

SECTION 6: WEATHER AND CLIMATE (EXECUTIVE SUMMARY)

Editor's Note: This is a summary of the full paper, Section 6: Weather and Climate, available [online at http://www.fairlds.org/DNA_Evidence_for_Book_of_Mormon_Geography/](http://www.fairlds.org/DNA_Evidence_for_Book_of_Mormon_Geography/). This paper was last updated 11 October 2008.

This document is an analysis of the scholarly merits of the evidence and research used by Rodney Meldrum¹ in his firesides and DVD presentation, *DNA Evidence for Book of Mormon Geography*.² Neither FAIR nor this document take any position on the geographic location of Book of Mormon events.³ It is important, however, that Meldrum's theories be analyzed according to the same standards by which other Book of Mormon geography theories are evaluated. To avoid confusion, this paper refers to Meldrum's geographic model as the Limited North American Model, or LNAM.⁴ This document is just one in a series of such analytical documents.

In this document we examine Meldrum's research and conclusions relative to weather and the climate. This examination addresses, specifically, Part 7 of the DVD presentation, which is titled "Weather and Climate: Indications of Weather and Climate of the Book of Mormon."

¹ This paper follows the scholarly custom of referring to an individual, at first reference, by full name and then subsequently referring to the individual by last name only. We fully recognize Rodney as a brother in the gospel, but in discussing secular issues (such as scholarly research and geographic models) it was felt that continually prefacing his name or the name of any other referenced scholar or individual with "Brother" or "Sister," while accurate, would distract from the readability of the paper.

² Rodney Meldrum, *DNA Evidence for Book of Mormon Geography: New scientific support for the truthfulness of the Book of Mormon; Correlation and Verification through DNA, Prophetic, Scriptural, Historical, Climatological, Archaeological, Social, and Cultural Evidence* (Rodney Meldrum, 2008). The DVD is in sections; citations in this paper reference the DVD's section number and title, followed by an approximate time stamp from the DVD.

³ FAIR recognizes that faithful individuals and scholars can honestly disagree on where Book of Mormon events took place; there is no revealed or officially accepted geography. FAIR provides an online reference to over 60 different geographic models at http://en.fairmormon.org/Book_of_Mormon_geography (click on Book of Mormon Geographical Models). That being said, this paper may occasionally make reference to a Mesoamerican model for Book of Mormon geography. Such reference is not made to argue for that particular geographical model, but because (1) the presentation often criticizes Mesoamerican models through misrepresentation and (2) the presentation often makes a claim that is equally true of the Mesoamerican model. If both models make the same claims and meet the criteria necessary for those claims, it stands to reason that both models would be equally viable relative to such claims.

⁴ Meldrum's model places Book of Mormon peoples in an area roughly covering the Atlantic seaboard to the Rocky Mountains. This name was chosen as descriptive of the general model. We recognize that Meldrum may pick a different name at some point and would invite him to do so.

ROUTE OF THE SEA VOYAGE

In describing the voyage of Lehi and company from the Old World to the New, the DVD lays out a course that takes them from Arabia, around the southern tip of Africa, across the Atlantic, to North America.⁵ There are two problems with the crossing proposed by the DVD: First, it doesn't take prevailing winds into account and, second, it doesn't take the variability of the currents into account.

We learn from the Book of Mormon that the ship used by Lehi and his party did not drift on the currents; it was actively pushed by the wind (see 1 Nephi 18:8). If this is the case, then it doesn't make sense to only look at ocean currents, as is done in the DVD. Instead, one needs to consider the prevailing winds that would push Lehi's ship.

For thousands of years sailors have exploited the monsoon winds, which are strong at various times of the year around Arabia. As scholars note, "Mariners have used these winds...for sea trade extending as far east as China."⁶ The DVD's journey has the Lehite ship going against the prevailing winds, drifting with the currents westward from Arabia and from there around the African continent.

Generations of sailors and traders would contest the idea that it would make more sense to go west from Arabia toward the Atlantic than east toward China and the Pacific. The DVD doesn't consider a Pacific crossing because it doesn't fit with the LNAM's requirement that the Lehiters make landfall at the Mississippi River delta. (See the next section.) There is an extensive published literature on the ideas related to crossing the oceans that the LNAM fails to engage.⁷

PROPOSED LANDING SITES

The LNAM's geography requires an Atlantic crossing and landing somewhere with access to the eastern American coast. This ignores the textual evidence of the Book of Mormon itself that suggests a western-shore landing for the Lehite group. For example, the Mulekites were focused around the east coast. (In any geography, one would expect them to spread from the coast where they landed.) Yet, despite the Mulekites being on the east,⁸ the Nephites do not encounter them at their own landing or in the city of Nephi—the two groups come in contact only as Mosiah's group moved further inland and down from the

⁵ See Meldrum, *DNA Evidence*, section 7, "Weather and Climate," 0:20-0:57.

⁶ Warren P. Aston and Michaela Knoth Aston, *In the Footsteps of Lehi* (Salt Lake City: Deseret Book Company, 1994), 20.

⁷ The long history of this concept can be explored in such references as: C. Douglas Barnes, "Lehi's Route to America," *Improvement Era* (1939); Lynn M. Hilton and Hope A. Hilton, "In Search of Lehi's Trail—Part 2: The Journey," *Ensign* (October 1976); John L. Sorenson, *An Ancient American Setting for the Book of Mormon* (Salt Lake City and Provo, Utah: Deseret Book Company and FARMS, 1985), 138; John L. Sorenson, "Transoceanic Crossings," *First Nephi: The Doctrinal Foundation: Papers from the Second Annual Book of Mormon Symposium*, edited by Monte Nyman and Charles Tate (Provo, Utah: Religious Studies Center, Brigham Young University, 1988); John W. Welch, "Winds and Currents: A Look At Nephi's Ocean Crossing," *Reexploring the Book of Mormon: The F.A.R.M.S. Updates* edited by John W. Welch (Salt Lake City and Provo, Utah: Deseret Book Company and FARMS, 1992), 53–55; Hugh Nibley, *Teachings of the Book of Mormon* (Provo, Utah: FARMS, 1993), 1:232.

⁸ See Omni 1:21, Alma 8:7, Alma 22:30–31, Helaman 6:10, and Ether 9:3.

city of Nephi to Zarahemla. This virtually requires that Nephite refugees be traveling in an eastward direction, requiring a landing on the west (Pacific) coast.

The Book of Mormon describes the Lamanites in the west as “spread through the wilderness on the west, in the land of Nephi; yea, and also on the west of the land of Zarahemla, in the borders by the seashore, and on the west in the land of Nephi, in the place of their fathers’ first inheritance, *and thus bordering along by the seashore*” (Alma 22:28, emphasis added). Thus, the land of first inheritance is on the western seashore—it would be very strange for the Lehites to land on the eastern seashore (or in the southern Gulf of Mexico, as in the LNAM) and travel across the entire landmass to the opposite sea before establishing their land of first inheritance.

The LNAM uses Lake Michigan as the “sea west,” and yet this is nowhere near the LNAM’s land of first inheritance, hundreds of miles to the south along the Gulf of Mexico. It seems most likely that Lehi approached from the Pacific, landing somewhere on the western coast. If Meldrum disagrees with the corpus of scholarly evidence, he would be more persuasive if he consulted the previous literature and demonstrated its errors.⁹

SEASONS AND HEAT

The DVD claims that a Mesoamerican model is impossible because there are only two seasons in Mesoamerica: “hot and ‘oh my gosh!’ it is really hot.” In addition, the claim is made that in Mesoamerica the Book of Mormon events were supposedly all “placed down in the jungle areas.”¹⁰

Unfortunately, this analysis of the available data is lacking. The DVD finds support in Alma 46:40, which talks about “seasons of the year.” This, however, is where the faulty analysis comes in—assuming that *season*, as used in this verse, refers to climatological divisions of the year. It may, in fact, be that the term is a synonym for time, as in “which at some times of the year.”

But even if one was to grant that the usage might be climatological in nature, does that make DVD’s analysis any more correct? Sadly, the analysis still fails because Meldrum doesn’t realize that there really *are* seasons in Mesoamerica. They are different from each other, and they are not “hot and oh-my-gosh hot.”

In Guatemala there is a wet season from May to October and a dry season from November to May, which would have been essential for an agricultural society.¹¹ The seasons also affected when wars were fought.¹² Central America has seasons as much as North

⁹ A good introduction is John L. Sorenson, *Mormon’s Map* (Provo, Utah: FARMS, 2000), 29–30.

¹⁰ Meldrum, *DNA Evidence*, section 7, “Weather and Climate,” 1:55-2:20.

¹¹ Brant A. Gardner, *Second Witness: Analytical and Contextual Commentary on the Book of Mormon*, 6 volumes (Salt Lake City: Greg Kofford Books, 2007), 2:89.

¹² Sorenson, *An Ancient American Setting*, 270–276; John L. Sorenson, “Seasonality of Warfare in the Book of Mormon and in Mesoamerica,” *Warfare in the Book of Mormon*, edited by Stephen D. Ricks and William J. Hamblin (Salt Lake City and Provo, Utah: Deseret Book Company and FARMS, 1990), 445–477; John L. Sorenson, “Seasons of War, Seasons of Peace in the Book of Mormon,” *Rediscovering the Book of Mormon*, edited by John L. Sorenson and Melvin J. Thorne (Salt Lake City and Provo,

America does. We cannot, then, use the presence of seasons to distinguish the validity of a North American geographical model versus a Central American one.

The area suggested for the Nephites in a Mesoamerican model is not particularly hot, nor did it take place only in jungle areas.¹³ The DVD presumes that Mesoamerica is so hot that the Nephites would have mentioned it,¹⁴ but the climate is more pleasant than the Arabian desert in which Lehi's family spent eight years without mention of the heat. Since their new land was the only place that all other Nephite recordkeepers would have known, why would they have thought to comment on what was normal to them?

Meldrum's website claims that "twice [the Book of Mormon] mentions frozen water (snow/hail)."¹⁵ While true, his examples do little to narrow down the climate in the New World. Snow is mentioned only by Nephi, and his home city of Jerusalem certainly gets snow.¹⁶ As for hail, one review article noted, "There is no question that the hail problem is a less serious one in the tropics than at mid-latitudes....Nevertheless, when hailstorms occur, they cause major damage to...crops."¹⁷ Hail is, in fact, mentioned twice in the Book of Mormon: once metaphorically (Helaman 5:12) and the other literally (Mosiah 12:6), emphasizing the damage to crops.

TREES, TEMPESTS, AND WHIRLWINDS

The DVD also sees evidence for a North American setting for the Book of Mormon in Helaman's reference to a lack of trees.¹⁸ Such statements ignore both the Book of Mormon text and the Mesoamerican model being criticized. The Book of Mormon text states that the area without trees was only in the Nephite "land northward" (Helaman 3:3–10). If the DVD is to place its model in North America, it needs to demonstrate that its "land northward" in Upper Canada had a serious deforestation problem between the birth of Christ and about A.D. 400.

We cannot look at modern aerial photos of the Mesoamerican jungle and decide that this is what it was like in Nephite times. There is extensive archaeological evidence for deforestation in Central America, contrary to the DVD's claims.¹⁹ The fact that ancient

Utah: Deseret Book Company and FARMS, 1991), 249–255. Sorenson updates his earlier views in John L. Sorenson, "Comments on Nephite Chronology," *Journal of Book of Mormon Studies* 2/2 (1993): 208–212.

¹³ Gardner, *Second Witness*, 2:88–89. Gardner points out that Mesoamerican temperatures range from 75 to 90 degrees F., hardly fitting the definition of hot stated by the DVD.

¹⁴ See Meldrum, *DNA Evidence*, section 7, "Weather and Climate," 4:30–5:00.

¹⁵ "What indications does the book itself give about climate?" Frequently Asked Questions, <http://www.bookofmormonevidence.org/FAQ.php> (last accessed August 28, 2008).

¹⁶ "Book of Mormon Anachronisms: Snow," *FAIR wiki*, http://en.fairmormon.org/Book_of_Mormon_anachronisms/Snow (accessed August 28, 2008).

¹⁷ E.M. Frisby and H.W. Sansom, "Hail Incidence in the Tropics," *Journal of Applied Meteorology* 6 (April 1967): 339.

¹⁸ See Meldrum, *DNA Evidence*, section 7, "Weather and Climate," 5:20–6:30.

¹⁹ Gardner, *Second Witness*, 5:62–63.

cities are now difficult to find, often being covered with vegetation, provides good evidence that there have been significant changes since earlier times.

The DVD also argues that some Book of Mormon weather features make a Mesoamerican model impossible. In particular, the DVD argues that whirlwinds (presumed to be tornadoes) “don’t occur in equatorial regions at all, because the conditions necessary for their very formation are absent” and that Central America “has never had a single recorded tornado.”²⁰

The DVD is simply mistaken. The first mistake is to presume that a *whirlwind* must be a tornado—it could be a hurricane, and *tempests* could be storms, which they clearly are in Nephi’s account of their sea crossing.²¹ But, even if we grant the assumption that Book of Mormon “whirlwinds” must be tornadoes, it is important to note that tornadoes *do* happen in Central America, even if they are not as common as in the United States. A tornado that occurred in Guatemala on August 29, 2007, was captured on video, and is available after a quick YouTube search.²² Mexico also has tornadoes.²³

CONCLUSION

The DVD’s treatment of climate and weather relative to Book of Mormon geography is disappointing. It contains many errors in its critique of competing geographic models. The North American model has not been shown to uniquely match most of the Book of Mormon’s requirements. The DVD ignores alternate readings and previous work on the subject.

Again, this paper is a summary of information presented in the full paper, *Section 6: Weather and Climate*. If you are interested in a longer exposition on the matters covered here, please see the full paper. The full paper also provides additional points at which the theories in *DNA Evidence for Book of Mormon Geography* should be rejected.

²⁰ See Meldrum, *DNA Evidence*, section 7, “Weather and Climate,” 7:18-9:00.

²¹ See 1 Nephi 18:13-14, which equates a tempest with a “great storm.”

²² See <http://www.youtube.com/watch?v=vCOl5pqFWWA> and <http://www.youtube.com/watch?v=p8z40dwQujw> (accessed October 10, 2008).

²³ See “Heat Waves and Tornadoes,” <http://www.yucatanliving.com/news/midsummers-news-in-the-yucatan.htm> (accessed October 10, 2008).