

A “Lost” Technique, Found

HOW THE HUNTINGTON’S MOON BRIDGE SPANS THE CENTURIES

By Lisa Blackburn

It’s not unusual to see graduate students at The Huntington; on any given day there are likely to be dozens of them hard at work conducting research among the collections. But it’s not every day that a doctoral candidate is spotted standing ankle-deep in the mud in the Japanese Garden pond.

That’s where Yan Liu spent a good part of her research time at The Huntington this summer. An architectural historian from the Technical University of Munich whose primary research focus is carpentry traditions in Europe and East Asia, Liu came to Southern California in June to conduct a detailed survey of the construction of the Japanese Garden’s iconic moon bridge. The century-old span is an example of a rare type of structure known as a timber woven-arch bridge, constructed from short pieces of wood woven under and over crossbeams.

Built in 1912 by Japanese craftsman Toichiro Kawai, the moon bridge at The Huntington has captivated visitors for generations. But Liu believes this familiar landmark has even deeper roots, with a lineage that can be traced to a very famous Chinese ancestor.

“The earliest example of this type of bridge comes from a 900-year-old painting known as the Qingming scroll,” says Liu. Now preserved in the Forbidden City’s Palace Museum in Beijing, the

Song dynasty scroll by artist Zhang Zeduan depicts a bustling river scene outside the gates of Bianjing (now known as Kaifeng), the capital city at that time. In one section of the 17-foot-long scroll, a gracefully curving bridge crowded with pedestrians arches over the river. From its shape came the name “Rainbow Bridge.” The bridge itself no longer exists,

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and Liu says those of similar construction are few and far between, located primarily in the remote mountain areas of southeast China.

Liu points out that it isn’t the arching shape that makes these bridges unique. Many moon bridges made of stone exist in China, and wooden bridges constructed with curved beams are also common throughout Asia. But the woven-arch technique is extremely rare.

“It is a genius invention as a structure for a large span,” says Liu. “For a long time it was thought to be a lost technique.”

Before Liu came to Southern California, she was conducting research for her thesis on woven-arch bridges when she came across a photo on the Internet



of a bridge that closely resembled the famous Rainbow Bridge. Her curiosity was piqued by the fact that it was set in a Japanese-style landscape, rather than in China, and that the people in the photo appeared to be westerners. “I was quite curious,” recalls Liu, “and I posted it on a forum asking for information. Some friends who study and live in the U.S. recognized it as The Huntington. From then on I was waiting for a chance to visit and study it.”

Liu describes herself as a “building biographer,” whose primary aim is to study everything about an object, from its historical context to its construction. And, like any good biographer, that means getting very close to her subject. To take detailed measurements of The Huntington’s bridge for a precise scale drawing, Liu used traditional architectural tools such as string and plumb lines, rather than relying on lasers or other high-tech devices. “This is an ‘old school’ method, used for thousands of years before modern machinery,” says Liu. “But it enables me—forces me—to observe the structure very closely.”

One of the things this close study revealed to Liu was that the standard of measurement used in the bridge’s original construction was neither centimeters nor inches. As she was taking her measurements, she noticed that many of the beams were cut to a width of 15.15 centimeters—a curiously irregular size. On a hunch, she looked up the length of the Japanese *shaku*, a unit of measurement used in 19th-century carpentry. “A *shaku* equals 30.3 centimeters, so 15.15 centimeters is exactly half a *shaku*,” she says. The bridge’s builder, she realized, had used the Japanese scale standard to measure and cut the beams.

But how did Toichiro Kawai, a Japanese craftsman working in Southern California in the early 1900s, happen to build a bridge that so closely resembled one created, and destroyed, centuries earlier in China? Had the unusual technique spread to Japan, along with other cultural influences that traveled east during the Tang and Song dynasties? Liu’s research has uncovered a reference to a similar structure built in Japan in the 19th century, but that example no longer exists. The Huntington bridge appears, at the moment, to be the only link.

Liu feels certain that the resemblance can’t be a coincidence: “The woven-arch structures of the Huntington bridge and the Rainbow Bridge are too similar. Even though they have some differences, the structural principles are identical. Both are



Left: Yan Liu uses “old school” measuring techniques, employing string and plumb lines, which enable her to make the closest possible observations. Photograph by Don Rasmussen.

Below: The Rainbow Bridge, detail in the famous Qingming scroll (*Along the River During the Qingming Festival*) by Song dynasty (960–1279) artist Zhang Zeduan (1085–1145).

Opposite: The Huntington’s moon bridge today. Photograph by Lisa Blackburn.



quite similar to a traditional Chinese folk game called ‘to build a bridge with chopsticks.’” From a structural and constructional view, Liu asserts, the kinship between the moon bridge and the Rainbow Bridge is almost undeniable.

As part of her Huntington research, Liu is creating a series of detailed drawings of the bridge, including a longitudinal section and a cross section, complete with precise measurements and notes on construction materials and techniques. She plans to donate a copy to The Huntington. No original plans for the Japanese Garden’s moon bridge exist, so Liu’s research will serve as a valuable historical record.

And so—across centuries, cultures, and continents—a technique once thought to be lost is found again, in a most unexpected place.

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