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**Abstract** The timing of volcanic eruptions in the Veracruz area, where many scholars suggest the Book of Mormon may have taken place, is contemporary with events recorded in the Book of Mormon, thus providing further evidence of the authenticity of that book.



## OUT OF THE DUST

### When Day Turned to Night

Archaeological work done in the last 15 years has yielded considerable insight into what happened in or about the Tuxtla Mountains of southern Veracruz state, Mexico, an area often considered a key part of the lands where the Book of Mormon story was played out. In John L. Sorenson's correlation of the internal and external geographies,<sup>1</sup> this area would have seen three notable events: (1) settlement of the general area by people mentioned in the Jaredite account (Ether 9:3) and their eventual climactic destruction (Ether 14:26–15:32), (2) major effects of the great natural disasters at the time of the Savior's crucifixion (3 Nephi 8),<sup>2</sup> and (3) the ultimate destruction of the Nephite people (Mormon 6:5–15).

Three scientific studies present the most important findings by recent researchers. Twenty years ago James E. Chase published an intriguing paper titled "The Sky Is Falling: The San Martin Tuxtla Volcanic Eruption and Its Effects on the Olmec at Tres Zapotes, Veracruz."<sup>3</sup> The second is a paper with the intriguing title "When Day Turned to Night: Volcanism and the Archaeological Record from the Tuxtla Mountains, Southern Veracruz, Mexico."<sup>4</sup>

The third source comprises several papers in a compilation on the archaeology of the Mexican Gulf Coast.<sup>5</sup> Between the three it is possible to see similarities between the historical patterns visible in the Nephite record on the one hand and in the archaeological record (as reconstructed so far) on the other.

In terms of the study of volcanism, the Tuxtla region is called the Tuxtla Volcanic Field (TVF). The elevated zone has been built up from eruptions over the last 7 million years. The last eruption, by Volcano San Martin, the northernmost peak in the TVF, took place in 1793 and was described in graphic detail by Moziño in 1870.<sup>6</sup> Altogether 10 volcanic eruptions have been identified in the TVF and dated within the last 4,000 years. Evidence comes from archaeological excavations at several locations. Since some eruptions were perhaps localized, as shown by the fact that they are evidenced at only a single site, it is possible that the total number of eruptions was greater than 10. In fact, two eruptions that are historically documented during the Spanish colonial period "left no evidence of ash at Matacapán," the archaeological site where the most excavation has been done. Obtaining the full record of volcanic

activity is further complicated by the likelihood that ancient inhabitants returning after an eruption removed all ash that had fallen on their residential areas. This would have left no evidence of a particular volcanic episode behind to be found by the archaeologists, who work only in settlement areas.<sup>7</sup>

Of interest in relation to the Book of Mormon record is the fact that corn pollen has been found in the Tuxtla, witnessing that that crop was being cultivated possibly as early as 2800 B.C.,<sup>8</sup> although the earliest actual artifacts date only to 1400 B.C. If the fleeing Jaredite ruler Omer made his way to this area (Ether 9:3, "by the seashore"), the known archaeological sequence can accommodate such a presence. By the last centuries B.C.,<sup>9</sup> a significant (though not large) population occupied part of the Tuxtla Mountains and nearby lowlands<sup>10</sup> (compare Alma 63:4, 9). The population of this mountain zone was heavily affected by an eruption soon after the time of Christ. Actually, "the precise timing of the eruption remains unclear."<sup>11</sup> A number of radiocarbon dates were obtained that relate to the question, but the results are not particularly consistent. (Nor were Santley and associates scrupulous

in their interpretation of the dates; they estimated that the combined dates placed a particularly destructive ash fall “at approximately 1900 B.P.” [before present], which they take to mean “about A.D. 100.”<sup>12</sup> Actually, following proper scientific procedure, their composite date translates to “about A.D. 50” because *present* is defined by the scientific community as 1950; elsewhere these authors give four carbon-14 dates ranging from A.D. 90 to 145 yet insist that these indicate a “third”-century-A.D. date.<sup>13</sup>) Following that eruption in the first century, the number of settlements “plummeted dramatically,”<sup>14</sup> no doubt because ash layers several meters in depth had fallen on some settlements in the area.<sup>15</sup>


Interestingly, another eruption is said to have taken place “about 1600 B.P.,” that is, around A.D. 350. Of course, all these dates are approximate, but this finding suggests the possibility that a volcano no more than 15 miles away from “Cumorah” had caused destruction either just before or just after the destruction of the Nephite population

(if Cerro El Vigía was Mormon’s hill Cumorah,<sup>16</sup> as a number of Latter-day Saint students of the Book of Mormon believe).

Chase’s 20-year-old paper, now somewhat out-of-date with respect to archaeological details, argued that an eruption in the Tuxtla Mountains area around 600 B.C. devastated a key portion of the area occupied by “the Olmecs,” effectively terminating that tradition as a unified cultural entity. In reality, the date of the eruption he documents from archaeological findings at the site of Tres Zapotes, at the foot of Cerro El Vigía, must be around the time of Christ. We know this because ash from the volcano buried the famous Stela C, which is considered to bear a carved date of 31 B.C. Thus the eruption must have been after that date. It could well be that this event was the same one that Santley’s group identified as “around A.D. 100” (but better “around A.D. 50”; see above).

Chase’s piece is actually more valuable for what it tells us about the nature of the destruction that can be produced by volcanic

action. He describes some of the harmful effects to health and agriculture brought on by ash falls. The ash and accompanying gases can be noxious. Acid may form in the atmosphere, and the fallout harms humans, plants, and animals in varying degrees. Water supplies are subject to contamination and aquatic life damaged on a temporary basis. Agriculture may become impossible due to heavy ash fall and might continue to be a problem for a generation or more while the ash slowly converts to soil. Mud (ash) flows can also be a serious hazard. Known to move at speeds up to 95 miles per hour, such flows could deeply cover home sites or other buildings.

Obviously, the relation between Book of Mormon statements and the archaeological findings are only similarities, not sure identities. But it is clearly plausible that the volcanism suggested by the Nephite account of the natural disasters at the time of the Savior’s crucifixion could relate to what has been found about known eruptions in the natural and cultural history of the Tuxtla Mountains. 

#### Out of the Dust

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3. James E. Chase, “The Sky Is Falling: The San Martin Tuxtla Volcanic Eruption and Its Effects on the Olmec and Tres Zapotes, Veracruz,” *Vinculos* 7/1–2 (1981): 53–69.
4. Robert S. Santley et al., “When Day Turned to Night: Volcanism and the Archaeological Record from the Tuxtla,” in *Environmental Disaster and the Archaeology of Human Response*, ed. Garth Bawden and Richard Martin Reyecraft (Albuquerque: University of New Mexico, Maxwell Museum of Anthropology, 2000).
5. Barbara L. Stark and Philip J. Arnold III, eds., *Olmec to Aztec: Settlement Patterns in the Ancient Gulf Lowlands* (Tucson: University of Arizona Press, 1997).
6. Joseph Mariano Moziño Suarez de Figuero, “Descripción del Volcán de Tuxtla,” in *Noticias de Nutka* (Mexico: Sociedad Mexicana de geografía y estadística, 1913), 103–17; summarized in Sorenson, *Ancient American Setting*, 322.
7. Santley et al., “When Day Turned to Night,” 156, 158.
8. *Ibid.*, 156.
9. *Ibid.*; and Philip J. Arnold III and Barbara L. Stark, “Gulf Lowland Settlement in Perspective,” in Stark and Arnold III, eds., *Olmec to Aztec*, 325–26.
10. Santley et al., “When Day Turned to Night,” 156.
11. *Ibid.*, 156–57.
12. *Ibid.*, 154–55.
13. *Ibid.*, 150; and Robert S. Santley, Philip J. Arnold III, and Thomas P. Barrett, “Formative Period Settlement Patterns in the Tuxtla Mountains,” in Stark and Arnold III, eds., *Olmec to Aztec*, 183.
14. Santley et al., “When Day Turned to Night,” 153.
15. Sorenson, *Ancient American Setting*, 343–44, 350.
16. “A Jaredite Barge in Lake Michigan?” *Journal of Book of Mormon Studies* 8/1 (1999): 73–74.