

This story first appeared in my book *The Puzzling World of Polyhedral Dissections*, where it constitutes Chapter 20. It is here revised and expanded. That book is no longer in print but can be found on the John Rausch website. It is also illustrated on page 105 of my *Compendium*.

The Two Tiers Puzzle (later renamed To Tears)

Some of the material for this book came from the far corners of the world and beyond. The following incredible story was provided to me by a correspondent in Calcutta named Paul E. Gahn. I cannot vouch for its authenticity and present it just as it came to me.

Paul is a puzzle craftsman. He was busily engaged at his workbench late one evening when there was a knock at his door. Being somewhat of a loner, he was not accustomed to having very many visitors knocking at his workshop door, and especially at night. At his door was a young woman, colorfully clothed in a *firiq*, the typical dress of Afghan women. Over her head she wore the traditional *chador* head scarf, and as the wind whipped it about, it revealed her attractive face. Paul invited her in.

She held a small bundle wrapped in a scarf. Naturally, Paul was puzzled by the sudden appearance of this young woman, especially on such a dark and stormy night. He would have liked to ask a few questions about the circumstances, but she came straight to the point and said she had something to show him, having heard of his reputation as not only a craftsman but also as a puzzle historian of sorts.

They sat down together on a couple of stools at his workbench and, as she unwrapped the bundle, six wooden puzzle pieces tumbled out onto the bench. Paul immediately became quite interested. She showed him that all six pieces were supposed to be made of eight strangely shaped wooden blocks glued together, but one of them had a block missing. She asked him if he could please replace the missing block and then reassemble the puzzle, correctly of course *this time*. He said he would be glad to, but only if she would reveal to him the whole story of this intriguing discovery, its origin, how she came to possess it, and especially what she meant by *this time*. She agreed to do that, and this was her amazing story.

The puzzle first appeared in the hands of a prosperous Afghan merchant in the early 19th century, and where he got it no one knows. The merchant had two daughters. The older daughter fell in love with a British soldier, and soon they announced they wished to be married, for which of course they sought the father's permission. He was not too impressed by the soldier, and so decided to put the young man's wits to a test. He gave the soldier the puzzle in pieces and said that as soon as the puzzle was returned assembled, a wedding could be arranged.

The suitor worked feverishly on the puzzle, with the girl secretly helping, and finally after several weeks he proudly presented it to the father, neatly assembled into the shape of a twelve-sided polyhedron. Plans were then made for a wedding

the following week. Just when everything seemed fine, the younger daughter brought the puzzle to her father and observed that she could hear something rattling inside. Taking it partially apart by separating it into two halves, they found one block broken off and loose inside. They concluded that the block had been broken off deliberately in order to create a second easier solution rather than the intended one. The enraged father summoned the two lovers and confronted them with the evidence, which they vigorously denied having any knowledge of.

At this point in her story, Paul interrupted and asked if it were not possible that the younger sister may have been jealous and had done this herself out of spite. She replied that, as a matter of fact, that was probably the case. The father was not sure, but he had begun to have his suspicions. After he had cooled down a bit, he agreed that the wedding could take place after all, but only after the puzzle was repaired and put back together correctly. The poor lovers worked desperately on the puzzle for weeks, for they had a very special reason for wanting to be married soon. But alas, they simply could not solve it. Finally, one fateful day, the distraught young woman took her own life by fire. The soldier vanished from the scene and was never heard from again. The accursed puzzle also disappeared.

Paul had excitedly been taking notes and making sketches while the woman was telling this strange tale. He began to wonder if this could at last be the fabled “Lost Puzzle” supposed to have been invented by the legendary Chinese mathematician Mee-Sing Won of the Ming dynasty!

Again the woman asked Paul if he could help her, but now she was moved to tears. He said that of course he would, but first he would try to match the wood for the missing block, which appeared to be some type of rosewood that might be hard to find. She said that would not be necessary, and reaching down into her bosom drew forth the missing block and handed it to him. Already rather shaken, he was even more startled to find the block too hot to handle! The woman said she could not stay any longer. Paul asked her how he might contact her when the job was done. She replied that would not be necessary – she just needed to have it fixed. Paul looked at her quizzically. “You see,” she said, “the wedding cannot take place until it is repaired and assembled correctly.”

Suddenly Paul thought he smelled smoke, which is enough to rouse any woodworker from his stupor. Glancing around, he found himself alone. The woman had vanished into the night, as mysteriously as she had arrived, and so had the puzzle pieces. All that remained was his notes and rough sketches on a piece of scrap paper. A strange story indeed, made all the more so by the bizarre time line - Ming Dynasty, early nineteenth century, British occupation, and now the present times. It all didn't seem to make any sense.

(At the time of publication I had not actually made one, but subsequently I have made a couple. The object of the puzzle is to discover both solutions with the block not attached. It could be left loose or held temporarily in place with tape.)

But here is the real puzzle. Which of the two sisters do you suppose she was?