Balloons Houses: 
The Original Aspects of Conventional Wood-Frame Construction 
Re-examined

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Recent historians have unquestioningly supported the hypothesis that balloon-frame construction was invented in Chicago in 1833. In Space, Time, and Architecture, Sigfried Giedion based his argument on a set of circumstances peculiar to Chicago and on the improved production of nails and dimension lumber. However, at the time, Chicago was not a unique town in the Midwest, and the amount and type of materials required for balloon framing, including nails, were not significantly different from those required for timber framing. Documentary evidence suggests that the balloon frame existed elsewhere in 1833 and as early as 1804 in the French settlements along the Mississippi River.

A Strategy of Derision: The Origin of Balloon

Every year in countless classes on the history of building, an anecdote is retold about the naming of the balloon-frame method of house construction. The gist of the story is this: In Chicago sometime in 1833, a comedian labeled a recently invented method of assembling thin wooden lumber a "balloon house." It's a derogatory nickname because the house appears fragile enough to blow away or burst at any moment. It's also an inspired nickname because it reflects public skepticism so skillfully that balloon-frame construction becomes part of popular language. This remarkable story, full of conjecture and implications, has attracted little critical attention, even though it is a necessary support of the assumption that the balloon frame system of light-wood construction sprang, fully formed, from the mind of one individual. Many historical texts that survey architecture, technology, and nineteenth-century America gloss over the anecdote as engaging and trivial or as mere factual detail. Since 1939, the historical view about this most American of all construction systems has remained unchanged.

This article challenges these precepts and suggests that our way of building houses is more likely to have issued from a culture of construction rather than the mind of one individual. It begins by suggesting that this seemingly inconsequential story about a nickname reduces the etymology of balloon frame to a trifling consideration. There is no evident basis for assuming that the original application of the word balloon to an early version of light-wood frame construction occurred as a derisive joke. In addition, there is no substantial evidence that the conditions for the telling and retelling of the joke existed, such as a sudden and obvious change in the appearance of house construction—a difference so distinct that the general public recognized it immediately. In fact, a great deal of the current historical view is based on conjecture and complicity. No documentary source or travel account of the period mentions the anecdote itself, refers to a sudden and obvious change in the appearance of house construction, or alludes to any derisive comment. For these and other reasons, this article suggests that the name itself embodies more meaning than is indicated in the anecdote. The article concludes with a set of documentary sources that suggest that the word balloon is a popular version of an earlier, more appropriate name.

Most twentieth-century historians commenting on the origin of balloon-frame construction have included an anecdote about its incongruous name. For example, Sigfried Giedion wrote, "The tag, 'balloon frame,' was a mere nickname, a jocular reference to the lightness of this new type of construction."3 Daniel Boorstin added, "It is appropriate that this great innovation should still be known by the derisive name, at first used to contrast its flimsiness with the craft-hewn heaviness of the traditional house. 'Balloon frame' is what respectable builders first called it because it was ridiculously light."43 Finally, Fred Peterson declared, "Balooning was still considered new and dangerous in the 1830s in America; people apparently thought that the thin membrane of a balloon encased in a network of ropes and cables was like the frame and sheathing of the new wooden framing system. During this period, numerous posters illustrated real and fictional balloons. . . . These images provided inspiration for the phrase for a house built according to the 'balloon plan.'"44

In the retelling of the anecdote, any narrator is implicated in the prevailing view of invention as (misunderstood) genius. An invention requires an instantaneous circumstance of naming, a spontaneous origin parallel to the invention itself; so, in this case, any search for another, historic source for the name would be fruitless. Instead, it is possible that the current history of the nickname was initiated and then sustained as a strategy involving a search for a presumed context of derision. Thus the search became an attempt to accumulate about the origin of the balloon frame derisive comments that predicted the invention would never work: necessary paraphernalia of the nineteenth-century genius from a perspective of privilege in the present. Invention, nickname, derision—a strategy of selective historical writing that supports a particular view of creative inventiveness popularized by Giedion.5

A skeptical reading of the earliest known reference to the balloon frame might raise doubts about the jocular origin of its name. Caroline Clarke wrote, in an 1835 letter to her sister, "The buildings now are mostly small, and look as though they have been put up as quickly as possible, many of them are what they call here
Balloon houses, that is built of boards entirely—not a stick of timber in them except the sills.6 Notice the matter-of-fact nature of the comments. In the established documentary sources, this is the first reference to "balloon," and yet no derision was implied.7 At the very least, the joke would have been current—a great story to tell in a letter to your sister. Perhaps at the time it was simply a name for a distinct way of building, no joke intended.

As Clarke noted, balloon house was a popular name in November 1835, a mere two years after its supposed invention. In a skeptical reading, this rapid diffusion of both name and technique is suspect. If balloon houses were widespread in the Chicago region, then it is likely that either the name was popular before the 1830s or the term balloon was applied to houses built in a number of different ways.8 In either case, the current history would start to unravel; indications of previous or indiscriminate applications of the name contradict the hypothesis that the balloon-frame system was invented by an exceptional man, on the occasion of a particular building, and instigated by a specific set of circumstances.9

Charles Dwyer made the first known written reference to the derisive quality of the name in 1855, and the analogy between the balloon frame and lighter-than-air balloons has gradually become more detailed and explicit over the last 150 years.10 However, few nineteenth-century accounts make mention of the significance of the name or its derogatory implications, and so any explanation of the etymology of balloon based on analogy and anecdote must be considered tentative.11

Giedion's Story of Architectural Invention

Walker Field has written the most extensive account of the balloon frame as an invented system. He asserts, with no substantiation, that "an invention it surely must have been, and as such it is regrettable that no explicit record of its inception has come down to us." He continues, "That the balloon frame was a 'folk development' originating somewhere in the prairie country was pretty generally believed until Sigfried Giedion, in his article in New Directions, 1929 [sic], sought to attribute the honor to George Washington Snow of Chicago. Thus, Giedion restored thelowly balloon frame to academic architectural circles, and appeared to have solved the problem of its birth for good."12

Throughout the article, Field supports Giedion's premise that the balloon frame is an early example of technological invention. Giedion viewed the inclusion of technological invention in buildings as the most important aspect of nineteenth-century architecture.13 This led him to select historical material carefully. In describing nineteenth-century construction techniques like skeletal-steel framing and balloon framing, he sought to present a correspondence between the way people built then and the way people build today. In Giedion's rush to arrive at similarities to the present, the balloon frame and the skeletal-steel frame were described as successive examples of similar technique. This exemplified his belief in the progressive mechanization of building and the ideal of an industrial building process.14

Field and Giedion cited balloon-frame construction as a decisive change in how people built their houses, and in it they discerned a protoindustrial building process. To them, it was a particular example of the "progressive" modification of conventional building practices. These progressive practices would reduce craft labor, produce components industrially, revise the method of assembly, simplify the joint or develop an identifiable connector, employ lightweight materials, and improve structural efficiency.15 Nonetheless, the balloon frame was worth only a brief mention as a development that anticipated the steel-skeleton skyscraper—a footnote to history.

A revised history of the balloon frame is necessary; a new, subtle, more plausible argument can be drawn from the past. This history, I believe, would reestablish the conception of the balloon frame as a "folk development" in building that evolved out of the popular culture of the early Midwest. Questions of origin would shift from a concentration on one time, one person, and one place to a reconstruction of the cultural context that generated this folk development. In addition, the investigation could be expanded to include the popularization of the balloon frame, with its attendant discontinuities and ruptures in the conventional practices of the time. This investigation might reveal changing attitudes toward home, house, the process of building, and work as well as nineteenth-century attitudes toward technology, innovative method, and general cultural change.16

Alternate Readings of Travelers' Accounts

Travelers' accounts are a substantial part of the documentary evidence of the balloon frame. Charles Joseph Latrobe, an established British travel writer, was a source for many remarks about early Chicago. In his reports, he describes buildings in Chicago and Galena, Illinois; Independence, Missouri; and Little Rock, Arkansas. "The interior of the village [Chicago, 1833] was one chaos of mud, rubbish, and confusion. Frame and clapboard
houses were springing up daily under the active axes and hammers of the speculators, and piles of lumber announced the preparation for yet other edifices of equally light character. 17 As Field and Giedion have noted, Latrobe’s references to lightness and “frame and clapboard” clearly suggest the balloon frame, but Latrobe did not confine his observations to Chicago.

Three other references by Latrobe closely match his description of the balloon-frame houses in Chicago. A few months later, he referred to buildings along the Arkansas River in a similar way: “As we descended, the style of architecture gradually improved, and after a long acquaintance with nothing but log-huts, we began to meet with frame and clapboard houses of various dimensions, though it was not until we reached Little Rock, five hundred miles from the fort, that we met with anything of a yet more permanent character.”18 Because these “frame and clapboard houses” were not of “permanent character” to someone accustomed to heavy timber framing, it must be assumed that the houses were the balloon frame, like those in Chicago. Latrobe referred to “clap-board houses” on another occasion as he traveled the rivers west of the Mississippi. “The town of Independence was full of promise, like most of the innumerable towns springing up in the midst of the forests in the West, many of which, though dignified by high-sounding epithets, consist of nothing but a ragged congeries of five or six rough log huts, two or three clap-board houses, two or three so-called hotels, alias grogshops; a few stores, a bank printing office, and a barn-looking church . . . a thriving and aspiring place.”19 The sequence of Latrobe’s observations—Chicago first, then Independence and Little Rock—makes the association among them all the more convincing, as he described the houses near Little Rock with the full knowledge of the balloon-frame houses in Chicago. Later in his book, Latrobe mentioned two ways of building that he considered roughly equivalent in time and effort, advising potential British settlers to arrive in the spring and “before the trees lose their leaves, [there will be] a comfortable family house of logs or clapboard, with the necessary out-buildings.”20 These observations, and those by other travelers, are strong indications that balloon-frame construction was widespread throughout the Midwest in 1833.

Most proponents of the invention of the balloon frame suggest that Chicaquans in 1832 and 1833 possessed a unique combination of motive and available materials. However, these attributes were pervasive throughout the Midwest in the early nineteenth century. Instead of one inventor, there were many; pioneers were flexible bricoleurs who responded to particular situations.21 In this era of expanding potential, they worked with plentiful materials and with tools that were constantly being improved. New technologies from the East Coast and Europe reached the frontier quickly because the Midwest was a testing ground, an attractive place to try things that were new and innovative.

Development was happening quickly, and the rush to build was endemic. In Jacksonville, Illinois, for instance, pioneers were building a town from scratch, and accounts indicate the types of construction. “Few towns have risen so rapidly as Jacksonville,” wrote John Ellis in 1829. “About a dozen frame buildings finished in good style have gone up last year. I have not counted the temporary buildings going up daily almost.”22 Indeed, the population growth was outstripping the construction of new dwellings, and the town’s first newspaper editor lamented the overcrowded conditions in 1830; by 1835, he noted that “many of the rustic cabins had been replaced by frame and brick buildings to house new businesses and offices.”23 These accounts of Jacksonville—the crowded conditions, the lack of skilled builders, and the “temporary buildings going up daily”—are remarkably similar to those of Chicago a few years later. The “frame” buildings might have been mortise-and-tenon, but, due to the lack of skilled carpenters, the buildings probably included many variations of frame construction.

Nails and Lumber: Not Determining Factors

The argument for the invention of the balloon frame in Chicago relies in part on the reduced cost and expanded availability of manufactured building materials in the 1830s. Nail prices did decrease: “Between 1805 and 1825 nail prices remained constant at 9.5 to 9.9 cents per pound . . . In 1823, prices began a decline that continued until 1835 when prices reached an average of five cents per pound.”24 Despite the decrease in the market cost of nails, the argument that this was a determining cause of the invention is based on some assumptions: that the balloon frame used more nails than the timber frame, that market cost is a good standard for the barter economy of the Midwest, and that the availability of nails was determined by cost.

In the 1830s, the quantity of nails in a balloon-frame house was not significantly greater than in a heavy timber frame house because many houses built with mortise-and-tenoned timbers also included a significant quantity of nails and dimension lumber (Figures 1 and 2).25 There are four typical locations where builders use nails in balloon- and heavy-timber-frame houses: shingles, floorboards, lath, and clapboards. If the builder chose not to sheathe the walls of the balloon house and relied instead on the clapboards for lateral stability, then the number of nails in both systems of framing would be nearly equivalent.
Historians assume that nails were scarce prior to the expanded availability of factory-made nails; however, skilled nailers produced five to six thousand handmade nails per day, and “except for specialty nails, nail-making did not require either high levels of skill or a large capital investment. Nail rod could be cut with a hammer and chisel on a common anvil using a fireplace as a source of heat. Although heading was a bit more complicated, a simple tool fashioned from wrought iron was all that was required for this task. . . . During the late colonial period most of the nails for domestic use were made either by the user or by local cottage industries, while commercial naileries specialized in making nails for ship-building.”

As the Midwest was a barter economy based on wood, nails were not a "luxury commodity" that became “democratized” in the 1820s and 1830s. In a barter economy, the availability of materials is markedly different than in a market economy. Certain goods have a kind of currency that allows their easy exchange to finance other ventures. A writer of the period explained the importance of nails as exchange: “It has become common for country people in Massachusetts to erect small forges in their chimney corners, and in the winters and on the evenings when little other work can be done, great quantities of nails are made even by children. These people take the nail rod iron of the merchant and return him the nails; and in consequence of this easy mode of barter, the manufacture is prodigiously great.” Besides the propensity for individuals to fashion their own nails or to trade them with neighbors, other potential sources included the blacksmiths established by the French crown throughout the Midwest and builders who scavenged existing structures. Before 1830, nails were a staple supply, part of an unrecorded barter economy, and therefore their price is difficult to establish.

As early as the eighteenth century, Pittsburgh was a cheap source of nails and an important source of other manufactured goods for the Midwest. Boards and scantling were supplied to pioneers by their local sawmills, but large quantities were also available in Pittsburgh. In 1833, Charles Fenno Hoffmann, on his way to the village of Chicago, mentioned Pittsburgh’s huge production of lumber: “The timber-trade is another great feature in the business relations of Pittsburgh; the boards and scantling measured within the city in 1830 amounted to more than five millions of feet.” Shipments to the Midwest were not always regular, but they frequently took advantage of transportation provided by traders and travelers en route from the Northeast, who paid for their journey by building a barge and ferrying supplies down the Ohio River. The quantities were prodigious and the transport easy; surely, pioneers used this scantling extensively, particularly to build houses for themselves.
Early Practice Discerned from Later Manuals

Balloon framing is structurally and materially efficient. It is strong and light—a substantial improvement in strength-to-weight ratio over the log or timber frame. The first known publication of a refined version of the balloon frame was by William E. Bell in his construction manual of 1858. Bell had been building balloon-frame houses for fifteen years before publishing a description of its method of assembly.33 He presented the balloon frame as a refined and codified building system, recommending materials and techniques appropriate to various building applications. Historians have conflated this construction system, distilled from Bell and later practices of the 1860s and 1870s, with the actual buildings that Chicagoans erected from 1833 to 1835.34 These construction manuals represented idealized and generic procedures for building a light and efficient structure (Figure 3). These procedures were possible in theory but difficult in practice. People build in a manner quite different from the idealized presentations of construction systems, particularly when new procedures are being tested. (It is not surprising that Bell practised balloon-frame construction for fifteen years before writing his manual.) In the 1830s, it is unlikely that the balloon frame approached the degree of perfection illustrated in later construction manuals.

In 1833, the wood itself was also variable in dimension and quality. In the balloon frame, builders nail the frame, the sheathing, and the clapboards to each other in many places. Each nailed connection contributes to the overall strength of the building. Because no joint is more important than any other, there has to be only a statistical probability of a good connection between adjacent wood members. An individual joint might fail due to a rogue piece of wood or a poor nailing job, but the overall structure is sufficiently redundant that the whole will maintain its integrity.35 Nevertheless, the structure cannot accept general misbehavior, and to a large degree, building rigidity depends on lumber of a uniform dimension and behavior. Charles Cleaver, in a contemporary comment about the lumber supply in Chicago, describes the potentially disastrous results: "In its green state . . . in drying it will shrink, warp and twist in every way, drawing out the nails, and, after a summer has passed, the siding will gape open, letting the wind through every joint. Such was the stuff used for building in 1833 and 1834."36 Dimension lumber reacts differently than timber or even planks: Posts made of the entire cross-section of a tree are stable; timber that squares the cross-section is only slightly less so; planks tend to be unstable in one direction since they slice across the growth rings; and two-by-four scantling, which cuts growth rings on all four of its faces, can bend and twist. Selecting lumber would have needed a trained eye, and seasoning and storing it would have been just as critical. Assembling it into a building would have required an allowance for expansion and contraction. Lumber was essentially a new and experimental product for houses in the 1830s. It was probably the potential for buildings to tear themselves apart, as much as to collapse structurally, that made early balloon-frame houses so risky to build.

Early balloon framing might have been risky for another reason: Ordinarily, it takes builders longer to produce innovative examples. New developments need more time, energy, care, dexterity, and judgment—both before construction, when the design is being planned, and during construction, when builders must cautiously consider the possible design improvements or mistakes while assembling the prototype. It is questionable whether carpenters, who were in great demand in early Chicago, would have been disposed to initiate a time-consuming experiment. For all of the reasons outlined above, the story of invention is suspect, and it is unlikely that such a complex building technique was invented in one instantaneous, imaginative act.

A Critical Review of the Story of Invention

The balloon frame is an important part of the general history of the founding of Chicago and is credited with a significant role in the explosive growth of the Midwest. In 1833, when Chicago was just a
year old, a carpenter named A.D. Taylor arrived in Chicago from Connecticut. In Walker Field’s account, he was the epitome of Yankee ingenuity: When asked to build large numbers of houses in the vast treeless prairie, he responded by inventing the balloon frame.

Field agreed with Giedion that the original balloon-frame building was St. Mary’s Catholic Church in Chicago, but he demonstrated that Taylor was its builder and not G.W. Snow, as Giedion claimed. Field supported his argument by showing that Snow was a merchant, not a carpenter-builder, and that there were no other recorded instances of Snow building in balloon frame. In fact, as Field pointed out, Snow had hired a carpenter named John Gavin to build a small house in traditional heavy-timber frame at the same time that St. Mary’s was being built. Field maintained that this was decisive; no inventor would abandon his invention so easily.

It is possible that St. Mary’s was Taylor’s first and only involvement with the balloon-frame building method. Taylor built some of Chicago’s first churches, some in brick and stone and some with elaborate interior woodwork, but there are no records that he built a balloon-frame building other than St. Mary’s. Therefore, based on Field’s own criteria, it is not likely that Taylor is the inventor, since the argument cannot be supported by demonstrating his recurrent use of the balloon frame. Therefore, both claims of invention depend on the flimsiest of evidence: a single building, poorly documented. Field’s argument—that no inventor would abandon his invention so easily—renders suspect the claims for both Taylor and Snow.

No record indicates that Taylor or Snow ever made a claim to the invention. Even during their lifetimes, when various authors published books on the balloon frame and on Chicago, they did not comment or respond. By that time, the balloon frame was a construction method of some significance, and was hotly debated in the agricultural and architectural press. The complete absence of any proprietary claim—especially in this era of patents and inventions—suggests that no individual was responsible for the balloon frame.

Other than a vague reference to “the balloon frame principle,” Field did not clarify the minimum components of the balloon frame. It is possible that particular components were developed at various times in separate buildings, such as the first building to use two-story studs with a let-in ribbon at the second floor, the first building to use no mortise-and-tenon joints, the first building of “scantling and siding,” the first building to use dimension lumber, and so on—all definitive instances of the balloon frame. St. Mary’s, probably a one-story building with heavy-timber sills, was not the first comprehensive example of the balloon frame; it was merely one of a series of “first balloon framed structures” (Figure 4). Rather than expanding on the minimum components of the balloon-frame construction system, a crucial aspect of his argument, Field glosses over the difficulty. “St. Mary’s, while it did not apply that balloon frame principle in its complete two-story form, marked nevertheless a decided break, and was an important step in the new direction. Although Augustine Taylor is definitely established as the builder of the first balloon framed structure, it is more difficult to assign responsibility for its invention.” There is no logical connection between his first sentence and his second; a “decided break” or an “important step” is not an invention. In fact, steps would imply a process of incremental innovation approaching an ideal type of construction. St. Mary’s Catholic Church must have been just one of many innovative steps, as it was a one-story building supposedly based on a two-story construction system.

In an article more recent than Field or Giedion, Paul Sprague has proposed a revision to the history of the balloon frame as an invention. He attempts to reestablish G.W. Snow as the inventor, based on an 1832 warehouse at the mouth of the Chicago River. He supports this proposition with two late-nineteenth-century sources:
a reference to the construction of the warehouse as "scantling and siding" and a description of the building erected by Snow as having been "a slight affair, yet served for the while as his place of business." Although Sprague helps clarify the history of the balloon frame in Chicago, his search is extremely narrow because he believes in the premise of Giedion's account. He agrees that the balloon frame was an invention and even that G.W. Snow of Chicago was the inventor; he is only quibbling about a detail: the identity of the first building.

At the conclusion of his article, Sprague asserts that Snow had erected a building "that could only have been constructed by the balloon frame method because he used only scantling." Although a reference to scantling can only hint at balloon framing, Sprague has turned it into something definite. Indeed, after referring to this building simply as a "scantling and siding" warehouse, in a later article Sprague describes the same warehouse as an example of the Chicago style of the balloon frame. "If it was a scarcity of heavy timbers that led Snow to invent balloon frame, he must have been able, nonetheless, to acquire at least a few large timbers to use as sills, for as Caroline Clarke and later writers [Bell, Bowen, and Van Osdel] tell us, it became common practice in Chicago to use heavy timbers for the sills of balloon frames." Sprague has presented no documentary evidence of the materials or the manner of construction of this warehouse: no bill of materials, no drawings, no contracts, and no firsthand descriptions during or after construction. Despite a lack of evidence to support any detailed discussion, he has extended the proposition from possible indications of the balloon frame found in secondary sources to detailed speculations about the composition of wooden sills. Like Field, he has conflated his descriptions of Snow's warehouse with later descriptions of the balloon frame and glossed over any discrepancies.

This story of invention now includes three possibilities, involving two people and two buildings: Either Snow was the inventor, based on the 1832 warehouse or the 1833 church, or Taylor was the inventor, based on the 1833 church. Sprague has not answered Field's arguments about Snow's qualifications as a builder, nor has he demonstrated Snow's continued use of the balloon frame. Similarly, Field's hypothesis has been undermined by Sprague's critical analysis. This adds to the uncertainty of any of these stories being correct. At the very least, the hypothesis of invention by either Snow or Taylor is questionable.

One possible explanation might be that the church, and even the warehouse, was a form of the balloon frame and that this method of construction was already in use in the Midwest. Observers noted that Taylor built St. Mary's Church quickly, perhaps because it was not a time-consuming prototype but a method of construction that Taylor had already seen or used. Taylor more than likely had seen balloon-frame buildings in St. Louis during the year before his arrival in Chicago. St. Louis was the center of culture in the trans-Mississippi West, and it is there that evidence of the "folk development" of the balloon frame would likely be found.

The Difficulty of Precise Definition

There are no known construction drawings or specifications for St. Mary's Church. In the histories that credit Snow with the invention, descriptions of the building are sparse; they are confined to the total cost, the names of the priest and the builder, the source of the lumber, and a sketch of the exterior. Field has defined the balloon frame with a short explanation and a drawing that shows a variation of the balloon frame, two stories high with two-by-four sills and no mortise-and-tenon connections. In contrast, Sprague has argued that early builders of the balloon frame often used heavy timber for the sills, mortised to accept the tenons of all the verticals and horizontals. In his second article, Sprague has started to narrow down the definition of the balloon frame by referring to the latter system as "Chicago frame" and Field's system as "Balloon frame." Splitting balloon-frame construction into two varieties has started to clarify its definition. Perhaps additional varieties of the balloon frame were prevalent in the nineteenth century and will yet be identified. The prospect of more and more variations makes the invention hypothesis less and less supportable. The balloon frame is not a rigorously predetermined system. It is a flexible set of building routines or conventions that allows for responses to local conditions, materials, and practices. The careful analysis of the balloon frame results in the definition of a variable construction system that undermines the proponents of its invention.

If the development of balloon-frame construction were similar to advances in other production methods—such as industrial manufacture or high-rise building—it would not have been the sudden inspiration of one man. In the history of technology, the "American system of manufacture" includes the invention of the industrial production line and products with interchangeable parts. Several studies show that it is difficult to credit the manufacturing system as a whole or even innovations in its various subprocesses to one person. Significant advances by individuals like Henry Ford and Samuel Colt were incremental refinements of established methods. Similarly, in architectural history, the system of skeletal-
As the various building systems might suggest, the French frame, or balloon frame, would be significant for the balloon frame. Scantling, though, might be a more significant example of an anglicized version of a French term. In the nineteenth century, it eventually came to mean dimension lumber, but its roots are in escuillon, originally meaning a (repetitive) measure or measuring device. Also, balloon has many more potential meanings in French than in English. If balloon was a popular term that already identified a distinct way of building, then perhaps it was an anglicized version of a term in use in the French settlements along the Mississippi River. There are several possibilities:

5. Plate and sill connections are lap-jointed and nailed in typical Franco-American construction. This example is near St. Louis and dated to 1807 by tree-ring analysis (LaSource-Durand House, phase 1, Historic American Building Survey, National Park Service, James Marsh, delineator, 1985). French poteaux-sur-sole construction is one likely source of the balloon frame.

steel-frame construction combines many separate innovations by various architects. Because innovations modify the component materials or techniques of an existing system until a completely new system forms, it is more likely that the balloon frame was based on another, earlier construction system (Figure 5).

One other detail of Sprague’s account deserves comment. Although he makes a reasonable point that a warehouse building is more suited to a balloon-frame structure than a church, it still might be significant that a church was one of the earliest examples in Chicago. St. Mary’s was commissioned in St. Louis and put in the hands of Father St. Cyr, a priest who had arrived recently from France. Again, this suggests a possible early version of the balloon frame in the French settlements along the Mississippi River.

The Likely Meaning of Balloon Frame

As in any history, research into origins is an issue that is more than causal. In this case, it can be considered part of a larger story of building innovation, assimilation, and acculturation. A new study of the balloon frame must readdress the question of its origins and reconsider the possibility that it is a hybrid of many cultures of construction. After all, balloon is a peculiar name to describe the way we build our houses in North America. This very peculiarity is remarkable and must embody more meaning than is suggested by the derisive anecdotes.

Etymology is one tool in a standard historical approach. Investigating the etymology of words originally based on French methods of construction might be productive. The terms plank, board, and slab—all products of the sawmill—have etymologies in middle English and Norman French that are too old to be significant for the balloon frame. Scantling, though, might be a more significant example of an anglicized version of a French term. In the nineteenth century, it eventually came to mean dimension lumber, but its roots are in escuillon, originally meaning a (repetitive) measure or measuring device. Also, balloon has many more potential meanings in French than in English. If balloon was a popular term that already identified a distinct way of building, then perhaps it was an anglicized version of a term in use in the French settlements along the Mississippi River. There are several possibilities:

balet, balai, balet, balen—various spellings of a word meaning “veranda,” “lean-to,” or “shed,” derived from the Gaelic word balacon
balloon—slang for “prison” (grillage of bars); and baloun—a wooden faggot, both from the German root balla
baler, balette—tall sticks used to mark roads in the snow, or sticks with nails used for leveling earth
balai, balain—broom, both the tool and the bush, perhaps related to basket material and broomsticks, from the Celtic root balaen
bailliveau—the saplings left behind after the forest has been cut down, or a post from these saplings, from the ancient French verb bailler*

Any one of these words could be the root of balloon frame. The resonance of the word balloon in the French language is extensive—far greater than in English—and provides one more clue to the inception of the balloon frame in the building culture of early French settlers.

One documentary source from Missouri describes a house as a “maison en Boullin,” which might be translated as “house made ofin boullin.” Boullin seems to be open to interpretation: In Missouri it meant a log for constructing a house or a fence, and in Quebec, in the phrase piece-sur-piece en boullins, it meant saddle-notched horizontal log construction. These boullin houses were “commonly found in the outlying villages of Florissant and Nouvelle Bourbon.”

Perhaps typical to these villages is this description of a house, transcribed from a deed written in Missouri French and in a reasonably clear hand: “une habitation située sur les cotes et a trois mil[es] ou environs de ce village sur la quelle il y a un parc [demie]
entouré, une maison en Boulin [capitalization in original] et une fontaine.” When this excerpt is translated and the surrounding sentences are added, the result is this surprising passage:

17 September 1804, 8am., before us Jean Baptiste Vallé, captain of militia, civil authority for U.S.A. for the port and district of Ste. Genevieve, here present are [list of parties and witnesses] . . . cede to Mr. Jacques Guibourd, party of the second part, a dwelling place located on the [river] bank and about three miles from this village on which there is a half-enclosed park, a balloon house and a natural spring, [consisting of] 50 arpents in area part and parcel and being a third of the concession given to them on May 1, 1797.

The date on this document, which describes a house being purchased, is 1804—thirty-one years before the “balloon house” reference in the letter by Caroline Clarke. The official phrasing in the document suggests that this term defined a particular sort of building technique that was in common use by the French along the Mississippi River in the first years of the nineteenth century.

The search for early versions of this most American of all construction systems at this new location needs to be expanded into a general investigation for evidence of similar houses and building techniques in the Midwest during the eighteenth and early nineteenth centuries. This would be a broad investigation—initially limited to studying building influenced by two or more cultures—unlike current historical research that has been confined to Chicago in 1833. Research has also been constrained by the assumption that the balloon frame sprang, fully formed, from the mind of one individual. Instead, it is more likely that many innovative builders contributed to its refinement, which would effectively transfer the locus of creative activity from the individual mind to a collective cultural sensibility. As it will not be a search for one origin or one inventor, origin itself will become less important to the history of the balloon frame. It might expand into a study in the elaboration and establishment of conventions. What building techniques were consolidated and codified into balloon-frame, and eventually platform-frame, construction? Can we, today, learn from this process of change?

The limit of this new research is not yet clear, but the impact is bound to be substantial. Building remains one of our basic cultural activities. It is possible that it will support new understandings of American pluralism—the balloon frame could be a hybrid building technique of a multicultural society, evidence in architecture of the assimilation and acculturation of the other.

Once again, a fascinating area of architectural history will be open to exploration of the vital relationship between building technology and building culture.

Notes


5. For example, see Giedion, Space, Time, and Architecture, pp. iv, 24.

6. Letter from Caroline Clarke to her sister, 1835, collection of the Chicago Historical Society. Boards were usually one and a half inches thick and sawn; timber was larger in dimension and was often hand hewn.


8. As late as 1855, Charles P. Dwyer refers to a different framing system, “balloon”: “PLANK, or BALLOON: . . . The requirements are, a moderately heavy cap and sill, and sides of plank nailed to both. The joints throughout these plank walls are to be covered with slips, three inches wide each. It is usual to apply floorboarding, tongued and grooved, to the purpose of forming these plank walls; but much the better plan is to use two-inch undressed hemlock, a sheat the outside of it with inch dressed boards, laid on horizontally.” Charles P. Dwyer, The Economic Cottage Builder, or Cottages for Men of Small Means . . . (Buffalo: Wranzer, McKim, 1856), p. 33.


10. Dwyer stated that the “nickname of balloon was given to this class of wooden structures to mark contempt for their apparently light and fragile formation.” Dwyer, Economic Cottage Builder, p. 33. The derogatory potential of


25. For timber frame, "Hatfield says these studs should be two-by-fours at about sixteen inches on center. (used) (1) as nails to which the outside surfacing was attached; (2) as support for the plaster lath inside; or (3) as guides for the insulation or in-filling." Robert Jensen, "Board and Batten Siding and the Balloon Frame: Their Incompatibility in the Nineteenth Century," Journal of the Society of Architectural Historians 30/1 (Mar. 1971): 43. He refers to R.G. Hatfield, The American House Carpenter: A Treatise upon Architecture, Cornices, Mouldings, Framing, Doors, Windows and Stairs . . . (New York, London: Wiley and Putnam, 1844). The comparison is based on detailed outlines of bills of materials for two houses: a pioneer cottage that used three types of nails and a larger house with lath- and-plaster walls that used two types of nails. See Sereno Edwards Todd, Todd's Country Houses and How to Save Money (Hartford, CT: Hartford Publishing, 1870). Even if a particular balloon-frame house required one-quarter or one-third more nails than a comparable heavy-timber-frame house, the argument can still be sustained.


28. Nails were used to finance trips sponsored by the U.S. government. George Hunter was traveling west in 1797 when he made these notes in his diary: "Having got in our loading [at Brownsville] consisting of 3 Tons Nail Rods & a quantity of nails in Cags. 2 Crates one Trunk one Still several barrels in all about lbs. 10,000, at 2/- pr cwt, put on board by Mr. Bowman of Redstone to be delivered to Mr. Jacob Boone at Limestone Kentucky," and a few days later in Lexington, "Yesterday dined with Colo. Hart who is one of the first people here: He lives in a fine new house he has built near that of Mr January situate[d] on a beautiful rising ground and in an improving part of the Town, where he carries on largely a nail Manufactory & Rope work." Dr. George Hunter, "The Western Journals of Dr. George Hunter, 1796–1805," ed. John F. McDermott, American Philosophical Society, new series, 53/4 (July 1963): 20. See also Charles E. Peterson, Colonial St. Louis: Building A Creole Capital (St. Louis: Missouri Historical Society, 1949). "One of the striking characteristics of eighteenth century contracts which have survived is due to the scarcity of hard money in the village. This resulted in the use of peltries for payment and a great deal of involved barter, often including the furnishing of bed, board, unskilled assistance, nails, hardware, lumber, and the loan of tools and equipment" (pp. 41–42).


30. The French government had a policy of posting blacksmiths to the frontier as support for trade with the Indians. See Richard White, The Middle Ground: Indians, Empires, and Republics in the Great Lakes Region, 1650–1815 (Cambridge: Cambridge University Press, 1991), pp. 122, 139, 248, 309. "There are many hints that on the American frontier structures were deliberately burned for nails. Military forts, structures that often contained large numbers of nails, were frequently abandoned as settlement advanced and had an uncanny record of destruction by fire." Lovedy, American Cut Nail Industry, p. 5, n. 6.


32. Hunter, "Journals," p. 20. See also n. 28 of this article.


34. Field, "A Re-examination," figure on p. 7, and Giedion, Space, Time, and Architecture, fig. 208 (from Woodward) and fig. 210 (from Bell).


39. Andreas, History of Chicago, p. 145. Taylor is referred to as the builder of many churches, for example, St. James' (Episcopal) in 1837, the second St. Mary's in 1843, St. Patrick's ($750) in 1846, St. Peter's (one-story frame, $900), and St. Joseph's. These churches could be balloon- or mortise-and-tenon frame; the prices indicate either larger churches than the first St. Mary's or inflation over ten years. William Bross identifies the Second Presbyterian Church as balloon frame but does not identify the builder. St. Peter's is identified as "one-story frame." This might suggest that public recognition of the balloon frame was not as widespread as the current history suggests.
40. This included events like the exhibit of Lyman Bridge at the 1867 Universal Exposition in Paris. See James H. Bowen, "Buildings, Building Materials, and Methods of Building," in William P. Blake, ed., Reports of the U.S. Commissioners to the Paris Universal Exposition of 1867, 6 vols. (Washington, DC: Government Printing Office, 1870); and books such as Bell, Carpentry in 1858; J.S. Wright, Chicago, Past, Present, Future Relations to the Great Interior and to the Continent (Chicago, 1868); and Hurbut, Chicago Antiquities in 1881.
41. See the debate between Solon Robinson of Indiana and George Woodward of New York. This occurred in various journals, including American Agriculturist, Country Gentleman, and the New York Tribune. See also Gervase Wheeler, Homes for the People (New York: C. Scribner, 1858).
43. Ibid., p. 20. It is likely that St. Mary's had timber sills, with mortises to accept the vertical studs and the horizontal joists, and timber top plates, with mortises to accept the vertical studs and perhaps the rafters.
45. Ibid., quoting from Industrial Chicago, 6 vols. (Chicago: Goodspeed, 1891-96) and Hurbut, Chicago Antiquities, p. 48.
46. Sprague, "Origin of Balloon Framing," p. 319. In the nineteenth century, scantling was used extensively in construction.
49. Hurbut, Chicago Antiquities, p. 603. "Mr. [A.D.] Taylor saw Bishop Rosetti in St. Louis in 1832. His brother, Anson, . . . went to St. Louis and brought Father St. Cyr here [1833]."
51. See Sprague, "Chicago Balloon Frame," p. 44. Builders used both methods concurrently, although the Chicago variety "gradually lost favor between 1874 and 1887."
53. Based on existing references, there is at least one more variety of balloon frame. "Post balloon frame" would include buildings built using similar framing procedures but with "rails or round poles" instead of dimension lumber. For houses built by Solon Robinson see Wheeler, Homes for the People, p. 409, and for the house built by Daniel Elston, see Mabel McIlvaine, ed., Reminiscences of Early Chicago (Chicago: R.R. Donnelley, 1912), p. 54.
61. Jean Baptiste Vallé, deed of transfer, 1804 collection of the Missouri Historical Society.