Simply Implausible: DNA and a Mesoamerican Setting for the Book of Mormon

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IN A RECENT ARTICLE, "Lamanite Genesis, Genealogy, and Genetics," published in the anthology *American Apocrypha*, I summarized existing genetic research into Native American origins, concluding, "While DNA shows that ultimately all human populations are closely related, to date no intimate genetic link has been found between ancient Israelites and indigenous Americans, much less within the time frame suggested by the Book of Mormon."[1] Instead of lending support to an Israelite origin as posited by Mormon scripture, genetic data have confirmed already existing archaeological, cultural, linguistic, and biological data, pointing to migrations from Asia as "the primary source of American Indian origins."[2]

Researchers associated with the Foundation for Ancient Research and Mormon Studies (FARMS) have rejected hemispheric models of the Book of Mormon but still express "confidence in an Israelite genetic presence in Central America and perhaps as far away as Arizona to the north and Colombia to the south."[3] I have found no genetic research to support this expectation. Instead, studies of mtDNA (even ancient mtDNA), Y-chromosomes, and protein polymorphisms in Central American indigenous populations indicate the same Asian origins found elsewhere in the Americas. Given overwhelming genetic evidence against the Book of Mormon's historical claims, I advised in my article "against confusing a spiritual witness [of the Book of Mormon] with scientific evi-

1. Thomas W. Murphy, "Lamanite Genesis, Genealogy, and Genetics," in Dan Vogel and Brent Metcalfe, eds., *American Apocrypha: Essays on the Book of Mormon* (Salt Lake City: Signature Books, 2002), 48.

2. Ibid.

3. Ibid., 63.

dence."[4] As Mormons, it appears, we tend to place far too much trust in prayer as a valid means of historical and scientific investigation. Our tendency to confuse our answers to private prayers with valid historical and scientific information has produced a classic science vs. religion conflict, comparable to evolution vs. creationism. I concluded:

> From a scientific perspective the Book of Mormon's origin is best situated in early nineteenth century America, and Lamanite genesis can only be traced historically to ca. 1828. The term Lamanite is a modern social and political designation that lacks a verifiable biological or historical underpinning linking it to ancient American Indians.[5]

In other words, the best explanation—i.e., the most plausible one—remains a nineteenth-century origin of the Book of Mormon.[6]

My purpose here is to review and respond to critiques of "Lamanite Genesis, Genealogy, and Genetics." Because those critiques have depended primarily upon a limited geographic setting for the Book of Mormon, my primary focus is upon such models.

Points of Agreement and Disagreement

Before identifying points of disagreement, I think it worthwhile to review the striking points of agreement between myself and other LDS scholars, especially those associated with the Foundation for Apologetic Information and Research (FAIR) and FARMS. Trent Stephens and D. Jeffrey Meldrum (LDS biologists at Idaho State University), Scott Woodward, Bill Bradshaw, and Michael Whiting (LDS biologists at Brigham Young University), Brant Gardner and Kevin Barney (LDS authors writing for FAIR), and Jeff Lindsay (LDS scientist maintaining his own web site) all agree that current genetic evidence indicates the principal ancestors of the American Indians came from Northeast Asia rather than ancient Israel. They accept the validity of the genetic evidence, my basic interpretations of it, and acknowledge that it poses fundamental problems for

4. Ibid., 68.

5. Ibid.

6. Despite my request that he stop misrepresenting my research, Dr. Michael Whiting of Brigham Young University continues to distort my conclusions, setting up a straw man, which he then attacks for greater effect. This is most evident in his exaggerated claims that I have announced "that modern DNA research has conclusively proved that the Book of Mormon is false and that Joseph Smith was a fraud," that I hold "the naïve notion that DNA provides infallible evidence," and that I tout my conclusion as being "assumption free" (Michael F. Whiting, "DNA and the Book of Mormon: A Phylogenetic Perspective," *Journal of Book of Mormon Studies* 12, no. 1 [2003]: 24-25, 35). To the contrary, I have only maintained that a nineteenth-century origin of the Book of Mormon is the best explanation of existing historical and scientific data. The scripture may be historical fiction and still contain inspired spiritual truths emanating from a prophet of God.

the traditional understanding of the Book of Mormon as *the* history of American Indians.[7] Daniel Peterson, former chairman for the Board of Trustees at FARMS, even endorses the label "Galileo Event" as an appropriate description of the implications of genetic research for Book of Mormon Studies.[8]

An apparent consensus on some central issues of debate about the Book of Mormon appears to be emerging. Most Book of Mormon scholars today, including those associated with FAIR and FARMS, reject a literal reading of the Book of Mormon and "agree that Nephites and Lamanites never actually rode horses, traveled in chariots, used steel swords, raised cattle, or ate wheat."[9] We basically agree that the English text of the Book of Mormon does not accurately describe the flora and fauna of ancient America in Central America or elsewhere. We agree that the population growth attested in the Book of Mormon is mathematically impossible for groups of the size and make-up described in the text and that the descriptions of distances traveled in the scripture are not consistent with a population that spread to "cover the face of the whole earth" on the American continents "from the sea south to the sea north, from the sea west to the sea east" (see Hel. 3:8). We agree that ethnonyms like *Lamanite* from the Book of Mormon can have social and political meanings, in addition to genealogical ones. We have reached a virtual consensus that the traditional interpretation of the Book of Mormon as the history of the American Indians has been thoroughly discredited by the discoveries of anthropology, biology, and history. Thus, we would seem to agree that the teachings about Israelite and Lehite ancestry of American Indians espoused by every LDS prophet since Joseph Smith must necessarily be disregarded as incorrect.

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7. Trent Stephens, D. Jeffrey Meldrum, and Thomas Murphy, "DNA and Lamanite Identity: A Galileo Event," panel discussion chaired by Brent Lee Metcalfe, Salt Lake City Sunstone Symposium, August 2001; KUER Radio West, "Science and Foundations of the Book of Mormon," interview with Terryl L. Givens, Thomas Murphy, and Scott Woodward, hosted by Doug Fabrizio, Salt Lake City, Utah, 19 December 2002, retrieved electronically April 12, 2003 from http://audio.kuer.org:8000/file/rw121902.mp3, transcript available at http://www.fairlds.org/; Bill Bradshaw, respondent to "Sin, Skin, and Seed: Mistakes of Men in the Book of Mormon," by Thomas W. Murphy, Salt Lake City Sunstone Symposium, August 2002; Michael F. Whiting, "Does DNA Evidence Refute the Authenticity of the Book of Mormon," streaming video of lecture at BYU on 29 January 2003, retrieved electronically 11 April 2003 from http://farms.byu.edu; Kevin L. Barney, "A Brief Review of Murphy and Southerton's Galileo Event," retrieved electronically 26 June 2003 from http://www.fairlds.org; Brant Gardner, "The Tempest in a Teapot: DNA Studies and the Book of Mormon," retrieved electronically 26 June 2003 from http://www.fairlds.org; Jeff Meldrum, "Children of Lehi: DNA and the Book of Mormon," Foundation for Apologetic Information and Research Conference, 8 August 2003; Jeff Lindsay, "Does DNA Evidence Refute the Book of Mormon?" retrieved electronically 25 August 2003 from http://www.jefflindsay.com/; Whiting, "DNA and the Book of Mormon," 24-35. D. Jeffrey Meldrum and Trent D. Stephens, "Who Are the Children of Lehi?" *Journal of Book of Mormon Studies* 12, no. 1 (2003): 38-51.

8. Daniel Peterson, "Random Reflections on the Passing Scene," Foundation for Apologetic Information and Research Conference, 8 August 2003.

9. Murphy, "Lamanite Genesis," 61-62.

The primary disagreement between scholars centers on how best to explain the inconsistency between the evidence and the traditional readings of the Book of Mormon text. Most scholars associated with FARMS and FAIR prefer to settle these inconsistencies by insisting on a limited geographic setting for the Book of Mormon in Central America. Non-LDS scholars and many Mormon scholars prefer the simpler explanation: The Book of Mormon is nineteenth-century fiction, produced by Joseph Smith. These scholars recognize that fictive accounts and allegorical stories are found in the sacred texts of all the world's major religions, and thus many are willing to accept the status of the Book of Mormon as scripture.[10] Let's take a closer look at this dispute as it has played out in critiques of my article, "Lamanite Genesis, Genealogy, and Genetics."

Argument #1: Murphy's conclusions are not scientific

While no LDS scholar has offered any historical or biological evidence to contradict my conclusions, several have raised objections to the article. Brant Gardner has contended, "[Murphy's] conclusions are not consonant with the science."[11] Michael Whiting told reporters that I failed to get the science right and that my article does not stand up to scientific scrutiny.[12] Kevin Barney accused Simon Southerton and me of confusing science with theology in a related article appearing in *Anthropology News*. Yet despite such bold statements, each critic basically concedes the scientific evidence. Gardner wrote:

> Is it true that, as Murphy writes, "...virtually all Native Americans can trace their lineages to the Asian migrations between 7,000 and 50,000 years ago." It is true enough. What does this tell us? We may correctly conclude from the evidence that the popular opinion long held among Latter-day Saints that the Book of Mormon explains the origins of all Native American populations is mistaken.[13]

Barney acknowledges:

> The extant DNA evidence simply confirms what scientists already knew: that most Native Americans ultimately derive from Asia. This is inconsistent with the hemispheric model of the Book of Mormon. To that extent, Murphy and Southerton are not arguing against a straw man; many contemporary Latter-day Saints (to the extent that they have thought of the issue at all) continue to uncritically accept a hemispheric model of the Book of Mormon. To the extent that the kind of DNA research

10. I am comfortable regarding the Book of Mormon as scripture, but not as history.

11. Gardner, "Tempest."

12. William Lobdell and Larry B. Stammer, "Mormon Scientist, Church Clash over DNA Test," *Los Angeles Times*, 8 December 2002; Antone Clark, "Murphy's DNA Claims Debated," *Standard Net*, 12 December 2002.

13. Gardner, "Tempest."

> publicized by Murphy and Southerton causes these people to reexamine their assumptions about the nature of the text, I think the effect will be a salutary one.[14]

While Whiting, in his presentation for FARMS at BYU, exclaimed delight at the prospect of evolutionary biology coming to the defense of the Book of Mormon, he offered no scientific data to substantiate an Israelite origin of indigenous peoples anywhere in the Americas. In fact, he conceded, "current genetic evidence suggests that Native Americans have a genetic history representative of Asia and not the Middle East."[15] Mel Tungate, an LDS chronicler of debates about DNA and the Book of Mormon, has observed key differences between Whiting's earlier statements to the *LA Times* questioning the science behind my conclusions and his embrace of the same scientific evidence in his presentation at BYU.

> A few weeks before his talk, [Whiting] criticized Murphy for not getting the science right, but in this presentation he in effect said "Murphy is right in his DNA science. He is not right in his other hypotheses.". . .Dr. Whiting's talk is good in that it puts him on the same side as almost all scientists who have studied the historic roots of the American Indians. He is on the same side as Tom Murphy in this area. In his talk, he did not address the hard issues (nor did he intend to)—the abandonment of the church's traditional teachings of the ancestry of the Amerinds (of the Book of Mormon), and the influence of the 19th century Joseph Smith on the translated book.[16]

I concur with Tungate's summary. LDS scientists and scholars have not presented any scientific data that challenge or contradict the basic conclusions of my original research.[17] Each critic has basically conceded that genetic research

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14. Barney, "A Brief Review."

15. Whiting, "DNA Evidence."

16. Mel Tungate, "DNA and the Book of Mormon," http://www.tungate.com/murphy.htm (accessed June 26, 2003).

17. One of the most surprising critiques to emerge was the false allegation that I am evading peer review or that the research I reviewed would not stand up to peer review. Whiting made this allegation in a statement to Antone Clark, a reporter for the (Ogden) *Standard-Examiner*. T. Allen Lambert of SUNY-Albany made similar assertions in a letter to the editor of *Anthropology News*. While it is uncommon for articles in anthologies to be subjected to peer review, "Lamanite Genesis, Genealogy, and Genetics" first appeared in *Mormon Scripture Studies*, where it had been subjected to peer review prior to publication. Neither claimant checked with the editor of *Mormon Scripture Studies* or me before making these allegations. Most importantly, though, the article was a summary of genetic research on Native American origins, nearly all of which had been subjected to peer review prior to publication in leading scientific journals such as *American Journal of Human Genetics, Proceedings of the National Academy of Sciences, and American Journal of Physical Anthropology*. Whiting's and Lambert's claims are little more than an inaccurate projection of the inadequacies of LDS apologetics onto my publications (see Clark, "Murphy's DNA"; T. Allen Lambert, "Views on the Book of Mormon," correspondence, *Anthropology News* 44, no. 5 [May]: 4).

fails to offer any support for the Book of Mormon's historical claims, either regionally or hemispherically.

Argument #2: Murphy failed to consider a limited geographic setting

The central aspect of dispute from Gardner, Barney, Lindsay, and Whiting is my alleged failure to consider a limited geographic setting for the Book of Mormon. Contrary to their representations of my research, I did consider such proposals in the section of my paper entitled "Limited Geography" where I concluded that a narrowed geographic setting for the Book of Mormon also lacked support from extant genetic research. Let me quote my summary of that section from the original article.

> While FARMS researchers are careful to note the importance of cultural influences on the construction of categories, they express confidence in an Israelite genetic presence in Central America and perhaps as far away as Arizona to the north and Colombia to the south. As we have seen, genetic studies of indigenous peoples throughout North, Central, and South America have failed to link Native Americans from these locations to ancient Hebrews.[18]

Assertions that I failed to consider a limited geographic setting for the Book of Mormon are incorrect. Regardless, the implication that a limited geographic setting or a local colonization model rescues the Book of Mormon from contrary genetic evidence deserves more careful scrutiny than I originally provided.[19]

In subsequent presentations entitled "Sin, Skin, and Seed: Mistakes of Men in the Book of Mormon" at Sunstone Symposia and elsewhere, I presented a more detailed analysis of DNA evidence from Central America which has since been validated by other scientists. Simon Southerton, an Australian geneticist and former LDS bishop, presented substantiating data in Salt Lake City in October 2001.[20] His examination of published mtDNA lineages from living and ancient indigenous peoples of Central America (including Maya, Mixe, Mixtec, Nahua, Zapotec, and others) revealed that of 496 individuals studied, 99.2 percent possessed mtDNA lineages A-D, traceable back to Asia but not the Middle East.[21] The remaining 0.8 percent may have the X lineage, or a lineage resulting

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18. Murphy, "Lamanite Genesis," 63.

19. The implication of exoneration is most forcefully expressed in Mark Nolte's title for a news article at BYU Newsnet: "BYU Professor Refutes Book of Mormon DNA Claims," http://newsnet.byu.edu/story.cfm/41852/ (accessed July 16, 2003).

20. Simon Southerton, "DNA Genealogies of Native Americans and Polynesians," given at the Ex-Mormon Foundations Conference, 2002, manuscript copy and Powerpoint file in my possession.

21. Simon Southerton, "Losing a Lost Race," manuscript copy in my possession, appendix B. The four unidentified samples could belong to X or may be the product of intermarriage with Europeans or Africans.

from intermarriage with post-Columbian immigrants. The X lineage is found in the Middle East and Siberia, but in the Americas it typically occurs with distinctive mutations which are also found in Siberian, but not Middle Eastern, populations.[22] The evidence collected to date from Central America is just as problematic for the Book of Mormon as that found elsewhere. In fact, Stephen Whittington, a non-LDS bio-archaeologist at University of Maine specializing in Mesoamerica, concurs with Southerton and me about the lack of supporting data from both archaeology and physical anthropology for limited geographic settings in North, South, or Central America.[23] Despite appealing for a consideration of a limited geographic setting in Central America, none of the defenders of the Book of Mormon have presented a summary of existing regional genetic data to their audiences.

Argument #3: Everyone has Jewish ancestors

Jeff Lindsay, John Sorenson, and Matthew Roper get a lot of mileage out of some erroneous statements made by science reporter Steve Olson in *Mapping Human History: Discovering the Past Through Our Genes*.[24] Olson reported:

> The forces of genetic mixing are so powerful that everyone in the world has Jewish ancestors, though the amount of DNA from those ancestors in a given individual may be small. In fact, everyone on earth is by now a descendant of Abraham, Moses, and Aaron—If indeed they existed.[25]

Earlier in his book, Olson made the same case in a more general manner:

> The exponential growth in the number of ancestors going back in time connects us tightly to the past. If a historical figure who lived more than 1,600 years ago had children who themselves had children, that person is almost certainly among our ancestors. Everyone in the world today is most likely descended from Nefertiti (through the six daughters she had with Akhenaton), from Confucius (through the son and daughter he is said to have had), and from Julius Caesar (through his illegitimate children, not through Julia, who died in childbirth). One need go back only a couple of millennia to connect everyone alive today to a common pool of ancestors.[26]

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22. Miroslava V. Derenko et al., "The Presence of Mitochondrial Haplogroup X in Altaians from South Siberia," *The American Journal of Human Genetics* 69, no. 1 (July, 2001): 237.

23. He concludes, "Archeologists and physical anthropologists have not found any evidence of Hebrew origins for the people of North, South and Central America" (*DNA vs. the Book of Mormon*, videorecording, Living Hope Ministries, 2002).

24. Lindsay, "DNA Research."; John Sorenson and Mathew Roper, "Before DNA," *Journal of Book of Mormon Studies* 12, no. 1 (2003): 23.

25. Steve Olson, *Mapping Human History: Discovering the Past Through Our Genes* (New York: Houghton Mifflin Company, 2002), 114.

26. Ibid., 47. He makes similar assertions regarding Kennewick Man (195).

Unfortunately, Olson is simply wrong. He based these statements upon an erroneous reading of the research by Yale statistician Joseph Chang. In an otherwise affirmative review of Olson's book published in the *American Journal of Human Genetics,* Lynn Jorde, a geneticist from the University of Utah, highlighted Olson's error:

> The one assertion I found troublesome—in part because it appears multiple places in the book—is that all humans alive today are direct descendants of virtually everybody who lived more than a few dozen generations in the past. Thus we are all said to be direct descendants of Confucius, Julius Ceasar, Nefertiti, and even Kennewick Man. This claim is based upon a statistical analysis by J. Chang (Adv Appl Prob 31:1002-1026) that assumes random mating throughout the population, no geographic structure, and a constant population size. As Chang himself recognized, these assumptions are completely unrealistic for the entire human population and therefore would not support Olson's conclusions.[27]

Lindsay's extended claim that "every Native American may literally be a descendant of Abraham and even Lehi," and a similar one by Sorenson and Roper, is likewise unsupported by an informed reading of Chang's research.[28]

Argument #4: Biological processes may account for genetic extinction

Scholars like Whiting, Woodward, Stephens, and Meldrum have suggested that common biological processes, like founder effect and genetic drift, could account for the lack of an Israelite genetic presence. They argue that Lehite, Jaredite, and Mulekite migrations involved small groups of colonists who intermarried with a much larger population of indigenous peoples. The genetic founders of these parties, they contend, may have had DNA that was not typical of contemporary or ancient Israelite populations, thus producing what is commonly known as a *founder effect.* They also suppose that chance events may have resulted in the loss of the genetic markers, a broader process encompassing founder effect and commonly called *genetic drift.*

Problems and Inconsistencies

There are four key problems with these arguments. First, genetic extinction of Book of Mormon founding populations is not consistent with statements in the scripture which identify multitudes—many thousands and millions—of descendants. Second, prophets in the Book of Mormon foretell the persistence of

27. Lynn Jorde, review of *Mapping Human History in American Journal of Human Genetics* 71, no. 6 (December 2002):1484-85.

28. See Lindsay, "DNA Research"; Sorenson and Roper, "Before DNA," 23.

Lehi's descendants to the present and beyond. Third, genetic lineages in putative founding populations from the ancient Middle East would not likely have included those commonly found in Siberia. Fourth, the chance events required for founder effect and genetic drift must occur not just once, but in three separate founding populations, for more than a hundred different genetic markers. These compounding problems significantly undermine the plausibility of a local colonization in Mesoamerica as the geographic setting for the Book of Mormon.

Problem #1: Book of Mormon describes numerous Israelite populations

The Book of Mormon explicitly identifies numerous populations as descendants of ancient Israelites. An angel told Nephi that the multitudes he saw in a vision were "thy seed and also the seed of thy brethren" and that later "many waters" divided the Gentiles from the seed of his brethren (1 Ne. 12:1-20, 13:10). In Mosiah 11:19, King Noah's people boasted about their ability to fight "thousands of Lamanites," identified as "their brethren." The prophet Abinadi, subsequently preaching to the people of King Noah, identifies them as members of the house of Israel brought out of bondage in Egypt (Mos. 12:34). Alma 56:3 describes two thousand stripling warriors as "descendants of Laman." In 3 Nephi 15-17, Jesus addresses an assembled multitude of "two thousand five hundred" as "a remnant of the house of Joseph" and as the "house of Israel," distinguishing them from the Gentiles for whom they were instructed to keep a record. Ether 15:2 describes Jaredite populations in the millions. Given Book of Mormon descriptions of many thousands of descendants of Israelites in the New World, a scenario where genetic drift results in no genetic markers of the founding parties surviving is highly unlikely.

Problem #2: Prophecies foretell persistence of Lehite descendants

Prophecies in the Book of Mormon tell of descendants of Israel who will live to receive the Book of Mormon, build a New Jerusalem, and even persist to the end of the earth. The angel promised Nephi during his vision that "the Lord God will not suffer that the Gentiles will utterly destroy the mixture of thy seed, which are among thy brethren. Neither will he suffer that the Gentiles shall destroy the seed of thy brethren" (1 Ne. 13:30-31). Nephi prophesied to his brothers of a day when "the remnant of our seed [shall] know that they are of the house of Israel. . .then shall they know and come to the knowledge of their forefathers" (1 Ne. 15:14). Lehi blessed the "children of Laman" that "the Lord God will not suffer that ye shall perish; wherefore he will be merciful unto you and unto your seed forever" (2 Ne. 4: 3-7). Ether 13:5-8 prophesied that "a remnant of the seed of Joseph" would come out of Jerusalem, occupy "this land," build a holy city, and most importantly "perish not. . .until the end come when the earth shall pass away." The prophet/general Mormon offers a parting sermon addressing the remnant of the people who survive the apocalyptic ending to the scrip-

ture, explicitly identifying them as "the house of Israel," calling them to the knowledge of their "fathers" (Mormon 7:1-5).[29] The Book of Mormon clearly does not describe a small population which fails to leave genetic descendants.[30] Instead, it both describes and predicts a numerous descendant population that will persist to receive the Book of Mormon as a record of their forefathers and survive to the end of time on earth.

Problem #3: Middle Eastern founder effects unlikely to produce Siberian genetic markers

If the Mulekite and Lehite parties were both unusual representatives of Jerusalem's Israelite population, they would not likely have had Siberian genetic markers commonly found among Native Americans. Geneticists identify those maternal lineages commonly found in contemporary European and Middle Eastern populations as H, V, J, K, T, U, W, I, X, M, and L. The largest percentage of Middle Eastern and European populations comes from lineages H and V. Native American/Asian lineages A-D are not present in Middle Eastern, European, or African populations. Only lineage X is also present in significant quantities in the Middle East, Europe, and Africa. A founding female from a Middle Eastern population who was genetically unusual would likely have come from lineages M, L, U, or perhaps X, but not from lineages A-D.[31] Even if the parties of Lehi, Mulek, and the brother of Jared were genetically unusual for the Middle East, the chances that they would have carried genetic markers of Siberian populations are extremely slim.

A founder effect in maternal lineages is only likely to produce the results we find in ancient and living Native American mtDNA if all the likely dozens of females in the Jaredite, Lehite, and Mulekite populations came: a) from the same branch of the X lineage, or b) from the approximately 0.5 percent of living Native American mtDNA typically attributed to intermarriage with European or African populations. Of course, these scenarios are both highly unlikely. Native American and Siberian (Altaian) X lineages typically have a distinctive mutation sequence distinguishing them from European and Middle Eastern variations of the same lineage. In a recent study by Miroslava Derenko, et al., all but one of the samples of the Native American X lineage they examined were directly descended from Siberian branches of the X lineage.[32] Could a branch of the X

29. Numerous other passages similarly identify the seed of Lehi, Nephi, and/or Laman as consisting of thousands and even many thousands: Alma 2:19, 3:26, 4:5, 23:5, 24:22-27, 26:4-22, 28:2-12, 37:9-19, 43:5, 49:23,50:22, 51:11-19, 53:18-22, 56:3-54, 57:6-26, 58:8, 60:5-22, 62:5-17; Hel. 3:24-26, 5:19, 11:6, 3 Ne. 3:22-24, 4:21-27; Mormon 1:11, 2:9-25, 4:9, 6:10-15.

30. One can have descendants who do not carry particular genetic markers. For example, women do not carry their father's Y chromosome. Thus, one's genetic markers can go extinct even though one has descendants. However, the greater the number of one's descendants the less likely it is that genetic markers will go extinct.

31. Southerton, "DNA Genealogies."

32. Derenko et al., "Mitochondrial Haplogroup X," 237.

lineage, represented by one individual in the Derenko study, represent an Israelite presence in the New World?[33]

The likelihood of such a scenario becomes even more improbable when we examine the distribution of the X lineage in Native American populations. The X lineage is largely restricted to northern American Indian groups like the Ojibwa, Sioux, Yakima, and Navajo. It has also appeared in a few ancient Brazilian samples, but is nearly absent from Central American populations.[34] Out of 496 Central American mtDNA sequences surveyed by Simon Southerton, not one has been confirmed as coming from an X lineage.[35] While it is plausible that members of the X lineage will yet be found in Central America,[36] evidence to date suggests a far different pattern of distribution in the Middle East, Asia, and the Americas than would be expected if a founder effect were at play in the genetic makeup of Book of Mormon populations. If American X lineages were a result of migration from the Middle East to Central America, they should appear most frequently in that region rather than in North America.

What about the approximately 0.5 percent of living American Indian mtDNAs typically attributed to intermarriage with Europeans and Africans? Evidence indicates these individuals are not likely to have had Lehite ancestry. First, they are found most frequently in tribes with the most contact with Europeans or Africans after Columbus. Second, they are found at very low frequency all over North, Central, and South America, not in a "hot spot" as would be expected for a localized Lehite presence. Third, European and African lineages have not been found in ancient DNA samples from individuals who lived before Columbus.[37] While a founder effect would most likely occur if small populations left the Middle East for the Americas, it is highly improbable that it would produce the patterns of genetic markers currently found in Central American or other Native populations.

Problem #4: Unlikely chance events must recur multiple times

For Michael Whiting's local colonization model to concur with current genetic evidence, there would have to have been multiple occurrences of similar,

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33. While Lindsay continues to place a glimmer of hope in the X lineage, Meldrum and Stephens considered the controversy of the X lineage "put to rest" with the Derenko study in 2001. Lindsay, "DNA evidence;" Meldrum and Stephens, "Who Are the Children of Lehi?"

34. Murphy, "Lamanite Genesis," 56-57.

35. Southerton, "Losing a Lost Race."

36. David M. Reed, Univ. of Michigan, has tentatively identified an X lineage individual among skeletons found at Ixímché, Guatemala but cautions that he has yet to verify his results (David M. Reed, "Recent Activities," retrieved electronically 30 July 2002 from http://www-personal.umich.edu/~dmreed/Activities.html). In a letter Reed cautiously notes, "We haven't prepared anything for distribution regarding the Iximché ancient DNA. We must verify our results before establishing the genetic composition of those peoples" (David Reed to Thomas [Murphy], letter, nd. Envelope bears the postmark of 5 July 2002).

37. Simon Southerton to Thomas Murphy, electronic mail, 17 August 2003.

yet unlikely, events. All the female founders of the Jaredite, Mulekite, and Lehite migrations would have to leave no genetic descendants, or else come from rare lineages usually attributed to post-Columbian admixture. If genetic extinction is to explain the lack of mtDNA from Middle Eastern populations, then it must have occurred not just once but independently in three separate migration events. Because the evidence from paternal lineages substantiates the Siberian origin indicated by maternal lineages, a similar set of unlikely occurrences would also have to be repeated for all the male founders of the Jaredite, Mulekite, and Lehite migrations.[38] Evidence from the Y-chromosome thus makes Whiting's hypothesis doubly implausible.[39]

When we look more broadly at over a hundred different genetic markers, the plausibility of Whiting's local colonization model rapidly dissipates. L. Luca Cavalli-Sforza's monumental *History and Geography of Human Genes* examines more than 110 different traits in more than 1,800 predominantly indigenous populations around the world. The data he considers include blood groups and protein and enzyme polymorphisms (polymorphism refers to multiple forms or alleles of a gene), including the highly informative human lymphoctye antigens (HLA) and immunoglobulins. Their global analysis—using 120 allele frequencies—found Central and South American populations clustering most closely with other Native Americans and Northeast Asians rather than with Middle Eastern or Southwest Asian populations. Likewise, a more extensive analysis of thirty different Central and South American populations using more than sixty genetic markers found their closest relatives among other Native Americans rather than Middle Eastern populations.[40] The implausibility of Whiting's model escalates exponentially with each additional genetic marker examined.[41]

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38. Murphy, "Lamanite Genesis," 58-59.

39. While Whiting contends that his hypothesis is not testable, Meldrum and Stephens took a more cautious approach, suggesting that any limited colonization hypothesis may not be testable. Whiting also ignores the existence of ancient DNA. In regard to living Native Americans, Whiting's assertion could only be true if one assumed that gene flow and genetic drift would exterminate genetic traces of the Book of Mormon populations. As noted above, this assumption is not warranted by internal evidence from the Book of Mormon. Whiting's claim appears to be just another attempt to circumvent the scientific method (see Whiting, "DNA and the Book of Mormon," 31; Whiting, "DNA Evidence"; Meldrum and Stephens, "Who Are the Children of Lehi?").

40. L. Luca Cavalli-Sforza, Paulo Menozzi, and Alberto Piazza, *The History and Geography of Human Genes* Abridged Paperback Edition, Princeton, NJ: Princeton University Press, 1994, 78, 328.

41. Rich Deem, whose analysis of DNA evidence and Molecular Genetics has substantiated the conclusions reached by Southerton and me, expands the analysis beyond just human genetics. He notes that founder effect must occur not only in mtDNA but also in Y-chromosome data and polymorphic Alu insertions (apparently inactive pseudogenes found in numerous copies in the human genome). Because the results are similar to that from maternal and paternal lineages, "the founder effect would require the simultaneous mutation of at least 5 polymorphic Alu insertions in Lehi's sons and wives—not likely!" He adds, "Not only do Mormon apologists have to deal with human genetics, they also have to explain the genetics of certain intestinal bacteria and domesticated dogs. . . .All of

Counter Arguments

After identifying these four problems with a limited geographic setting, I offer here six counter arguments. First, limited geographic proposals derive from circular reasoning, commonly referred to as a tautology. Second, limited geographic settings rest historically upon a rejection of the scientific method. Third, the most prominent proposal by John Sorenson has failed initial evaluation by a more careful Mormon scholar, Thomas Stuart Ferguson. Fourth, Sorenson's proposal fails to meet his own standards, as set forth in published statements. Fifth, several scholars have successfully refuted Sorenson's model by more careful study of the Book of Mormon text and evaluation of external evidence. Finally, the popularity of Sorenson's model at FARMS and FAIR rests primarily upon its social functions, and not on an evidentiary basis.

Counter #1: Proposals for a limited geography are tautological

John L. Sorenson, emeritus professor of anthropology at Brigham Young University, has credited Louis E. Hills, writing between 1917 and 1924, with a series of innovative interpretations of the Book of Mormon, which would become increasingly common in the treatments of Book of Mormon geography. Among Hills's innovations were "the first regionally limited model" and a Mesoamerican setting, with the Isthmus of Tehunatepec as the narrow neck of land described in the Book of Mormon.[42]

The methodology employed by Hills began with the presumption of the validity of the Book of Mormon's history, then reshaped indigenous and mestizo histories to fit the Mormon view of the past.[43] By careful selection of facts from post-conquest narratives, removal of all contradictory elements as "cobwebs and dusts of fiction," and filling in blanks with the narrative of the Book of Mormon, Hills tautologically reshaped the ancient history of Mesoamerica to conform to his predetermined model of truth.[44] Similar methods would underlie the increas-

these five extremely improbable, multiple mutation effects would have had to have happened within one or two generations in the same small populations. The idea is scientifically ludicrous" (Deem, "DNA Evidence and Molecular Genetics Disprove the Book of Mormon," retrieved electronically 26 June 2003 from http://www.GodAndScience.org.).

42. John L. Sorenson, *The Geography of Book of Mormon Events: A Source Book*, rev. ed. (Provo, Utah: Foundation for Ancient Research and Mormon Studies, 1992), 32-33; L. E. Hills, *A Short Work on the Geography of Mexico and Central America from 2234 B.C. to 421 A. D.* (Independence, Mo.: L. E. Hills, 1917).

43. Hills claimed, "Indian traditions and legends, handed down for about 2,000 years, would probably become distorted" (Hills, *A Short Work*, 6). Consequently he "condensed many quotations for the sake of brevity, and to better gather out facts from the mass of fables, thus getting a clearer view of the true history by brushing away the cobwebs and dust of fiction, which have been accumulating for many centuries" (Louis E. Hills, *Historical Data from Ancient Records and Ruins of Mexico and Central America* [Independence, Mo.: Louis E. Hills, 1919], 1).

44. Hills's approach is tautological because it never seriously considers the possibility that the Book of Mormon might not be historically accurate. He assumes the Book of Mormon is true and dismisses contradictory evidence as "cobwebs and dusts of fiction" (Hills, *Historical Data*, 1).

ing popularity of limited geographies in the twentieth century. Scholars at FARMS have adopted Hills's methodology, along with his limited Mesoamerican geography. The inside back cover of the *Journal of Book of Mormon Studies* includes a mission statement making the tautological approach of FARMS explicit:

> The work of FARMS rests on the conviction that the Book of Mormon and other ancient scriptures are authentic historical documents written by prophets of God.[45]

With a methodology that presupposes the validity of the Book of Mormon, it does not matter whether DNA evidence supports or challenges the historicity of the scriptures, because researchers at FARMS have already reached a conclusion before they started their research. Whiting's claim that his local colonization model is not testable simply covers a tautological methodology (i.e., the regional genetic evidence may point to either Asia or Israel, but regardless the scripture remains true). Tautological methods such as those mandated by FARMS and employed by Whiting implicitly reject the validity of scientific methodology, which otherwise would require that statements of historical authenticity be subjected to rigorous evaluation.

Counter #2: Limited geography's advocates reject scientific method

John Sorenson, the most prominent advocate of a limited geography, abandoned scientific tests which had proved so disappointing to his predecessors, B. H. Roberts and Thomas Stuart Ferguson. He turned instead to interpretive social science to propose a "plausible" model for the Book of Mormon in a limited region in Central America. In *An Ancient American Setting for the Book of Mormon*, Sorenson explicitly dismisses scientific approaches, making it very clear that his "intention is not to put the Book of Mormon 'on trial' in some make-believe scientific dock." He presumptuously and incorrectly rejects scientific testing as outdated.[46] Sorenson took the same difficulty faced by all scientists when they aim for objectivity as a license for his own subjectivity. He recently explained his approach to Hampton Sides, a reporter for *Doubletake*:

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45. The 12th volume of *Journal of Book of Mormon Studies* no longer contains this statement. A similarly worded statement remains, however, in a prominent position under the heading of "By Study and Also by Faith" at http://farms.byu.edu. Retrieved electronically November 19, 2003.

46. Sorenson wrote, "Well then, do I present a 'hypothesis' to be 'scientifically tested'? The whole idea is rather out-of-date. Scientists never did that sort of thing in the cool, 'objective' way many laymen have been led to suppose, except perhaps for minor, uninteresting problems. Nobody ever examines 'all' the evidence on any issue, for there is too much to discover or manage. In any case the investigator's own feelings and presuppositions, certainly on a matter like this, enter into phrasing the issues, so ultimately objectivity is all but impossible" (Sorenson, *Ancient American Setting*, xviii-xix).

> I've never asked the question, '*Did* the events in the Book of Mormon happen?' I was born and raised in the church, and so for me this is beyond doubt (ital. original).[47]

Rather than confronting and working to minimize the difficulties inherent in scientific quests for truth, Sorenson used the limitations of science to dismiss its methodology. Thus, he began and continues his quest for establishing the historicity of the book with the unassailable tautological presumption of the text's historical truth.

Sorenson has to reject scientific methodology because his model consistently fails to withstand rigorous evaluation and hypothesis testing. If he is to adhere to his belief in the Book of Mormon, he cannot provide a more honest evaluation like that of his predecessor B. H. Roberts.[48] The same rejection of scientific methodology underlies more recent attempts to use limited settings for the Book of Mormon as an evasion of DNA evidence. When Whiting presents a purportedly untestable local colonization model as a vindication of the Book of Mormon, he is averting not advocating scientific methodology.

Counter #3: Sorenson's proposal failed initial evaluation by Ferguson

Thomas Stuart Ferguson, LDS founder of the New World Archaeological Foundation (NWAF) and another advocate of a limited geographic setting for the Book of Mormon, was invited in 1974 to participate in a written symposium. David A. Palmer, an LDS chemical engineer, hoped to generate some consensus on Book of Mormon geography through the circulation of papers by V. Garth Norman, NWAF archaeologist, and John Sorenson, BYU anthropologist. Palmer invited Ferguson to join other LDS scholars in responding, via writing, to the propositions of Norman and Sorenson. In his twenty-nine-page analysis, Ferguson outlined four areas of critical difficulty in Sorenson's proposal: "[T]he Plant-Life Test, the Animal-Life Test, the Metallurgy Test, and the Script Test."[49]

Stan Larson, curator at the University of Utah library, has summarized and reapplied each of Ferguson's tests at the end of the twentieth century.[50] Ferguson had expected any legitimate Book of Mormon geography to provide evidence of

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47. Hampton Sides, "This is Not the Place," *Doubletake* no. 16 (Spring 1999): 50.

48. Sorenson's approach stands in stark contrast to that adopted by his predecessor B. H. Roberts, a vaunted defender and later critic of the Book of Mormon, who rejected contemporary arguments for a limited geographic setting. Roberts welcomed challenges in a 1911 address on the Book of Mormon and higher criticism: "The Book of Mormon must submit to every test, literary criticism with the rest. Indeed, it must submit to every analysis and examination. It must submit to historical tests, to tests of archeological research and also to higher criticism" About a decade later Roberts subjected the Book of Mormon to more rigorous analysis and found the scripture wanting (B. H. Roberts, "Higher Criticism and the Book of Mormon," *Improvement Era* 14 (June 1911): 667; see also B. H. Roberts, *Studies of the Book of Mormon* [Salt Lake City: Signature, 1992]).

49. Stan Larson, *Quest for the Gold Plates* (Salt Lake City: Freethinker Press, 1996), 175-77.

50. Ibid.

wheat, barley, figs, and grapes, plant life mentioned in the text. He found Sorenson's proposed geographic setting lacking evidence in each of these cases. Ferguson may have expected too much, as the Book of Mormon's references to figs and grapes are biblical quotations. Domesticated barley has since been found in Arizona, Illinois, and Oklahoma, but it is a New World rather than Old World strain and is not found in the limited Central American setting where he expected to find it. Wild but not domesticated figs have been found at the archaeological site of Don Martín in Chiapas. In his reevaluation of the evidence, Larson concludes, "The lack of evidence for the existence of wheat in the New World remains a major difficulty in verifying antiquity of the Book of Mormon."[51] Likewise, the lack of evidence for plow agriculture remains an obstacle to Sorenson's proposal.[52]

Sorenson's proposal failed Ferguson's animal-life test. Any viable geography for the Book of Mormon must be complemented with evidence for animals described in the scripture: ass, bull, calf, cattle, cow, goat, horse, ox, sheep, sow (swine), and elephant. Ferguson found Sorenson's and Norman's geographies inadequate on each of these accounts.[53] While there is ample evidence of the existence of horses in America during the Pleistocene, none of these extinct horses appear to have survived into Book of Mormon times, nor do they appear to have been domesticated by ancient Americans. Rather, it was a common assumption "in early nineteenth century America that horses—as well as asses, oxen, cows, sheep, goats, and swine—were native to America though serious scholars were aware that these animals had been imported by the Europeans."[54]

Ferguson likewise dismissed the geographic settings proposed by his colleagues because they failed to pass his metallurgy test by supplying evidence of the Book of Mormon's references to "bellows, brass, breastplates, chains, copper, engravings, gold, hilts, iron, ore, plowshares, silver, steel, and swords."[55] Evidence of pre-Columbian metalworking—shaping metals like gold, silver, and copper by cold hammering—is found in Peru by about 1000 B.C. for gold and silver and by 500 A.D. for copper, but not in Mesoamerica until the ninth century A.D. Evidence for pre-Columbian iron metallurgy, which requires temperatures of 700° to 800°, is absent from the entire New World.[56]

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51. Ibid., 179-81.

52. John A. Price, "The Book of Mormon vs Anthropological Prehistory," *Indian Historian* 7 (Summer 1974), 35-40.

53. Larson, *Quest for the Gold Plates*, 182, 246.

54. Larson concludes, "The absence of support for the animals mentioned in the Book of Mormon—at the same time as there exists clear evidence of what the Mesoamerican animals actually were [deer, jaguars, turkeys, coatis, dogs, etc.]—constitutes a serious obstacle to verifying the historicity of the Book of Mormon" (*Quest for the Gold Plates,* 194).

55. Ibid., 195.

56. Larson concludes, "The absence of Mesoamerican copper/bronze/brass metallurgy during Book of Mormon times and the complete absence of Mesoamerican iron metallurgy during any pre-Columbian time period constitute a major problem for the historicity of the Book of Mormon" (ibid., 197, 199, 204).

Ferguson considered his script test to be definitive, the most exacting and precise test that a viable Book of Mormon geography must pass. Based upon the Book of Mormon's claims, he expected evidence of cuneiform from the Jaredites, and Egyptian and Hebrew scripts from the Nephites, but found the proposed geographies wanting. Ferguson had previously accepted a cylinder seal found at Tlatilco, Mexico, as containing a Hebrew inscription of the name Hiram. Despite a purported translation by diffusionist scholar Barry Fell, the claim did not stand up to scholarly scrutiny, and by 1982 Ferguson was convinced there was no evidence of Hebrew scripts from pre-Columbian America. The best evidence located was "a three-inch cylinder seal, found at Chiapa de Corzo, state of Chiapas, Mexico, by the New World Archaeological Foundation."[57] Although the inscription had been identified as Egyptian by the famed biblical archaeologist William Albright, other leading scholars seriously questioned this identification.[58] Despite tremendous advancements made in the decipherment of Mayan hieroglyphics in the latter part of the twentieth century, no personal or place names from the Book of Mormon have been found, let alone compelling evidence of Hebrew, Sumerian/Akkadian, or Egyptian languages or scripts in the New World.[59]

The two geographies proposed by Norman and Sorenson overwhelmingly failed the tests originally posed by Ferguson and recently reapplied by Larson. While Norman did not publish his geographical model, highlights of Sorenson's proposal would appear in the Ensign a decade later. While openly admitting that many questions remained and that he was not satisfied with the results, he revised his original manuscript and published it as *An Ancient American Setting for the Book of Mormon* in 1985.[60]

Counter #4: Sorenson's proposal fails by his own standards

Sorenson's *Ancient American Setting* dramatically reinvents the Book of Mormon. Rejecting a hemispheric model, he locates the events of the Book of Mormon in a limited region near the isthmus of Tehunatepec in southern Mexico. He sets aside or reinterprets geographic references in the text, turns direc-

57. Thomas Stuart Ferguson, "Written Symposium on Book of Mormon Geography: Response of Thomas S. Ferguson to Norman and Sorenson Papers," (typescript March 12, 1975), 24, in Ferguson Collection, University of Utah. Cited in Larson, *Quest for the Gold Plates,* 206

58. Larson, *Quest for the Gold Plates,* 204-206.

59. Larson concludes, "Especially now that the Mayan writing system can be understood to a great degree, this lack of confirmation has become a serious problem for the Book of Mormon" (ibid., 210).

60. Ibid., 178. See also John L. Sorenson, *An Ancient American Setting for the Book of Mormon* (Salt Lake City: Deseret Book and Foundation for Ancient Research and Mormon Studies, 1996 [1985]), xiii-xx; John L. Sorenson, *Geography of Book of Mormon Events: A Source Book Study Aid*, rev. (Provo, Utah: Foundation for Ancient Research and Mormon Studies, 1992 [1990]), 29-31; John L. Sorenson, "Digging into the Book of Mormon: Our Changing Understanding of Ancient America and Its Scripture," *The Ensign* 14 (Sept. 1984): 26-37; (Oct. 1984): 12-23.

tional references sideways, transforms Old World flora and fauna into misnamed species from the New World, accepts linguistic terms for metallic substances as evidence of metallurgy, ignores the descriptions of pastoral cultures in the scripture, neglects prophetic claims of the scripture, dismisses Joseph Smith's knowledge of the Book of Mormon as geographically invalid, and abandons two centuries of interpretations by church leaders, which most Mormons believed were inspired by God. Despite these deficiencies, Sorenson's geographic model has emerged as the dominant paradigm in the scholarship of FAIR and FARMS.

Sorenson's efforts to situate the events of the Book of Mormon in a limited Tehuantepec region of Central America, however, fail by his own interpretive standards. In his geographic source book, he claims, "Any discussion of the geography must be exhaustive; selective citation of the scriptures treating lands, elevations, etc., will not do, for each clue ultimately should fit with every other."[61] Yet, elsewhere in the same book, he admits parenthetically that his model cannot adequately account for geographic statements in the book of Ether:

> The Jaredite record is impossible to deal with except where it connects with the Nephite account; thus I ignore those geographical statements and hints in the book of Ether which I cannot connect to Mormon's account.[62]

Passages "omitted" by Sorenson pose devastating problems for his model. For example, the Lord's commandment to the party of Jared and his brother that they "gather thy flocks, both male and female, of every kind; and also of the seed of the earth of every kind. . .[and] go forth into the wilderness, yea, into that quarter where never had man been" (Ether 1:41, 2:5) undermines Sorenson's claim that the peoples of the Book of Mormon were a small group in a land already occupied by immigrants from Asia with primarily indigenous plants and animals. Likewise, while he acknowledges that Ether 13: 2 can be interpreted to refer to the whole continent, he fails to note the verse's apparent reference to the post-diluvian Jaredite settlement of the land: "After the waters had receded from off the face of this land it became a land choice above all other lands." Sorenson's approach is selective in its quotations from the scripture and inconsistent with the biblical literalism reflected in the Book of Mormon. Even when discussing passages elsewhere in the scripture, Sorenson often has to omit or reinterpret contradictory parts from the verses themselves.[63] For example, in discussing the four

61. Sorenson, *Geography of Book of Mormon Events*, 216.

62. Ibid., 2. See also p. 307.

63. Sorenson represents his model as being the most consistent with the Book of Mormon text; but as we have seen, it depends heavily upon a selective and misrepresentative reading of the text. Even Sorenson acknowledges, more forthrightly than fans of his model, the limitations of his own interpretations: "Many purport to 'let the text speak for itself,' but that is nonsense. For practically all of us, our anxiety *to hear* what we want to hear almost invariably overwhelms the other voice(s) the text conceivably may be directing toward our ears" (Sorenson, *Geography of Book of Mormon Events*, 210).

seas of Helaman 3:8, he limits the reference to "the land northward" and fails to acknowledge the reference to covering "the face of the whole earth."[64]

To make his model fit Mesoamerica, Sorenson must shift Nephite direction terms "by 45 degrees or more." He justifies his claim of a different directional framework through references to an outdated translation of the Popol Vuh in which the translators conflate references to Mexican brothers "in the east" with the northern location of lowlands of the Yucatán peninsula.[65] In a more recent translation of the Popol Vuh directly from Quiché to English, rather than via Spanish to English, Dennis Tedlock draws upon other Mayan narratives and inscriptions at Copán to suggest, more practically, that the eastern city of the Quiché and Cakchiquel narratives is either Kaminaljuyú, the eastern outpost of the Mexican empire, or Copán, whose leaders claimed descent from the royal line of Teotihuacan.[66] Both Copán and Kaminaljuyú lie to the east of the Quiché highlands, with Kaminaljuyú a little more to the southeast. No distortion of directional references to the rising sun in highland Mayan narratives is needed with the increased knowledge now available from translations of hieroglyphic inscriptions at Copán, but it remains a necessary precondition of Sorenson's geography.

While Sorenson's approach may help soothe the fears of believing Mormons, it fails to propose a plausible model which meets his own standards, let alone the expectations of those who believe a truthful text should be able to pass the most basic scientific tests.

Counter #5: Scholars have successfully refuted Sorenson's model

Not only did Sorenson's model fail to meet his own and others' tests prior to publication, it has also been successfully refuted since its publication. I have already discussed Larson's reapplication of Ferguson's plant-life, animal-life, metallurgy, and script tests, but his is not the only work to refute Sorenson. Deanne Matheny, an LDS archaeologist and a former part-time faculty member at BYU, evaluated Sorenson's limited Tehuantepec geography and found "issues of directionality" to be the "most fundamental geographical problem" with his model. She points to evidence collected by Barbara Tedlock that Quiché terms for east mean "at the rising sun," and west "at the setting of the sun," as well as

64. Sorenson, *Geography of Book of Mormon Events*, 289. The scripture actually reads as follows: "And it came to pass that they did multiply and spread, and did go forth from the land southward to the land northward, and *did spread insomuch that they began to cover the face of the whole earth*, from the sea south to the sea north, from the sea west to the sea east" (Hel. 3:8; emphasis added).

65. Sorenson, *Ancient American Setting*, 39-41. For the Popul Vuh translation, see Adrián Recinos, *Popol Vuh: Sacred Book of the Ancient Quiché Maya*, trans. by Delia Goetz and Sylvanus G. Morley (Norman: University of Oklahoma Press, 1950), 68-69, 207.

66. Dennis Tedlock, "Introduction," in Dennis Tedlock, trans. *Popol Vuh: The Definitive Edition of the Mayan of the Dawn of Life and the Glory of Gods and Kings* (New York: Touchstone, 1996[1985]), 22, 45-47.

similar evidence from the common Israelite directional system.[67] She finds Sorenson's efforts to circumvent the problems associated with the lack of evidence for metallurgy and Old World flora and fauna to be inadequate.

Matheny employs archaeological reports to evaluate Sorenson's claim that Zarahemla (a Nephite capital city) is the site of Santa Rosa in Chiapas, Mexico. However, Santa Rosa lacks evidence of metallurgy, carved monuments or other forms of early writing, Old World plants and animals, walls and fortifications like those described in the text, evidence of destruction by fire at the time of Jesus' death, a large population center, or a role as a significant trading center.[68] Not only does Sorenson fail to present evidence of metallurgy and Old World flora and fauna, but also the archaeological evidence in the Isthmus of Tehuantepec at about 3000 B.C. "consist[s] of a few small horticultural villages and groups of Archaic hunters and gatherers," not the vast civilization of Jaredites described in the Book of Mormon.[69] Sorenson's method, Matheny concludes, "is a bits-and-pieces approach involving a large area and all time periods rather than the specific area and time he has selected, failing to take into account the specific cultural processes and developments in that area."[70]

Other scholars have discredited Sorenson's proposal. For example, Dan Vogel and Brent Metcalfe, editors of *American Apocrypha*, characterize his model as pseudoscientific and "a last gasp of Book of Mormon apologetics."[71] It rests on "an *ad hoc* hypothesis designed to shield a central hypothesis from adverse evidence," and this approach violates "the principle of parsimony, or Occam's Razor, which posits that the best hypothesis is the simplest or the one that makes the fewest assumptions."[72] In addition, to recognizing its inconsistency with the Book of Mormon, Joseph Smith's "divine edicts," and Mesoamerican archaeology, Vogel and Metcalfe challenge the idea that the Isthmus of Tehuantepec is a narrow neck of land, emphasize the directional failures of the model, and attribute the geography of the Book of Mormon to the nineteenth-century myth of the mound builders which preceded it.[73] Sorenson and most other advocates of a limited geography have yet to adequately respond to these critiques.[74]

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67. Deanne G. Matheny, "Does the Shoe Fit? A Critique of the Limited Tehuantepec Geography," in Brent Lee Metcalfe, ed., *New Approaches to the Book of Mormon* (Salt Lake City: Signature Books, 1993), 277.

68. Ibid., 312-17.

69. Ibid., 317-19.

70. Ibid., 322.

71. Dan Vogel and Brent Metcalfe, "Editor's Introduction," *American Apocrypha*, viii.

72. Ibid., ix.

73. Ibid., ix-xiii.

74. Meldrum and Stephens acknowledge that the principle of parsimony drives scientific rejections of a local colonization model, but they contend the principle of parsimony does not guarantee the scientific response is the correct one. Such an assertion is only valid if one begins with the belief that the Book of Mormon is historically accurate (Meldrum and Stephens, "Who Are the Children of Lehi?" 43).

Earl M. Wunderli, a retired LDS attorney from Sandy, Utah, draws upon the Book of Mormon itself to challenge "the validity of any model smaller than a hemispheric model," "the Isthmus of Tehuantepec as the narrow neck of land," and "the survival of the Jaredites and the presence of other people to mix with Nephites and Jaredites."[75] Wunderli observes that the Book of Mormon: a) attributes a literal biblical history to the Jaredites, thus disallowing more ancient non-biblical migrations to the Americas, and b) presents Jaredites as the world's greatest nation rather than a tiny enclave engulfed by a larger Asiatic population.[76] He points out that southern Guatemala and Mexico are not surrounded by water, as required for the "land southward" by Alma 22:32, and that the Isthmus of Tehuantepec at 120 miles wide is neither small, narrow, nor a "neck" of land.[77] He observes that Sorenson ignores the word only in the description of the narrow neck as "only the distance of a day and a half's journey. . .from the east to the west sea" (Alma 22:32), and that Sorenson uses contradictory measurements for journeys of a similar length elsewhere in his analysis.[78] Likewise, Sorenson's claim of a directional shift contradicts the use of a familiar concept of direction during the departure of Lehi from Jerusalem (1 Ne. 2:5-6, 16:13-14, 17:1).[79] The hemispheric model, unlike the limited one, requires neither contortions of Alma 22 nor directional shifts, and it neatly fits the geographic descriptions in the text.[80] Furthermore, only the hemispheric model is consistent with Lehi's prophecies of North American historical events in 2 Nephi 1.[81]

Sorenson's model has been thoroughly discredited. Matheny, Vogel, Metcalfe, and Wunderli have each demonstrated key failings of Sorenson's methodology, his distortions of the text of the Book of Mormon, and the refutation of his geographic setting by external archaeological evidence.

Counter #6: Sorenson's model serves social functions

The appeal of a limited geographic setting and a local colonization for the Book of Mormon is based primarily on social factors rather than on scientific evidence. In this respect, the limited setting model resembles the arguments of creationists in the creation and evolution debate.[82] First, the model serves the function of facilitating anthropological, molecular biological, and historical research

75. Earl M. Wunderli, "Critique of A Limited Geography for Book of Mormon Events," *Dialogue: A Journal of Mormon Thought* 35, no. 3 (Fall 2002): 172.

76. Ibid., 175.

77. Ibid., 184-85.

78. Ibid, 185-87.

79. Ibid., 190.

80. However, Wunderli concedes that the bulk of Nephite history appears to reflect a limited range (ibid., 182).

81. Ibid., 176-79.

82. For an insightful discussion of the social and political functions of creationism see Niles Eldredge, *The Triumph of Evolution and the Failure of Creationism* (New York: W. H. Freeman and Company, 2000).

and teaching at BYU and elsewhere by church members, despite a repressive social atmosphere which exacts heavy penalties for forthright examination of the historical, biological, and anthropological record.[83] Second, the limited setting model serves a social function when it presents a "plausible" explanation for why someone might get a prayerful witness of the book's truthfulness despite the lack of corroborating external evidence. Unfortunately, scholars at FARMS and FAIR too frequently have confused this social and spiritual function with scientific and historical methodology and evidence. Prayer, while important for emotional and spiritual reasons, is not a valid scholarly means of discerning history or science. Perceived answers to prayers vary by individual and are necessarily preconditioned by experiences and cultural background of the individual seeking knowledge through prayer. We might be more effective in accommodating genetic evidence if we reconsidered the way we understand prayer: Whereas prayer might provide an emotional, psychological, or spiritual confirmation of feelings, it should not be employed as a tool for answering historical or scientific questions.

The dogmatic believer's tendency to confuse prayer with historical and scientific inquiry produces a stifling social atmosphere which is destructive to free inquiry and honest introspection. Lacking substantive evidence, the church, its subsidized scholars, and its defenders depend on this questionable social imperative for defending the Book of Mormon. Consequently, primary methods of promoting a limited geographic setting for the Book of Mormon have included intellectual intimidation, character assassination, and ecclesiastical abuse.[84] Social actions like church disciplinary courts, dismissals from BYU, disregard of outside peer review, sheltered discourse, and a reluctance to participate in genuine interfaith

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83. For discussions of the repressive social atmosphere in the LDS church and at BYU, see the following articles. D. Michael Quinn, "150 Years of Truth and Consequences about Mormon History," Sunstone 16 (February 1992): 12-14; Lavina Fielding Anderson, "The LDS Intellectual Community and Church Leadership: A Contemporary Chronology," *Dialogue: A Journal of Mormon Thought* 26, no. 1 (Spring 1993): 7-64; "Six Intellectuals Disciplined for Apostasy," *Sunstone* 16, no. 6 (November 1993): 65-73; D. Michael Quinn, "Dilemmas of Feminists and Intellectuals in the Contemporary LDS Church," *Sunstone* 17 (June 1994): 67-73; "Disciplinary Actions Generate More Heat," *Sunstone* 16, no. 7 (December 1993): 67-68; Anonymous, "'Clipped and Controlled': A Contemporary Look at BYU," *Sunstone* 19, no. 3 (August-September 1996): 61-72; Brian Evenson, "Unwritten Rules," letter to the editor, *Sunstone* 19, no. 4 (December 1996): 2-5; Scott Abbott, "On Ecclesiastical Endorsement at Brigham Young University," *Sunstone* 21, no. 4 (April 1997): 9-14; "Academic Freedom Organization Investigates BYU," *Sunstone* 20, no. 2 (July 1997): 73-74; Thomas W. Murphy, "Laban's Ghost: On Writing and Transgression," *Dialogue: A Journal of Mormon Thought* 30, no. 2 (Summer 1997): 105-126; Bryan Waterman, "Policing 'The Lord's University': The AAUP and BYU," *Sunstone* 21, no.4 (December 1998): 22-38; Lavina Fielding Anderson, "DNA Mormon: D. Michael Quinn," in *Mormon Mavericks*, eds. John Sillito and Susan Staker (Salt Lake City: Signature, 2002), 329-63.

84. An untitled insert, signed by the editor of *Journal of Book of Mormon Studies* 12, no. 1 (2003): 37, notes that I have a Ph.D. in anthropology from the University of Washington but falsely claims that I have "little or no scientific background." The editor is apparently unaware that the discipline of anthropology bridges social sciences, humanities, and natural sciences. In addition to training in biological anthropology for my B.A., M.A,, and Ph.D. in anthropology, I have partici-

dialogue typify the means through which the limited geographic model has attained ascendancy among some LDS scholars.[85] These approaches are destructive to our community and undermine legitimate questions and intellectual discourse.

Conclusion

The insistence by LDS scholars on a limited geographic setting for the Book of Mormon should not be confused with the accrual of actual scientific or historical evidence. A limited geography or local colonization in Central America does not save the Book of Mormon's historical claims from the implications of genetic research. In fact, no evidence from molecular anthropology supports a limited colonization of Middle Eastern or Israelite populations in Central America. The idea that founder effect and genetic drift may account for the lack of genetic evidence is contradicted by statements and prophecies in the Book of Mormon itself, and would require hundreds of unlikely chance events in three different founding populations. While John Sorenson has made the best case for a limited geographic setting for the Book of Mormon in Central America, his proposal depends upon a rejection of the scientific method and a tautological faith in the historicity of the text, as well as requiring unwarranted directional shifts and an assumption that most references to flora, fauna, and technology in the scripture are misnomers. LDS scholars had already soundly refuted particulars of his proposal prior to publication, and other LDS scholars have done the same following publication. Sorenson's limited geography has gained ascendancy through repetition and as a byproduct both of a repressive social atmosphere in the LDS research community and a confusion of prayer with science. But however ascendant, a limited geography for the Book of Mormon anywhere in the Americas is, in sum, simply implausible.

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pated in ethnobiological research, funded by the National Science Foundation, in a Zapotec community in southern Mexico. I teach a course in "Human Origins," transferable in fulfillment of natural science distribution requirements at major research universities across the country. In the laboratory portion of this class, students extract and amplify DNA, send samples to another laboratory for sequencing, and analyze the sequenced DNA using publicly available databases of global populations. As an additional example of intellectual intimidation, John Tvedtness (Institute for the Preservation and Study of Ancient Texts at BYU) sent an email message to Dean Richard Asher at Edmonds Community College, claiming I was not qualified to lecture on either genetics or the Book of Mormon. In the midst of my tenure review, he falsely alleged, "Murphy is unacquainted with the vast array of scholarly publications on the Book of Mormon, both pro and con, and has been fed the material he uses by an avowedly anti-Mormon writer who is not in the academic community and hence wants Murphy, who is in academia, to disseminate his material" (John Tvedtness to Richard Asher, "Tom Murphy Lecture," 7 February 2003). At my request, the Dean responded by inviting Tvedtness or another representative of FARMS to our campus to offer an alternative view. Tvedtness did not accept the invitation and his allegations failed to derail my tenure process. I was granted tenure the following month.

85. See examples in previous notes. For yet another example of character assault, see Allen Wyatt, "Motivation, Behavior, and Dissension," retrieved 1 Aug. 2003 from www.fairlds.org. See my response at "DNA and the Book of Mormon," retrieved 1 Aug. 2003 from www.tungate.com. For a justification of such tactics, see Daniel C. Peterson, "Text and Context," *Review of Books on the Book of Mormon* 6, no. 1 (1994): 524-62.