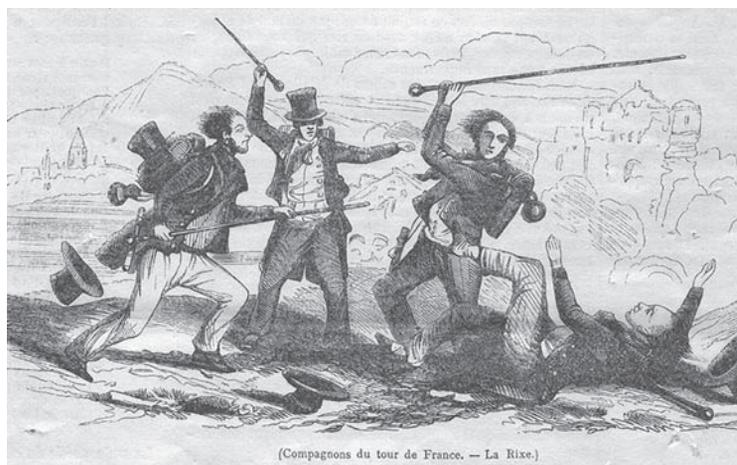
C*ompagnonnage* is a French tradition of craftsmanship with roots in the Middle Ages, drawing inspiration from even earlier. Written evidence of the tradition dates back to the 13th century, but we do not know how long before then it actually began. Origin myths take it back to King Solomon's temple in the Old Testament. In 2010, *compagnonnage* as an organized culture for transmitting knowledge in the trades was inscribed on UNESCO's Intangible Cultural Heritage list. A *compagnon* must complete a lengthy and rigorous training process grounded in the longstanding traditions of *compagnonnage*. Today, there are about 45,000 *compagnons*, in a wide range of trades, but membership and popularity have fluctuated over the centuries as *compagnonnage* has fallen in and out of favor with church and government in France. The endurance of the organization and practice of *compagnonnage* despite significant adversity and a drastically changing environment for the trades may rest on its many rituals and symbols, which create a strong sense of continuity, identity and pride in membership (Fig. 1).

Historically, *compagnonnage* has consisted of several different organizations or communities, shifting and merging over the centuries, reflecting both internal and external politics. The current organizations, in order from largest to smallest, are L'Association Ouvrière des Compagnons du Devoir du Tour de France (AOCDTF), La Fédération Compagnonnique des Métiers du Bâtiment (FCMB), and L'Union Compagnonnique des Devoirs Unis (UCDDU).

The Association, Fédération and Union each has its own set of traditions, trades and cities included on its training circuit, called the *Tour de France*. The AOCDTF, established in 1941, comprises five countries, 45 cities, and 25 trades. Since 2004, it has been the only major organization to permit women *compagnons*. The FCMB, established in 1953, is made up of five autonomous societies each of which has its own tour. Twenty-one cities and 13 trades are included in the tours of the Fédération. The UCDDU is the oldest of the three main organizations, founded in 1889 by Lucien Blanc, a *compagnon* who wanted to unite members of the three existing groups of Solomon, Maître Jacques, and Père Soubise followers (see page 8). In contrast to the other two organizations and in keeping with its spirit of reconciliation, many UCDDU ceremonies are relatively uniform across its roughly 100 trades.

Each group has different symbols and rituals, but in most cases they are variations on common themes. Additionally, the different trades within each group often have unique practices. The symbolism in rituals of *compagnonnage* may hark back to biblical origin myths, but often the rituals themselves were developed or elaborated upon in the 18th and 19th centuries.

The evolution of *compagnonnage*, significantly influenced by historical events and political climates, has required adaptation to reflect the times. In earlier days of the tradition, the French Catholic church looked on the rituals with suspicion, which drove many of the practices into secrecy and fueled claims that the groups were blasphemous and immoral. In 1655, Church officials at the Sorbonne went so far as to pronounce a resolution generally condemning *compagnonnage* of several trades, including shoemakers, tailors and saddlemakers. As a result, some branches created alliances with the Church and evolved to incorporate



2 Compagnons brawl with canes, 1845 engraving. Canes have deep significance in *compagnon* lore.

Christian virtues more prominently in their practice. This practice was seen most with the shoemakers and gradually undermined their identity as a *compagnonnage*, until it was revived centuries later (Truant 1994, 68–78). Religious differences among *compagnons* themselves also resulted in internal divisions in organizations and contributed to the multitude of variations that we see today throughout the rituals of the different sects. Ultimately, however, opposition to *compagnons* in the 17th century only served to unite the myriad groups and strengthen their collective identity and power before they began to grow apart again in the 18th and 19th centuries.

Additionally, French regimes disapproved of the *compagnons*, who became strong enough in organization and number to demand payment commensurate with their high level of skill. The *compagnons* of the 16th and 17th centuries laid the groundwork for labor unions (and organized rebellion such as strikes), which remain powerful in France today. As distinct from the theory of trade guilds, however, the theory of *compagnonnage* was to elevate the work and trade itself over the practitioner or the employer, striking a balance between strength in unity and individual virtue.

In the late 18th century, the French Revolution once again put the *compagnons* under criticism by the government. In 1791, the Chapelier Law, in an absolutist spirit of free enterprise, prohibited guilds (business associations by trade) and workers associations such as the *Compagnons du Tour de France*, and *compagnonnage* once again had to adapt. The Chapelier Law was repealed in 1864. By the mid-19th century, when Agricol Perdiguier (1805–75) wrote his book *Livre du compagnonnage*, which describes the practices of the adherents of the *Tour de France* group, they had a reputation for being a rowdy bunch with a tendency to confront and fight one other (Fig. 2).

Observing its declining popularity and sensing an unsure future, prominent *compagnons* such as Perdiguier sought to preserve the culture and rituals of *compagnonnage* while minimizing altercations and rivalries. Gradually, exclusivity and rivalry between organizations and trades became less pronounced. In the midst of the broader folklore movement of the later 19th century, ceremonies and traditions that had been shrouded in secrecy were shared more openly. *Compagnon* apparel, especially their

earrings, became less specialized by trade, tacitly signifying a shift away from the pronounced divisions that had become so dominant.

Advances in technology, transportation and labor practices that accompanied 19th-century industrialization and then the First World War further challenged *compagnons* to adapt to a changing world. During World War II, perceived as Freemasons, they were persecuted by Nazis in occupied France. A deal was struck with the Vichy government to avoid this persecution, which after the war was often negatively interpreted as collaboration. A major reorganization of the *Compagnons du Tour de France* took place in 1945, resulting in the groups as they exist for the most part today. Women have been allowed to enter the AOCDTF only in the past decade, and they are still not permitted in the FCMB and the OCDDU, although the latter are reevaluating their position. Some marginal groups have included women since the 1970s and there is a movement to establish a separate group just for women.

One of the biggest threats to *compagnonnage* today is the perception that it is stuck in the past, but in practice the training program consciously adapts to stay relevant and continue to train craftspeople who excel at their trade. For example, contemporary methods using computer technology are included alongside the traditional methods. Despite (or indeed partly because of) this long history of change and adversity, many core values and rituals of *compagnonnage* endure as integral parts of its identity today.

Becoming a *compagnon* has several stages, each with special ceremonies and rites of passage. A prospective *compagnon* must first qualify to be accepted as an apprentice, or *aspirant*. After several years of training and traveling to work all over France, the *Tour de France* (and nowadays the world), an *aspirant* completes a masterpiece, or *travail de réception*, in order to be received as a *compagnon*. For carpenters, this reception takes place March 19 every year at the Saint-Joseph ceremony. Three years after reception, a *compagnon* becomes a *sédentaire* (meaning he is no longer on the tour). This whole process can take three to ten years, depending on the trade, including the tour. After more experience, hard work and accomplishment, a *compagnon* who emerges as a leader in a trade may become a *maître compagnon*.

TO understand much of the symbolism embedded in *compagnonnage*, one must be familiar with the elements of the origin stories. *Compagnon* legend has it that when King Solomon constructed his famous temple between 1014 and 930 BCE, to manage the immense project he appointed a builder named Hiram who had two assistants, Maître Jacques (St. James), in charge of stonemasons, and Père Soubise, who directed the carpenters. Because some workers were much more skilled than others, Hiram devised a system for the more accomplished craftsmen to be appropriately compensated. In an underground room below the temple, he gave them a secret password to distinguish themselves when being paid. Three apprentices (sometimes called Holem, Sterkin and Hoterfut), jealous because they were not included in this initiation, attacked and killed Hiram. They buried his body, his clothing and his cane. His body was later found by nine of his companions (thus *compagnons*) because of the acacia tree that had taken root and grown above his tomb. (Other story versions exist.) Maître Jacques and Père Soubise went on to have followers of their own. Maître Jacques was killed by one of Père Soubise's followers and buried at Sainte-Baume, which has become a pilgrimage site within the *Tour de France*.

Other biblical and Christian figures are woven into

compagnonnage ceremonies, symbols and rituals. Mary Magdalene is often portrayed (praying in the cave at Sainte-Baume), as is Joseph, patron saint of carpenters. Certain symbols represent virtues held dear to the various associations and the institution in general—particularly the seven *compagnon* virtues of faith, honesty, brotherhood, courage, generosity, discipline and patience.

Three objects laden with symbolism and closely linked to the rituals of *compagnonnage* are *la canne* (the cane or walking staff), *les couleurs* (the colors), and *les joints* (the earrings).

Nicolas Adell-Gombert, an ethnologist who has studied *compagnonnage* extensively, places these accessories of a *compagnon* on a spectrum of the sacred and the informative. The cane recalls Hiram and shows the *compagnon's* name, status, trade and affiliation. It is used ceremonially but also practically during the *Tour de France* itself. It is both a public display and a personal belonging close to the *compagnon's* heart, its top end literally at that height. Even more detailed than the staff are the colors, worn in varying manners and stamped with symbols which often track the progress of journeying *compagnons* through their tour. The fashion in which they are worn, combined with the colors and decorations displayed, immediately communicate the trade and affiliation of a *compagnon* to those who know how to interpret them. When not in use, they are stored carefully in a tin box. Adell-Gombert argues that the earrings are the most sacred of a *compagnon's* items, since they are in fact joined with his body and are worn always, not just on occasion. “They are the body of the trade in the body of the individual” (Adell-Gombert 2004, 117).

La canne. The walking staff (Fig. 3), universal symbol of a journey or pilgrimage, appeared in *compagnonnage* at the beginning of the 19th century and signifies the upright path of the *compagnon*. Obviously, the staff was more vital when aspiring *compagnons* walked from city to city, rather than taking the train or bus as they are more likely to do today. An *aspirant* or *compagnon* used to be recognized by his staff, propped on his shoulder with his belongings tied to it in a bundle called the *malle à quatre nœuds* (trunk with four knots). During the 19th century, it was not uncommon for the staff to be used as a weapon in fights against *compagnons* from other organizations and trades as they encountered one another on their travels, which contributed to the *compagnons'* brutish reputation at the time. It was, in fact, considered an accomplishment to take another journeyman's staff from him in a fight. Finally, the staffs are an important part of ceremonial functions. According to the blog *La Rose Couverte*, there are 13 specific manners of holding the cane.

There are also special staffs that belong to the *rôleur* (or *rouleur*), who serves as the master of ceremonies and keeper of customs in *compagnon* lodging houses. Apprentices stay in such lodges in the different cities where they go to complete their tours. Each house has a “mother” who oversees it, strict rules for work hours, eating (they dress for dinner), and so on, and traditional customs such as singing (see TF 97). The *rôleur's* staff is twisted and decorated with ribbons of many colors.

Aspirants receive short, strong staffs made of ash, and then when they become *compagnons* they upgrade to a tall, thin staff made of rattan, or Malacca cane, that reaches to the height of the heart, about 1 to 1.4m (Fig. 3). Malacca cane, originally from Malysia and difficult to find and rarely used now, was chosen because it is a strong, straight and flexible material that mimics Maître Jacques's and Hiram's canes of legend. The properties of the materials are considered symbolic of the virtues of the *compagnon* journeyman.



Musée du Compagnonnage, Tours

3 Blacksmith-farrier companion portrayed in formal attire with sash and decorated cane, Paris, ca. 1900.



Compagnonnage.info

4 Pommel, 1846, engraved with tools of marine carpenter.



Musée du Compagnonnage, Tours

5 Above right, carpenters' colors. Sashes show, from top, inverted pyramid, canes crossing in front of wineskin, collapsing Tower of Babel, canes crossing with wineskin and walking dog, and labyrinth.

6 At right, array of embroidered sashes.



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Each staff has an iron or brass-clad tip, possibly reminiscent of the lances of the Knights Templar. At the top of the staff is a prominent pommel. Whether or not decorated, it is made of horn, brass, steel, silver, wood or an ivory substitute, depending on the rite of the compagnon's community. Materials and colors used are also symbolic—for example, ivory is used by stonemasons, plasterers and bakers to represent the white colors of stone and flour. The staff of a stonemason *compagnon passant* (a name used to distinguish sects of compagnons, also an individual status title) is made up of a solid ivory pommel with a golden rope. Pommels in general may be hexagonal, octagonal or round, but are usually marked with a brass, silver or ivory disc engraved with the name, initials, trade and rite of its owner along with the date and the city where it was issued, symbolic letters, and the square and dividers accompanied by a tool representing the appropriate trade (Fig. 4).

Today, compagnon canes are made from materials other than the traditional Malacca and tusk ivory (a plant-based substitute is now used). Canes are decorated with two acorns or pompons whose colors and material depend on the trade and the organization. A rope with the acorns is threaded through two holes in the cane and wrapped around the cane seven times, to indicate the seven virtues. One version of a legend explains the presence of the three distinct parts of the cane: the pommel as the symbol of the mallet with which Holem struck Hiram, the shaft as the straightedge that Sterkin used likewise and the iron-clad end as the chisel that Hoterfut used to kill him.

Les couleurs. The colors (Figs. 5–7), an important part of the ceremonial garb of compagnons put on at the time of reception, are silk sashes, ribbons or stoles that, through color, embroidery and branded symbols (*les frappes*) communicate the role, rank, trade and affiliation of a compagnon. Their use as a distinction between groups of compagnons may date back as far as the Middle Ages, and their form and the manner of wearing them have evolved over time. Evidence of an early version of the colors of the stonemasons can be found in 13th-century stained glass windows in Chartres and Bourges, which depict masons wearing bands of leaves or flowers. Later illuminations from the 15th century show carpenters and stonecutters wearing simple bands of ribbons

around their heads (see Fig. 9). Since then, the colors have become more complex, with multiple ribbons from 1 to 1.5m long by 6 to 10cm wide. They can be silk, velvet or moiré, embroidered with gold and silver.

According to the 19th-century account of Agricol Perdiguiet, roofers, carpenters and stonemasons wore ribbons decorated with floral embroidery on their hats. Roofers let them fall onto their backs, carpenters put them over their left shoulder and stonemasons put them slightly higher over their left shoulder. It has been suggested that there was a correlation between men working up high on buildings and wearing their colors on their heads (Perdiguiet 1839, 151–52). Jean Connay has a more likely explanation, that colors were worn based on how long a trade had been part of the compagnonnage: stonemasons, the original compagnons, wore them on top of their hats, carpenters wore them three centimeters lower, followed by stone carvers in front of the left shoulder, roofers from the left shoulder hanging down the back, joiners and locksmiths from a boutonnière on the left, and so on (Connay 1909, 95).

Non-French stonemasons wore flowered ribbons of all colors around their necks, falling on their chests. The dyers (*teinturiers*) wore scarlet belts. Joiners and locksmiths of the Devoir de Liberté wore blue and white ribbons attached on their left side. Joiners, locksmiths, and almost everyone else had red, green and white as their primary colors and gathered more as they traveled. They wore them all on the left side attached to a boutonniere, even those who wore their primary colors on their hat or around the neck. Additional colors were worn when a compagnon was in mourning.

In its description of compagnon carpenter Gaston Courtois, who began his apprenticeship in 1898, the blog *Du côté de chez nous* explains that the white is embroidered with symbols and represents the purity of Hiram. The red represents the blood spilled for him, and the green represents the acacia from his tomb. Today, in the AOCDFE, the colors primarily signify trades. Woodworking trades wear blue, leatherworking trades green; electricians, plumbers, and mechanics wear red; bakers, masons, and roofers wear beige; and stonecarvers wear white. The ribbon



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www.folkcollection.com

7 Dauphiné la Fidélité, compagnon passant, by Leclair (ca. 1820). Compagnon carpenter from Dauphiné region, beribboned cane in hand, colors flying from hat, leaves for tour, with small dog in motion representing journey. Suspended above, St. Joseph, patron saint of carpentry, and symbolic letters U.V.G.T. as seen also in Fig. 1. Tools of trade tied to columns represent entry to Solomon's Temple. Note plumb bob on lower lefthand column, plumb level on top righthand. Landmark towers of tour cities rise in background. Illustrations symbolically depicting compagnon's journey were common 19th-century souvenirs of tour, especially for members of group La Société des Compagnons Charpentier Passants Bons Drilles du Devoir. *Bondrille* roughly means "good fellow."

8 Earrings of compagnon carpenter, gold with compass blazon, ca. 1838. Blazon would hang from one ring.

decorations include the initials of compagnons, specific ornaments like woven floral motifs for the stonemasons, or imprinted symbols showing the progressive compagnonnage training process. In some groups, a person adopted as an aspirant receives the colors branded with the marks of that trade and images of a labyrinth and the Tower of Babel. The labyrinth (originating in Minoan Crete) represents the slow internal journey toward professional and moral perfection. The Tower of Babel is depicted crumbling, and represents both the early achievements that foster pride and the danger of vanity, since the tower collapsed before it was ever finished. When aspirants are received as compagnons, their colors are branded with a pyramid, a temple, a tomb and a cathedral. The pyramid symbolizes the perfection and mystery in building, the temple represents Solomon's temple and a meeting place, the tomb shows death and the great works that must proceed it during life, and the cathedral shows fertility, sacrifice, built perfection, the union between heaven and earth, the union of hand and mind. In the AOCDFE, the symbols include Mary Magdalene, the tomb, the pyramid, the labyrinth, a walking dog (the compagnon is still on tour), a sitting dog (the compagnon has finished the tour and is now a *sédentaire*), crossing canes, the Tower of Babel collapsing, and Leonardo da Vinci's Vitruvian Man. (In the 19th century, the business of producing the colors as well as the canes was monopolized by a compagnon in Saint-Maximin near Sainte-Baume, named Audebaud and called Le Père des Compagnons du Devoir.) To

remove a compagnon's colors was and is a serious offense. Perdiguer compares the colors of a society to a national flag. Compagnons wear them for formal occasions and are often buried with them or leave them to their association when they die. A traditional compagnon song concludes, "Next to him the rose fades, the rainbow with all its colors shines less brightly than his noble cane" (Fig. 7).

Les joints. "The joints" (Fig. 8) are small hoop earrings worn by compagnons. According to historian Claudette Joannis, quoted by Adell-Gombert, they "tend to melt into the ear," aiming to be almost invisible. They have seven or eight facets—those in the Maître Jacques rite have seven for the seven virtues, and the Père Soubise rite, according to compagnon Patrick Moore, adds an eighth for the "rebirth of becoming a Compagnon." Since the early 20th century, the earrings of a compagnon have been optional dress and left to individual preference. A compagnon who chooses to wear one or both is called a *jointé* and must have the approval of his community to go through the *jointoiment* or *jointoyage* ceremony. They represent a public display of membership in the community of compagnons as well as an individual's commitment to his values (Adell-Gombert, 113).

The earrings have been worn at least since the 19th century, as documented in the autobiographies of several compagnons of the era. At that time, it was common practice to wear an ornament from one ear that depicted a tool of one's trade. Agricol Perdiguer described the different symbols—a square and dividers for



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9 Medieval illumination depicts 'Turks' siege of Rhodes, 1480. Grand Master of Knights Hospitallers receives carpenters and stonemasons, tools in hand, with additional trade tools placed in foreground. Craftsmen leaders wear head ribbons.

carpenters, a horseshoe for metalworkers, a hammer and adze for roofers and a scraper for bakers. The interwoven dividers and square symbol frequently associated with *compagnonnage* (and also with Freemasons, whose origins are in Britain and who have evolved away from active practice of trades) represents precision and righteousness.

In the 19th century, when brawls between *compagnons* of different trades and associations were common, wearing the symbol of a trade or association that was not your own could have violent repercussions. The earrings were made of gold and could serve as insurance against financial emergencies due to illness or even death during a *compagnon's* travels. It has been theorized that the wearing of earrings has some origins with sailors, especially from the Caen region in Normandy, who wore earrings to symbolize a voyage.

In contrast to the practice of the sailors, however, *compagnons* do not receive their hoops until partway through their Tour de France. They are eligible to wear them after the Saint-Pierre ceremony, which usually takes place in June about a year and a half after a *compagnon's* Saint-Joseph ceremony. Adell-Gombert suggests that the earring serves therefore as a symbol of the memory of a *compagnon's* tour after it has taken place. The St.-Pierre ceremony has also been attributed to the practice of giving earrings to freed slaves in antiquity to represent and signal their freedom. When many were bound in servitude, the independence of a *compagnon* and master craftsman was prized.

While the practice of suspending blazons from the earrings (Fig. 8) grew in the 19th century, the earrings have since returned to their simpler form of small symbolic hoops, and the rings no longer distinguish among trades and associations. Fights between *compagnons* of different associations became less frequent in the 20th century when advances in transportation meant they were less likely to encounter each other on the road. As a result, *compagnons* most often interact only with members of their same association and, for the most part, trade. Rather than differentiating among the trades, this shift has also served to create a formal internal distinction between the *jointés* and those who do not wear earrings. Adell-Gombert argues that this differentiation creates an elite group internally, which places more of a focus on the individual and less on the community as a whole.

The rituals and symbols of *compagnonnage* are less elaborate, ornate, secret and prominent today than in the past, but they are still tied to the deep roots of professional and spiritual ethics that it has come to represent over the centuries. The tradition of the Tour de France remains focused on identity and community, intentionally and painstakingly crafted and maintained through these unique objects and the practices associated with them.

—JULIANA GLASSCO

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Medieval Germanic Roof Structures 1

TO illuminate a general path through historical roof evolution in Central Europe, we might select examples from the typological groups set out in Günther Binding's 1991 work *Das Dachwerk auf Kirchen im deutschen Sprachraum vom Mittelalter bis zum 18. Jahrhundert* (Roof Framing of Churches in German-Speaking Areas from the Middle Ages to the 18th Century), and we might augment these examples with some unusual or individual designs. Binding's is the most up-to-date attempt at defining the history of roofs in German-speaking Central Europe from the Middle Ages to the 18th century, and is essential literature for the serious roof frame historian.

It complements Friedrich Ostendorf's 1909 book *Die Geschichte des Dachwerks* (The History of Roof Framing), still considered to be the bible for any roof framing historian in the German-speaking area of Central Europe. Ostendorf managed to record some 270 individual historical wooden roof frame structures (as well as some 70 wooden spires and turrets), the vast majority of which were delineated as well as described, and he mapped out a basic typology for the construction of large and complicated framing, but his building dates were limited to information available before the introduction of dendrochronology. Binding has taken advantage of its arrival to provide us with a good chronology.

My own research into historic timber roof frames started a few years before Binding's book appeared, and stemmed from my postgraduate studies in building archaeology. I had a unique chance to research a large baroque roof, and in 1996 I was able to visit and document 173 historic roof frames in the Austrian province of Styria, many virtually unknown. In 2001, I started building model roof frames with students at Neubrandenburg University of Sciences in Germany. It took 10 years to complete a score of models that represented a general history of Germanic roofs culminating in an exhibition in Neubrandenburg in 2011.

It must be noted that there are other structural solutions than the ones we will discuss, such as the use of low-pitched purlin roofs in the Alps, and that some of our typologies can be found in modern-day Poland, the Czech Republic, Austria, Slovenia, Northern Italy, Eastern Switzerland, and in parts of Eastern and Northern France, Belgium and the Netherlands, the exact boundaries and dates still to be defined, but extending into those areas where German was spoken or German culture exported—which included, much later, North America! In fact German terms such as *liegender Stuhl* and *stehender Stuhl* are well known in parts of North America and have been reported on in this journal (most recently, "Liegenger Roof Style" in TF 108.)

Other authors have called this group of roof designs Germanic. This distinguishes them from roof frames found in the Mediterranean and up into Great Britain based on methods going back to classical antiquity. For the moment this term is a useful device, but will need revising at some point as a more differentiated picture of their evolution emerges.

Germanic roofs seem suddenly to appear on the scene from nowhere, but it is highly likely that the very earliest examples of the style are simply long gone and were not documented. A few 12th-century roofs make up the oldest known Germanic roof frames. These can be found atop the naves of churches and were

large spans in their day, but today are considered small with spans around 30 ft. or smaller. Shallow roof angles and simple triangular frames spread out repetitively along the length of the nave characterize these designs.

A GOOD extant example of this form is the nave roof over the St. Lucius Church in Essen-Werden, North Rhine-Westphalia (N51° 23.551' E007° 00.10'), pictured in Fig. 1.

The church is considered to be the oldest parish church north of the Alps, with construction commencing in the year 995. Other sources suggest that building work began after the middle of the 11th century, even as late as 1080, despite a dedication that took place in the year 1063. Following secularization in 1803, the church was sold and converted into apartments. In the 1950s the building was restored to its original appearance. It was reported that some of the original tie beams were retained but the rafters were replaced. During the restoration work the roof was documented and the basic dimensions recorded.

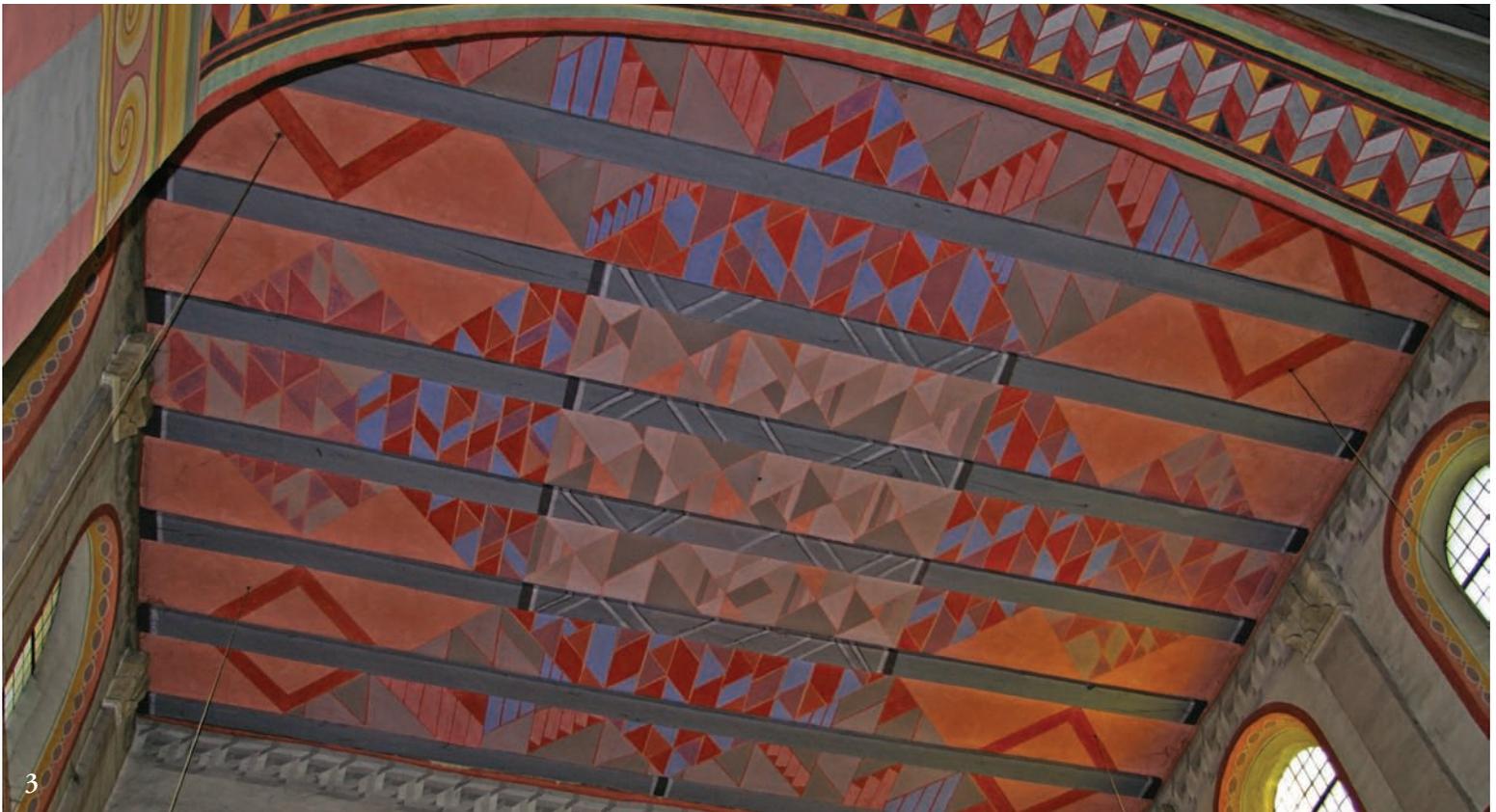
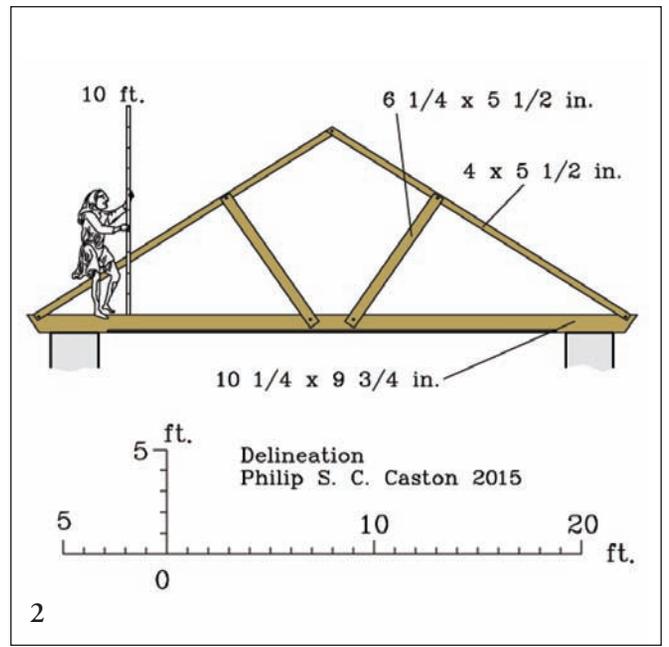
The gable roof is over 60 ft. long, but the shortest free span is just 23 ft. from one nave side wall to the other, well within the limits of a single timber hewn from a medium-sized tree to withstand a noticeable deformation caused by its own weight and a small dead load. The framer chose to use this to his advantage and constructed a simple roof structure, probably in oak, by repeating triangular frames made from tie beams and simple rafter pairs (Fig. 2).

The tie beams, in section about 10x10 in., form part of the ceiling and are decorated in two ways. First, the two underside arrises are chamfered and profiled, with this detail extending the length of each beam and ending just short of the nave side wall. Second, the area between each beam is closed to the roof space by boards slotted into channels. The ceiling was then painted in bright colors, here in a modern interpretation, but based on the remains of the original pigments found on site (Fig. 3).

The beams cantilever out slightly beyond the nave walls and end with a simple "angled back" detail. The roof pitch is formed by two rafters lap-jointed at both ends. These diminutive timbers, at 4x5½ deemed too flimsy to carry the roof load, are supported by counterdiagonals (or raking struts) 6x5½. These connect each rafter at midspan to the tie beam near midspan.

The rafters and raking struts are set to one face of the tie beam. The lap joints reveal that the rafters were fitted first to form a triangle and then the raking struts were applied to complete the flush upper or reference face (Fig. 4). This reflects the cutting and fitting sequence of all the parts on the ground. Probably they were hoisted up individually to the top of the nave walls for reassembly.

Once up at roof level the parts could have been reassembled horizontally on staging, then each frame tipped up and moved into place. An alternative method would have been to attach the rafters and struts in the upright position to tie beams previously hoisted up and planked over to use as a work platform. There is no clear evidence for the use of either method of assembly and possibly even a mixture of the two was employed. The 33-degree roof pitch makes the roof space cramped and the raking struts divide it up even further, suggesting that the roof space had no function other than to support the covering.



Photos and drawings Philip Caston

1 St. Lucius Church, Essen-Werden, North Rhine-Westphalia, Germany, ca. 1100, begun as a simple basilica and modified several times to include aisles and towers. Secularized in 1803, it was used as corn storage, dormitory for French soldiers and, much later, apartments. It returned to church use and assumed its current appearance in 1965.

2 Elevation of St. Lucius truss, with lapped and pegged joints.

3 St. Lucius ceiling reputedly incorporates tie beams over 900 years old. Modern color scheme designed by Egon Stratmann is based on fragments of pigment found in church.

4 Author's partial model of St. Lucius shows simplicity and diminutive size of roof construction. Basic design is still (albeit with plated joints) in use in mass housing today.

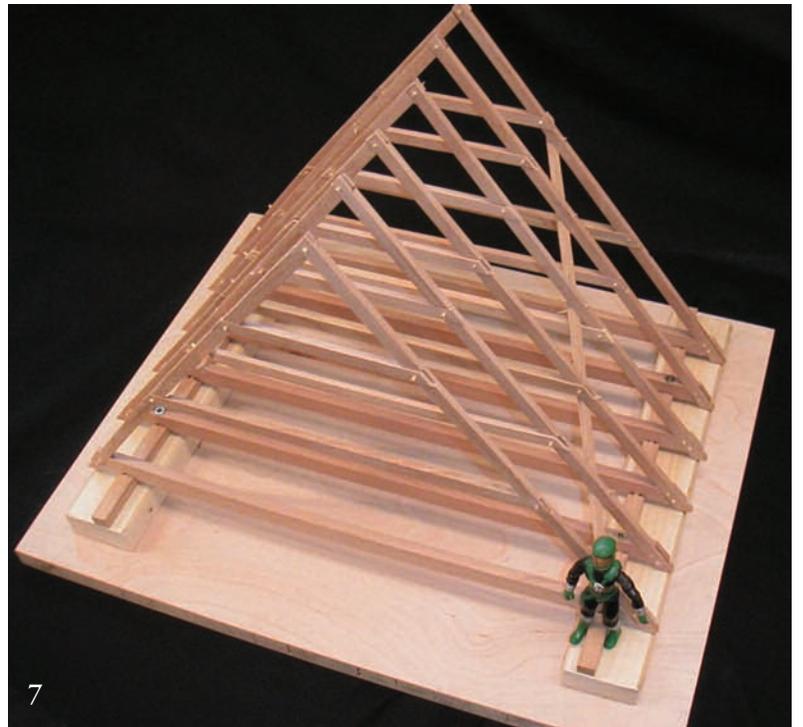




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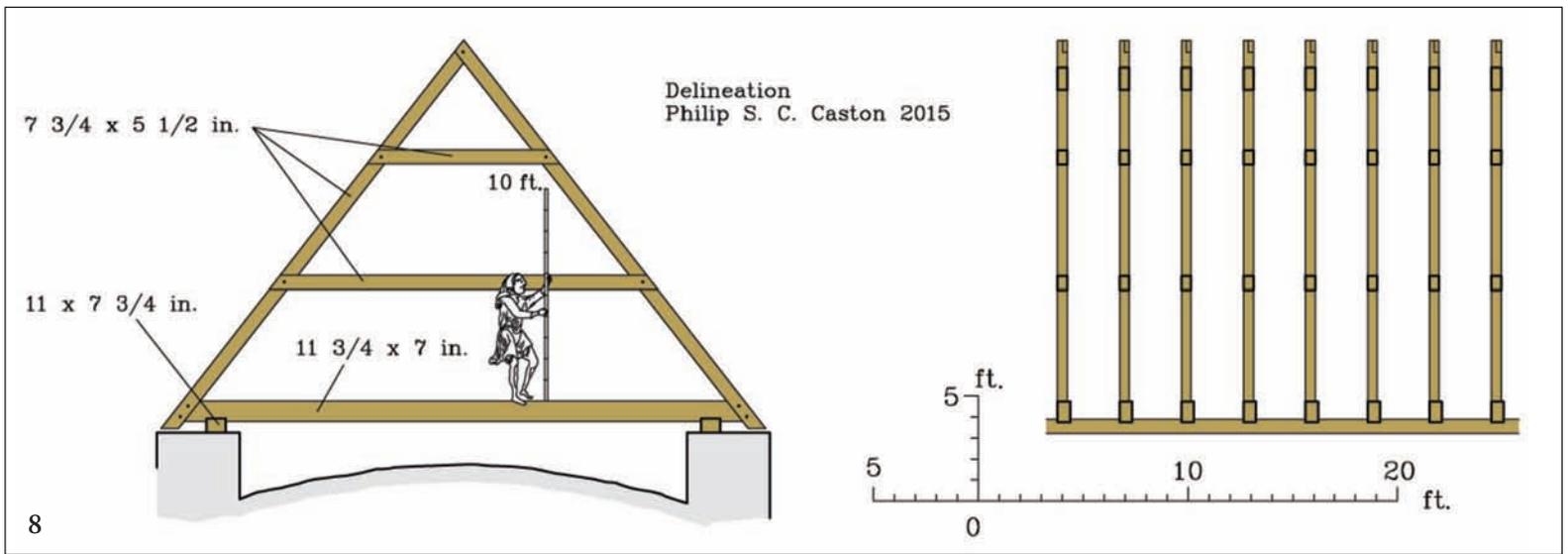


7

ANOTHER ancient roof frame stands over the southern transept of the former Cistercian monastery church in Bebenhausen, Baden-Württemberg (Fig. 5), at N48° 33.698' E009° 03.365'. One of the oldest remaining wooden roofs in Germany complete with rafters, its north end was modified at a later date. A tie beam and a rafter have been dendrochronologically dated to ca. 1191. The roof was probably raised a short time later.

The oak roof structure now consists of just four triangular frames, and only one of those has all the component parts. The tie

beams span the same ca. 23-ft. distance as in Essen-Werden. The ends are not built into the walls but rest in coggled joints on narrow wall plates at each end. The roof is hidden from view by the vaulting, consequently the tie beams are not decorated but are just simple rectangular sections 11¾ x 7 in. The beam ends project beyond the wall plates but only to the external face of the supporting walls, where they intersect the rafters (8 x 5½) with a parallelogram-shaped lap joint (Fig. 6). The rafters project further downward almost touching the crown of the supporting wall,



8 Sectional views of Bebenhausen roof frame.

5 Klosterkirche Bebenhausen, Tübingen, Baden-Württemberg, at former Cistercian abbey. Romanesque church has kept late-12th-century roof framing despite major works including 1407 tower undertaken later that meant major modifications to transept roof. Shortened southern section (left of tower) survives.

6 Simple half-lap joint is secured by two square pegs each in round hole. As pegs and holes both crush and take on rounded square form, shape can be used to ascertain if peg was ever inserted in empty hole.

7 Model shows use of collars to stiffen opposing rafters rather than supporting their weight on tie beams.

which allowed the original clay bullnose roof tiles to project out beyond the wall much as the replacements do today.

At 52 degrees, the roof pitch is much steeper than in Essen-Werden, giving more volume in the roof space and longer rafters. The designer could have supported the rafters against sagging with raking struts at their midpoints as at Essen, but instead chose collars to brace the rafters against each other at two equally spaced heights. This freed up the roof space and gave an uninterrupted open space 5 ft. 3 in. high. The horizontally laid collars do not transmit any forces to the tie beams, which only have to support themselves and any other dead load over the free span. The self-weight and a possible dead load deflection are also slightly counteracted by the rafters attached to the ends of the beams in a short cantilever (Figs. 7 and 8).

Altogether, the design of the triangular frame is a well-balanced and a practical solution, a collection of repetitive two-dimensional plates simply stacked up one behind another. The wall plate and roof-covering battens tie the individual frames together in the third dimension, and this whole assembly is wedged behind a gabled wall at one end for stability. Possibly a diagonal rafter brace could have added further stability. The use of such bracing has been documented in other medieval roofs.

This type of simple tied triangular frame would continue to be used by framers for small spans for centuries right up to the present day, the only modification being the type of joint employed. Larger roofs necessarily require larger timbers or a cleverly assembled collection of smaller pieces to transmit the larger forces and to direct them away from causing deflections in each component piece and the roof frame as a whole. This is where Germanic roof frame design gets interesting, and one roof design in particular is especially important.

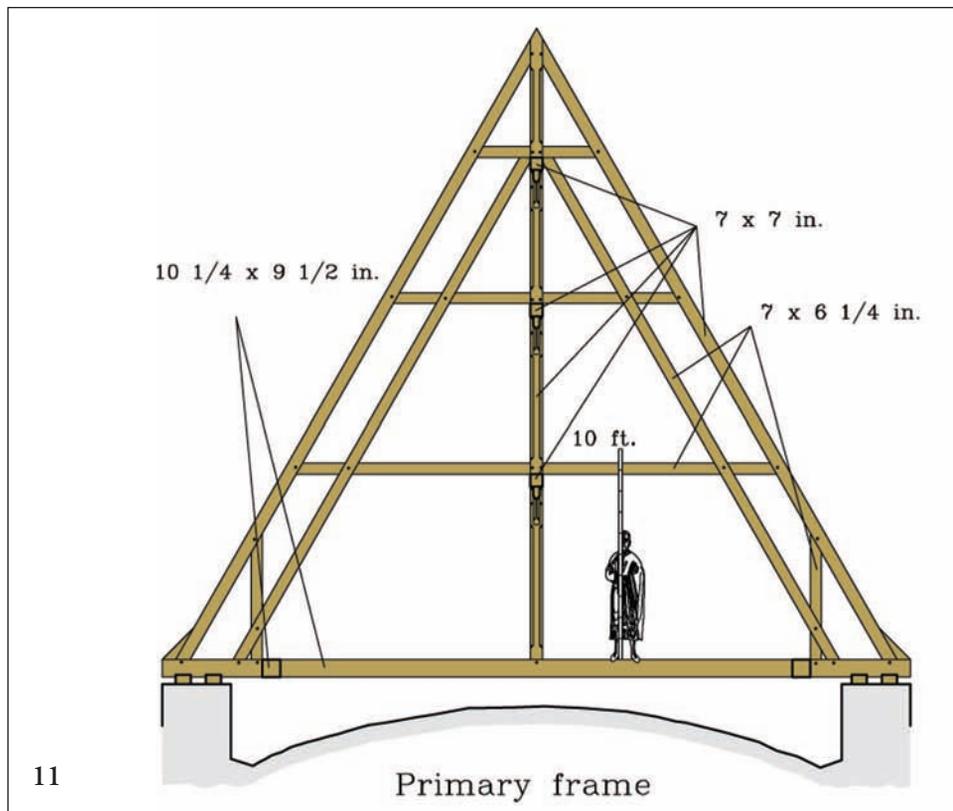


9 St. Elizabeth's Church, Marburg, Hesse, 13th century, built by Order of Teutonic Knights and housing tomb of St. Elizabeth of Hungary. Nave roof, between transept and tower, covers notably advanced framing for 13th-century Germany.

THE nave roof over one of Germany's earliest Gothic churches, St. Elizabeth's in Marburg, Hesse (N50° 48.896' E008° 46.203'), pictured in Fig. 9, has a free span of ca. 30 ft. between the northern and southern side walls. It was built in three sections from east to west. The eastern part is the oldest, some of the timbers being dendrochronologically dated to the year 1245, and the western is the youngest with timbers dating from 1270. This reflects how the building of the nave progressed during the 13th century.



10



10 St. Elizabeth's Church, view up central post in eastern end of nave roof, showing probable earliest German attempt to design three-dimensional roof structure as well as difference between primary and secondary frames.

11 Sectional views of St. Elizabeth's nave roof frame, first stage, ca. 1248.

12 Close-up of mortise-and-tenon joints at junction on central post, in this case making on-site assembly of the pieces easier than with equivalent overlapping joints.

Each of the three sections is constructed with slight variations on the previous section, indicating that the framers reconsidered the previous section and made "improvements." The design of all three sections uses triangular frames stacked up along the length of the nave, as we have seen before, but two different frame designs alternate. The German terms for these two designs are, respectively, *Vollgespärre* (full frame), which I will call a "primary frame," and *Leergespärre* (empty frame), which I will call a "secondary frame."

The literal translation reflects the observation that the two frame types are distinguished by their number of component parts, the "full" being full-up of structural members, and the "empty" lacking certain elements. Especially the latter just does not sound right in English. Since English carpentry descriptions often use hierarchical notation, primary and secondary classification seem appropriate and accurate from a constructional point of view.

The primary frame in the oldest part of the Marburg nave roof forms an equilateral triangle, two of the sides 7x7 rafters tenoned into the third, a tie beam 10 1/4 x 9 1/2. The tie beam ends extend past the rafter joints to finish flush with the external wall face, providing timber mass to resist the roof forces transmitted through the rafters and tenons. The amount of relish outboard of the rafter seats, however, is modest. Small sprockets were fixed over these joints to deflect the roof covering out over the wall surface (Figs. 10 and 11).

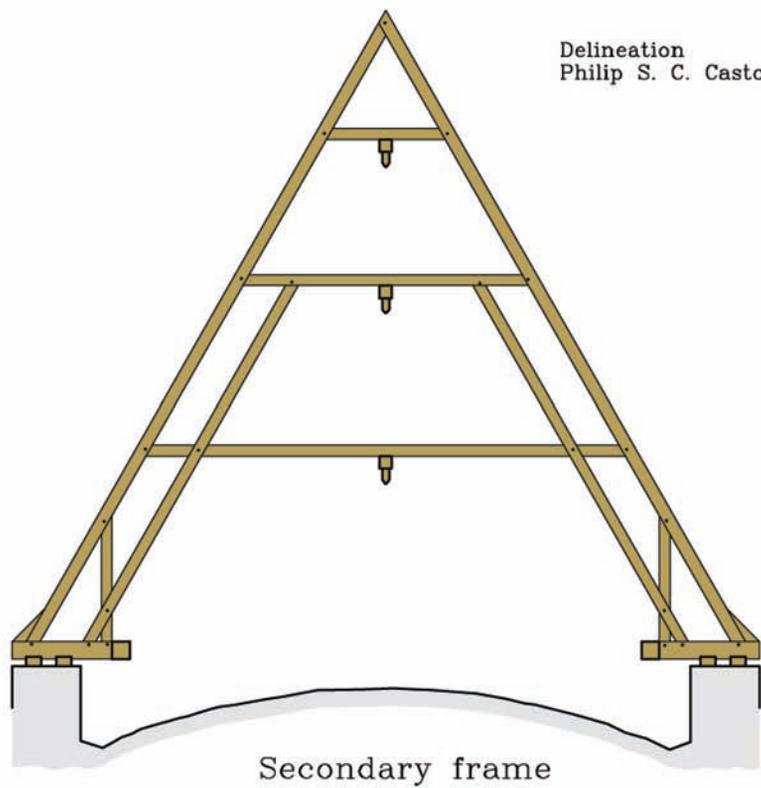
As in Bebenhausen, horizontal collars (3 1/2 x 3 in.) connect two opposite rafters. Instead of using larger dimensioned members to compensate for the longer lengths and larger spans, the designer

opted for slender but reinforced components. This meant "filling" the triangular frame with additional elements. First is a central post to suspend the tie beam and carry the lower collars. The post in turn is supported by two inner rafters that terminate under the highest collars, altogether forming a kind of kingpost truss.

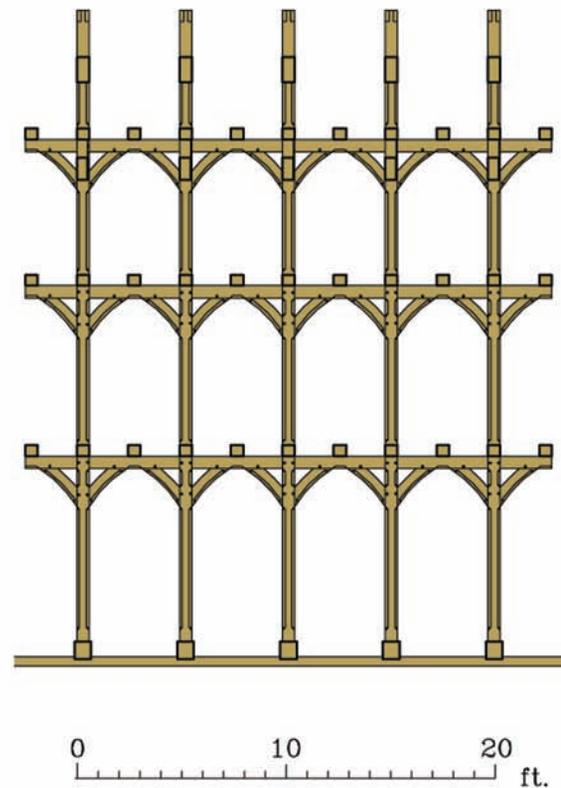
These additional members are not just lap-jointed over the simpler system but integrated in a complex way. The post interrupts the collars, each half being mortised into the post and the outer rafters (Fig. 12). The outer rafters are also mortised into the top of the post and help to support the post. The bottom of the post is mortised into the tie beam and presumably pegged, allowing the post to carry the tie beam, although this connection has been modified with iron straps and the original detailing is obscured.

The inner rafters are mortised into the tie beam and the top collar, and they half-lap the lower collars in passing joints. The designer chose his joints with care, using both laps and mortise and tenons rather than just one or the other. He obviously understood the function of each type of joint, but the extensive use of the mortise and tenon is unusual in medieval Germanic carpentry.

The secondary frame design in the oldest part of the Marburg nave roof is unusual in that almost all of the joints are mortised. Also, the full-length tie beams have been replaced with interrupted ties cogged over the doubled wall plates on both sides and tenoned at their inner ends to short bridging joists, themselves firmly tenoned into the faces of adjacent full-length ties, thus recovering a portion of the base-tying function for the lower side of the triangle. This frame uses fewer members than the primary frame and has no static equilibrium on its own.



Delineation
Philip S. C. Caston 2015



13 Frames may have been erected in pairs (one primary and one secondary) starting with tie beam and short horizontal connectors. Central post would then have been stood up on tie beam.

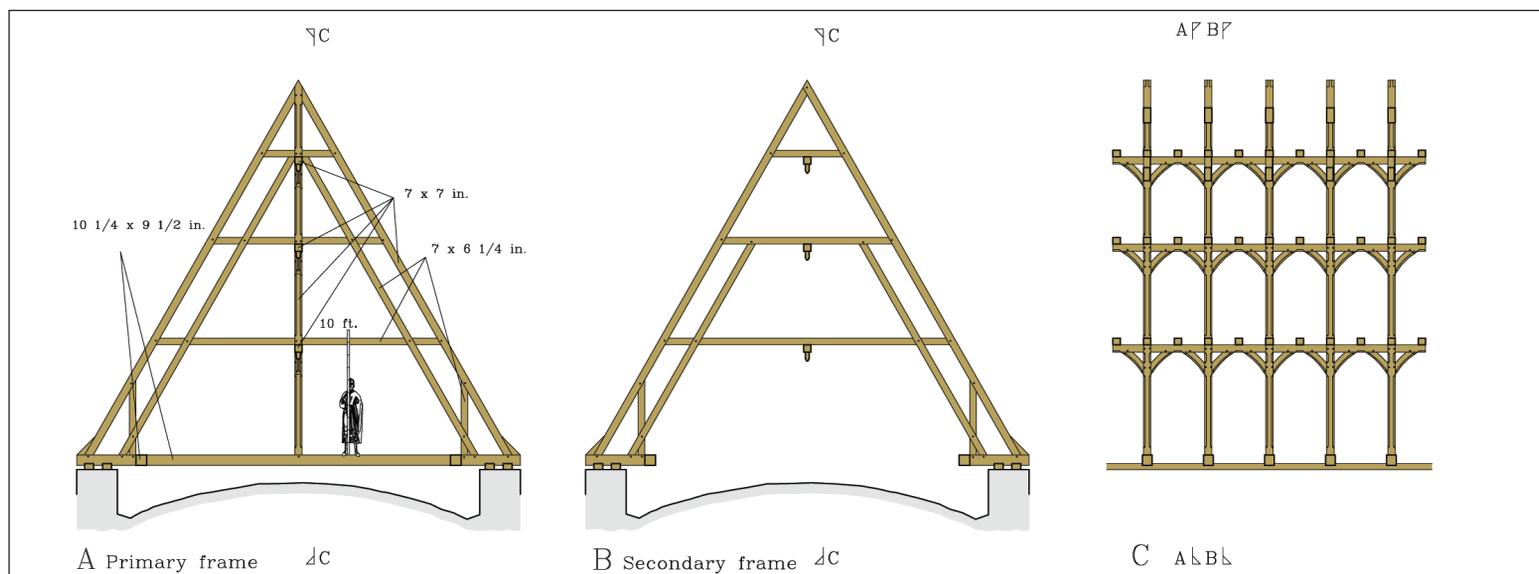
14 Next, enter short purlins (probably with braces) into previous post and swing next post onto tenon ends. (In a test to understand Marburg's design, model is shown here with laps for collars as opposed to mortises for original tenoned beams.)

Understanding the framing in a two-dimensional way does not do it justice at all, and the genius of this roof is that the designer considered—as far as we know, for the very first time in Central Europe—the roof structure as an inherently three-dimensional object, and transferred forces from the secondary to the primary frames in the third dimension using short bridging joists and braced collar purlins (Figs. 13 and 14).

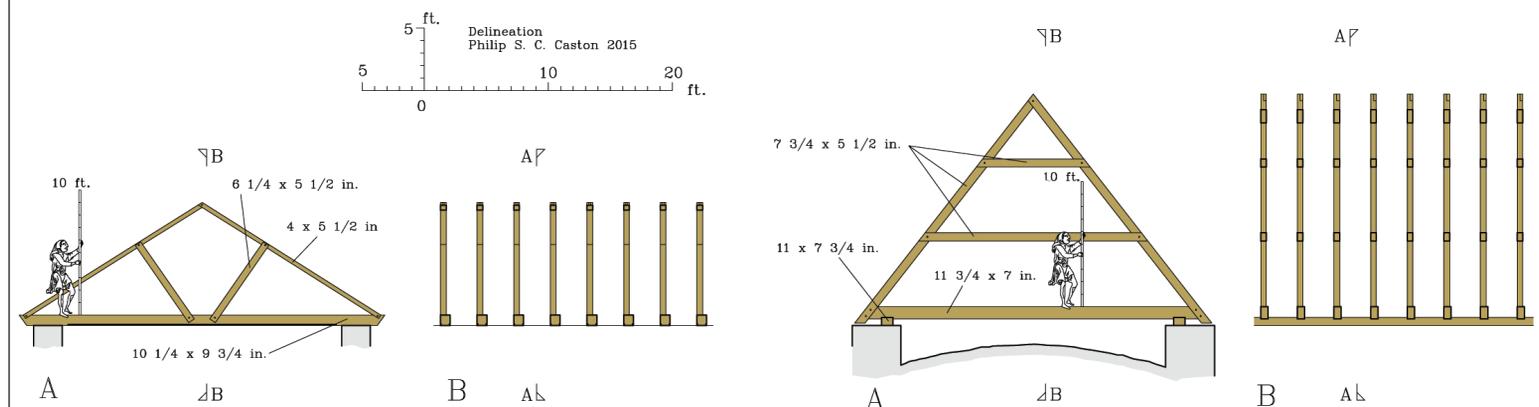


In this way, repetitive massive frames of heavy members were avoided by longitudinally uniting complex primary truss frames of relatively light members with simpler secondary frames, the latter helping support roof loads but not working alone as statically stable frames at all. It remains to be proven if this light but complex construction would have been cheaper than a massive, strictly repetitive version. At some point the effort required to obtain large trees for the massive frame would be financially





Marburg, St. Elizabeth, first (eastern) stage of nave roof, 1248 AD (d)



Essen-Werden, St. Lucius, nave roof, c. 1100 AD

Bebenhausen, Cistercian monastery church, south transept roof, c. 1191 AD

15 All three roofs discussed drawn in same scale and style for comparison, with increasing size and complexity over time. Marburg roof frame, however, is more than two centuries ahead of its time in terms of German roof frame evolution.

prohibitive, and eventually the largest trees would limit the largest size of a roof. Also, the work required to manufacture and lift large balks of timber up to the roof, as well as the huge point-loading at the top of the wall, would reach a point of nonfeasibility.

The joinery in the oldest part of the Marburg nave roof gives preliminary insight into the raising sequence. The short collar purlins and their mortise-and-tenon joints dictated the erection of the roof in short sections that proceeded along the supporting walls. Each central post had to be slotted into its mortise in the tie beam and then swung onto the tenons at the ends of each short collar purlin. The other pieces could then be attached, post by post (Figs. 13 and 14). While lapping component members is the easier joinery method, especially when timbers are laid flat on or over a template in the yard, when it comes to assembling them in a vertical frame on top of the walls it is more secure to assemble using mortise-and-tenon joints, lapping only where necessary, and this was the technique adopted. This idea would not catch on generally for another 250 years in Germanic carpentry, making the original Marburg design well, well ahead of its time (Fig. 15).

Unfortunately, there is no record of the designer's name or how he arrived at his design, but he obviously wielded respect and had the means to "splash out" on a quality piece of work. The oak carpentry, which includes curved collar purlin braces and beveled edges, is outstanding and singular.

As the roof progressed along the nave walls to the west in the later stages of construction of the church, the basic system was

copied, presumably by another framer or team of framers, but the mortise-and-tenon connections were replaced with lap joints, the collar purlin braces were cut as straight timbers and chamfers no longer graced the arrises of the posts and braces.

As the Church introduced to Germany the Gothic style of architecture developed in medieval France, a movement of practical building ideas is likely to have accompanied the design. This could have taken the form of German craftsmen-designers who went to France to study the buildings there, or their French equivalents who were employed to build the Marburg church directly. One of these possibilities may well explain the sudden use of mortise-and-tenon joints.

It would seem that the younger part of the roof structure, the western end erected some 25 years later, was constructed by local framers in the Germanic tradition, who copied the older frame's layout but built it with their own traditional lap-joint detailing. This traditional Germanic detailing was destined to continue for another 25 decades despite radical changes in the design of the frame component pieces, which can be seen in several examples of late-medieval roof structures in German-speaking Central Europe.

—PHILIP S. C. CASTON

Philip Caston (caston@hs-nb.de) has been studying roof framing in Central Europe for over 25 years and wrote about the large twisted spire at the Collegiate Church in Rasdorf, Germany, in TF 114. This article is first in a series charting the development of roof framing in Central Europe based on selected real examples investigated.

The Triple Bottom Line and The Timber Framing Business

OVER 40 years ago, a number of American builders and craftsmen began to explore the structural framing methods of older timber buildings. Driving them was a deep disappointment in the US construction industry they saw at that time, coupled with growing respect for the very old and still strong post-and-beam buildings (as we called them then) standing all around them. The timber frame revival began, and its impact on building soon far surpassed the actual number of new timber frames being built. There was a sense that something special could be brought to the construction process and, as it grew, the words “craftsmanship,” “quality” and “legacy” crept back into our lexicon.

During this early period in the revival, the notions of craft and craftsmanship were researched in any source available, and aspirations like this one, by the sociologist and author Richard Sennett, looking back over the history of work and workmanship in *The Craftsman* (2008), were seen as more and more applicable to homes and shelter:

Make every product better than it's ever been done before.
Make the parts you cannot see as well as the parts you can see. Use only the best materials, even for the everyday items.
Give the same attention to the smallest detail as you do the largest, design every item you make to last forever.

Though the absolute number of new timber-framed houses was (and still is) small, they have been on the cover of every consumer home magazine in the country. One could sense the growing appeal of a more highly crafted, well-thought-out structure, and at least some of this influence could be seen elsewhere in the housing industry. This same artisan's mentality of building can conveniently describe a healthier, more powerful model for other disciplines, including commerce. Just as true craftspersons in the trades look upon much more than solely financial gain, business today can do the same, and the business owner can acknowledge the critical role to play in healthier communities, healthier bio-systems and our environment, and set the tone for a truly sustainable future.

Lately an approach to business earnings and profitability called the *Triple Bottom Line* (or 3BL) has seen a lot of attention. While not a brand-new set of ideas, its recent popularity parallels the re-emergence of energy and resource efficiency as primary considerations in housing and construction. 3BL refers to equal consideration being given by a business to social, environmental and financial goals when evaluating an enterprise's success. These three criteria are also referred to as *People*, *Planet* and *Profit*. Simply put, a business or organization that considers all of these factors has more value to its community and therefore to itself than the one focused solely on financial gain.

People stands for the metric representing the social context and capital of coworkers, of partners and suppliers, and of community members where *community* is defined in multiple levels. The word here encompasses our families, our churches and schools, our company, the Guild, our town and up through our country and

beyond. When using people as a business decision filter, the actions resulting from those decisions can often be seen in those around us, and in our various communities.

Planet is obvious, as in our natural resources. It would be hard to find the person not at least somewhat attuned to changes in climate being attributed to fossil fuel extraction, water conservation, solid waste and more. It's much more difficult, however, to find businesses that run with the environment as a primary filter in decision matrices. Yet public pressure against environmentally questionable corporate initiatives exists in the light of recent environmental disasters like the BP oil rig catastrophe in the Gulf of Mexico, and in the ongoing fight against the Keystone Pipeline and the exposure of the problems with fracking that have led to numerous state and municipal sanctions.

Profit is the best-known bottom line in business. It is critical to a business's health and longevity. (In not-for-profit organizations we might call it excess revenue rather than profit, but it is just as important.) In business, profit is used for capital investment, cash reserves, return on investment for ownership risk, gain-sharing and community charity or development. If a business makes no profit, it lacks the capacity to be the better force of community and environmental good described above, as decisions need to be made based on survival.

Traditional US financial markets, what we loosely call “Wall Street,” have long operated on a much narrower model. By both law and expectation, publicly traded corporations are required to maximize the return on investment for their stockholders, beyond most other considerations. This is typically interpreted to mean profitable short-term results, quarter after quarter. Failure to do this steadily and aggressively is punished by the market, in diminishing a corporation's stock price and sometimes in the replacement of its leadership. Publicly held companies' managements' hands are often tied even if they themselves have a longer term view or are more community minded.

Timber frame companies rarely have the outside or legal constraints of this short-term (and at times short-sighted) financial strategy. While quarterly returns need to be tracked, and financial profitability underscored, longer-term financial goals, community good, and environmental sensitivity can be considered, as desired by ownership. The small size, family ownership and local makeup of the typical timber frame company all make timber framing fertile ground for triple-bottom-line companies.

The reasons seem obvious. Small companies have greater interaction between ownership or management and the workforce. The economic stratification often seen in large corporations between top management's and the average worker's paycheck is far less pronounced. In one remarkable example, a recent *New York Times* article cited the CEO of Disney as enjoying a compensation package approximately 2,200 times greater than the median Disney employee. Compare this with Ben and Jerry's Homemade's ground-breaking effort in the 1980s to maintain no

Continued on page 28

The Other English Barn

LAST summer, we were asked to remove a barn scheduled for demolition in Newtown, Bucks County, Pennsylvania, about 20 miles outside of Philadelphia, in a region settled primarily by English Quakers in the late 17th century. The Howes barn was a tall, 30x45-ft. three-bay bank barn with a 12-ft.-wide ramp shed. Standing inside the barn, I was reminded of several similar barns in the area that I had seen or worked on. Their English frames were different from those of the German frames just miles to the north and west. In the end, we were unable to dismantle the Howes barn because of public bid requirements. Sadly, the barn, which was in good condition and dated to the mid-19th century, was demolished and the debris fed into a tub grinder.

The typical Pennsylvania bank barn was built into a hillside with the threshing floor reached from the upland side and the livestock area below opening out of the opposite side (Fig. 1). This configuration was sufficiently important that if the barn site was flat, a substantial earthen ramp was constructed to gain access to the main floor (Fig. 2). In addition, a great many of these bank barns included a *forebay*, an aisle of the barn, integrated or added, projecting out over the lower-level openings. In some cases, similar shelter for the animal doors was provided not by a projecting aisle but by a pent roof.

Most of these barns were either frame or stone, with a few built of brick or logs, and while many are closely associated with the Germans who settled in southeastern Pennsylvania, the bank barns closer to Philadelphia, home to the English Quakers, have somewhat different characteristics.

David Hackett Fischer, in *Albion's Seed: Four British Folkways in America* (1989), observes that there were four separate waves of migration from Britain to America in the 17th and 18th centuries: the Puritans to Massachusetts, the Quakers to the Delaware Valley, the Anglicans to Virginia and the Scots-Irish to the back-country frontier. Of these, two are of particular interest here.

Puritans to Massachusetts, 1629 to 1640. To escape persecution, 21,000 people emigrated from East Anglia and the South of England to the Massachusetts Bay colony. They were strict, culturally conservative and intolerant of outsiders, to the point of persecuting or executing nonconformists, including hanging four Quaker missionaries in Boston by 1661. New England by and large presented poor soils, but with pockets of fertile farmland. The eaves-side entrance English ground barn, a common form in masonry in numerous parts of England, was adapted by settlers in a region richer in straight timber than good building stone. Many thousands of such barns, usually three bays long with a threshing floor behind center-bay wagon doors, were built entirely in timber throughout New England in the 18th and 19th centuries (Fig. 3). The earliest known surviving example dendro-dates to 1715.

Quakers to the Delaware Valley, 1675 to 1715. Some 23,000 Friends arrived in Philadelphia and West Jersey (as it was known 1674–1702), Northern Delaware, and Northeastern Maryland, having fled persecution in the North and the Midlands of England. They were joined by Welsh and Dutch Quakers and German Pietists. This diverse group was suspicious of social hierarchy and sought a pluralistic society. They were pacifists, collaborative and tolerant. Their buildings, most often of stone or brick, were similar in style to those in the region whence they came.

While *Albion's Seed* is concerned with the four waves of English-speaking immigration to America, another band of emigrants was an important component of the settlement of the Delaware Valley. Between 1708 and 1750 two groups of Swiss-German and German settlers appeared, first the sect people who mostly arrived before 1720, and subsequently the church people who came from 1720 to 1750. By 1750, an estimated 100,000 German-speaking people lived in Pennsylvania.

The distribution of ethnic groups in the Philadelphia area is perhaps best put by Philip S. Klein and Ari Hoogenboom in their *History of Pennsylvania* (1980): "Picture a stake driven into the ground at the waterfront of Philadelphia. A 25-mile radius from this peg would encompass the area of Pennsylvania settled mainly by English immigrants between 1680 and 1710. Extend the radius to the length of 75 miles, and the outer 50 miles of the circle would correspond roughly to the 'Dutch' [*deutsch* or *deutsch*] country from Northampton to York Counties. Here, from 1710 to 1750, German-speaking immigrants to colonial Pennsylvania made their homes. Again extend the radius to 150 miles, and in the outermost circumference . . . the Scotch-Irish settled."

Settlement patterns of ethnic groups help us classify early period buildings. The three acknowledged European influences on barn frames in America are English, Dutch and German. Of these, the first is understood to have produced a ground barn with three bays, often with a footprint of 30x40 ft., framed with principal rafters, flared posts and English tying joints. This form was ubiquitous throughout New England at least through the first quarter of the 19th century. Thereafter, a modified version, with dropped tie beams, continued to be built and spread to New York state, Pennsylvania, Ohio and elsewhere to the West.

BUT another English barn type was brought by English settlers to America, if to a different part of the continent, a barn quite different from the first influence. What I will call the *Quaker barn* was derived from precedent in the English Lake District, an area in the Northwest where Quakers lived in the 17th century and which contributed settlers to the American migration of 1675–1715.

The Lake District barn, as its descendant is called today in Pennsylvania (Fig. 4), was typically constructed into a bank with a large entrance on the uphill side and a walkout cellar below for farm animals. In form and function, the similarity between Lake District barns and Quaker barns is striking. In the North of England the hilly land offered abundant building stone for the walls, and timber for these structures was used only for floor and roof frames, the latter typically comprised of tie beams, principal rafters and common purlins. In the Delaware Valley, settlers found tall, straight trees that allowed for larger barns and, in some cases, timber in the walls.

The English who landed in the Delaware Valley came from different areas of Britain and on a separate wave of immigration from the Puritans, and they drew on different customs and building traditions. According to Fischer, of the Quaker immigrants who settled in Bucks County before 1687, "Two-thirds came from the counties of Yorkshire, Lancashire, Cheshire, Derbyshire, Nottinghamshire and Staffordshire. . . . None were East Anglians; the region which was so important to the settlement of Massachusetts was entirely absent from the list of Bucks County settlers" (Fig. 5).



1 At left, Germanic five-bay forebay bank barn, space under forebay closed at ends by foundation. Forebay may also be open-ended. Shartlesville, Berks County, Pa., ca. 1850.

2 Above, absent hilly site, earthen bank is needed to reach wagon-door level of three-bay tall-walled bank barn. Stockton, Hunterdon County, N.J., ca. 1850.

Photos by Alex Greenwood unless otherwise credited



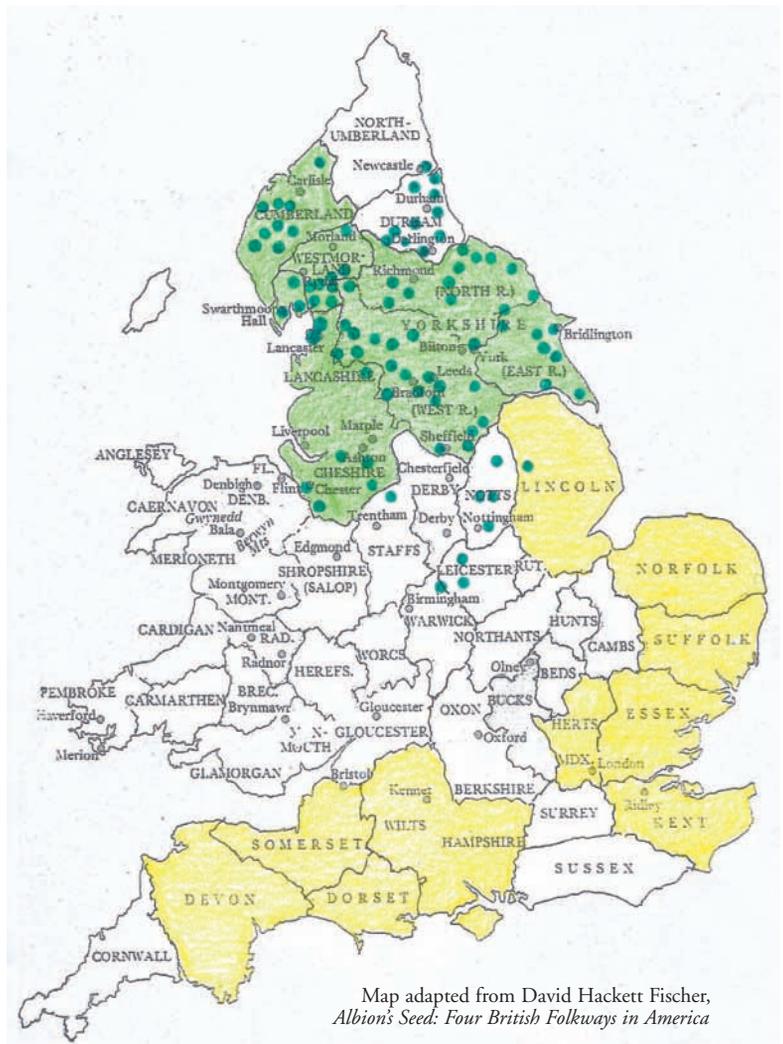
Jack A. Sobon

3 English barn, 30x40 ft., built between 1812 and 1840, Windsor, Mass.



Jeffrey Marshall

4 Lake District barn, Durham, Bucks County, Pa., 19th century, modeled after 17th-century bank barns in Northwest of England. Characteristic pent roof over stable doors missing, stone drip course and joist pockets visible. See also Fig. 8.



Map adapted from David Hackett Fischer, *Albion's Seed: Four British Folkways in America*

5 Origin areas of two waves of English immigration to North America, green for Quakers, yellow for Puritans. Green dots represent Quaker communities in the North of England in 1654. Quaker communities in Wales not shown.



6



7

Ken Rower

6, 7, 9 Graeme Park barn, 38x64 ft., Horsham, Montgomery County, Pa., built ca. 1810, probably by Samuel Penrose, Quaker. Barn has three long bays and added 12-ft. strawshed, fully framed inside (Fig. 8) and supported by truncated conical stone columns. Roof framing over long bays has sagged (Fig. 9). Ramp is 80 ft. long. Barn posts measure 17 ft. 6 in.



8

8 Cox barn, Lake District type, Titusville, Mercer County, N.J., 33x54 ft., late 18th century. Original straw shed and (probably) stone columns gone, leaving only joist ends and ledger hardware.

extended forebay. This extension may project 12 ft. or more and in many cases was added to an existing building. The masonry pillars that Dickey mentions are the distinctive conical stone columns prevalent in the area just outside Philadelphia in Chester, Montgomery and Bucks counties (Fig. 6). Some Quaker barns used stone arcades to support an integral forebay wall (Fig. 10).

In addition to these features, most of the Quaker barns that we have inspected are bank barns built with three bays, even in barns as long as 60 ft. (Fig. 9). While they were built 100 to 150 years after the period of initial settlement, certainly many of the earliest barns were smaller, mostly built of stone, and some built of logs. For example, tax records for 1798 in Upper Dublin Township in Montgomery County, an area with both Quaker and Germanic settlement, show 67 percent of barns were stone, 15 percent log, and just 6 percent frame. The remaining 12 percent were composites. While the Quakers had a long tradition of building stone barns in England, in continental Europe the Swiss and Germans mainly built barns of timber. Since there was no shortage of timber here, the use of stone by Swiss and Germans appears to have been an adoption of an English practice.

The Pennsylvania barn research conducted by Ensminger is unsurpassed. He sought out Old World precedents for distinguishing features, discovering for instance that stone-arch forebays, conical stone columns and three-level barns are likely of English origin, and that the cantilevered-forebay barn can likely be traced to Switzerland, but he stopped short of drawing distinctions between Quaker and Germanic timber frames and their bent typologies. I suggest that there are differences to be observed, with statistical support to be gathered.

WHAT are the features of Quaker barns? And how do they differ from Germanic barns? Examining and contrasting their timber frames may show how these separate framing traditions collided and merged into the Pennsylvania bank barn. Twentieth-century observer John R. B. Dickey, quoted in Bernice M. Ball, *Barns of Chester County, Pennsylvania* (1974), described the Quaker barn thus: “The basement and sometimes the ends were of stone. . . . There were no ornamental louvers or ventilators. Usually there was a large strawshed supported by masonry pillars. . . . The double-decker barn, with the drive six or eight feet above the mows, was common.” Dickey refers to a *strawshed*, a Quaker term for the appendage that others, notably Robert Ensminger, author of the standard reference work *The Pennsylvania Barn* (1992), call an



Ken Rower

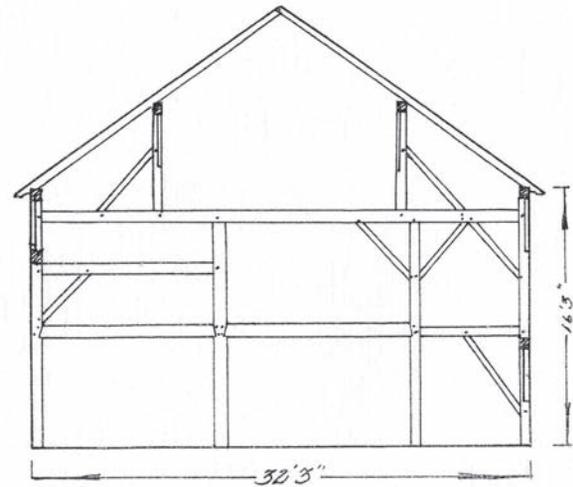
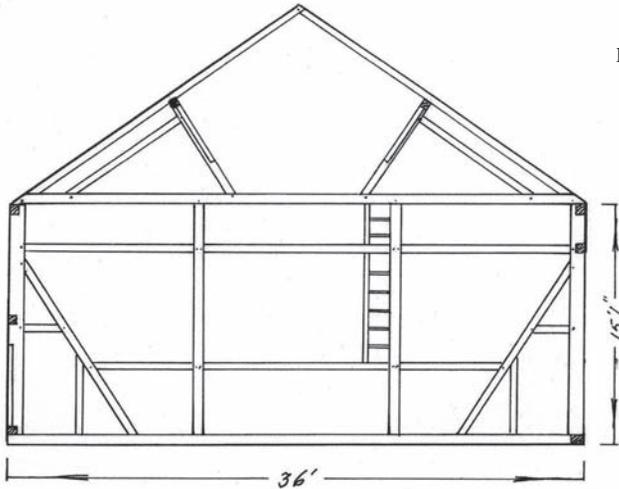


10 Stone-arch forebay barn 38 ft. x 53 ft., near Edison, Bucks County, Pa., ca. 1830. Built for Dr. Samuel Moore, who was Quaker, and remarkable for its rare dressed stone work. Stone arch form is likely of English origin.

Germanic Bent Typology

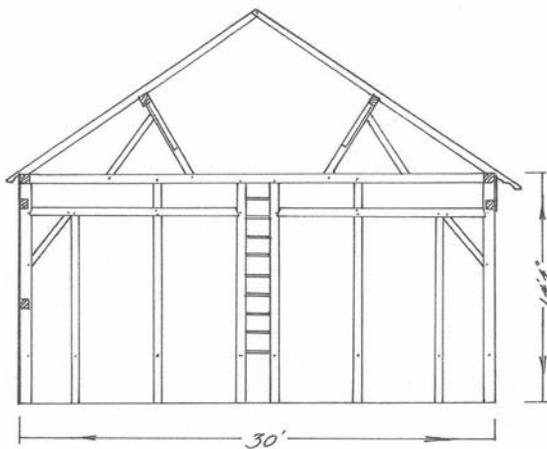
Quaker Bent Typology

Drawings Elric Endersby

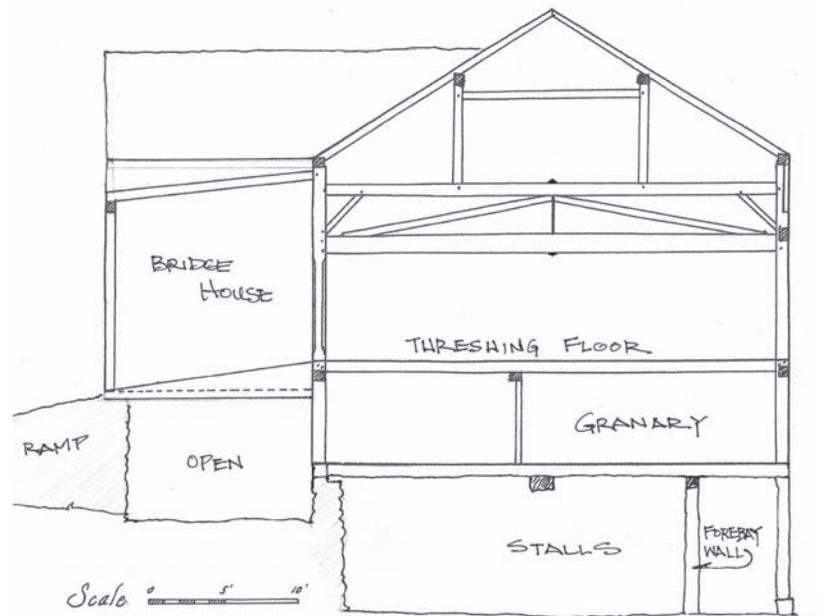


11 Interior bent, H. H. Fink barn, 36x80 ft., ca. 1840, near Shartlesville, Berks County, Pa., with three threshing floors and six bents. Long Germanic braces in bents as well as walls, with posts only about 15 ft. tall. No Quaker barns examined by author were built at this length or proportion or with five bays.

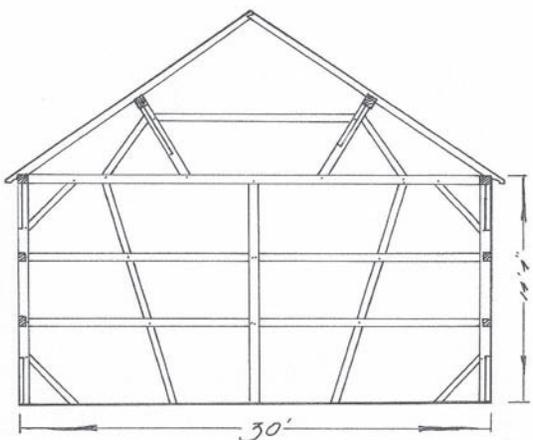
14 Interior bent, Lovett barn, 32x36 ft., ca. 1860, forebay bank barn near Newtown, Bucks County, Pa. Bent framing is asymmetric in order to locate interior post above wall that supports cantilevered floor joists. Forebay to right.



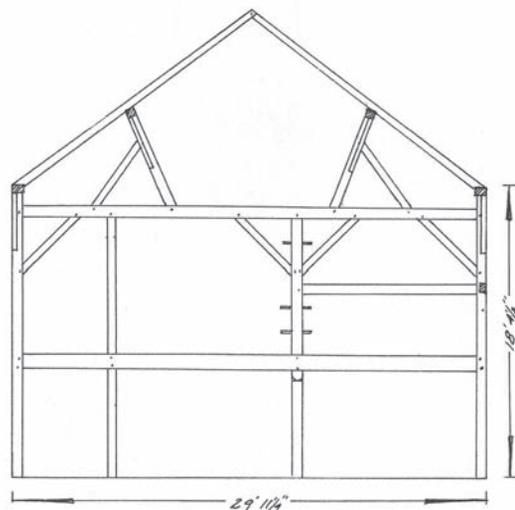
12, 13 Interior and end bents, Bake Oven Road barn, 30x36 ft., ca. 1830, New Tripoli, Lehigh County, Pa. German bank barn, with rafters hewn top and bottom but left round on sides, making them wider than they are deep. Note posts about 15 ft. tall, shorter than typical Quaker posts. Below, end bent of same barn. Long braces from tie to sill are Germanic, if here combined with English-style knee braces.



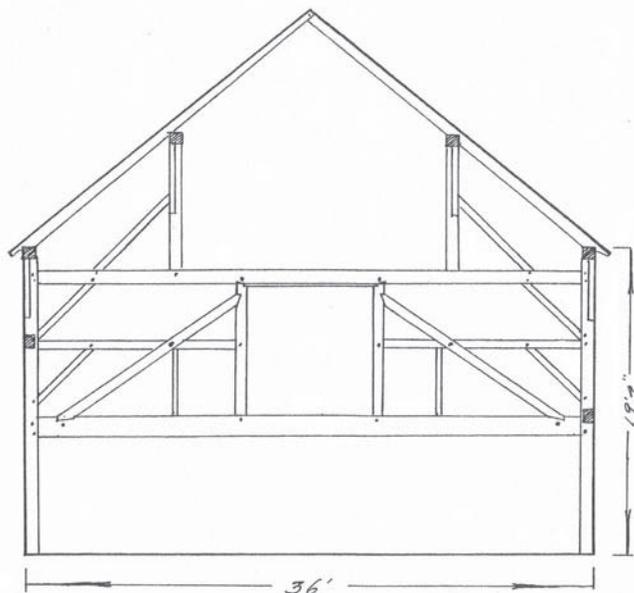
15 Section, Bonnell barn, 32x46 ft. plus 14x28 ft., bridge house, 1856, near Clinton, Hunterdon County, N.J. Three-level or *double-decker*, also called *saddlebag* barn, to describe how hay was stored beside and below threshing floor (see Fig. 20). House protects bridge connecting ramp to threshing floor. Granary floor grates allowed grain to be sent directly to animals.



When we look at the timber frames, Quaker barn proportions are different from those of Germanic barns found farther out from Philadelphia to the north and west (Figs. 11–18). Quaker barns tend to be several feet taller, with posts as high as 20 ft. The bent configurations tend to be less busy than Germanic examples, with fewer braces and ladders. Long, heavy wind braces, both in the walls and within bents, are found more often in Germanic than Quaker barns. Queenpost and kingpost trusses are found integrated in some Quaker forebay and strawshed walls, intended to carry the outboard ends of forebay or strawshed joists, for example in the J. S. Williams barn in Bucks County (cover images) or in the demolished Howes barn (Fig. 18). Figs. 15 and 17 show



16 Interior bent, Kirkbride barn, 30x35 ft., ca. 1850, Woodbourne, Bucks County, Pa. Tall frame with posts about 18 ft. Many Quaker barns surveyed are several feet taller than Germanic barns of similar footprint. Forebay to left.

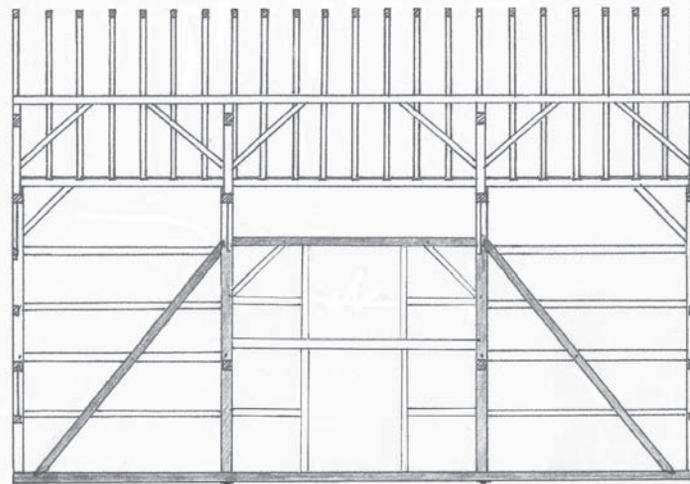


17 Interior bent, Cornell barn, 36x55 ft., 1844, near Newtown, Bucks County, Pa., destroyed for residential subdivision 1987. Quaker features included strawshed added to original structure and supported on stone columns, Exterior walls studded, lathed and shingled. Queenpost framing stiffened a 32-ft. swing beam, a configuration not seen in German cultural hearth area.

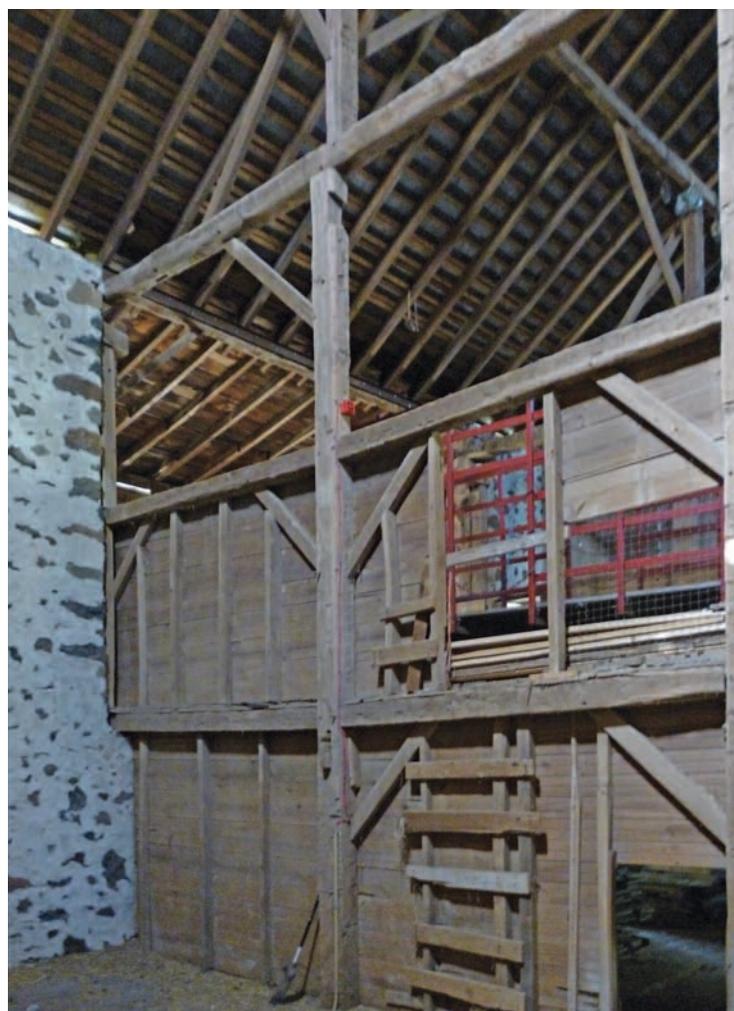
trusses stiffening swingbeams, one in a double-decker (likely Quaker) barn in Hunterdon County, N. J., across the Delaware.

Some frames we see are clearly Quaker and others clearly Germanic. Yet others are difficult to categorize and represent designs with features borrowed from both traditions. This is particularly true in the area between the two hearth regions. It appears that the two groups, despite a language barrier, were quick to collaborate and open to adopting new ideas.

Many sturdy Quaker barns, built of stone and white oak, still stand in the Delaware Valley, though they are mislabeled and misunderstood. The Quaker barn may be an unrecognized root form for the Pennsylvania bank barn, which over time mutated



18 Queenpost truss in forebay wall, Howes barn, Newtown, Bucks County, Pa., 19th century (destroyed).



19 Williams barn, New Hope, Bucks County, 1853. Hayrack offers saddlebag-style storage. Wagon entrance upper left.

under the influence of the Germanic barn and eventually spread over a vast area in North America. Acknowledging the Quaker barn as a root type, and understanding how it has evolved, helps us better comprehend the story of the American barn.

—ALEX GREENWOOD

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Glimpses of Dutch Framing

AFTER nearly two decades of looking at Dutch architecture and timber framing in the New World, I was given an opportunity last fall to go and see where it all came from. In Scheveningen, a small seaside community outside The Hague, I was offered a couch to sleep on and a kitchen to cook in, and in the end what more could one ask for? The architecture in Scheveningen dated mostly from the 19th and 20th centuries, but the public transit system allowed me to roam, and I noticed interesting framing in Arnhem at the building museum, as well as in Delft and Maastricht.

Arnhem. The Nederlands Openluchtmuseum (Netherlands Open Air Museum) in Arnhem was established in 1912 and displays buildings spanning many centuries. A barn from Terstraten, primarily used as an apple-syrup boiling house, was built in 1800 and comprises five bents with medium-sized anchorbeams tenoned through the building's wall posts (Fig. 1). The whitewashed barn has wattle-and-daub infill between three sets of sawn beams on gable walls and five sets on eaves walls. Bracing runs from the anchorbeams to the sill on the gable walls and the small wattle beams are mortised into it. On the eaves walls, the bracing runs uninterrupted from the corner post to the sill in a similar manner. There are two runs of plates, one on top of the main posts and a flying plate on which the rafters rest, which stands off of the building to create an overhang, possibly to protect the exposed ends of the anchorbeams (Fig. 2). Small braced beams mortised into every post support this rafter plate. The steep pitch of the roof may have been thatched originally, but the roof is now covered in clay tiles. A curious feature of this barn is the fact that the sills protrude past the plane of the wall at some corners (in Fig. 3 but not in Fig. 1), apparently lapped, with corner posts tenoned down through. The advantage in having the sills continue past the plane of the walls could be in the long relish to secure the lap joint, but the sill extensions invite decay.

A 16th-century farmhouse from Zeijen, also infilled by wattle and daub, has the same detail at every corner post (Fig. 4). As the barn is from Terstraten (Limburg) and the farmhouse is from Zeijen (Drenthe), over 300 kilometers separated them. More than two centuries passed between the respective building dates, and there is also a cultural difference as Drenthe is in the Protestant northeast, while Limburg, in the extreme southeast, is still heavily Catholic. (Limburg even has its own language, *Limburgs*, recognized by the Dutch government, the Belgian government and the EU.) The differences make it difficult to believe that this sill corner technique is a regional tradition.

The Zeijen farmhouse is both a house and barn, with low walls and a steeply pitched high roof covered in thatch. The wall timbers are hewn, with a majority of the horizontal members being naturally curved timbers, only hewn on two sides. Not only the sills but also the plates extend past the wall plane at the corners of the frame, and in the eaves walls an intermediate transverse sill projects from the wall line at every bent. On the farmhouse end of the structure another flying rafter plate connects to the frame by short braced beams, much like the Terstraten barn (Fig. 5). Long sills (not shown) are scarfed of three timbers.



Photos Ian Stewart





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Delft. The Oude Kerk in Delft was begun in 1246, and is one of the older churches in the city. Under a pointed barrel vault lined in *charpente lambrissée*, the tie beams of the nave, chancel and side aisles have splayed, tabled and undersquinted scarfs at each end, supported by brackets tied to a wall post (Fig. 6). The main spans are consistently much lighter in color than the scarfed ends, possibly because of species variation, or possibly indicative of repair. The end of the bracket arm is decoratively molded and the square head can be seen of a bolt up into the tie beam, further suggesting repair (Fig. 7). A stiffener in the bracket appears to be mortised into the back of the brace and to the underside of the arm, but not to the wall post. Oude Kerk's transepts have wood-ribbed groined vaults with bosses, springing from stone corbels, and again lined with wood (Fig. 8). In theory, the groined vault obviates the need for tie beams, and indeed we see none here. The Nieuwe Kerk in Delft, begun in 1396 and finished in 1496, has pointed arches in its nave and aisles with tie beam systems similar to those of the church begun 150 years earlier (Fig. 9).

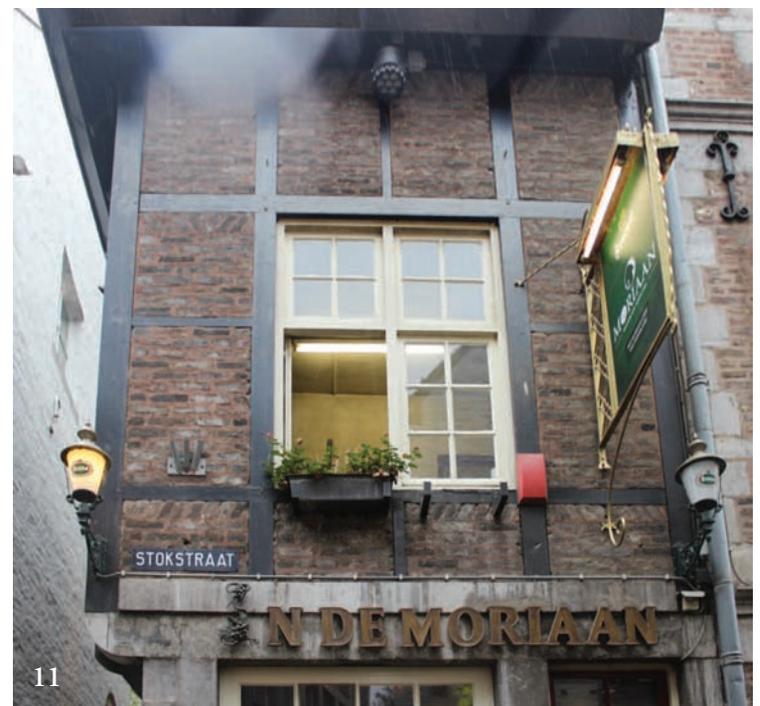
Maastricht. Capital city of the Province of Limburg and site of the 1992 European Union treaty signing, Maastricht lies in the Netherlands close between Belgium and Germany. Most of the city is brick and stone, but some buildings show half-timbered walls. The complicated mixed-use building shown in Fig. 10 has a datestone labeled 1625 and a timber-framed gable wall supported on stone corbels. The brick infill of the frame is a mix of 90-degree and 45-degree herringbone patterns. A French window covered by a grille, plausibly a modification, penetrates the lower right corner of the wall. Just around the corner stands the café In de Moriaan (the *I* stylized as a bunch of grapes), with a brick-infilled timber frame above the stone-built ground floor (Fig. 11). Running bond brick pattern changes to slanted under two beams and at the top of the wall.

—IAN STEWART

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greater than a 7:1 ratio between the highest paid and lowest paid member of their company when it was a Waterbury, Vermont, business (an effort sadly lost with the 2001 buyout of the firm by the multinational Unilever). The average ratio in the US, according to the labor union AFL-CIO, is 354 to 1.

Closer working quarters and shared duties and activities are more prevalent in smaller, closely held corporations, and clearly are the norm in timber framing companies. Social interaction and even friendships are not uncommon in these shops. All these factors make it more plausible for ownership or management in a well-run shop to be in tune with the capacities as well as the needs of its coworkers. The same can be said of the timber frame company's relationship to the people in its community, where often interrelationships through the suppliers, subcontractors, schools, churches and others suggest a greater sensitivity to the common good and, ideally, the greater implied stewardship.

Timber framing's relationship to environmental sensitivity is easily chronicled. From the revival's beginnings in the 1970s, the predominant enclosure system whereby the structural framing does not interrupt a relatively uncompromised insulation cover, best seen in the early development and proliferation of structural insulation panels (SIPs), has set our buildings apart from the issues of thermal bridging, air infiltration and high energy usage that characterize conventional light frame construction. In addition, the lower carbon footprint of wood as a construction material, and the theoretically long life associated with timber frame structures, support the presentation of timber framing as a planet-sensitive commercial venture.

The final leg of the triple-bottom-line business model, profit, has notoriously and at many times eluded timber frame companies. This failure tends to be true of craft industries, and in timber framing may be somewhat associated with the industry's young age and its lack of experienced management. In timber framing seen collectively as an industry, basic business acumen has a greater impact than inherent lack of profitability.

The 3BL view ideally can be a tool to support the financial sustainability of timber framing. The value of the 3BL company mindset for people and planet is likely self-evident. For many, business and commerce represent immense forces and could truly be the strongest for social and environmental change. What's not as obvious is what the practical financial value is to the individual company that follows this ethic. Earlier I referred to the dilemma faced by publicly traded companies when they look at other criteria than short-term return on investment. This isn't a comprehensive statement, nor should it suggest that there are no ethical or far-sighted companies publicly trading. It is, however, the norm in traditional commerce.

A different model is seen in Socially Responsible Investing, or SRI, where companies are analyzed by additional filters beyond solely profit analytics. Companies that trade in guns, tobacco or fossil fuels, or have a bad track record of labor violations, for example, may not find themselves in an SRI mutual fund. Until recently, SRI investing had been undertaken primarily for philosophical reasons. It's now being suggested that by employing environmental, social and governance (ESG) filters in studying companies, better financial performance can be predicted for the companies with higher scores in those categories, therefore suggesting that SRI funds may be a safer and just as profitable investment tool as its counterparts, simply because these

companies are basing their practices on the principles described here. (As examples, the Domini Social Index Fund and the Vanguard FTSE Social Index Fund, two well-known SRI/ESG funds in the large-capitalization asset class of the stock market, have performed equal to or better than their category averages in recent year-over-year analyses.)

This is not dissimilar to People, Planet, Profit as a business strategy, and so the same can be implied about the smaller, more intimate scale of the timber frame company. By taking into account their people and community, the planet and related issues of sustainability, and paying attention to the company's financial health, timber framers can succeed as businesses, beyond what they may be able to achieve in the more traditional earnings-only model. Some companies have been doing just that. As we look around for examples, two come quickly to mind: Bensonwood, in Walpole, New Hampshire, one of the first companies in our industry, and South Mountain Company, in West Tisbury, Massachusetts, a worker-owned cooperative. While the latter is not a timber frame company *per se*, their work often includes timber framing, and their founder, John Abrams, is a well-known member of the Timber Framers Guild community. There are other companies, but these two qualify easily because of their evident public efforts for their people and community, their leading-edge approach to building sustainability (in the case of South Mountain, their effort to be carbon-neutral in their own facility is particularly germane) and, although they are privately held and thus their finances are not public, because each has evidently done well over the years.

A final and important value to the timber frame company in adhering to the 3BL approach is simply that more people want to buy products and services from a company that they can believe in. Timber framing companies have the opportunity to communicate their intentions and values in a personal setting with their more limited number of clients, who often get to know the companies face to face. The triple-bottom-line view of business offers a great opportunity for commerce to do well by doing good—for the people and communities it touches, for the environment of our planet, and for its own financial health and reward. The artisan's mentality brought by the timber framer to timber framing is perfectly in sync with the same care and thought brought to the business itself.

—JONATHAN ORPIN
Jonathan Orpin (jonathan@newenergyworks.com) founded New Energy Works (timber framers) and Pioneer Millworks (recycled timber manufacturers), with premises in Portland and McMinnville, Oregon, and Farmington, New York. He first served on the Guild board 1991–93 and has been interim-appointed for the term 2013–15.



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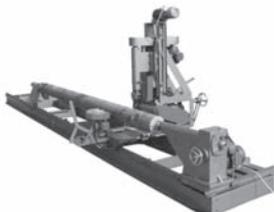
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