Field Report

HOUSE BUILDING IN SHAANXI, CHINA: A CHRONICLE OF THE TECHNIQUE AND CEREMONY OF RAISING THE ROOF FRAME

J. AZEVEDO


J. AZEVEDO is a consulting writer specializing in house construction. While teaching in Xi'an, Shaanxi Province, he pursued his interest in Chinese building techniques.

We arrived in Lantian at dusk, the last of the passengers to get off the aging bus, and set off on foot toward the village we could just make out in the failing light. My companion Li Wenxin, a fellow teacher at the University in Xi'an, led the way along the footpath that crossed fields fresh with the sprouts of winter wheat. After living in the crowded confines of the city, it felt odd to be virtually alone, to hear nothing but our own footsteps. Just before we dropped down into the cut leading to the village, a November moon, one day short of full, breasted the horizon to light our way.

We had come to the village to join in a roof raising, the central symbolic and physical act in the building of a house in northern China. I knew of Chinese architecture from its temples and palaces, its official historic structures, but I was also very interested in the buildings where people lived, specifically how these were put together. The next day I would...
have the privilege of participating in a building activity that had as much to do with firecrackers as with hammer and nails.

THE SETTING

Lantian County, about three hours by creaky bus east of Xi’an, Shaanxi Province, lies on the southern fringe of northern China’s vast loess region (FIG. 1). The aeolian loess soil, a fertile silty clay or silty clay loam that extends down uniformly to 100 meters or more, provides not only a productive soil for growing the staple wheat of north China, but also a decent building material for mud-based plaster, clay tiles, and fired and unfired bricks. During the dry, cold, Continental winters, the fine-textured loess flies on the prevailing northeast wind and settles on every surface. The major river passing through the region owes its turbidity, and its name, to the yellow loess.

The middle reaches of the Yellow River, where it is joined by the Wei near Xi’an, are known to have nurtured some of the first Chinese peoples. Archaeologists have excavated a prehistoric village on the outskirts of Xi’an. Others have found nearby the skull of an early pre-hominid, a namesake of Lantian County.

Whereas Xi’an sits down in the Wei River valley, Lantian County perches on top of the surrounding plateau. Not tabletop flat, but gently rolling, the plateau is dissected by minor watercourses which create cuts ranging from small glens to major ravines. The village I was visiting lined one of the smaller glens with a cluster of houses and trees. The older houses nestled within the protection of the glen, but the newer ones had outgrown the site and expanded over the crest of the plateau onto the farmland. All the houses were built on terraced platforms cut into the hill, and all had essentially the same form: the rectangular courtyard plan of north China.

THE HOUSE AND ITS SITE

Tian Xiaolong, the eldest son of Tian Baoan, had lived in his father’s house until he married, at which point he had moved into the adjacent addition within his father’s courtyard. As with other traditional courtyard houses in northern China, the Tian compound had been planned to accommodate this room as the entitlement of the eldest son. At some point, however, the son was expected to move out of his father’s courtyard and build a courtyard for his own family. Tian Xiaolong, now in his mid-thirties with a wife and two children, had come to this point, and his new house was the one I had come to see being constructed.

When I arrived, the house was a brick shell located at the end of a row of recently built houses. The row ran east, away from the center of the village, stair-stepping out of the glen onto the plateau. Each house sat on a level terrace just a bit higher than the previous one. Still, the terrain rose even more steeply, and the base of Tian’s house had had to be cut about three meters into the plateau (FIG. 2). Mr. Tian explained that the village plan called for a new road running east-west in front of the houses (south) and for a regrading of the adjacent farmland to make room for more houses. Even as the builders worked on Tian’s house, other men excavated the loess nearby, using the soil to make tamped mud bricks (tupi) (FIG. 3). Tupi used to be the standard building block in northern China. Tupi are still used for walls and some rough structures, but most houses are now built of brick.

Because the house site faced south, I first thought the Tians had used the principles of feng shui to orient it. In fact, the method of choosing the site had been more prosaic and pragmatic than cosmological or divinatory. Though in the past a builder might have consulted only one authority, the feng shui xiansheng (expert), Tian had needed to get the approval of many. The procedure for obtaining permission to build a house in this village, as in other areas of rural China, consisted of a series of hierarchical steps, each requiring discussion and consensus. Especially since 1982, when a national regulation directed collectives and towns to plan their development, the local bureaucratic process has generally been codified. Tian, for example, first had to apply to the leader of his production team (an aggregate of several families). The leader had then held a meeting and, after agreement
was reached, had forwarded the application to the housing leader at the commune level. That person had also held a meeting, and then he had sent the proposal to the county. Following consensus at the county level, approval for Tian’s request had been sent back through the same channels. Finally, the production team had decided that the house would be sited in the row of recently built houses in accordance with the village plan.

Though adjacent houses had been built to a more modern flat-roofed design, Tian’s house followed the gabled form of the older houses in the village and the vernacular of farm cottages in northern China. Proponents of flat roofs argue that the roof space can be used for drying grains, and that the scant rainfall in north China does not justify a sloped roof. Mr. Tian, however, simply preferred the traditional gabled form.

The rectangular plan of the new Tian house enclosed a space nine meters deep by twelve meters wide, symmetrical about both axes. The walls were of local fired brick in two wythes with a Flemish bond (alternating stretchers and headers), corbelled at each rake. Two reinforcing pilasters, at the bearing points of the future roof trusses, divided the wall into thirds. In each long wall, a wood frame outlined a centered door, flanked by two windows, each centered on one of the side bays.

Departing slightly from the older convention of keeping the interior open as a single multi-use space, Tian planned to follow the more recent trend of dividing his house into five rooms: first splitting the space into thirds, following the symbolic divisions set out by the trusses, then further dividing the two flanking bays in half, front and rear. The two rooms in the rear corners would be for storage of food and tools. The room at the southwest would be a “parlor,” and that at the southeast, a mere sixth of the total space, would shelter all main indoor activities such as eating, sleeping, and watching television. The central bay, a full third of the space, would remain undifferentiated, with a function close to that of a wide passageway. Tian could not speculate on how his family might otherwise use the hallway, and in fact he considered the unaccessed space a limitation of this plan.

Tian planned to extend courtyards off the front and back, enclosing the spaces with mud-plastered block walls. The shallow rear courtyard is a recent trend, but the deeper courtyard to the front (south) is consistent with the traditional form. Symbolically, the courtyard wall defines one’s place not only spatially but also in the realm of human relationships. The wall — whether in the country or in a city, for a workplace or for a house — distinguishes those who are treated as insiders from everyone else.
From a practical rather than a spiritual standpoint, though, Tian's courtyard will provide room for a future kitchen and eventually a separate room for his own son when he marries. Like the traditional courtyard, Tian's courtyard was planned to face south, although that orientation had again come about by chance, not by design. Opposite Tian's house, another row of houses would front the future street, and their courtyards would face north. Though vernacular form may remain, for new houses that conform to government planning, traditional orientation may not.

RAISING THE FRAME

Construction of the shell of the house had been in progress for almost a week when I first saw it, and would continue for almost as long after I left. I would join in the central activity, however, that of raising the trusses.

Tian had hired two builders, brothers with the surname Wang from a neighboring village, to supervise construction of the house. Carrying the standard plan in their heads, the Wangs were responsible for completing the shell. By arrangement, Tian provided them with materials, hired laborers as needed, meals and housing, and tea and cigarettes. He would finish off the interior.

Perhaps the most complex of the Wangs' jobs was the prefabrication of the roof frame. Cut on the ground, the two main trusses and 39 purlins would be raised and joined by a large but unskilled group of men; all of the pieces had to fit. The Wangs built the two trusses of peeled pine logs, cut the previous year in the mountains to the south (FIG. 4). Basically, each truss was a triangle with a vertical king post and triangulated bracing.

Although the corner joints were bolted, the other joints were either mortised or clipped with iron dogs. Four vertical iron rods in tension held the top chords to the bottom.

Raising the massive trusses is a community event, by necessity and by choice. On this day, Tian had spent the morning carting purlins and rafters to the building site and helping the Wangs finish up the trusses and arrange stopes and braces. Though the whole village knew the raising was to be at noon, form still required that Tian light strings of firecrackers to announce his intentions and request help. Soon after, Tian's house was crowded with about 30 men of the village and a boy who had managed to escape school.

Before they could begin, the work party needed to set off more firecrackers. This time, a local official, the county superintendent of schools, climbed the scaffolding to the west gable and held a string extended over the peak. Then everyone shouldered the first truss and, under the direction of the senior Wang, inverted it and guided one end into its pocket on the south wall (FIG. 5). With some men below and some above on the wall with ropes, they then hoisted the other end in place (FIG. 6). The second truss went up as the first. With both trusses now hanging upside down, the men rotated the first upright, pushing with poles and pulling with ropes (FIG. 7). This truss was stabilized with a ridge pole extending from the gable end, and then the crew rotated the other. With both trusses upright, the Wangs scaled the frames to lock them in place with the center ridge pole (FIG. 8). After this, it was a matter simply of spiking the remaining purlins to the trusses. All that remained was to place the upper central ridge beam. But raising this last piece proved to be a complex and significant act.

A TRADITIONAL CELEBRATION

Accompanying with a frame raising in northern China is a ceremony, part of a set of house rituals that begins with the choosing of the site and continues through the life of a house and its occupants. These rituals have changed little over time — after all, timelessness must be part of the definition of ritual — but their meanings have changed. At this frame raising I saw the elements of the ceremony and caught a glimpse of the different ways they were viewed by those present.

While most of the men had been raising the frame, an older man skilled in calligraphy had been preparing traditional red banners with a variety of auspicious sayings (FIG. 9). Red generally symbolizes joy and good luck; it is the color of weddings and New Year celebrations. These red banners have a particular place at the doorways of new houses where, not unlike the horseshoe over the door in a Western culture, they set a tone of good fortune. These paper talismans are renewed at each New Year season.

The ridge of this house is formed by two sets of beams, smaller poles mortised into the trusses and larger ones resting on top of them. On the center inferior beam, on the surface facing down, the family had written the date and time of the raising and an expression of good wishes (FIG. 10). Red generally symbolizes joy and good luck; it is the color of weddings and New Year celebrations. These red banners have a particular place at the doorways of new houses where, not unlike the horseshoe over the door in a Western culture, they set a tone of good fortune. These paper talismans are renewed at each New Year season.

The ridge of this house is formed by two sets of beams, smaller poles mortised into the trusses and larger ones resting on top of them. On the center inferior beam, on the surface facing down, the family had written the date and time of the raising and an expression of good wishes (FIG. 10). Also on that beam was tacked the circular taiji, symbolizing the original taiji at the source of the universe. That a couple of the younger men I talked with could not explain the origin of this symbol suggests that it has become more a generalized emblem of good luck than a specific spiritual icon.
FIG. 4. The two nine-meter trusses for this house are built from pine poles with simple joinery. Bolted iron plates hold the corners together, and four vertical iron rods hold the truss in tension.

FIG. 5. The volunteer crew raises the first truss and slips the end into its slot in the front wall. At times the unwieldy truss seemed barely in control, yet the raising was completed without mishap.

FIG. 6. With one end of the truss resting on the south wall, the men begin to raise the other end, a more complicated (and dangerous) process as the truss gets above the reach of their arms. For push-props, the men use pairs of long poles lashed together with twine. The twine forms a cradle under the truss.

FIG. 7. With the truss hanging upside-down in its pockets in the walls, the men rotate it upright. At each gable end, men with ropes tied to the apex of the truss pull in opposition to keep the truss from swinging back down.

FIG. 8. With both trusses upright in their final positions, the builders slip a tenoned ridge pole into mortises in each truss, locking the frames in place.
A more elaborate ceremony was involved in raising the final ridge beam, the one directly on top of the *taiji* beam. In preparation, the elder Mr. Tian had brought a table to the center of the house and set on it some of the builders' tools, an incense burner, and two candles in glass bottles. The men laid the beam across the table and draped two red cloths over its ends. They tied ropes to the ends and passed the ropes over the ridge and down again.

The first part of the ceremony was solemn and reverential. The elder Mr. Tian lit the candles and incense as a tribute to Lu Ban, the mythical forefather of architects and builders, as represented by the tools (Fig. 11). The ceremony also recognized the efforts of the two builders who worked on this house; the red cloths draped over the ridge beam symbolized the Tians' appreciation for their work. The next rite, which the younger men joined in with more enthusiasm, closed the frame raising the way it began, with firecrackers. Tian tied two strings of them to the beam, and lit them as the men hauled the beam up towards the ridge (Fig. 12). The room filled with noise and acrid smoke.

When the present government came to power in 1949, it began a systematic program to eliminate folk superstition and religion. Though more successful in the cities than in the countryside, that program seems to have had a profound effect
on traditional ceremonies — if not on their form then in the way people view that form. At this ceremony, the perception of the ritual seemed to break along generational lines. For the elder Mr. Tian it would have been unthinkable to skip the elements of the ceremony. That is not to say that he felt compelled by superstition. Rather, he abided by the rituals out of custom, because it was expected and out of respect for the traditions of his ancestors. His son, in contrast, felt less need for the rituals; he acquiesced to his father’s wishes. Yet, even without pressure from his father, he would still have celebrated the frame raising. As in most other cultures, the building of a house in northern China is a joyful event to be shared with the community.

The setting of the ridge beam concluded the physical activity of the frame raising, but the social activity continued. It was a simple but elaborate celebratory meal on tables around the Tian courtyard that spilled out into the street and ended the social aspect of the frame raising.
The author thanks Li Wenxin for arranging the visit and explaining local customs. He also thanks the Tian family for sharing their celebration with a stranger.

1. The two uses are not incompatible. Unlike most other soils, the uniform loess has no distinct topsoil and subsoil, and so it can be stripped of its surface layer without a significant loss in fertility.

2. A family builds this room and accumulates furniture in anticipation of the event. As the timing of the marriage cannot be predicted with certainty (more so today than in the past), the room may remain empty for some time after it is built. During my first night in the village, I slept in the vacant room of an unmarried eldest son.

3. The Chinese would embrace my choice of the word "consensus" though they might disagree with the words "approval" and "permission" used earlier. Officially, no decision in China is unilateral. A supplicant always "suggests" or "proposes," and the official "agrees," usually after a discussion with others.

4. Zhao Bonian, "Rural Housing Boom: New Designs for Changing Lifestyles," China Reconstructs 52 (March 1983), pp. 44-48. The planning regulation is more significant than it might at first seem because China is a country of few official laws. Behavior is generally governed by collective assent.

5. As a variation on the building contract, the builders may bring their own team and complete the house without any assistance from the owner other than providing materials. Of course, the builders would charge more, about $200 (at the standard exchange rate in late 1987), whereas Tian paid only about $100. The difference is significant, as most rural homes in China today are financed by the owners. Fang Jinggen and Chen Rinong, "About Housing in China Today," China Reconstructs 29 (September 1980), pp. 11-12.

6. The Chinese call these trusses renziliang or renzijia, meaning ren-shaped trusses. The character ren ("person") looks like an inverted "V".

7. I was somehow delighted to hear the men coordinate their efforts using the words: "One. Two. Three." This small congruity with my own culture, where every young child, it seems, learns that collective effort proceeds on the count of three, reminded me of the many parallels that exist in cultures that are superficially dissimilar.

8. In a country where such beliefs are politically unacceptable, even if he had held a religious view of these rituals, he would not have told me so.