



# BEFORE DNA

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**I**N RECENT YEARS CRITICS who question that the Book of Mormon is an ancient document have made noisy claims that “facts” from the science of molecular biology contradict what the Nephite record says about the peoples it describes. In this issue of the *Journal*, specialists in DNA analysis emphasize the care one must take in responsibly conceptualizing problems and then using DNA data in any evaluation of the Book of Mormon as a historical source. The issues they take up are technically complex, and it is important that they raise the cautions they do. But from our perspective there are questions that should precede any technical matters.

This article provides a framework within which the quality and aptness of questions about DNA studies on Native Americans and their implications for Book of Mormon history should be approached. We raise a set of issues that anyone should confront when thinking clearly and honestly about this subject. Our answers are succinct because the space available is limited. For those who wish to know more, the endnotes point to additional sources of information.

Critics of the Book of Mormon frequently take the position that the New World events related in the Nephite record must be read as taking place on a stage consisting of the entire Western Hemisphere. This allows them to treat the scripture as though it purported to be a history of the American Indian. Their arguments about the supposed factual inaccuracy of the sacred record rest heavily on this claimed geography. But what the book actually says contradicts the idea that two entire continents were involved in the story. Although early Latter-day Saints assumed a hemispheric setting (and some church members today still hold that view), the record actu-

ally describes a setting where the people were limited in numbers and the lands they occupied were restricted in scale. Yet the issue touches more than geography alone; the entrained question is one of demography and descent. Were there other populations present in the Americas who were not exclusively descended from Lehi’s party? We treat both issues below.

A responsible approach to the scripture requires getting clear about the actual geographic and demographic scale on which its events were played out, as Elder Dallin H. Oaks has pointed out. He recalled taking a class as a student at Brigham Young University in which

I was introduced to the idea that the Book of Mormon is not a history of all of the people who have lived on the continents of North and South America in all ages of the earth. Up to that time I had assumed that it was. If that were the claim of the Book of Mormon, any piece of historical, archaeological, or linguistic evidence to the contrary would weigh in against the Book of Mormon, and those who rely exclusively on scholarship would have a promising position to argue.

In contrast, if the Book of Mormon only purports to be an account of a few peoples who inhabited a portion of the Americas during a few millennia in the past, the burden of argument [about its historical accuracy] changes drastically. It is no longer a question of all versus none; it is a question of some versus none. In other words, in the circumstance I describe, the opponents of historicity must prove that the Book of Mormon has no historical validity for *any* peoples who lived in the Americas in a par-



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ticular time frame, a notoriously difficult exercise. One does not prevail on that proposition by proving that a particular . . . culture represents migrations from [eastern] Asia. The opponents of historicity of the Book of Mormon must prove that the people whose religious life it records did not live *anywhere* in the Americas.<sup>1</sup>

Furthermore, DNA scientists have to answer the questions of location and scale if they are to know from where to draw data appropriate for historical analysis of the Book of Mormon. Our first questions assist in that task.

### **1. How does the Book of Mormon characterize the geographical scene in the American “promised land” where the events the book relates took place?**

Numerous books and articles have addressed bits and pieces of this question.<sup>2</sup> The problem is very complex, for hundreds of passages in the Book of Mormon either tell us directly about or imply spatial relationships and other geographical parameters that characterized the setting.

As the primary author and editor of the Book of Mormon, the prophet Mormon evidently had his own mental map of Nephite lands, which made it possible for the total body of geographical information that he employed to be remarkably consistent. This is not surprising, because from his own account we know that he had personally traveled over a great deal of Nephite territory (see Mormon 1:6, 10–6:6). The geographical data in the book lead to the following salient points:<sup>3</sup>

1. When mapped, the outline of lands familiar to the Nephites appears to have been more or less in the shape of an hourglass but with the nature of the northward and southward extremities being left unclear.

2. What the Nephites considered their “east sea” in all likelihood was the Atlantic Ocean.<sup>4</sup>

3. The Nephites’ “west sea” was part of the Pacific Ocean. Lehi’s party landed on the west sea coast at the extreme south of the territory they knew as “the promised land.”<sup>5</sup>

4. The two crucial landmasses were called the land southward and the land northward. They were connected by an isthmus described as “narrow.” The Nephites thought of their land as “nearly surrounded by water” and, at least in their early days, as an “isle of the sea” (Alma 22:32; 2 Nephi 10:20). (*Isle* anciently did not necessarily mean an area entirely isolated by

water, but rather that the area so labeled could be reached via boat. See the dictionary in the Latter-day Saint edition of the King James Version of the Bible, s.v. “Isles.”)

5. The southern portion of the land southward, called the land of Nephi, was mostly elevated and mountainous (it included the headwaters of the principal river); the territory closer to the isthmus, called the land of Zarahemla, lay at an intermediate elevation.

6. From the south highlands (the land of Nephi), the river Sidon, the only river identified in the record, flowed northward through a drainage basin that constituted much of the land of Zarahemla.

7. The west sea coastal zone of the land southward was considered a “narrow strip,” apparently with such a small population that it played no significant historical role in Book of Mormon history, but the flatlands adjacent to the east sea coast of the land southward were more extensive.

8. Based chiefly on the travel times required to go between various points, we can confidently infer that the land southward was on the order of only a few hundred miles in length (northward–southward). At one point the land southward was plausibly about 200 miles wide. The distance across the narrowest part of the narrow neck, or isthmus, is left vague but might have been on the order of 100 miles.

9. The dimensions of the land northward are also unclear, but the implication is that the size of that area was of the same order of magnitude as the land southward.

10. Topographically the land northward consisted of lowlands (and drainage) toward the east sea, while westward the land was more elevated.

11. Near the east sea a relatively small area of hills was located no great distance northward from the narrow pass. The final battleground of the Jaredites (at “the hill Ramah”) and of the Nephites (at the same hill, called by them “the hill Cumorah”) was in this area.

12. The climate throughout the entire territory was relatively warm, at least as far as the text indicates. While we read of extreme heat, there is no hint of cold weather or snow.

13. The groups occupying most of this territory at times reached a civilized level of development and at one point constituted a population of more than two million. At their greatest the inhabitants occupied numerous cities with extensive public buildings, kept

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many written records, fought in large-scale wars, and carried on extensive trade. In short, they were in a civilized condition.

All of these features (and many more) must characterize that part of the Americas where the events recorded in the Book of Mormon took place. It is not enough that just arbitrarily selected features from Mormon's record be made to match up with today's map.

## **2. Do all of the geographical facts sketched in the Nephite account agree with any actual location in the Americas? With more than one?**

That the inhabitants of Book of Mormon lands knew and used formal writing systems and compiled numerous books (see Helaman 3:15) restricts the possible real-world location to Mesoamerica<sup>6</sup> (central and southern Mexico and northern Central America). In Mesoamerica there were thousands of books in use at the time of the Spanish Conquest, but nowhere else in the Western Hemisphere is there convincing evidence for genuine writing being used on a consistent basis. In addition to writing, other social and cultural conditions required by the scriptural text to be present in the Nephite homeland area confirm Mesoamerica as the only plausible location of Book of Mormon lands.

retically possible that another area of the New World could meet the criteria to be the historical Nephite and Lamanite lands, it has proved impossible to identify any such territory. All proposed locations other than Mesoamerica suffer from fatal flaws.

DNA scientists can be confident that all or part of Mesoamerica was where the Nephite and Lamanite peoples took on their historical identities and where their history recorded in the Book of Mormon was played out, although their descendants might have spread into other New World zones and additional peoples might have migrated to Mesoamerica from other regions.

## **3. What evidence is there that the original Book of Mormon peoples from the Mesoamerican area where the events related in the scripture took place spread to other parts of the Americas?**

Archaeologists cannot precisely identify at this time any of their study materials as those of "Book of Mormon peoples." But it is clear from their research that Mesoamerica was a center from which influence spread throughout certain portions of the Western Hemisphere. Latter-day Saints plausibly suppose that at least some Mesoamerican groups included "Nephites" or "Lamanites" and that Israelite genes could have spread out from the Mesoamerican

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In addition to the cultural criteria, only in that area can all of the geographical requirements be met. For example, only in Mesoamerica are there lands of appropriate scale (that is, several hundreds, but not thousands, of miles in extent) that can appropriately be said to be "nearly surrounded by water" (Alma 22:32), as well as an isthmus bounded by Pacific and Atlantic waters.

Ingenuous and impassioned arguments have been mustered in support of other theorized areas (from the Great Lakes to Peru or encompassing the entire hemisphere) as the scene for Nephite history. But every proposed geographical setting other than Mesoamerica fails to meet the criteria established by the text of Mormon's account.<sup>7</sup> So while it is theo-

core. For example, Amerindian groups in the southwestern United States area were heavily influenced by peoples in Mexico. Expert opinions differ on how persuasive the evidence is for the movement of actual gene bearers from the one area to the other. One scholar says, "Mesoamerican symbolism, ceremonialism, and ceremonial art swept through the Pueblo IV Anasazi [people of about A.D. 1300] like an early Ghost Dance religion."<sup>8</sup>

Archaeologist Charles Di Peso pointed out that in the late pre-Spanish period at Casas Grandes, near the Arizona border, no fewer than four Mesoamerican religious complexes "—involving the worship of [the Central Mexican gods] Quetzalcóatl, Xiuhtecutli, Xipe, and Tláloc—were present." It seems likely that



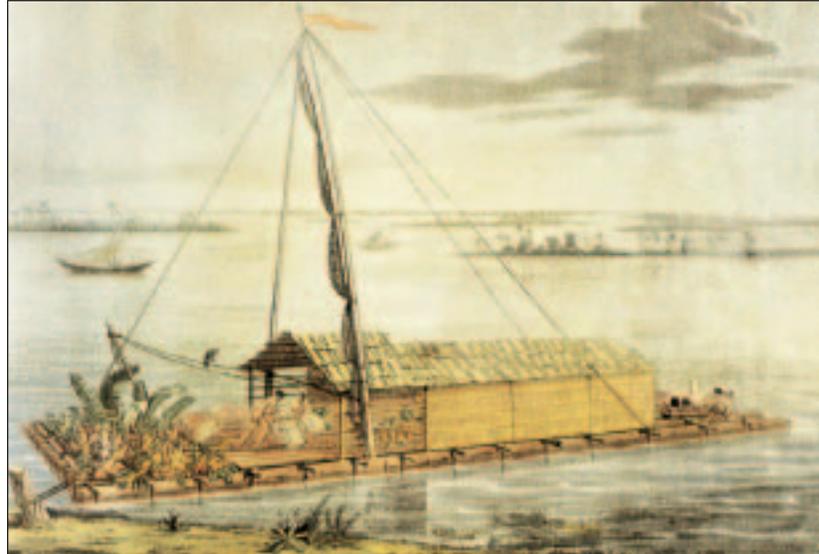
the very specific cultural information that was at the heart of those cults arrived with small Mesoamerican immigrant groups rather than by vague cultural seepage northward. In fact, “it appears that Hohokam and Mogollon cultural groups of the southern Southwest were influenced by Mesoamerican culture over several millennia, perhaps from 2000–3000 B.C. until 1300–1400 A.D.”<sup>9</sup> A minor trickle of actual Mexican people moved northward bearing some of that cultural freight.

Is it possible that what archaeologists refer to as cultural “influences” spread by some indirect means, like pollen in the wind? The answer seems clear to us that in some circumstances human agents were necessary to convey such influences between distant points. Because the cultural items shared were so detailed and elaborate, it is most reasonable to suppose that actual persons carried specific knowledge from Mexico to Arizona or New Mexico.<sup>10</sup> It is quite certain that those persons who acted as transfer agents frequently also passed their genes into the local pool at the destination.<sup>11</sup> In any case, DNA scientists ought not to exclude the possibility that genetic carriers from Mesoamerica reached other areas.

Mesoamerican peoples and cultures were also generally influential on the Mississippi River valley and the southeastern United States. Maize spread there from Mesoamerica, and substantial knowledge of various cultural features also slowly spread into the area.<sup>12</sup> Mesoamerican influence is seen especially in the Mississippian period, from around A.D. 900 to perhaps after A.D. 1500. From Georgia to Oklahoma and from Louisiana to Wisconsin, large temple mounds were erected, and ideas about rulership seem also to have been shared. Again, the tendency is for one wing of the archaeological community to consider that the similarities to Mexico do not demonstrate that any human biological connection was involved. Yet some of the concepts, implied or obvious, that connect the two areas strike others as sufficiently pointed to suggest specific imports, and probably people, going beyond vague “influence.” While it cannot be shown for sure that actual persons arrived in the Mississippian area from Mexico, DNA scientists may do well to consider that there possibly was limited Mesoamerican gene intermixture.

There is also evidence for long-lasting relationships between Mesoamerica and South America. Maize moved southward from its origin in western Mexico more than 6,000 years ago. Many cultural

characteristics as well as traits of human biology quite certainly accompanied it. Some of the linkage was facilitated by travelers on raft or ship who moved back and forth along the Pacific Coast of the Americas for thousands of years.<sup>13</sup> In a few cases, whole populations and their cultures seem to have made the move, such as the Kogi people.<sup>14</sup> Later indications are that South



This type of massive raft from Ecuador sailed along the coast as far as Mexico and back. (From A. de Humboldt, *Vues des cordillères*, 1810)

America was the source of south-to-north influence (a few actual Incan buildings have been found in western Mexico).<sup>15</sup> Dr. Marshall Newman has also presented morphological data from physical anthropology to argue that groups of people migrated to South America from Mesoamerica.<sup>16</sup>

Details on many of the indicated movements remain too vague or conjectural for complete clarity, but a significant number of specialists believe that both Mesoamerican concepts and people spread into some areas of South America, as into North America, long before the European conquest of the New World.<sup>17</sup>

#### **4. How does this geographical picture square with traditions held among the Latter-day Saints about the scenes and peoples involved in Book of Mormon events?**

We face a lack of detail in our historical sources as to what the earliest Latter-day Saints thought about Book of Mormon geography. Even so, there is little question that generally an obvious interpretation was in many readers’ minds. The “land southward” they

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considered to be South America, the Isthmus of Panama was “the narrow neck,” and North America was thought to be the “land northward.”<sup>18</sup> However, there is no evidence that in the early years any detailed thought was given to geography. Actually, the Book of Mormon was little referred to or used among church members in the first decades except as a confirming witness of the Bible. The writings or preaching of some of the best-informed church leaders of that day show that they did not read the text carefully on matters other than doctrine.<sup>19</sup> For instance, no statement shows that anyone read the scripture closely enough to grasp the fact that the plates Mormon gave to Moroni were never buried in the hill of the final Nephite battle.

In 1842 a best-selling book by explorer John Lloyd Stephens<sup>20</sup> was read by Joseph Smith and associates in Nauvoo. Their reading prompted an extensive review of the book in the Nauvoo newspaper, the

smaller than the entire hemisphere could satisfactorily serve as the scene of the chief events in the Nephite record.

In the long run, nevertheless, the Stephens-stimulated view of Central America as the Book or Mormon heartland did not prevail among the Saints generally. The new implications were apparently overwhelmed by the inertia of the old belief in a whole-hemisphere geography. Orson Pratt, who was separated from the church during 1842 when the new thought on this topic was stirring, seems to have continued to believe in the original geographical theory.<sup>24</sup> His views along those lines are reflected in the geographical footnotes that he added to the 1879 edition of the Book of Mormon. His opinions led several generations of readers of the scripture to assume with him that only the Nephites and Lamanites of Mormon’s account occupied the Americas, from the Arctic to the Antarctic, at least during Book of

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which now embraces Central America.”**

**—*Times and Seasons*, 1842**

*Times and Seasons*. (No author is listed, but Joseph Smith was editor in chief with John Taylor as managing editor.) Stephens’s was the first book in English reporting great ruins in Central America. It strongly impressed the newspaper writer (whoever he was), for on 15 September the paper reported, “We have to state about the Nephites that . . . they lived about the narrow neck of land, which now embraces Central America, with all the cities that can be found.”<sup>21</sup> Stephens’s new information obviously was causing the leadership in Nauvoo to think of Nephite geography in a new way. Two weeks later they continued to exult in their study of what was for them “the latest research”: “We have [just] found another important fact relating to the truth of the Book of Mormon. . . . The city of Zarahemla . . . stood upon this land,” that is, Central America or Guatemala, which “once embraced several hundred miles of territory from north to south.”<sup>22</sup> Since Zarahemla was located in the land southward, their new insight put the land southward to the *north* of Panama. The new thinking inferred that South America was of little or no significance for Book of Mormon geography.<sup>23</sup> The further inference is that the new thinking was that an area much

Mormon times. By the beginning of the 20th century, likely not more than a handful of readers of Mormon’s book questioned the interpretation that Lehi landed in Chile, that Panama was the narrow neck, and that the final battle of the Nephites took place in New York.<sup>25</sup>

Anecdotal evidence (there are no systematic data) suggests that even now, after church members have been reading the Book of Mormon for a century and three-quarters, a large number of readers continue to assume the whole-hemisphere view of Book of Mormon geography. Moreover, some unbelievers insist in their anti-Book of Mormon propaganda that this view was and is completely orthodox (which makes their criticisms more damaging).<sup>26</sup> But the proportion of Saints who still accept that antiquated geography is irrelevant in light of the decisive information in the Book of Mormon. The text itself gives an unmistakable picture of a very restricted territory. And as President Joseph Fielding Smith said, “My words, and the teachings of any other member of the Church, high or low, if they do not square with the revelations, we need not accept them.”<sup>27</sup>

## 5. What does the Nephite scripture tell us about the meanings of the terms *Nephite* and *Lamanite*?

At many points Mormon's record states or clearly implies that the terms *Nephite* and *Lamanite* bore multiple meanings during the Book of Mormon period. At least six senses of the term *Nephite* can be identified: The term sometimes referred to (1) those belonging to the relatively small lineage consisting of direct descendants from Lehi's son Nephi<sub>1</sub> (compare Mormon 1:5; 3 Nephi 5:20); (2) a larger "noble" group consisting of the descendants of the kings who succeeded Nephi<sub>1</sub>, each of whom bore *Nephi* as a royal title (see Jacob 1:11);<sup>28</sup> (3) those descended from, as well as all those who were ruled by, any of the monarchs bearing the title *Nephi*; (4) believers in a particular set of religious practices and ideas (compare Jacob 4: 4–6; 4 Nephi 1:36–38); (5) participants in a particular cultural tradition (see 2 Nephi 5: 6, 9–18); and (6) an ethnic or "racial" group (see Jacob 3:5, 8–9). Most of the same principles of naming applied to the Lamanites. One could be called by that term on several bases, such as direct descent (e.g., Alma 55:4, 8), political choice (e.g., Alma 54:24; Moroni 9:24), or a combination of political, religious, and other factors (e.g., 3 Nephi 2:12, 14–16; D&C 10:48). Note that people could choose to change their affiliation by adoption or formal transfer of allegiance (see, e.g., Mosiah 25:13; Alma 43:4; Alma 45:13–14).<sup>29</sup>

The broadest societal category in the Book of Mormon is *Lamanite*, treated in the prophecies as including the "remnant" seed of Laman, Lemuel, and Ishmael, to whom particular promises had been made. Yet those same promises were extended also to others besides direct descendants. The words of Lehi's promise in 2 Nephi 1:5 refer not only to his elder sons' literal biological descendants but also to "all those who should be led out of other countries by the hand of the Lord." No one, Lehi added in pronouncing his blessings, would come into his promised land unless they were "brought by the hand of the Lord" (v. 6), so "this land [would be] consecrated unto him [everybody] whom he shall bring" (v. 7). This last expression refers not only to the eventual Gentile (European) settlers of the 16th through 21st centuries but also to those ancient peoples whom the Lord brought as well (see vv. 10–11).<sup>30</sup> By the time Lehi pronounced his blessings, the vessel that brought Mulek from Jerusalem either had already landed or at least was en route to the promised land

(see Omni 1:15–16), and some of that party's descendants, called "the people of Zarahemla," eventually became Nephites (Omni 1:19; Mosiah 25:13). Jaredite survivors also must have been around,<sup>31</sup> and they too could have been blessed under the heading of "Lamanites" according to the prophetic ethnology.

Lehi saw from the beginning that *Nephites* and *Lamanites* were labels that would include a variety of groups that could have differing biological origins, cultures, and ethnic heritages. According to the title page of the Book of Mormon, the generic term *Lamanite* was applied by Moroni to all the amalgamated groups whose descendants would survive right down to Restoration times as "the [American] remnant of the house of Israel." There is no indication anywhere in the Book of Mormon that "the Lamanites" were to be a genetically exclusive line descending only from the two oldest sons in Lehi's family.

## 6. Have leaders of the Church of Jesus Christ of Latter-day Saints provided definitive answers to questions about the origin, composition, and geography of the Nephites and Lamanites and about the possibility that other peoples were present in the land?

Latter-day Saint ecclesiastical authorities have never claimed that revelation has settled where the lands of the Book of Mormon were located. Even the comments in the *Times and Seasons* in 1842 were put forward as tentative. Those challenging ideas ended with the convoluted caution, "We are not agoing [*sic*] to declare positively that the ruins of Quirigua [in Guatemala] are those of Zarahemla, but when the land and the stones, and the books tell the story so plain, we are of [the] opinion, that it would require more proof than the Jews could bring to prove the disciples stole the body of Jesus from the tomb, to prove that the ruins of the city in question, are *not* one of those referred to in the Book of Mormon. . . . It will not be a bad plan to compare Mr. Stephens' ruined cities with those of the Book of Mormon."<sup>32</sup>

Later statements have made clear that no definitive answer to issues of geography in the Book of Mormon has been pronounced or implied. George Q. Cannon, longtime counselor in the First Presidency, once stated: "The First Presidency have often been asked to prepare some suggestive map illustrative of Nephite geography, but have never consented to do so. . . . The reason is, that without further information

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they are not prepared even to suggest [a map].”<sup>33</sup> Church president Joseph F. Smith affirmed President Cannon’s reticence. Regarding a proposed map of Book of Mormon sites, he “declined to officially approve of the map, saying that the Lord had not yet revealed it.”<sup>34</sup> John A. Widtsoe, not only an apostle but a Harvard-educated former president of two uni-

Have church leaders made clear whether or not people other than those directly noticed in the Book of Mormon were included among the “native” population of the Americas? Some have assumed that only people from the three immigrant parties mentioned in the book (Jaredites, Lehiters, and Mulekites) were ancestors of today’s Native Americans.<sup>38</sup> (The

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**—Hugh Nibley**

versities, observed in 1950, “As far as can be learned, the Prophet Joseph Smith, translator of the book, did not say where, on the American continent, Book of Mormon activities occurred. Perhaps he did not know.”<sup>35</sup>

In regard to the origins and ethnic composition of the ancient inhabitants of America in relation to the Book of Mormon, opinions among the leaders have varied. Again no definitive or “orthodox” viewpoint has claimed to provide “the” answer.

Joseph Smith himself laid the foundation for the variances in interpretation. While he served as the responsible editor of the *Times and Seasons* in Nauvoo, the paper printed another excerpt from Stephens’s book that quoted “a goodly traditional account” from Guatemala. Descendants of the former native rulers there (“Toltec kings of the Quiche and Cakchiquel Indians”) claimed that they had “descended from the house of Israel,” their line having split off from Moses’ party of Israelites after the escape from Egypt. When those Toltec ancestors made their way to Mexico, they “found it already inhabited by people of different nations.”<sup>36</sup> Hugh Nibley observed, “Whether such a migration ever took place or not, it is significant that the Prophet was not reluctant to recognize the possibility of other migrations than those mentioned in the Book of Mormon.” He continued, “There is not a word in the Book of Mormon to prevent the coming to this hemisphere of any number of people from any part of the world at any time, provided only that they come with the direction of the Lord; and even this requirement must not be too strictly interpreted.”<sup>37</sup>

introduction to the 1981 edition of the Book of Mormon calls these groups “the principal ancestors of the American Indians.” However, that phrasing (1) is not found in scripture, (2) was never used by Joseph Smith, and (3) did not appear in any previous edition of the Book of Mormon.) Other church leaders have specifically felt that different peoples also settled in the New World.

Apostle Orson Pratt, one of the most vocal 19th-century interpreters of the Book of Mormon, believed that since Book of Mormon times “there [have been] *many nations* who have come here [before Columbus]. And *lastly* Europeans have come from what is termed the old world across the Atlantic.”<sup>39</sup> In 1909 Elder B. H. Roberts observed, “It is possible that Phoenician vessels might have visited some parts of” America, as well as, perhaps, other settlers “by way of the Pacific Islands” or via the “Behring straits.”<sup>40</sup> In the 5 April 1929 general conference of the church, Anthony W. Ivins, first counselor in the First Presidency, urged: “We must be careful in the conclusions that we reach. The Book of Mormon teaches the history of three distinct peoples . . . who came from the old world to this continent. It does not tell us that there was no one here before them. It does not tell us that people did not come after. . . . We do believe that other people came to this continent.”<sup>41</sup> Elder Widtsoe added in 1937, “There may also have been others [in ancient America] not recorded in the Book or not known to the ancient authors.”<sup>42</sup> Elder Richard L. Evans characterized the Book of Mormon as “part of a record . . . of prophets and peoples who (with supplementary groups) were *among* the ancestors of



the American Indians.”<sup>43</sup> In short, some of the leading brethren have long believed that peoples not mentioned in the Book of Mormon lived or might have lived in ancient America, and they have assumed that the idea need not trouble believers in the Book of Mormon. Obviously there is no accepted or orthodox church position that only Book of Mormon peoples were present in the land. That being so, there is no reason why DNA analysts need to be constrained by the idea that all American Indians are Lamanites in a strict genetic sense.

**7. Is it unrealistic to think ancient people could have sailed across the ocean to or from America?**

This classic question used to be answered by scholars with the a priori response, “Of course it is unrealistic!” Nearly all who gave that answer were landlubbers. Their response has reflected their own psychology rather than real-world experience. One scholar has referred to this attitude as “intellectual

*mal de mer* when archaeologists look seaward.”<sup>44</sup> Others have called this isolationist opinion “thalasophobia,” or fear of the sea.<sup>45</sup> Old hands at small-boat sailing have never voiced such qualms. Experience has shown that while some voyagers may indeed be lost at sea, there is still a reasonable chance for a successful passage along certain routes. For instance, Hannes Lindemann, who made three solo voyages from West Africa to the West Indies, said that he and fellow sailors scoff at nonsailors’ view of the “dangers” at sea. He felt that it takes “a damn fool to sink a boat on the high seas.”<sup>46</sup> Charles A. Borden recounts stories of all sorts of unlikely craft that have crossed the ocean. He concluded that “seaworthiness has little to do with size; little ships are often safest.”<sup>47</sup>

Two phenomena have changed attitudes in this regard over the past 50 years. First, many hundreds of persons have crossed the oceans in or on all sorts of craft—log rafts, rubber boats, replicas of Polynesian canoes, rowboats, and, more recently, personal watercraft and sailboards, not to mention numerous kinds of small boats. A second reason for the change in atmosphere, especially among scholars, has been recent recognition that ancient (or, as critics were wont to say, “primitive”) sailors ages ago were already making remarkable voyages. We now know that the first settlers of Australia crossed open sea from the north as early as 60,000 years ago,<sup>48</sup> while others reached islands east and north of New Guinea nearly 30,000 years ago.<sup>49</sup> These observations have tended to pull the teeth out of old objections about ancient nautical technology being too crude to allow sailing out of sight of land.<sup>50</sup>

Nowadays it is acceptable for an established archaeologist like E. James Dixon to assume that navigators would have been able to come from Asia to America around the North Pacific by “perhaps 13,000 years ago.”<sup>51</sup> These changing opinions do not imply that the Jaredite or Lehite voyages would have been easy, but at least those trips as described in the Book of Mormon now look quite feasible.

**8. Does the Nephite record allow or indicate the presence of other peoples in America who are not specifically named?**

Several lines of evidence in the Book of Mormon point directly to the presence of other peoples in the land from the very beginning of Nephite colonization. One of the most telling passages in the record of Nephi relates the confrontation of Sherem and



From Brigitte Boehm de Lameiras, coord., *El Michoacán antiguo*, 1994

Genealogies like this one from Mesoamerica are social constructions with meanings and relationships quite different from what a chart of DNA connections would show. A “Nephite” genealogy could be as complex in a nonbiological way as this one.



In the Book of Mormon's figurative language of the olive tree, we are taught that a "branch" from the original ethnic tree representing Israel in Palestine would be carried to the American promised land, where it would be "grafted" onto an indigenous root or people.  
(Photo by Carrilyn Clarkson)

Jacob. By the time Sherem showed up in the first Nephite settlement, the maximum population that could have resulted from the most rapid conceivable natural descent from Nephi<sub>1</sub> and his fellow settlers would not have exceeded a few dozen adults. Yet Sherem had never met Jacob, the chief Nephite priest (see Jacob 7:1–26), and he had come from some other settlement. Questions about population actually arise still earlier in the story. We find Nephi setting out to build a temple when his adult male relatives in the little colony in the land of Nephi apparently would have numbered only three: Nephi, Sam, and Zoram (plus Jacob and Joseph if they were old enough). So few men could not have put up much of a temple. Furthermore, what kind of wars could the group have fought against the Lamanites with the minuscule "army" that the handful of immigrants could have mustered at the end of 25 years in the land? (see 2 Nephi 5:34). Without increases in the early population of the two factions that can only be explained by the accretion of people from a resident population, reference to "wars" could not be a significant reality. We who are confident of the historicity of the Book of Mormon are assured from these incidents and other textual references that substantial numbers of local "native" residents had joined the immigrant parties. If we had the plates of Nephi that reported the more historical part of their story, perhaps we would find on them explicit information about such contacts with resident populations.

Other statements in the Book of Mormon also indicate that the writers were familiar with, rather than surprised by, the idea of non-Israelites living among the Nephites. The only example we will cite



is when Alma visited the city of Ammonihah and Amulek introduced himself with the words, “I am a Nephite” (Alma 8:20). Since the city was nominally under Nephite rule (see Alma 8:11–12, 24) and was a part of the land of Zarahemla at the time, Amulek’s statement seems nonsensical, unless many, perhaps most, of the people in the land of Ammonihah did not consider themselves to be Nephites, by whatever criteria.<sup>52</sup>

The familiarity of Lehi’s people with the words of Old Testament prophets should have led them to expect to be placed in their new land in the midst of other people. The prophets in old Israel had often announced that the tribes of Israel would be “scattered among all people” (Deuteronomy 28:64), would be “removed into all the kingdoms of the earth” (Jeremiah 29:18), and would become “wanderers among the nations” (Hosea 9:17). Further, “the Lord shall scatter you among the nations, and ye shall be left few in number among the heathen, whither the Lord shall lead you” (Deuteronomy 4:27). These prophecies made plain that the whole house of Israel was subject to being scattered among non-Israelite peoples who would be more numerous than they. The people of Lehi were explicitly told that they would suffer this scattering:

Yea, even my father spake much concerning the Gentiles, and also concerning the house of Israel, that they should be compared like unto an olive tree, whose branches should be broken off and should be scattered upon all the face of the earth. Wherefore, he said it must needs be that we should be led with one accord into the land of promise, unto the fulfilling of the word of the Lord, that we should be scattered. (1 Nephi 10:12–13)

The allegory of the olive tree spelled their fate out even more plainly. Branches broken off the tame tree, which represented historical Israel (see Jacob 5:3), were to be grafted onto the roots of “wild” olive trees, meaning non-Israelite groups. That is, there was to be a demographic union between two groups, “young and tender branches” from the original tree, Israel, represented as being grafted onto wild rootstock in various parts of the vineyard or earth (see Jacob 5:8–9). Jacob 5:25 and 43 clearly speak of Lehi’s people being represented by such a broken-off branch. That branch was to be planted in “the choicest spot” of the vineyard. In that prime location, the Lord had already cut down “that which cumbered this spot of

ground,” clearly a reference to the elimination of the Jaredites. In addition, the statement that one part of the new hybrid tree brought forth good fruit while the other portion “brought forth wild fruit” is an obvious reference to the Nephites and the Lamanites respectively (v. 45).

So the Lehiite “tree” of the allegory was constituted of a geographically transplanted population from the original Israelite promised land “grafted” onto a wild root—joined with a non-Israelite people. (Note that the Lord considered the new root to be “good” despite its being “wild,” v. 48). This allegorical description requires that a non-Israelite “root”—“other peoples” in terms of this paper—already be present on the scene where the “young and tender branch,” Lehi’s group, would be amalgamated with them.

DNA analysts should expect that the immigrants, Lehi’s party and Mulek’s group too, would immediately begin to incorporate and hybridize with New World “native” populations.

## 9. What do Mesoamerican native traditions suggest about immigrant groups arriving by sea?

Traditions are not, of course, to be believed as completely historical reports, but when the core of a tradition is reported numerous times and in disparate sources, it is likely that there was a factual basis behind it. Mesoamerican traditions that report ancient arrivals by sea are found recorded in early



From Cyrus Gordon, *Riddles in History*, 1974

This kind of Phoenician ship (shown in a model based on ancient descriptions) sailed from the Mediterranean Sea at least as far as the Azores in the Atlantic by 800–900 B.C. A vessel like this one was capable of carrying Mulek’s party to America.

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Spanish sources. Most of them were of pre-Columbian vintage, not simply words put in the mouths of natives by Spanish recorders. And many are supported by traditions from other areas. Their consistency and distribution make it plausible that there were at least two and possibly three or more “families” of such stories of an arrival of ancestors from across the ocean. We have space here only to sample this genre.

Fernando de Alva Ixtlilxóchitl was a descendant of the rulers of the city of Texcoco, nominal co-rulers with the Aztec kings of the powerful alliance that dominated northern Mesoamerica in the decades preceding A.D. 1521. Don Fernando was Spanish educated. His *Obras Históricas*<sup>53</sup> was compiled in the first quarter of the 17th century using extensive records to which his noble ancestry gave him access. At one point he reported, “It is the common and general opinion of all the natives of all this Chichimec land, which now is called New Spain . . . that their ancestors came from western parts . . . as appears in their history; their first king was called Chichimecatl, who was the one who brought them to this New World where they settled . . . and they were those of the division of Babylon.”<sup>54</sup> His mention of “Babylon” may, of course, be his personal interpolation, but it seems apparent that he was interpreting the tradition to refer to a transpacific voyage.<sup>55</sup>

The chief ruler at the great Aztec center, Tenochtitlán, Moctezuma Xocoyotzin (popularly known as Montezuma), greeted Hernán Cortés with these words:

For a long time and by means of writings, we have possessed a knowledge, transmitted from our ancestors, that neither I nor any of us who inhabit this land are of native origin. We are foreigners and came here from very remote parts.

We possess information that our lineage was led to this land by a lord to whom we all owed [allegiance]. He afterward left this for his native country.

. . . But we have ever believed that his descendants would surely come here to subjugate this land and us who are, by rights, their vassals.

Because of what you say concerning the region whence you came, which is where the sun rises . . . we believe and hold as certain that he [the Spanish king] must be our rightful [natural] lord.<sup>56</sup>

Fray Bernardino de Sahagún gathered a huge collection of materials from the best native Mexican informants available to him in the middle of the 16th century. One thing he reported being told was this:

Concerning the origin of this people, the account which the old people give is that they came by sea from toward the north [from the direction of Florida, he adds], and it is certain that they came in some vessels of wood, but it is not known how they were built; but it is conjectured by one report which there is among all these natives, that they came out of seven caves and that these seven caves are the seven ships or galleys in which the first settlers of this land came . . . they came along the coast and disembarked at the Port of Pánuco, which they call Panco [near Tampico, Veracruz], which means, place where those who crossed the water arrived. These people came looking for a terrestrial paradise.<sup>57</sup>

Still today, reported Lorenzo Ochoa in 1979, in certain places near Tampico, traditions exist paralleling Sahagún’s to the effect that ancestors arrived by sea navigating in “turtle shells.”<sup>58</sup>

A native document from 16th-century Guatemala, *Titulos de los Señores de Totonicapán*, said that their ancestors “came from the other part of the ocean, from where the sun rises, a place called *Pa Tulán, Pa Cíván*.”<sup>59</sup> Those whose signatures attested this 16th-century document further noted, “[W]e have written that which by tradition our ancestors told us, who came from the other part of the sea, from Cíván-Tulán, bordering on Babylonia.” At least that was their geographical interpretation of the tradition as of 1554.<sup>60</sup>

Other traditional accounts could be cited, but they are generally parallel to those above.<sup>61</sup> The conventional interpretation of these traditions by scholars has been that they either stem from remembrance of crossings over local waters or are notions picked up by Amerindians from the Christian fathers and the Bible. That might be so in some cases, yet because of the widespread occurrence of the traditions, we consider that two or more tales of the arrival of ancestors from across the ocean were definitely maintained in pre-Columbian times among Mesoamerican peoples. If so, then any attempt to interpret the physical ancestry of a people by DNA analysis will need to be open to reconciling the data from the conventional



interpretations of Amerindian genetics with these traditions that point to transoceanic intruders.

### 10. What languages were spoken in the Western Hemisphere? Is it known that Hebrew was in use in ancient America? What do these facts mean for the Book of Mormon?

The number of Native American languages spoken at the time European conquerors or settlers arrived is not known for sure, but a current best estimate is around 1,000 from Alaska to Argentina.<sup>62</sup> Methods of classifying those into larger groupings are varied and inconsistent, but hemisphere-wide the number of major groupings (whether called “families,” “stocks,” etc.) is on the order of 80. In addition, there were about 80 “isolates,” that is, single tongues that have not been convincingly connected to any other language or grouping.<sup>63</sup> Mesoamerican languages fit into perhaps 14 families, with upwards of 200 separate tongues having once existed in the area. (A family is a group of tongues believed to have descended from a common ancestral language.) Indications are strong that there was considerable linguistic differentiation in Mesoamerica as early as 1500 B.C.<sup>64</sup> Latter-day Saint students of the Book of Mormon should understand that long prior to Lehi’s day, Mesoamerica was already linguistically complex.<sup>65</sup> Moreover, many archaeological sites were occupied continuously, or so it appears, for thousands of years without clear evidence in the material remains of any replacement of the culture of the inhabitants. That continuity suggests, although it does not prove, that many of those people probably did not change their tongues.



This scene from La Venta Stela 3 (southern Veracruz state, ca. 600 B.C.) shows, on the right, a man with a large, beaked nose and a sizable beard. Such figures have been termed “Semitic” and “Uncle Sam” by some art historians. (From Philip Drucker, Robert F. Heizer, and Robert J. Squier, *Excavations of La Venta, Tabasco*, 1959)

All this means that the old supposition by some Latter-day Saints that the Hebrew tongue used by Lehi’s and Mulek’s immigrant parties became foundational for all ancient American languages is impossible.

When we examine the social and cultural implications of what the Book of Mormon record tells us, we discover that it cannot possibly be a “history of the American Indians.” Mormon’s book was never meant to serve as a history of an entire territory but is what has been termed a “lineage history.”<sup>66</sup>

It relates certain events and interpretations of those events that relate to a fairly small number of people, chiefly the descendants of Nephi. These serve the same purpose as most of the historical books of the Bible, like Genesis and Exodus. Those records focus

on stories about Abraham and those of his descendants who became the founders of the house of Israel. For example, the Old Testament source only briefly mentions Ishmael and his clan, let alone more distant ethnic entities like the Canaanites, and then only as far as the events involving those outsiders impinged on the key descent line. In short, a lineage history is a partial record of historical events, emphasizing what happened to one group of people, phrased in the recorders’ ethnocentric terms. The lineage histories of other groups on the scene, if they were kept, would report different versions of what was going on. Knowing that the Nephite record is of this limited sort, we can appreciate why, for example, their

story gives a total of only 100 words or so to the “people of Zarahemla,” although that group was much more numerous than ethnic Nephites (see Mosiah 25:1). Such narrowly told accounts were a very common form of “history” in many parts of the ancient world, including, as we could expect, among native peoples of Mesoamerica.

The upshot is that we need to think of the Nephite record keepers as a minority—an elite minority at that—who, like most ruling minorities, tended to have their speech and customs eventually smothered by the speech and lifeways of the majority population (think of the Norman conquerors of England, whose French language did not last long on the island). So it makes sense when Moroni reports, after nearly 1,000 years of his people’s history, that by then “no other people knoweth our language” (Moroni 9:34).

Still, we may find remnants of Hebrew in Mesoamerican languages when we look carefully, just as English vocabulary reveals traces of Norman French. Little looking has yet been done by qualified scholars, yet the slim efforts have turned up interesting results. The prominent Mexican linguist Maurice Swadesh had student P. Agrinier search Zapotec and related languages in south-central Mexico for Hebrew words. They identified a significant number of Hebrew parallels, which Robert F. Smith later more than doubled.<sup>67</sup> Swadesh said of that project, “I was surprised at the number and closeness of the parallels” between the languages compared.<sup>68</sup> More pointedly, linguist Brian Stubbs has identified more than one thousand Hebrew and/or Arabic forms in tongues of the Uto-Aztecan family, which stretches from Central Mexico to Utah.<sup>69</sup> Mary LeCron Foster, a mature linguist long at the University of California, independently concluded that “Uto-Aztecan proves to derive either from Proto-Indo-European . . . or even from pre-IE ancestors,” while “Quechua [the language of the Incas of Peru] shows “extensive borrowing from a Semitic language, seemingly Arabic.”<sup>70</sup> Much more work must be done to convince the majority of linguists of the reality of Semitic language remnants appearing in Mesoamerican (and perhaps



other native American) languages, but the evidence so far is promising and new studies are under way.

Now, if Semitic languages penetrated Mesoamerican societies, might we not expect evidence that so did Hebrew or Arab genes?<sup>71</sup> After more than a cursory effort is devoted to studying the question, we may see more concrete confirmation. We note, as a methodological parallel, that the implications of another example of an Asian language intrusion into America has been equally ignored

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Dating to about the first century B.C., this scene from southern Veracruz state shows a bearded and ethnically distinct lord perhaps giving an oath to a pleading prisoner. (From Ignacio Bernal, *The Olmec World*, 1969)

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by most linguistic professionals, not to mention geneticists. Otto J. Von Sadvovsky has demonstrated from remarkably extensive evidence that a series of Amerindian languages in north-central California are directly related to the Ugrian family of tongues of western Siberia (of which Finnish is a relative).<sup>72</sup> He has compiled more than 10,000 word relationships between the two areas (probably as of around 500 B.C.) as well as a large number of parallel customs and beliefs. It is obvious that DNA testing of the tribes concerned ought to demonstrate genetic links, but nobody has yet bothered to carry out the study. Soon the Mesoamerican linguistic links may be compelling enough to demand DNA testing of the implied relationship.

### **11. Has research in hard science supported the claim that a variety of Old World peoples came to live in the Americas?**

Most researchers in the life sciences, like their colleagues in archaeology and geography, typically claim that the two hemispheres, commonly called the Old World and the New World, effectively had distinct histories. One of the key arguments against the proposition that people anciently settled the Americas from Eurasia, Oceania, or Africa has been the assertion by biologists throughout the 20th century that no cultivated plants (of any consequence, at least) were shared on both sides of the Atlantic or Pacific Oceans before Columbus’s day.<sup>73</sup>

This conservative view has been progressively weakening for years, although defended by presti-



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gious natural scientists. However, in 2002 a paper was presented (and now is in press) that tackled the issue on an unprecedented scale. New evidence was used to demonstrate beyond question that extensive cross-ocean voyaging has been taking place for at least the last 8,000 years.<sup>74</sup> The study documents that more than 80 species of plants had crossed all or part of the ocean to or from the Americas before A.D. 1500.<sup>75</sup> The list includes amaranth grains, the cashew nut, pineapple, the peanut, hashish, tobacco, coca, two species of chili pepper, the kapok tree, various squashes and pumpkin, at least six species of cotton, bananas, the prickly pear, the guava, several grasses and (human-dependent) weeds, corn, and two kinds of marigolds. For another 29 species, significant evidence invites more research on their transoceanic status, and for 34 more there is enough evidence to recommend further study.

Decisive evidence consists, for example, of clear representations of a plant in ancient art. Carl L. Johannessen (and other investigators) had earlier found and photographed hundreds of images of maize ears (maize is, of course, an American native plant) held in the hands of sacred beings in scenes carved on the walls of temples of medieval age in southern India. More art now shows corn that dates to B.C. times, while archaeological excavation (another form of decisive documentation) on the island of Timor in Indonesia places the crop there before 2500 B.C.<sup>76</sup> In other Indian art we see sunflowers, the annona fruit, cashew nuts, and other plants of American origin. In fact, at least two dozen American species were in India before Columbus, which means that a great deal of two-way sailing must have taken place.

### The idea of some influential connections between cultures in Asia and in America is increasingly being accepted by some scholars who once were adamantly opposed to the idea.

Finding a name of a plant in ancient historical and literary texts also confirms the early presence of that plant. For India a unique linguistic situation contributes to the significance of some plant references. The classical religious texts of India were written in the Sanskrit language. Sanskrit was in use as an active language until no later than about A.D. 1000. After that date, the language served like Latin

in Europe, as a sacred “dead” tongue that was no longer adding new words and that one learned only to study the ancient sacred texts. So when a Sanskrit dictionary of known texts uses a name such as *sandhya-rāga* (for the American native flower plant that we today call the “four o’clock”), this can only mean that the word and the plant were present in India many centuries before the time in the 1500s when the first European sailors could have brought either the plant or a name from America. Also, since a name for another New World plant, the sweet potato, was written in Chinese characters in a classic historical document, this guarantees that the plant was being grown in Asia many centuries ago.

The evidence on plant sharing across the ocean has been buttressed by data regarding fauna. The opinion has prevailed generally among the experts that America anciently was a virtual diseaseless paradise. Nevertheless, John L. Sorenson and Carl L. Johannessen have shown that a surprising number of disease organisms were present in the New World, as much as they were in the Old World. The key point, however, is that since organisms do not arise independently in different parts of the earth, it is necessary to determine how the two hemispheres could have shared so many “bugs.” The causes of 14 ailments have been conclusively found in both hemispheres—two species of hookworms, the roundworm, the tuberculosis bacteria, lice, ringworm, a leukemia virus, and others. Furthermore, several larger faunal species also crossed the ocean. For instance, the turkey, that thoroughly American fowl, appears in art in Europe by the 13th century A.D., and its bones have turned up in Hungarian and Swiss ruins of that time.

In regard to all the species mentioned above, only voyages by humans provide a suitable explanation. Those trips—and floral and faunal data—point to the transoceanic passage of perhaps hundreds of boats between 6000 B.C. and A.D. 1500. Voyages were certainly not routine, but neither were they unknown.

These data strongly imply that humans from numerous Old World areas reached the New World.

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Until DNA analysis finds evidence of the Old World visitors and migrants who arrived in those boats, molecular biologists ought to consider their picture incomplete.

## 12. Does evidence from archaeology and cultural studies support the idea that there were intrusions by Old World groups?

This is a vast topic, impossible even to summarize here. Only a few illustrative references to relevant material can be examined in the space available here.

One kind of information concerns cultural complexes and the populations that brought them that certainly arrived from across the ocean. Some archaeologists finesse the issue by insisting that only “concrete archaeological evidence” for a cultural intrusion will satisfy them.<sup>77</sup> This spurious response is well illustrated by the case of the Ugrian-language enclave in central California mentioned above; the supporting linguistic material is vast and highly “concrete,” though in a nonmaterial sense. No archaeologist has yet assessed this evident connection between California and western Siberia on the basis of material remains. Contradictorily, in the case of the settling of the island of Madagascar off the east coast of Africa, the dominant language is so obviously Austronesian (related to Malayo-Polynesian) that no scholar questions that the people came from Indonesia, despite the fact that no artifact from there has ever been found on Madagascar.<sup>78</sup>

Another example within the Americas illustrates the same point. Julian Granberry established that the Timucuan language of Florida, and the people speaking it, originated in the Amazon area. He infers that they reached Florida by boat from western Venezuela at approximately 2000–1500 B.C. without any stopovers en route, a trip on the order of 1,000 miles long.<sup>79</sup> These relationships are evidenced beyond question by linguistics but not by any archaeological or ethnological facts, let alone by DNA evidence.

A similar example from Ecuador is provided by the Bahia culture, dated around the beginning of the Christian era. Excavation provided the first evidence for patently East Asiatic features that characterize this complex (ceramic model houses, neck rests in lieu of pillows, rectanguloid pottery net weights, golf-tee-shaped earlobe decorations, symmetrically graduated panpipes, seated figurines that look very

much like Buddha, and use of the coolie yoke for carrying burdens),<sup>80</sup> but those Asiatic links are now little mentioned. There is no question that Asians could have reached South America, since studies have shown that balsa rafts manufactured in Ecuador are essentially identical to log rafts of China and Vietnam (despite the label *rafts*, these conveyances were virtual ships).<sup>81</sup> They were used in the seas off China from at least the fifth century B.C.<sup>82</sup> Bahia pottery has been found in the Galápagos Islands, 700 miles off the coast of Ecuador.<sup>83</sup> Despite these facts, many archaeologists ignore the Bahia intrusion, or at least its significance as a mechanism for the arrival of Asians.

Moreover, it is entirely possible that some transoceanic migrant groups adapted successfully to their new American homes for a while but in the long run failed to survive. James Dixon notes the case of the Norse settlers in Greenland and their North American Vinland, “a clearly documented case of a major and long-lived transoceanic colonization of the Americas that ultimately failed.” According to Dixon, events since the Norse went extinct have obscured the scientific record so that not only is the archaeological evidence for their presence very limited but there are no recognized survivors in North America. He concludes that “the original Norse colonization [there] cannot be demonstrated ever to have happened.”<sup>84</sup> As in the case of the Nephites, only in surviving historical accounts can one “prove” that Norse people lived in America.<sup>85</sup>

The idea of some influential connections between cultures in Asia and in America is increasingly being accepted by some scholars who once were adamantly opposed to the idea. Sir Joseph Needham, one of the 20th century’s greatest scholars, with colleagues Wang Ling and Lu Gwei-Djen, first published extensive data on the contacts question in their masterful series entitled *Science and Civilisation in China*.<sup>86</sup> In 1985 Needham and Lu put out a concise but elegantly argued statement of the case for a voyaging connection.<sup>87</sup> Since then it has been more difficult for thoughtful scientists to ignore the issue. Even conservative scholars have begun to accept a limited version of the view that accepts transoceanic voyaging. For instance, Michael D. Coe, once an adamant opponent of voyaging from Asia, was quoted in 1996 as being impressed with the many resemblances between “mental systems known from Bali in Indonesia and Mesoamerica.” He now thinks that some of the parallels were “almost identical on





Portraits by ancient American sculptors display sharp ethnic differences in Mesoamerican peoples that DNA analysis so far has failed to identify. (From Alejandro von Wuthenau, *Altamerikanische Tonplastik*, 1965)

both sides of the Pacific.” Coe acknowledges, however, that his thinking on the point is not orthodox: “Most anthropologists are so fuddy-duddy. They’re not willing to let their minds roam ahead, speculate.”<sup>88</sup> If the “fuddy-duddy” no-voyaging paradigm does break down, it will mean even more questions to be faced by DNA analysis because exotic populations can be expected to be involved in the hitherto monolithic study of “Amerindian” genetics.

A remarkable confirmation that such a shipborne link once existed that tied the central Old World civilizations to ancient America across the Atlantic (as the story of Mulek implies) comes from a Greek merchant ship that sank at Kyrenia, Cyprus, in the fourth century B.C. When examined by underwater archaeologists, it was found to have utilized leaves of the agave plant as caulking.<sup>89</sup> That plant is considered by biologists to be exclusively Mexican, so there are no explanations for its presence and use in the Kyrenia vessel except that the ship had itself reached the New World, where it was recaulked before returning to the Mediterranean, or else that living agave plants had been transported to some Old World area where the harvested leaves could be used in routine caulking of ships there.

On the basis of research summarized above, there is no longer any real question that cultural, and presumably human biological, connections existed between Eurasia and Mesoamerica many centuries ago. What remains to be done to round out the picture is to carry out specific research aimed at determining the

details of those connections. Future DNA study is going to have to consider these facts in generating and testing hypotheses. If molecular biology fails to find a place in its models to handle the historical contacts attested by such cultural data, that failure will cast doubt on the adequacy of the biological studies.

### **13. Have races or ethnically distinct populations that exhibit non-Amerindian characteristics been revealed in ancient Mesoamerican art?**

For us the answer to this question is unequivocally “Yes!” Of course, there is no demonstrated direct connection between most features of human beings’ external appearance and specific DNA; nevertheless, if we see striking differences in appearance (phenotype) of a population, we can plausibly expect differences in genetic makeup (genotype).

The concept that all American Indians formed a monolithic “race” whose ancestors came from northern Asia was made a part of early 20th-century physical anthropology by one of the field’s first leaders, Ales Hrdlicka. He claimed that if “some members of the Asiatic groups and the average [*sic*] American Indians were to be transplanted and body and hair dressed like those of the other tribe, they could not possibly be distinguished physically by an observer.”<sup>90</sup> That extreme view is no longer held, yet intellectual inertia seems to prevent many anthropologists from acknowledging that substantial variation exists among so-called Native Americans.

Nowhere is this variability shown more clearly than in the modeled clay figurines and other repre-

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sentations of humans in art. They show up in considerable numbers in Mesoamerica and in lesser numbers among human effigies in Peru. Heads and skin shades that would be at home on all of the different continents are seen. Samples of these heads are reproduced with this article. Others are shown in various books.<sup>91</sup> Specific ethnicities are obvious in some of the representations: African blacks, Southeast Asians, Chinese, perhaps Koreans, possibly Japanese, and Mediterranean people are commonly encountered. Of special interest is a whole class of “Semitic” or “Jewish” or “Uncle Sam” faces, so called by some archaeologists or art historians because of the large aquiline noses and beards. This type of face also occurs not only in clay but also on stone sculptures.<sup>92</sup> At the very least, the presence of out-of-place images challenge Hrdlicka’s old oversimplification. Some scholars have claimed that these “racially” distinctive heads are “stylized” versions of “normal” or majority Mesoamerican figurines, but anyone can see that most of the representations are not stylized in the least but are individualized portraits.<sup>93</sup> If even a part of the anomalous figures are authentically ancient and accurate portrayals of living people, we have to infer that DNA research has some major discoveries yet to make to account for them.

Another physiological anomaly confirms what we have just discussed. Students of ancient voyaging have commented on the presence of beards on male figures in Mesoamerican art. A preliminary study of the topic done a few years ago by Kirk Magleby yielded provocative results.<sup>94</sup> Inasmuch as nearly all Amerindians seem predisposed to producing only meager beards, it is reasonable to take that condition as the genetic norm. So when fulsome whiskers and mustaches are found on ancient figures, a genetic explanation is called for. In Magleby’s research on hundreds of bearded representations, the frequency of beards proved highest in objects of Pre-Classic age (before A.D. 300), when the proportion of abundant beards was also highest. Beardedness was also found to decrease as one moved outward from central Mesoamerica. Some critics claim that there is no reason to think that such bearded people represented descendants of Old World immigrants. Nevertheless, the world center of the growth of heavy beards is the Near East. Furthermore, critics also point out that some of the beards seen in Mesoamerican art appear to be artificial. We agree that is possible (for example, artificial beards were donned by Egyptian pharaohs

in an investiture rite). But then we wonder where the preference for a full beard would have come from. Obviously, the notion came from persons with beards. Or why would sparsely bearded native Amerindians have adopted artificial beards to be worn by their societies’ leaders? Overall, the scenario that makes most sense is that Old World immigrants to Mesoamerica from the Eurasiatic homeland where heavy beards appear in art set a standard of elite appearance that was watered down as the responsible genes were submerged in a pool of Mongoloid DNA. At the least, beardedness seems to be a topic that deserves consideration in DNA studies of Amerindians.

#### **14. What are some limits of DNA research in clarifying historical and genealogical relationships among the “native” inhabitants of the Americas?**

It is in the nature of all scientific research that one cannot predict the course of its development nor the value of its results. Still there is reason to think that some scientists and also consumers of information from DNA studies have unrealistic interpretations of what such studies have accomplished and what they may yet do. A recent article by Peter N. Jones rings a loud alarm bell for everyone concerned with American Indian DNA studies by pointing out some of the flaws in methods and logic imposed on the field to date.<sup>95</sup>

The basis of this type of research so far has been specimens taken from very small samples of a total population.<sup>96</sup> Typically the published DNA characteristics for many American Indian tribes have been calculated on specimens taken from only a few dozen, or at most a couple of hundred, individuals. (Jones points out that most DNA investigators do not even know for sure whether the specimens of blood used in their research actually came from Indians or not.)<sup>97</sup> And quite aside from the quality of the specimens, the analytical models used are only a tiny sample of the methods that ultimately would be significant. We have, as it were, a net of very coarse weave that lets most of the fish escape. Recent cautionary writings teach us the highly tentative nature of the results so far from DNA research on the history of American Indians.

One set of concerns stems from the fact that, as a person’s genealogical lines go back in time, the number of his or her ancestors obviously multiplies. Within a few centuries all of us have thousands of forebears. Ultimately or theoretically our foreparents



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could number in the millions. Yet there is a paradox here. Beyond a certain point in time the theoretical number of one's ancestors exceeds the number of persons who were actually alive then! The truth is that our genealogical lines eventually converge on a restricted set of people. Joseph Chang, a statistician at Yale, in a 1999 article<sup>98</sup> showed that there is a high probability that *every* European alive today shares at least one common ancestor who lived only about 600 years ago. Science writer Steve Olson, who has explained this principle in greater detail in his superlative new book, *Mapping Human History*, observes:

The forces of genetic mixing are so powerful that everyone in the world has [for example] 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.<sup>100</sup>

In parallel, if one assumes that Lehi was a real figure, Chang's or Olson's model would argue that all Amerindians today are likely to be his descendants. But would present-day DNA research indicate anything of the kind? Actually, it would be virtually impossible via today's DNA procedures to document such slender genealogical links as Chang and Olson are talking about.

Other scientists have noted that

mtDNA represents a small, though essential, piece of our whole genome. . . . However, our genetic ancestry is much broader, because we know that a large fraction of any population many generations ago is included in our genealogical tree. . . . Mitochondrial genes contain informa-

tion largely about energy production. But most of the information that characterizes us as human beings resides in our so-called nuclear genes, which constitute more than 99.99 per cent of the human genome. . . . If we could follow all the branches through which we have inherited our genes, we would probably find that all those people included in our genealogical tree have contributed—maybe in an extremely diluted way—to our genetic inheritance.<sup>99</sup>

While contemporary studies of human DNA and human populations primarily utilize mitochondrial DNA and Y chromosome DNA, the genetic information from these tests represents less than .01 percent of the genetic information passed down from our numerous ancestors. It is possible that, in the future, scientific methods may conceivably expand in order to tap into some of that 99.99 percent of the genetic information denied to us by today's limited tools, but such studies may never be able to reveal the full diversity of our ancestry.

The next time you hear someone boasting of being descended from royalty, take heart: There is a very good probability that you have noble ancestors too. The rapid mixing of genealogical branches, within only a few tens of generations, almost guarantees it. The real doubt is how much "royal blood" your friend (or you) still carry in your genes. Genealogy does not mean genes. And how similar we are genetically remains an issue of current research.<sup>100</sup>

Neither can DNA scientists reliably tell whether Native Americans have links to Israelites. We may never know. ❏



## ENDNOTES

### Before DNA

John L. Sorenson and Matthew Roper

- Dallin H. Oaks, "The Historicity of the Book of Mormon," in *Historicity and the Latter-day Saint Scriptures*, ed. Paul Y. Hoskisson (Provo, Utah: BYU Religious Studies Center, 2001), 238–39; emphases added.
- Many are listed and summarized in John L. Sorenson, "Summary of Models," pt. 2 of *The Geography of Book of Mormon Events: A Source Book* (Provo, Utah: FARMS, 1992), 38–206.
- For details see John L. Sorenson, *Mormon's Map* (Provo, Utah: FARMS, 2000).
- To all appearances, it was the Atlantic that Mulek's party crossed on their way from Palestine to the New World. The east coastal "city of Mulek" was very probably the first settlement spot of Mulek's party (see Alma 8:7) in the promised land, as first mentioned in Alma 51:26 (compare Alma 22:31).
- Lehi's party left from southern Arabia. In most cases, pre-Portuguese voyages from that spot into the Indian Ocean went east and followed the predominant winds to reach the southwestern part of the Indian peninsula. Since they landed in the New World on the coast of the "west sea," we can only conclude that Nephi's ship had proceeded via the Malacca Straits (Singapore) into and then across the Pacific Ocean, so that their "west sea" in the promised land would have been on the Pacific side of America.
- See John L. Sorenson, "The Book of Mormon as a Mesoamerican Record," in *Book of Mormon Authorship Revisited: The Evidence for Ancient Origins*, ed. Noel B. Reynolds (Provo, Utah: FARMS, 1997), 391–521.
- For more details on the map reflected in the Book of Mormon text, see, in addition to *Mormon's Map*, John L. Sorenson, *An Ancient American Setting for the Book of Mormon* (Salt Lake City: Deseret Book and FARMS, 1985), especially chap. 1. Also see John Clark, "A Key for Evaluating Nephite Geographies," *Review of Books on the Book of Mormon* 1 (1989): 20–70.
- J. Charles Kelley, "Mesoamerica and the Southwestern United States," in *Archaeological Frontiers and External Connections*, vol. 4 of *Handbook of Middle American Indians*, ed. G. F. Ekholm and G. R. Willey (Austin: Univ. of Texas Press, 1966), 109; compare Charles C. Di Peso, *Casas Grandes: A Fallen Trading Center of the Gran Chichimeca*, vol. 1, ed. Gloria J. Fenner (Flagstaff, Ariz.: Northland Press, 1974); and several articles in Randall H. McGuire, eds., *Ripples in the Chichimec Sea: New Considerations of Southwestern-Mesoamerican Interactions* (Carbondale: Southern Illinois Univ. Press, 1986).
- Michael B. Stanislawski, "Mesoamerican Influence in North-eastern Arizona," in *International Congress of Americanists, XXXVI Congreso Internacional de Americanistas, España, 1964: Actas y memorias*, ed. Alfredo Jimenez Núñez (Seville, Spain: ECESA, 1966), 1:309.
- Clarence H. Webb ("The Extent and Content of Poverty Point Culture," *American Antiquity: A Quarterly Review of American Archaeology* 33/3 [July 1968]: 297–321) long ago pointed out significant similarities between early Mesoamerica and the unique Poverty Point, Louisiana, site. There is no trace of those shared features at any site in the intervening 1,200-mile stretch. To all appearances, people from the former area traveled directly to the other.
- See Robert N. Zeitzlin (review of *Ripples in the Chichimec Sea: New Considerations of Southwestern-Mesoamerican Interactions*, by F. J. Mathien and R. H. McGuire, eds. [Carbondale: Southern Illinois Univ. Press, 1986], 59–65), who comments on the "parochialism" of American "isolationist" archaeologists who resist any idea that some area other than their own bit of turf was responsible for developments there. On the other hand, he accuses some of considering "the Southwest as little more than an outpost of Mesoamerica." His review of these preferences demonstrates, we believe, that the personal opinions of individual archaeologists, not the quality of the evidence they muster, often determine their viewpoints on this matter.
- See James B. Griffin, "Mesoamerica and the Eastern United States in Prehistoric Times," in *Handbook of Middle American Indians*, 4:119.
- See Jorge G. Marcos, "Breve prehistoria del Ecuador," in *Arqueología de la costa ecuatoriana: Nuevos enfoques*, ed. J. G. Marcos (Guayaquil, Ecuador: ESPOL y Corporación Editora Nacional, 1986), 25–50.
- See Gerardo Reichel-Dolmatoff, "The Loom of Life: A Kogi Principle of Integration," *Journal of Latin American Lore* 4/1 (1978): 5–27. See also Jaime Errázuriz, *Tumaco-La Tolita: Una cultura precolombina desconocida* (Bogotá, Colombia: C. Valencia Editores, 1980); Reichel-Dolmatoff, *Colombia*, vol. 44 of *Ancient Peoples and Places* (New York: Praeger, 1965), 111–15. For substantial discussion of evidence (shaft tombs, the chimaera motif, knowledge of metallurgy, and the motif of a male figurine seated on a bench or stool) for direct movements between the west coast of Mexico and Ecuador/Peru, see articles by Clinton R. Edwards, Clement W. Meighan, and Joseph B. Mountjoy in *Precolumbian Contact within Nuclear America*, Mesoamerican Studies, vol. 4, ed. J. Charles Kelley and Carroll L. Riley (Carbondale: Southern Illinois Univ., University Museum, 1969). See also Presley Norton, "El señorío de Salangone y la liga de mercaderes: El cartel spondylus-balsa," in *Archeología y etnohistoria del sur de Colombia y norte del Ecuador*, comp. José Alcina Franch and Segundo Moreno Yáñez (Cayambe, Ecuador: Ediciones Abya-Yala, 1987); see also Robert C. West, "Aboriginal Sea Navigation between Middle and South America," *American Anthropologist* 63/1 (Feb. 1961): 133–35.
- See Robert Chadwick, "Archaeological Synthesis of Michoacán and Adjacent Regions," in *Archaeology of Northern Mesoamerica*, pt. 2, vol. 11 of *Handbook of Middle American Indians*, ed. R. Wauchope, G. F. Ekholm, and I. Bernal (Austin: Univ. of Texas Press, 1971), 677.
- Marshall Newman, "A Trial Formulation Presenting Evidence from Physical Anthropology for Migrations from Mexico to South America," in *Migrations in New World Culture History*, University of Arizona Social Science Bulletin no. 27 (Tucson: Univ. of Arizona Press, 1958). Since he published that item, most physical anthropologists have chosen not to be persuaded by the kind of data he used, yet it is not without significance.
- A concise summary of information on this topic is found in "Mesoamericans in Pre-Spanish South America," in *Reexploring the Book of Mormon*, ed. John W. Welch (Salt Lake City: Deseret Book and FARMS, 1992), 215–17.
- See *Times and Seasons*, 15 Sept. 1842, 922, which says that the Jaredites "covered the whole continent from sea to sea, with towns and cities." See also Sorenson, *Geography of Book of Mormon Events*, 9–15, 75–76.
- See Grant Underwood, "Book of Mormon Usage in Early LDS Theology," *Dialogue: A Journal of Mormon Thought* 17/3 (autumn 1984): 35–74; see also Sorenson, *Geography of Book of Mormon Events*, 11–15.
- Incidents of Travel in Central America, Chiapas, and Yucatan* (New York: Harper & Brothers, 1841).
- "Extract," *Times and Seasons*, 15 Sept. 1842, 914.
- "Zarahemla," *Times and Seasons*, 1 Oct. 1842, 927.
- The 15 Sept. 1842 *Times and Seasons* article also suggested that the "wonderful ruins of Palenque" in Chiapas, Mexico, "are among the mighty works of the Nephites," and that they compared favorably with the temple of Nephi. Since the Book of Mormon places the land of Nephi and its temple in the land southward, this early model would seem to exclude South America.
- See, for example, *Journal of Discourses*, 12:340–42; 14:324–30, 333.
- In 1856 George Q. Cannon, who in Nauvoo had worked in the *Times and Seasons* office with his uncle John Taylor and was familiar with the works of Catherwood and Stephens, put forward an exception to the usual whole-hemisphere view of Book of Mormon geography. He questioned the argument that the Indians were too primitive to build cities and temples, since these discoveries were made "in the country declared by the Book of Mormon to be the principal residence of one of the colonies that were led to this land" (George Q. Cannon, "Buried Cities of the West," *Western Standard*, 15 Oct. 1856; reprinted in *Millennial Star*, 10 Jan. 1857, 18; emphasis added). In 1876 another writer, after learning of parallels between native Mesoamerican traditions and the Book of Mormon, shifted his earlier support for Orson Pratt's model. "Is it not possible," he asked in light of this new information, "that the Rio Usumasinta, 'flowing north into the sea,' may be the ancient river Sidon? Those remarkable and world-famous ruins known under the name Palenque may yet be proven to be the remains of that 'great city and religious center' of the aboriginals, called Zarahemla" (G. M. Ottinger, "Votan, the Culture Hero of the Mayas," *Juvenile Instructor* 14/5 [1 Mar. 1879]: 58). The implications of placing Zarahemla at either Quirigua in Guatemala or at Palenque in southern Mexico would obviously shift the land Bountiful to a more northerly location, leaving the Isthmus of Tehuantepec as the only viable candidate for the narrow neck of land. In contrast, Pratt's popular model puts the Sidon River, Zarahemla, and Bountiful in the northern regions of South America between Colombia and Panama (see *Journal of Discourses*, 14:324–33). We clearly have at least two drastically different models of Book of Mormon geography being bandied about, suggesting that such things were not considered to have been settled by revelation.
- See, for example, B. H. Roberts,

- Studies in the Book of Mormon*, ed. Brigham Madsen (Urbana: Univ. of Illinois Press, 1985); Dan Vogel, *Indian Origins and the Book of Mormon: Religious Solutions from Columbus to Joseph Smith* (Salt Lake City: Signature Books, 1986); Brent Lee Metcalfe, "Apologetic and Critical Assumptions about Book of Mormon Historicity," *Dialogue* 26/3 (fall 1993): 154–84; "Editors' Introduction," in *American Apocrypha: Essays on the Book of Mormon*, ed. Dan Vogel and Brent Lee Metcalfe (Salt Lake City: Signature Books, 2002), vii–xvii; and Thomas W. Murphy, "Lamanite Genesis, Genealogy, and Genetics," in *American Apocrypha*, 47–77. For one response, see William J. Hamblin, "An Apologist for the Critics: Brent Lee Metcalfe's Assumptions and Methodologies," *Review of Books on the Book of Mormon* 6/1 (1994): 434–523.
27. *Doctrines of Salvation: Sermons and Writings of Joseph Fielding Smith*, comp. Bruce R. McConkie (Salt Lake City: Bookcraft, 1956), 3:203–4; emphasis removed.
  28. That is, the title *Nephi* was used in the same manner as *Caesar* (a shortened form of *Caesar*) was used in historical Russia.
  29. For further scriptural references, see Sorenson, *Ancient American Setting*, 54.
  30. See John L. Sorenson, "When Lehi's Party Arrived in the Land, Did They Find Others There?" *Journal of Book of Mormon Studies* 1/1 (fall 1992): 19–24; Hugh Nibley, *Lehi in the Desert; The World of the Jaredites; There Were Jaredites*, ed. John W. Welch, Darrell L. Matthews, and Stephen R. Callister (Salt Lake City: Deseret Book and FARMS, 1988), 237, 240–48.
  31. See Anthony W. Ivins, "Are the Jaredites an Extinct People?" *Improvement Era* 6/1 (Nov. 1902): 43–44; Janne M. Sjodahl, "Have the Lamanites Jaredite Blood in Their Veins?" *Improvement Era* 31/1 (Nov. 1927): 56–57; and Nibley, *Lehi in the Desert; The World of the Jaredites; There Were Jaredites*, 240–46.
  32. *Times and Seasons*, 1 Oct. 1842, 927; emphasis added.
  33. Editorial, "The Book of Mormon Geography," *Juvenile Instructor*, 1 Jan. 1890, 18.
  34. The statement was made about 1918; see *Juvenile Instructor*, April 1938, 160, which also reprints Cannon's statement.
  35. "Is Book of Mormon Geography Known?" *Improvement Era*, July 1950, 547.
  36. *Times and Seasons*, 15 Sept. 1842, 921. The full tradition may be read in English in Don Domingo Juarros, *A Statistical and Commercial History of the Kingdom of Guatemala, in Spanish America . . .*, trans. J. Baily (London: John Hearne, 1823; reprint, New York: AMS Press, 1971).
  37. *Lehi in the Desert; The World of the Jaredites; There Were Jaredites*, 250–51.
  38. See, for example, Joseph Fielding Smith, "Book of Mormon Establishes Location of Historic Region," *Church News*, 27 Feb. 1954, 2–3. Such a view was often considered to be supported by a statement attributed by some sources to Joseph Smith concerning Lehi's supposed landing in Chile and by statements about the "Zelph" skeleton, as in Donald Q. Cannon, "Zelph Revisited," in *Regional Studies in Latter-day Saint Church History: Illinois*, ed. H. Dean Garrett (Provo, Utah: BYU Dept. of Church History and Doctrine, 1995), 97–109. For critical treatments of the problematic value of those statements in regard to geography, see Kenneth W. Godfrey, "The Zelph Story," *BYU Studies* 29/2 (1989): 31–56; "What Is the Significance of Zelph in the Study of Book of Mormon Geography?" *Journal of Book of Mormon Studies* 8/2 (1999): 70–79; and Frederick G. Williams III, *Did Lehi Land in Chile? An Assessment of the Frederick G. Williams Statement* (Provo, Utah: FARMS, 1988).
  39. *Journal of Discourses*, 12:343; emphasis added.
  40. B. H. Roberts, "Indirect External Evidences—American Antiquities, Preliminary Consideration.—Continued," ch. 25 of "Of the Probability of Intercourse Between the Eastern and the Western Hemispheres During Jaredite and Nephite Times," pt. 3 of *New Witnesses for God* (Salt Lake City: Deseret News, 1909), 2:356.
  41. In *Conference Report*, April 1929, 15.
  42. John A. Widtsoe and Franklin S. Harris Jr., *Seven Claims of the Book of Mormon: A Collection of Evidences* (Independence, Mo.: Zion's Printing and Publishing, 1937), 87.
  43. Richard L. Evans, "What Is a Mormon?" in *Religions of America: Ferment and Faith in an Age of Crisis*, ed. Leo Rosten (London: Heinemann, 1957), 94; emphasis added. The 1975 edition of this book states that Evans's article had been slightly modified before being approved by the First Presidency for publication, during which this statement was left unchanged.
  44. N. A. Easton, "Mal de mer above terra incognita, or What Ails the Coastal Migration Theory?" *Arctic Anthropology* 29 (1992): 28–41.
  45. A. P. Elkin and N. W. G. MacIntosh, eds., *Grafton Elliot Smith: The Man and His Work* (Sydney, Australia: Sydney Univ. Press, 1974), 181.
  46. Hannes Lindemann, *Alone at Sea* (New York: Random House, 1957); compare Alan Villiers, *Wild Ocean: The Story of the North Atlantic and the Men Who Sailed It* (New York: McGraw-Hill, 1957).
  47. Charles A. Borden, *Sea Quest: Global Blue-Water Adventuring in Small Craft* (Philadelphia: Macrae Smith, 1967). In 1991, 11 Frenchmen even rowed across the Atlantic in 36 days, and none of them had had sailing experience. Still more recently, another Frenchman succeeded in *swimming* across the middle Atlantic. "On arriving in Barbados less than sixty days after his start, he admitted that it was quite easy to drift along in the current" (Patrick Ferryn, "A European View of Diffusion and Transoceanic Contacts before 1492," in *Across before Columbus? Evidence for Transoceanic Contact with the Americas prior to 1492*, ed. Donald Y. Gilmore and Linda S. McElroy (Edgecomb, Maine: NEARA, 1998), 261–66.
  48. See A. Thorne et al., "Australia's Oldest Human Remains: Age of the Lake Mungo 3 Skeleton," *Journal of Human Evolution* 36/6 (June 1999): 591–612.
  49. R. G. Bednarik (in "Replicating the First Known Sea Travel by Humans: The Lower Pleistocene Crossing of Lombok Strait," *Human Evolution* 16/3–4 [2001]: 229–42) cites the literature on early voyaging in and from Southeast Asia and deep-water islands in the Mediterranean, the latter on the order of 300,000 years ago.
  50. For a summary of historical and current thinking, see Clive Gamble, *Timewalkers: The Prehistory of Global Colonization* (Cambridge: Harvard Univ. Press, 1993). For a fuller treatment, consult the index to John L. Sorenson and Martin H. Raish, *Pre-Columbian Contact with the Americas across the Oceans: An Annotated Bibliography*, 2nd rev. ed., 2 vols. (Provo, Utah: Research Press, 1996).
  51. E. James Dixon, *Quest for the Origins of the First Americans* (Albuquerque: Univ. of New Mexico Press, 1993), 119; and E. James Dixon, *Bones, Boats, and Bison: Archeology and the First Colonization of Western North America* (Albuquerque: Univ. of New Mexico Press, 1999), 31–34.
  52. For further citations in the Book of Mormon, see John L. Sorenson, "When Lehi's Party Arrived in the Land," 1–34.
  53. See Fernando de Alva Ixtlilxóchitl, *Obras Históricas*, ed. Eduardo Chavero, 2 vols. (México: Editora Nacional, 1950).
  54. Ixtlilxóchitl, *Obras Históricas*, 1:15–16.
  55. The late Thomas S. Barthel, in a number of publications, argued eruditely that Hindu cultural and linguistic elements were introduced at different times to central Mexico and Palenque by intruders from "Greater India." See especially "Hindu-Maya Syncretism: The Palenque Focus," *Ibero-Amerikanisches Archiv* 11 (1985): 51–63; and also his "Planetary Series in Ancient India and Prehispanic Mexico: An Analysis of Their Relations with Each Other," *Tribus* 30 (1981): 203–30. Maurice Swadesh believed that the Nahuatl (Aztec) language showed relationships to Indo-European; see his "On Inter-hemisphere Linguistic Connections," in *Culture and History: Essays in Honor of Paul Radin*, ed. Stanley Diamond (New York: Columbia Univ. Press, 1960), 894–924. Swadesh's views were independently confirmed in linguistic analyses by the late Mary LeCron Foster of the University of California, Berkeley, in "Old World Language in the Americas: 1," an unpublished paper read at the annual meeting of the Association of American Geographers, San Diego, 20 April 1992; and also in her "Old World Language in the Americas: 2," an unpublished paper given at the annual meeting of the Language Origins Society, Cambridge University, September 1992; copies are in the possession of Sorenson and Roper.
  56. Quoted in Zelia Nuttall, "Some Unsolved Problems in Mexican Archaeology," *American Anthropologist* 8/1 (Jan.–Mar. 1906): 135.
  57. Fray Bernardino de Sahagún, *Historia General de las Cosas de Nueva España* (México: Editorial Nueva España, 1946), 13–14.
  58. *Historia prehispánica de la Huasteca* (México: Instituto de Investigaciones Antropológicas, Serie Antropológica 26, Universidad Nacional Autónoma de México Ciudad Universitaria), 112.
  59. *The Annals of the Cakchiquels*, trans. A. Recinos and D. Goetz; [and second part of the title] *Title of the Lords of Totonicapán*, trans. D. J. Chonay and D. Goetz (Norman: Univ. of Oklahoma Press, 1953), 169.
  60. See *Annals of the Cakchiquels*, 194.
  61. See John L. Sorenson, "Some Mesoamerican Traditions of Immigration by Sea," *El Mexico Antiguo* 8 (Dec. 1955): 425–38.
  62. See Terrence Kaufman and Victor Golla, "Language Groupings in the New World: Their Reliability and Usability in Cross-disciplinary Studies," in *America Past, America Present: Genes and Languages in the Americas and Beyond*, ed. Colin Renfrew (Cambridge, England: McDonald Institute for Archaeological Research, 2000), 47–57, esp. 48. However, Merritt Ruhlen's article ("Some Unanswered Linguistic Questions," 163–75) in the same volume challenges their logic and conclusion.
  63. See Kaufman and Golla, "Language Groupings in the New World," 47–49.
  64. See Terrence Kaufman, "Areal Linguistics and Middle America," in *Native Languages of the Americas*, ed. T. A. Sebeok (New York: Plenum Press, 1977), 2:65.
  65. Hints of linguistic complexity exist in the Book of Mormon; see, for example, Omni 1:17, 25;

- Mosiah 24:4; Alma 7:1 and 9:21; Moroni 10:15–16; and Ether 12:23–26.
66. See the discussion in Sorenson, *Ancient American Setting*, 50–56.
  67. See P. Agrinier, “Linguistic Evidence for the Presence of Israelites in Mexico,” *S.E.H.A. Newsletter* 112 (Feb. 1969): 4–5; the report is greatly amplified by Robert F. Smith in a manuscript in possession of Sorenson and Roper. Alma M. Reed, in *The Ancient Past of Mexico* (New York: Crown, 1966), reprises information about this study.
  68. Quoted in Reed, *Ancient Past*, 10.
  69. See “Was There Hebrew Language in Ancient America? An Interview with Brian Stubbs,” *Journal of Book of Mormon Studies* 9/2 (2000): 54–63.
  70. Mary LeCron Foster, “Old World Language in the Americas” (see note 55 herein), copy in Sorenson’s possession and abstracted, including this quotation, in Sorenson and Raish, *Pre-Columbian Contact*, as item F–146B. See Foster, “Old World Language in the Americas: 2,” unpublished paper presented at the annual meeting of the Language Origins Society, Cambridge University, Sept. 1992, copy in Sorenson’s possession; see Sorenson and Raish, *Pre-Columbian Contact*, item F-146C. See also Foster’s “The Transoceanic Trail: The Proto-Pelagian Language Phylum,” *Pre-Columbiana* 1/1–2 (1998): 113.
  71. See Ruhlen, “Some Unanswered Linguistic Questions,” 171ff.
  72. Otto J. Von Sadvovsky, *The Discovery of California: A Cal-Ugrian Comparative Study* (Budapest: Akadémiai Kiadó; Los Angeles: International Society for Trans-Oceanic Research, 1996).
  73. See, for example, E. D. Merrill, “The Phytogeography of Cultivated Plants in Relation to Assumed Pre-Columbian Eurasian-American Contacts,” *American Anthropologist* 33/3 (July–Sept. 1931): 375–82, which was highly influential.
  74. See John L. Sorenson and Carl L. Johannessen, “Biological Evidence for Pre-Columbian Transoceanic Voyages,” in press in a volume of papers to be published by the University of Hawaii Press from a conference titled “Contact and Exchange in the Ancient World,” held at the University of Pennsylvania, 4–6 May 2001.
  75. Because of their length, full references are omitted from this paper; for details see the primary article when it appears.
  76. See Carl L. Johannessen and Wang Siming, “American Crop Plants in Asia before A.D. 1500,” *Pre-Columbiana: A Journal of Long-Distance Contacts* 1/1–2 (1998): 9–36. For the corn, see Ian C. Glover, “The Late Stone Age in Eastern Indonesia,” *World Archaeology* 9/1 (June 1977): 42–61.
  77. For example, see Gordon R. Willey, “Some Continuing Problems in New World Culture History,” *American Antiquity* 50/2 (April 1985): 351–63.
  78. See Wolfgang Marschall, *Influencias Asiáticas en las Culturas de la América Antigua: Estudios de su Historia* (México: Ediciones Euroamericanas Klaus Theile, 1972), 61.
  79. Julian Granberry, “Amazonian Origins and Affiliations of the Timucua Language,” in *Language Change in South American Indian Languages*, ed. Mary Ritchie Key (Philadelphia: Univ. of Pennsylvania Press, 1991), 195–242.
  80. See Emilio Estrada and Betty J. Meggers, “A Complex of Traits of Probable Transpacific Origin on the Coast of Ecuador,” *American Anthropologist* 63/5 (1961): 913–39.
  81. Clinton R. Edwards says, “From the practical seaman’s point of view Pacific crossings in such craft were entirely feasible.” See “Commentary: Section II,” in *Man across the Sea: Problems of Pre-Columbian Contacts*, ed. C. L. Riley et al. (Austin: Univ. of Texas Press, 1971), 304.
  82. See Clinton R. Edwards, *Aboriginal Watercraft on the Pacific Coast of South America* (Berkeley: Univ. of California Press, 1965); and Edwin Doran Jr., “The Sailing Raft as a Great Tradition,” in *Man across the Sea*, 115–38.
  83. See Norton, “*El señorío de Salangone*.”
  84. Dixon, *Quest for the Origins of the First Americans*, 130–31; for the changing picture, now see Heather Pringle, “Hints of Frequent Pre-Columbian Contacts,” *Science* 288/5467 (2000), 783, about “stunning new traces of the Norse . . . in the Canadian Arctic.”
  85. Swadesh (in *Culture and History*, 896) observes, in parallel, that “new languages probably came into America in the late millennia just before Columbus, but their speakers must have been absorbed . . . without leaving any language that has continued to modern times.”
  86. Joseph Needham, Wang Ling, and Lu Gwei-Djen, *Civil Engineering and Nautics*, pt. 3 of *Physics and Physical Technology*, vol. 4 of *Science and Civilisation in China* (Cambridge: Cambridge Univ. Press, 1971).
  87. Joseph Needham and Lu Gwei-Djen, *Trans-Pacific Echoes and Resonances: Listening Once Again* (Singapore and Philadelphia: World Scientific, 1985).
  88. Quoted in Caleb Bach, “Michael Coe: A Question for Every Answer,” *Américas* 48/1 (1996): 14–21.
  89. See J. Richard Steffy, “The Kyrenia Ship: An Interim Report on Its Hull Construction,” *American Journal of Archaeology* 89/1 (Jan.): 71–101. This finding was confirmed by Steffy in an e-mail message to John L. Sorenson, 18 April 2001.
  90. Ales Hrdlicka, “The Genesis of the American Indian,” *Proceedings, 19th International Congress of Americanists*, Washington, 1915 (Washington), 559–68.
  91. See, for example, John L. Sorenson, *Images of Ancient America: Visualizing Book of Mormon Life* (Provo, Utah: Research Press, 2001). A larger selection can be seen in O. L. Gonzalez Calderón, *The Jade Lords* (Coatzacoalcos, Veracruz, México: the author, 1991) and three published books by Alexander von Wuthenau: *Altamerikanische Tonplastik: Das Menschenbild der neuen Welt* (Baden-Baden, Germany: Holle, 1965); *Terres cuites précolombiennes* (Paris: Albin Michel, 1969); and *Unexpected Faces in Ancient America, 1500 B.C.–A.D. 1500: The Historical Testimony of Pre-Columbian Artists* (New York: Crown, 1975). Some scholars believe the topic should not be discussed because Wuthenau and Calderón are not “accepted experts” among orthodox anthropologists. Whatever merit, if any, there might be in such an exclusivist posture, it does not eliminate the fact that the figurines actually exist and in many cases are unquestionably ancient.
  92. See, for example, Matthew W. Stirling, “Great Stone Faces of the Mexican Jungle . . .,” *National Geographic Magazine*, Sept. 1940, 327; John F. Scott, “Post-Olmec Mesoamerica as Recalled in its Art,” *Actas, XLI Congreso Internacional de Americanistas*, 2–7 Sept. 1973 (México, 1975), 2:380–86; and the discussion in Wuthenau, *Unexpected Faces*, 69–70.
  93. This point is confirmed with regard to Maya Late Classic (“Jaina style”) portrait figurines by two prominent scholars. Román Piña Chan said, “They are extraordinary because of their faithfulness to their human models” (quoted in Linda Schele and Jorge Pérez de Lara, *Hidden Faces of the Maya* [Poway, Calif.: ALTI, 1997], 11). Schele and de Lara observed that “the Maya figurines represented individual people who had readable expressions on their faces” (p. 13).
  94. See Kirk Magleby, *A Survey of Mesoamerican Bearded Figures* (Provo, Utah: FARMS, 1979).
  95. See Peter N. Jones, “American Indian Demographic History and Cultural Affiliation: A Discussion of Certain Limitations on the Use of mtDNA and Y Chromosome Testing,” *Anthro-Globe Journal*, Sept. 2002.
  96. Note this observation: “However, with the exceedingly spotty sampling of Native America populations, it may be a long time until we have sampled enough populations truly to tell how localized or widespread any polymorphism really is.” See D. A. Merrifether et al., “Gene Flow and Genetic Variation in the Yanomama as Revealed by Mitochondrial DNA,” in *America Past, America Present: Genes and Languages in the Americas and Beyond*, ed. Colin Renfrew (Cambridge: McDonald Institute for Archaeological Research, Univ. of Cambridge, 2000), 89–124, esp. 117.
  97. Jones, in his study “American Indian Demographic History,” gives a devastating critique of the typical inadequate sampling. For example: “It is evident that the population groups current studies are using to infer American Indian cultural affiliation and demographic history are not acceptable. One cannot use contemporary allele frequencies from a few individuals of a contemporary American Indian reservation to arrive at an unequivocal haplotype for that group, either presently or prehistorically.”
  98. Joseph T. Chang, “Recent Common Ancestors of All Present-Day Individuals,” *Advances in Applied Probability* 31 (1999): 1002–26.
  99. Susanna C. Manrubia, Bernard Derrida, and Damián H. Zanette, “Genealogy in the Era of Genomics,” *American Scientist* 91 (March–April 2003): 165.
  100. Manrubia, Derrida, and Zanette, “Genealogy in the Era of Genomics,” 165.

#### DNA and the Book of Mormon: A Phylogenetic Perspective

Michael F. Whiting

1. The most noted is that of Thomas W. Murphy, “Lamanite Genesis, Genealogy, and Genetics,” in *American Apocrypha*, ed. Dan Vogel and Brent Lee Metcalfe (Salt Lake City: Signature Books, 2002), 47–77; see the “Editors’ Introduction” therein, vii–xvii.
2. See Peter Forster et al., “Origin and Evolution of Native American mtDNA Variation: A Reappraisal,” *American Journal of Human Genetics* 59/4 (1996): 935–45; and Santos et al., “The Central Siberian Origin for Native American Y Chromosomes,” *American Journal of Human Genetics* 64 (1999): 619–28, for reviews of the evidence.
3. For a review of studies, including some from the early 19th century, see John L. Sorenson, *The Geography of Book of Mormon Events: A Source Book* (Provo, Utah: FARMS, 1992), 7–35. Consult also Sorenson’s study *An Ancient American Setting for the Book of Mormon* (Salt Lake City: Deseret, 1985), 91–95, 138–189; and “When Lehí’s Party Arrived in the Land, Did They Find Others There?” *Journal of Book of Mormon Studies* 1/1 (fall 1992): 1–34.
4. The distinction in tracking historical relationships among sexually reproducing populations (phylogeny) versus within sexually reproducing populations (tokogeny) was best elucidated by Willi Hennig in his *Phylogenetic Systematics* (Urbana: