Aztec Turquoise Tiles May Solve a Mesoamerican Mystery

A recent geochemical analysis calls into question the idea of extensive contact between Mesoamerican and Southwest American cultures before the Spanish invaded.

By Nicholas St. Fleur

June 13, 2018

A reconstructed turquoise mosaic recovered from Templo Mayor, the main temple of the Aztec city of Tenochtitlan, in present day Mexico City. Oliver Santana/Editorial Raíces

With its brilliant hues of blue and green, turquoise was a highly prized gemstone to the ancient Aztecs and Mixtec in the region that stretches from central Mexico to Central America known as Mesoamerica. They used the mineral to create armbands and nose plugs, for handles on sacrificial knives and also to design elaborate mosaics of warriors that adorned their ceremonial shields and fearsome statues of double-headed serpents.

For more than a century, archaeologists have questioned the origins of the turquoise used in these beautiful pieces of artwork and jewelry. Because scientists have found little evidence of turquoise mining in Mesoamerica, some researchers have used the presence of turquoise artifacts in the area as evidence of a long-distance trade exchange with ancient civilizations thousands of miles away in the American Southwest, where turquoise mines have been found.

But a recent geochemical analysis of Aztec and Mixtec turquoise suggests that the mineral did not originate in the American Southwest, but rather in Mesoamerica. The finding, published Wednesday in the journal Science Advances, also calls into question the idea that there was extensive contact between Mesoamerican and Southwest American cultures before the Spanish invasion in the 1500s.

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Alyson Thibodeau, a geochemist at Dickinson College in Pennsylvania and lead author on the paper, was given a jar filled with turquoise tiles that were associated with Mesoamerican mosaics. Many had been excavated from offerings in the Templo Mayor, which was the main temple in the ancient Aztec city of Tenochtitlan, present day Mexico City. The pieces date mostly to the late 15th century. Some of the samples came from loose tiles associated with Mixteca-style turquoise mosaics held by the Smithsonian Institution in the collections of the National Museum of the American Indian.

A Mixteca-style shield decorated with turquoise. The findings cast doubt on the idea that Mesoamericans and Southwest American cultures traded or interacted extensively before the Spanish invaded in the 1500s. Frances F. Berdan

After shaving off the tiles' edges to remove adhesives, Dr. Thibodeau ground them up individually and dissolved them in acid. She then analyzed the samples for their isotopic fingerprints, which provided insight into their origins.

Late in the lab one night, she got back her first results.

"I saw the number pop up and I'm pretty sure I did a dance around the lab," Dr. Thibodeau said.

"Not only do they have isotopic signatures that are absolutely consistent with the geology of Mesoamerica," she said, "but they are completely different from the isotopic signatures of the Southwestern turquoise deposits and artifacts that we have seen so far."

Dr. Thibodeau said that even though archaeologists have not found remnants of turquoise mines in Mesoamerica, that does not mean they were never there.

Turquoise forms near the surface as a product of copper weathering, typically caused by rainwater or groundwater. Mesoamerica has plenty of copper mines, she said, which suggests that turquoise deposits may have once been present there, too. The isotopic signatures she found on the turquoise artifacts also matched the signatures of copper deposits found in Mesoamerica.

David Killick, an anthropologist from the University of Arizona and a co-author on the paper, added that the findings offer clues to the extent of any interactions between the Aztecs and Mixtecs and surrounding cultures during this time period.

“The evidence increasingly suggests there was no organized contact between Mesoamericans and the American Southwest,” Dr. Killick said.

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A version of this article appears in print on , Section D, Page 2 of the New York edition with the headline: Empty Deposits: Changing Their Mines For the Sources Of Aztec Turquoise