

Taj is not symmetrical, discover city researchers

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By Mihika BasuMihika Basu, Bangalore Mirror Bureau | Mar 25, 2016, 04.00 AM IST

Nias scholars say the central dome is tilted from vertical axis
Wise men say there's no such thing as perfect love. Even the ultimate Indian emblem of love, the Taj Mahal — known for its perfect symmetry and flawless architecture — has its flaws. Now an interesting research by the National Institute of Advanced Studies (Nias), Bengaluru, shows that the central dome of the monument is slightly askew.



"The Taj Mahal is renowned for its perfection, symmetry and attention to detail; its beauty and magnificence appeal to almost all viewers. It does, however, possess some slight imperfections that escape most observers," says the findings. While it may be renowned for its bilateral symmetry, the central structure, the study points out, has two imperfections.

"The main anomaly is that the central dome of the monument is not perfectly symmetrical. The other is relatively minor: in some of the photographs, the finial over the central dome is tilted from the vertical axis. The tilt could have occurred when the bronze replica was installed in the early 19th century, or during a subsequent restoration," says the report.

Nevertheless, authors Dilip R Ahuja and MB Rajani from the institute clarified in their paper that they counted themselves among Taj Mahal's admirers, and neither the reasons for its construction nor its symbolism concerned them. Ahuja said he had noticed the imperfection decades ago. "I had noticed on my second visit to the Taj, some 30 years ago, that the central dome was asymmetric."

In April last year, at a talk on Mughal funerary architecture at Nias, he mentioned this. "Since this was not widely known, we were encouraged to write about it," Ahuja told Bangalore Mirror.

"Would it have been less beautiful had the dome been more symmetric? We doubt it. It is imperative to determine whether the asymmetry poses any risk to the structural integrity of the monument," say the authors in the paper published in the Current Science journal of the Indian Academy of Sciences.

How they did it

With the geographic information system (GIS) software, it did not take the researchers much effort to establish the asymmetry.

They took horizontal slices at different heights from the drum (on which the dome sits) and measured the pixels on the right and the left sides. "Since they were unequal, we concluded that the dome is asymmetric," said Ahuja, who has visited the Taj Mahal four times.

Three possibilities

One is so struck by the beauty and size of the monument that the imperfections are not so obvious, says Rajani, adding that some angles are more telling than the others.

Being the first to report this observation, the authors in their paper have discussed three possible reasons for it.

"Three possible conjectures present themselves. One, that it was an intentional error. Second, the deformation did not exist at the beginning but became accentuated over time, and third, it was a construction error that has existed from the beginning," says the paper.

While discussing the first conjecture, that it could be an intentional error, the authors write: "Islam holds that only Allah is perfect. We have heard stories that for this reason, Islamic master carpet weavers deliberately introduce a slight error in their carpets that is detectable only by a trained eye. This is unlikely to be the case for the Taj's central dome."

They say that there are other small imperfections in the building — not visible from the ground level — that seem intentional. "For example, the base of the chatris is left in red sandstone and not covered with marble."

For the second conjecture, the paper says, it is becoming apparent that the northern and the southern ends of the platform on which the Taj sits are differentially sinking over time, with the northern end towards the river having sunk 35 mm more than the southern end.

"It seems highly unlikely to us that this slight sinking would have caused the rigid dome to become more asymmetric over time," it says.

The plausible one

The researchers believe the third conjecture is the most plausible — the imperfection has existed from the beginning.

"It is an outer dome constructed after the inner dome was finished and therefore perhaps the builders did not have the benefit of a central plumb line," reveals the paper.

"It seems incredibly unlikely to us that for someone with his aesthetic sense, he would not have known. More likely, he chose to overlook it. It is quite possible that the artisans may have convinced him that there was no way to guarantee that a second attempt would lead to an improvement, given the 'tools' available to them and the complexity of the dome's shape."

In fact, the authors say they've found similar asymmetry in Delhi's Jama Masjid too.