

Cache Withdrawal at Classic Maya Site

Twelve centuries ago, when the Maya king known as Smoke-Shell buried a ceremonial offering in the ancient Honduran city of Copan, he left a time capsule for anthropologists. On March 5, a scientific team uncovered Smoke-Shell's cache of jade and flint artifacts, which supports hieroglyphic evidence for the stability of the family dynasty at Copan for much of the Classic period (A.D. 250 to A.D. 900).

"This is the finest ceremonial offering that's yet been discovered in the ruins of Copan," says William L. Fash of Northern Illinois University in DeKalb, leader of the group. The cache was found beneath an altar at the foot of Copan's temple-pyramid 26 by Princeton University sophomore David Stuart, who is already considered an authority on Maya hieroglyphics. The two researchers say the offering was probably made at the dedication of the temple-pyramid in A.D. 756.

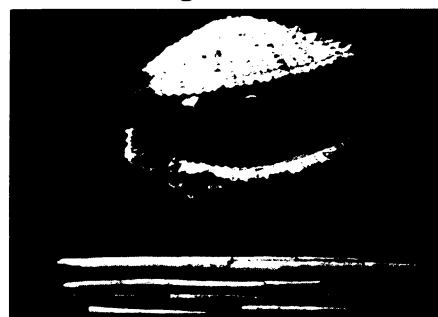
A ceremonial pot beneath the altar contained two jade pieces. One portrays a squat male figure wearing a loincloth and headband. The other represents a Maya god associated with symbols of the sun and the jaguar, and was carved in the form of a plaque worn across the chest. Artistic styles of both pieces date to between A.D. 250 and 600, says Fash. This suggests that they were heirlooms passed by Copan kings from generation



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to generation over at least two centuries. Jade heirlooms have been found at a few other Maya sites, but most are from the Olmec civilization that preceded the Maya.

The ceremonial pot also held a flint lance head, several stingray spines and a spiny oyster shell with a reddish-brown substance coating its interior. Fash and Stuart suspect the substance is dried blood, but a laboratory analysis has not yet been conducted. It is likely, they say, that Smoke-Shell used the stingray spines to draw his own blood for inclusion with the offering.



Dark substance inside shell, above, may be blood from a Maya ritual ceremony. Stingray spines lie in front of the shell. Jade figure, left, was an heirloom of kings.

Another possibility, says Fash, is that Smoke-Shell used one of three elaborate flint lance heads found next to the ceremonial pot, each with carved Maya faces branching out from the body of the lance, to rip out the still-beating heart of a captive, which was then placed in the shell.

In any case, says anthropologist George Stuart (David Stuart's father) of the National Geographic Society in Washington, D.C., which announced the discovery, "this find appears to confirm that the [Classic-period] Maya engaged in elaborate bloodletting ceremonies [SN: 6/7/86, p.360]."

— B. Bower

San Salvador: Small quake, big problems

Last year's San Salvador earthquake provided a graphic demonstration of how local geology can turn a relatively small seismic event into a killer. Researchers who studied the quake also said at last week's Seismological Society of America meeting in Santa Barbara, Calif., that the lesson may go beyond the city of San Salvador: Sections of San Francisco have similar geology, suggesting that a small quake in the Bay Area could do more damage than is currently suspected.

The meeting provided a forum for the first full scientific postmortem of the Oct. 10, 1986, earthquake, which had a magnitude of 5.4. The quake occurred when two of the tectonic plates that compose the earth's outer shell suddenly slipped past each other 8 kilometers underground, just beneath the edge of town. Though its strength was not sufficient to rupture the ground, the event nevertheless released enough energy to cause landslides and topple buildings, killing 1,500 people. Another 10,000 suffered injuries, and a quarter of a million people were left homeless.

While 5.4 magnitude quakes are likely to be felt by anyone in the vicinity, they generally don't damage buildings. There were several such quakes in California in 1986, and they caused few problems.

The root of the San Salvador quake's destructiveness traces back to several local volcanic eruptions, ending in A.D. 260, which spewed a layer of ash that collected in deposits up to 25 meters thick, says Michael J. Rymer of the U.S. Geological Survey (USGS) in Menlo Park, Calif. When the 3-second-long quake hit last year, the ash amplified the waves to four or five times the strength they had when traveling through solid rock, according to Rymer.

Certain parts of San Francisco, especially landfill areas, are composed of loose, rocky soil that could similarly amplify the power of a small quake, Rymer says.

Amplification was also critical in a magnitude 8.1 quake in 1985, which traveled several hundred kilometers from its epicenter to inflict severe damage on Mexico City (SN: 9/28/85, p.196;

10/5/85, p.214). While that quake showed that a seismic wave from a strong quake can travel vast distances and become destructive due to local amplification, the San Salvador quake showed that amplification from a local, weak quake can also be damaging, says the USGS's Randall A. White.

A second factor in the damage was the frequency of the earthquake wave in San Salvador. Whereas the Mexico City quake affected buildings five to 20 stories high, the higher frequency of the San Salvador seismic wave destroyed one- to five-story buildings, the predominant type in that city.

The USGS researchers were helped in their San Salvador analyses by a fortuitous placement of equipment. Scientists had put in measuring devices two years before the quake, and there were six monitors operating within 6 kilometers of the quake's center. "I don't think we've ever had one that close to the instruments," says White. "The formulas predicted many things, but it was unusual to finally get the data."

— J. Silberman