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Abstract Stewart examines the DNA research applicable to Native Americans and how it relates to Book of Mormon peoples.

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The Traditional Latter-day Saint Position

The Book of Mormon recounts the story of a small Israelite group led by Lehi (and also one headed by Mulek) from ancient Jerusalem to the American continent in approximately 600 BC. Prophets who taught of the Messiah were called from among this people for over a millennium, but the people often fell into apostasy, and one branch of this civilization was destroyed. Modern prophets from Joseph Smith to the present have consistently taught that the remnant of the other branch, the Lamanites, are ancestors of modern Native Americans. According to Joseph Smith, translator of the Book of Mormon,

> The Book of Mormon is a record of the forefathers of our western tribes of Indians; having been found through the ministration of an holy angel, and translated into our own language by the gift and power of God. . . . By it we learn that our western tribes of Indians are descendants from that Joseph which was sold into Egypt.[1]

The Lord's revelations to Joseph Smith repeatedly refer to Native Americans as "Lamanites" (see Doctrine and Covenants 28:8–9; 28:14; 30:6; 32:2; 54:8). Dedicatory prayers of temples given by Latter-day Saint

1. *History of the Church,* 1:315.

prophets in Bolivia, Guatemala, Mexico, Hawaii, and Peru have proclaimed the descent of indigenous peoples from Lehi's colony. Elder Spencer W. Kimball put it this way:

> With pride I tell those who come to my office that a Lamanite is a descendant of one Lehi who left Jerusalem some six hundred years before Christ and with his family crossed the mighty deep and landed in America. And Lehi and his family became the ancestors of all of the Indian and Mestizo tribes in North and South and Central America and in the islands of the sea, for in the middle of their history there were those who left America in ships of their making and went to the islands of the sea.[2]

Latter-day Saint Position Challenged

In recent years, some critics have alleged that research demonstrating considerable homology between modern Native American, Mongolian, and southern Siberian DNA, as well as a seeming lack of homology between modern Jewish and Native American DNA, provides conclusive proof that the traditional Latter-day Saint view of Native American origins is false. Some Latter-day Saint defenders have attempted to explain the data by invoking limited geography theories proposing that Nephite and Lamanite activity was restricted to a small area in Central America and that any trace of "Israelite" DNA was lost by intermixing with larger indigenous groups. A closer examination demonstrates that modern DNA evidence does not discredit traditional Latter-day Saint beliefs and that the views of critics are based on nonfactual assumptions and unsupportable misinterpretations of genetic data.

Mitochondrial DNA

In his paper "Lamanite Genesis, Genealogy, and Genetics," Thomas Murphy claims that "some of the most revealing research into Native

2. Spencer W. Kimball, "Of Royal Blood," *Ensign,* July 1971, 7.

American genetics comes from analyses of mtDNA" and presents mitochondrial DNA (mtDNA) data to support his conclusion that Native Americans could not possibly have an origin in ancient Israel.[3] Murphy points out that over 98 percent of Native Americans tested to date carry mitochondrial DNA haplogroups A, B, C, or D. Outside of the Americas, these haplogroups are most commonly found in Mongolians and south Siberians and rarely in modern Jews. Another 1 percent carries haplogroup X, which is found in South Siberian, European, and Middle Eastern populations.

Murphy's arguments are based on the assumption that modern Jewish mtDNA accurately represents the mtDNA of ancient Israel. However, the findings of modern geneticists that the mtDNA of different Jewish groups shares little commonality with other Jewish groups but closely reflects the mtDNA of their host populations flatly contradict Murphy's conclusions. Mitochondrial DNA studies have had little success in linking different Jewish groups, leading geneticists to discount mtDNA as a reliable means of ascertaining "Jewish" roots. In an article entitled "Beware the Gene Genies," genetic researcher Martin Richards observes:

> Studies of human genetic diversity have barely begun. Yet the fashion for genetic ancestry testing is booming. . . . Other groups, such as Jews, are now being targeted. This despite the fact that Jewish communities have little in common on their mitochondrial side—the maternal line down which Judaism is traditionally inherited. It's the male side that shows common ancestry between different Jewish communities—so, of course, that's what the geneticists focus on. . . . Geneticists—like preachers and philosophers before them—need to avoid promising more than they can deliver."[4]

3. Thomas W. Murphy, "Lamanite Genesis, Genealogy, and Genetics," in *American Apocrypha: Essays on the Book of Mormon,* ed. Dan Vogel and Brent Lee Metcalfe (Salt Lake City: Signature Books, 2002), 47–77; see Murphy, "Sin, Skin, and Seed: Mistakes of Men in the Book of Mormon," at www.tungate.com/sinskinseed5.pdf (accessed 30 May 2004).

4. Martin Richards, "Beware the Gene Genies," *Guardian,* 21 February 2003; see www.guardian.co.uk/comment/story/0,,899835,00.html (accessed 7 July 2006).

A University College London study found that while separate Jewish communities were founded by relatively few female ancestors, this "process was independent in different geographic areas" and that the female ancestors of different communities were largely unrelated.[5] According to Nicholas Wade, "A new study now shows that the women in nine Jewish communities from Georgia . . . to Morocco have vastly different genetic histories from the men. . . . The women's identities, however, are a mystery, because . . . their genetic signatures are not related to one another or to those of present-day Middle Eastern populations."[6] Dr. Shaye Cohen of Harvard University notes, "The authors [of this study] are correct in saying the historical origins of most Jewish communities are unknown."[7] Mark G. Thomas and colleagues maintain that "in no case is there clear evidence of unbroken genetic continuity from early dispersal events to the present. . . . Unfortunately, in many cases, it is not possible to infer the geographic origin of the founding mtDNAs within the different Jewish groups with any confidence."[8]

Even close mtDNA homologies among different Jewish groups would not necessarily prove an Israelite origin, but the conspicuous absence of such homologies provides strong circumstantial evidence of non-Israelite origins for the mtDNA and, likely, much of the other genetic makeup of most modern Jews. With no evidence that modern Jewish mtDNA constitutes a valid control of the genetics of ancient Israel—and considerable evidence to the contrary—claims of Israelite lineage can neither be confirmed nor denied based on mtDNA data.

Joseph's wife Asenath, daughter of Potipherah, priest of On, is the ancestral mother of the tribes of Ephraim and Manasseh (Genesis 46:20). While her genealogy is unknown, there is no reason to believe that her mitochondrial lineage or that of her descendants, including the Lehites, would have matched that of the tribe of Judah. The pres-

5. Mark G. Thomas et al., "Founding Mothers of Jewish Communities: Geographically Separated Jewish Groups Were Independently Founded by Very Few Female Ancestors," *American Journal of Human Genetics* 70/6 (June 2002): 1411.

6. Nicholas Wade, "In DNA, New Clues to Jewish Roots," *New York Times,* 14 May 2002, F1 (col. 1).

7. Quoted in Wade, "In DNA, New Clues to Jewish Roots."

8. Thomas et al., "Founding Mothers of Jewish Communities," 1411, 1415, 1417–18.

ence of mtDNA types in Native Americans that do not match those found in modern Jewish groups is fully consistent with both Book of Mormon and Bible accounts.

Mitochondrial DNA Data Points to a Few Closely Related Founding Groups

Studies seem to demonstrate that Native Americans have less mitochondrial DNA diversity than found among any other large group of comparable size and even less diversity than the much smaller modern Jewish population. The mtDNA research of D. Andrew Merriwether suggests that the mitochondrial genetics of Native Americans could be explained by a single migration,[9] while others believe that there may have been two or three migrations from closely related groups. One writer insists that "most Indians of North America, and all Indians of Central and South America seem to be descended from this first wave of migrants. . . . Similarities in Amerindian languages, as well as in DNA, point to the conclusion that a very small group of migrants gave rise to this enormous, farflung assemblage of peoples in a relatively short time."[10] Genetic evidence of one or a few closely related founding groups serving as the ancestors of the overwhelming majority of Native Americans is consistent with traditional Latter-day Saint views of Native American origin from the Lamanites, Nephites, and Mulekites.

The Cohen Modal Haplotype

Murphy provides only one example—the Lemba—of an ostensibly non-Jewish group "decisively confirmed" by modern genetics to have at least some Israelite roots. He mentions this group ten times

9. D. Andrew Merriwether, Francisco Rothhammer, and Robert E. Ferrell, "Distribution of the Four Founding Lineage Haplotypes in Native Americans Suggests a Single Wave of Migration for the New World," *American Journal of Physical Anthropology* 98 (1995): 411–30.

10. Edward J. Vajda, "The Siberian Origins of Native Americans," at pandora.cii.wwu.edu/vajda/ea210/SiberianOriginsNA.htm (accessed 5 May 2006).

in order to highlight his contrast with Native American groups. One example will illustrate his argument:

> [Molecular anthropologists] Neil Bradman and Mark Thomas have used the Cohen haplotype to link ancient Hebrews to the modern population of the Lemba, a black southern African, Bantu-speaking population with oral traditions asserting a Jewish ancestry. . . . Claims regarding an Israelite ancestry for Native Americans would fit into this category, but DNA tests of the Lemba yielded a strikingly different outcome than for Native Americans. Two studies to date have demonstrated that one of the Lemba clans carries a high frequency of "a particular Y-chromosome termed the 'Cohen modal haplotype,' which is known to be characteristic of the paternally inherited Jewish priesthood and is thought, more generally, to be a potential signature haplotype of Judaic origin."[11]

The Cohen Modal Haplotype, or CMH, is a genetic signature postulated to be inherited from Aaron Ha-Cohen, brother of Moses. This marker is believed to have originated approximately three thousand years ago, a suitable timeframe for a presumptive origin with the biblical Aaron. The CMH is present in approximately 45–55 percent of Ashkenazic and Sephardic Cohens, compared to 2–3 percent of non-Cohen Jews. It is also found in the Buba clan of the Lemba tribe of Zimbabwe, the Bnei Menashe of India, and in several non-Jewish populations, including Armenians, Kurds, Hungarians, and central and southern Italians.

The Book of Mormon account does not support Murphy's assumption that the CMH, a presumptive genetic signature of Levite priests, should have been present among the Lehites. We would not expect that two small groups that left Israel without Cohens among them would carry the Cohen Modal Haplotype. Lehi was a descendant of Joseph (1 Nephi 5:14). Mulek, son of Zedekiah, was a descendant of Judah. While the lineages of Ishmael, Zoram, and the servants of

11. Murphy, "Lamanite Genesis, Genealogy, and Genetics," 60–61; see 75 n. 74 for Murphy's references.

Mulek are unknown, there is no textual evidence that Cohen priests were present among these groups. Had Cohens been present, it seems unlikely that Lehi and other non-Cohens could have officiated in sacrificial ordinances that were confined to Levite priests by the Mosaic law. Cohens were specifically forbidden to intermarry even with other Israelites, accounting for the high prevalence of the CMH in today's Jewish Cohens and the very limited presence of this unique genetic marker in non-Cohen Jews even after an additional twenty-six centuries of intermixing. The presence of the CMH among Diaspora Jewish groups with Cohens, including the Lemba and Bnei Menashe, and its absence among Native Americans, is an expected finding fully consistent with the Book of Mormon story.

While he sharply criticizes traditional Latter-day Saint teachings because of the lack of homology between modern Jewish and Native American mtDNA, Murphy inexplicably fails to disclose that the Lemba have virtually no mtDNA commonality with other Jewish groups. Dr. Himla Soodyall noted that "using mtDNA the Lemba were indistinguishable from other Bantu-speaking groups."[12] Murphy also fails to mention that in contrast to the Lehite colony and the lost ten tribes, which left Israel over two and a half millennia ago, the Lemba are believed to be descended from Yemenite Jews who migrated to their current location in Zimbabwe less than a thousand years ago, representing a recent offshoot of post-Diaspora Judaism. Yet it is only through the priestly Cohen Modal Haplotype that the Lemba have been identified as having a possible Jewish genetic origin at all.

Murphy repeatedly demands "similar evidence" such as he thinks he has found with the Lemba for the Israelite ancestry of Native Americans, while failing to disclose that the CMH is the only known haplotype with a presumptive origin in ancient Israel that demonstrates significant homogeneity among differing Jewish populations worldwide. Ken Jacobs, author of various studies on Jewish genetics, indicates: "The only Jewish subgroup that does show some

12. Himla Soodyall, quoted in Izelle Theunissen, "Every Gene Tells a Story," *Science in Africa,* February 2003, at www.scienceinafrica.co.za/2003/february/gene.htm (accessed 5 May 2006).

homogeneity—descendants of the Cohanim, or priestly class—makes up only about 2 percent of the Jewish population. Even within these Cohanim, and certainly within the rest of the Jewish people, there's a vast amount of genetic variation."[13] In view of the lack of a single validated CMH-like haplotype among modern Jews relevant to non-Cohen Israelites, it seems that Murphy has contrived what might be called a fool's errand for Book of Mormon believers.

Y-Chromosome Data

Although critics have claimed that Native Americans and modern Jews share no relevant Y-chromosome affinities, recent data have proven such statements resoundingly false. Douglas Forbes points out that Y-chromosome SNP biallelic marker Q-P36 (also known by the mutation marker M-242), postulated by geneticist Doron Behar and colleagues to be a founding lineage among Ashkenazi Jewish populations,[14] is also found in Iranian and Iraqi Jews[15] and is a founding lineage group[16] present in 31 percent of self-identified Native Americans in the U.S.[17] A branch of the Q-P36 lineage (M-323) is also found in Yemenite Jews.[18] The Q-P36

13. Tony Ortega, "Witness for the Persecution," *New Times Los Angeles,* 20–26 April 2000.

14. Doron M. Behar et al., "Contrasting Patterns of Y Chromosome Variation in Ashkenazi Jewish and Host Non-Jewish European Populations," *Human Genetics* 114 (2004): 354–65.

15. Michael F. Hammer et al., "Jewish and Middle Eastern Non-Jewish Populations Share a Common Pool of Y-Chromosome Biallelic Haplotypes," *Proceedings of the National Academy of Science* 97/12 (6 June 2000): 6769–74 (p. 6770, table 1; see correlates for 1C in Y Chromosome Consortium, "A Nomenclature System for the Tree of Human Y-Chromosomal Binary Haplogroups," *Genome Research* 12 [2002]: 339–48); and Peidong Shen et al., "Reconstruction of Patrilineages and Matrilineages of Samaritans and Other Israeli Populations from Y-Chromosome and Mitochondrial DNA Sequence Variation," *Human Mutation* 24 (2004): 248–60. (M-242 is another label for the Q-P36 group.)

16. Stephen L. Zegura, et al., "High-Resolution SNPs and Microsatellite Haplotypes Point to a Single, Recent Entry of Native American Y Chromosomes into the Americas," *Molecular Biology and Evolution* 21/1 (2004): 164–75.

17. See dougsaythis.blogspot.com/2005/09/lamanites.html (accessed 7 July 2006), which refers to Michael F. Hammer et al., "A Population Structure of Y Chromosome SNP Haplogroups in the United States and Forensic Implications for Constructing Y Chromosome STR Databases," *Forensic Science International* (3 December 2005), article in press.

18. See Forbes at dougsaythis.blogspot.com/2005/09/lamanites.html (accessed 7 July 2006).

lineage is ancestral to the Q-M3 mutation group. The Q-P36 and Q-M3 lineages together (haplogroup Q) are found in over 76 percent of Native Americans.[19] Forbes writes, "We find M-242 scattered all over central Eurasia and concentrated in Turkistan just north of Iran.[20] The ten tribes, including Manasseh, were taken captive to Media (northwest Iran). So M-242 is found scattered just where you would expect it would be if legends of the ten tribes escaping captivity by going north are true."[21] While the ethnohistory behind these variations remains to be elucidated, these intriguing findings produce considerable difficulty for critics' arguments. Forbes further notes: "Other west Eurasian lineages found in Native American test subjects include R, E3b, J, F, G, and I. All of these are also found in modern Jews."[22] The question of which of these latter lineages are pre-Columbian and which may represent post-Columbian admixture has not been definitively resolved and will require further research.

The finding of two dominant Y-chromosome lineages in Amerindian populations is harmonious with traditional Latter-day Saint views of Lehi and Ishmael representing the principal male ancestors of Native Americans, with Zoram and the Mulekites contributing minor lineages. The discovery of a founding Y-chromosome lineage prevalent at a very high frequency among Native Americans corresponding to a founding lineage present at a lower frequency in world Jewish populations demonstrates remarkable consistency with the Book of Mormon account.

Some widespread Jewish Y-chromosome affinities represent recent, post-Diaspora influences. Behar and colleagues report:

> The Levites, another paternally inherited Jewish caste, display evidence for multiple recent origins, with Ashkenazi Levites having a high frequency of a distinctive, non–Near Eastern haplogroup. . . . the Ashkenazi Levite microsatellite haplotypes

19. Zegura et al., "High-Resolution SNPs," 168.

20. Forbes refers to Mark Seielstad et al., "A Novel Y-Chromosome Variant Puts an Upper Limit on the Timing of First Entry into the Americas," *American Journal of Human Genetics* 73/3 (September 2003): 700.

21. Douglas Forbes, personal communication, 21 November 2005.

22. See dougsaythis.blogspot.com/2005/09/lamanites.html (accessed 7 July 2006).

> within this haplogroup are extremely tightly clustered, with an inferred common ancestor within the past 2,000 years. . . . A founding event, probably involving one or very few European men occurring at a time close to the initial formation and settlement of the Ashkenazi community, is the most likely explanation for the presence of this distinctive haplogroup found today in >50% of Ashkenazi Levites.[23]

Another study shows that "comparisons of the Ashkenazic Levite dataset with the other groups studied suggest that Y-chromosome haplotypes, present at high frequency in Ashkenazic Levites, are most likely to have an east European or west Asian origin and not to have originated in the Middle East."[24] David Keys writes that the so-called Ashkenazi Levite marker that is shared by 30 percent of Ashkenazi non-Cohen Levites was most likely introduced into the Jewish population with the mass conversion of Turkic Khazars between AD 700 and 900.[25] DNA studies demonstrating presumably non-Israelite origins of many of today's Jews highlight the problems in using modern Jewish genetics as a standard against which claims of other groups to Israelite ancestry are assessed.

Regional Affiliation Haplotypes

Certain haplotypes have been identified frequently among modern Jews and Middle Eastern Arabs. These haplotypes, some claim, represent markers for regional affiliation to the Middle East. The absence of many of these haplotypes in Native American populations has led some to claim that traditional Latter-day Saint beliefs of an Israelite origin for some Native Americans are false. The genetic

23. Doron M. Behar et al., "Multiple Origins of Ashkenazi Levites: Y Chromosome Evidence for Both Near Eastern and European Ancestries," *American Journal of Human Genetics* 73/4 (October 2003): 768.

24. Neil Bradman, Dror Rosengarten, and Karl L. Skorecki, "The Origins of Ashkenazic Levites: Many Ashkenazic Levites Probably Have a Paternal Descent from East Europeans or West Asians," Proceedings of the 6th International Conference on Ancient DNA and Associated Biomolecules, 21–25 July 2002.

25. David Keys, *Catastrophe: An Investigation into the Origins of the Modern World* (New York: Ballantine Books, 2000), 99–100.

markers found among Native Americans are distinctly different from those of most modern Middle East peoples.

Michael Hammer reports that Jewish and non-Jewish Middle Eastern populations share similar prevalences of certain Y-chromosome haplotypes. However, he cautions: "Many of the same haplotypes present in Jewish and Middle Eastern populations were also present in samples from Europe, although at varying frequencies."[26] Most so-called regional affiliation markers are present only in a small fraction of modern Middle Eastern peoples. These markers are neither inclusive (that is, not all modern Middle Easterners share these haplotypes) nor exclusive (that is, their absence does not preclude an origin in ancient Israel or elsewhere in the Middle East). Studies of modern Middle Eastern groups like Armenians reveal in many cases a "strong regional structure" as the result of a relatively high degree of genetic isolation even within a "single ethno-national group."[27] The vast regional differences seen within the Middle East today defy the assumption that a few generic haplotypes can definitively rule in or out a historic origin anywhere in an ethnically heterogeneous region that has been home to many diverse cultures.

Simplistic claims that an Israelite origin for non-Jewish groups can be either ruled in or out based on so-called regional affiliation haplotypes fail to adequately account for known ethnohistoric dynamics. The questions of what these haplotypes represent in the ethnohistory of modern peoples, when were they introduced, and where they came from have not even begun to be answered. Hebrew University geneticist Howard Cedar has argued that "researchers still don't know what the history is behind the variations. As a result, it is difficult to draw conclusions about genetic affinity."[28] Many of the haplotypes shared among modern Jews and non-Jewish Middle Easterners may represent genetic material assimilated through intermarriage rather

26. Hammer et al., "Jewish and Middle Eastern Non-Jewish Populations," 6771.

27. Michael E. Weale et al., "Armenian Y Chromosome Haplotypes Reveal Strong Regional Structure within a Single Ethno-national Group," *Human Genetics* 109 (2001): 659.

28. Dina Kraft, "Study Finds Genetic Links between Jews and Arabs," Associated Press, 10 May 2000.

than genuine Israelite DNA, as not one of the modern Middle Eastern regional affiliation haplotypes has been demonstrated to have been prevalent in Israelite populations before the Babylonian captivity.

John M. Butler has pointed out an Icelandic study in which mtDNA and Y-chromosome haplotypes of many known ancestors were not detectable in modern populations just over a century later.[29] The study traced the genealogy of over 131,000 Icelanders back to known ancestors born between 1848 and 1892 and between 1742 and 1798.[30] The authors argued that the "populationwide coalescent analysis of Icelandic genealogies revealed highly positively skewed distributions of descendants to ancestors, with the vast majority of potential ancestors contributing one or no descendants and a minority of ancestors contributing large numbers of descendants." They observed that this has caused "considerable fluctuation in the frequencies of mtDNA and Y chromosome haplotypes, despite a rapid population expansion in Iceland during the past 300 years."[31] According to the study, 86.2 percent of modern Icelandic males are descended from just 26 percent of potential male ancestors born between 1848 and 1892. Women demonstrate even more dramatic trends due to the shorter female intergenerational time: 91.7 percent of modern females descended from only 22 percent of potential female ancestors born between the same years.[32] This study documents that dramatic shifts in haplotype prevalence can occur and that genetic evidence for many known ancestors is entirely lost in an advanced, peaceful, relatively isolated society over the course of little more than a century. It also cautions against drawing sweeping ethnohistoric conclusions about haplotypes present in many different groups based exclusively upon their prevalence in modern populations. One can appreciate the lack

29. John M. Butler, "Addressing Questions surrounding the Book of Mormon and DNA Research," in this number of the *FARMS Review,* pages 101–8. This has appeared since February 2006 on the Maxwell Institute Web site.

30. Agnar Helgason et al., "A Populationwide Coalescent Analysis of Icelandic Matrilineal and Patrilineal Genealogies: Evidence for a Faster Evolutionary Rate of mtDNA Lineages than Y Chromosomes," *American Journal of Human Genetics* 72/6 (2003): 1370–88.

31. Helgason et al., "Populationwide Coalescent Analysis," 1370.

32. Helgason et al., "Populationwide Coalescent Analysis," 1373.

of any scientific basis for critics' demands that groups facing frequent episodes of war, persecution, famine, and disease, while experiencing ongoing intermarriage with other groups, should maintain persistent haplotype commonalities over twenty-six hundred years of separation from the initial founders.

Ethnohistory and Genetics: Affinities vs. Origins

"Virtually all Native Americans," Murphy insists, "can trace their lineages to the Asian migrations between 7,000 and 50,000 years ago."[33] Yet Merriwether and colleagues explain further: "We conclude that Mongolia or a geographic location common to both contemporary Mongolians and American aboriginals is the more likely origin of the founders of the New World."[34] While ignored by Murphy and other critics, the possibility of an outside "geographic location common to both contemporary Mongolians and American aboriginals" is allowed by the original researchers.

The only compelling genetic validation that the ancient inhabitants of an area are the ancestors or close relatives of modern peoples can come from comparisons of ancient and modern DNA. DNA studies have demonstrated that the early inhabitants of the New World appear to have had all the main mtDNA haplogroups (A, B, C, and D) found in modern Native Americans, supporting the belief that ancient Native Americans are in fact the ancestors of the present ones.[35]

Issues on the Asian side are more problematic. Very little is known of the peoples inhabiting Mongolia before 200 BC—over five centuries after the dispersion of the ten tribes. Ethnohistory provides abundant data of large groups of people of almost entirely unknown origins who settled in Mongolia and south Siberia, which were active areas

33. Murphy, "Lamanite Genesis, Genealogy, and Genetics," 68.

34. D. Andrew Merriwether et al., "mtDNA Variation Indicates Mongolia May Have Been the Source for the Founding Population for the New World," *American Journal of Human Genetics* 59/1 (July 1996): 204.

35. "Summary of Mitochondrial DNA New World Haplogroups in Humans Worldwide," National Park Service Archaeology and Ethnography Program Kennewick Man homepage at www.cr.nps.gov/aad/kennewick/t_ktable2.htm and www.cr.nps.gov/aad/kennewick/t_kfig2.htm (accessed 1 May 2004).

for mass migrations from across central Asia. As a nomadic people traveling over vast areas but leaving few permanent settlements, the ancient ancestors of the Mongolians are particularly difficult to trace. The nomadic character of the equestrian Mongols, whose predecessors ruled an empire from eastern Europe to the Pacific; the absence of any real natural barriers across thousands of miles of territory that comprise the largest plain in the world; and the history of hundreds of migrations of groups allow us to question the genetic basis for Murphy's assumption that those living in Mongolia and southern Siberia today harbor essentially the same gene pool as that present thousands or even tens of thousands of years ago.

DNA studies of ancient human remains from Siberia and Mongolia predating the dispersion of Israel are conspicuously absent. To my knowledge, the only ancient mummies that have been found adjacent to Mongolia are Tocharian—an ancient and mysterious civilization of blond- and red-haired, Caucasian-appearing people who inhabited the Tarim basin approximately three thousand years ago.[36] The Chinese government to date has not permitted DNA testing on these mummies, but mainstream geneticists and anthropologists do not believe the Tocharians to be the principal ancestors or even significant genetic contributors to modern Mongolian, Siberian, or Uighur populations. Our awareness of the ethnogenetic distinctiveness of the Tocharian people and even their very existence comes almost exclusively from their custom of mummification and from the fortuitous discovery of Tocharian mummies in the desert sands in 1987.

The ancient East Asian populations from which we do have some mtDNA data—namely, the Chinese and Japanese—demonstrate genetic patterns strikingly different from those of modern populations. The ancient remains tested from Japan contain none of the four main mtDNA haplogroups (A, B, C, and D) present in 98 percent of modern Native Americans and 52 percent of modern Mongolians. Among ancient Chinese studied, only 13 percent shared a mtDNA haplogroup

36. Howard Reid, "Mysterious Mummies of China," PBS NOVA broadcast, 20 January 1998, transcript at www.pbs.org/wgbh/nova/transcripts/2502chinamum.html (accessed 15 May 2006).

with Native Americans, and only two of the haplogroups (B and C) were present at all. Even these ancient Chinese remains are only two thousand years old, over seven centuries later than the dispersion of the northern kingdom of Israel. In contrast, a modern study of "central Chinese" with a similar sample size demonstrated the presence of all four mtDNA haplogroups, and the prevalence of the shared mtDNA haplogroups has increased to 45 percent.[37]

The further back we go, the greater genetic distinctiveness we find between ancient and modern Asian populations. One of the earliest Asian studies of ancient human remains was conducted in the Linzi area of central China. The authors studied human remains from three different time periods and found that

> the genetic backgrounds of the three populations are distinct from each other. Inconsistent with the geographical distribution, the 2,500-year-old Linzi population showed greater genetic similarity to present-day European populations than to present-day east Asian populations. The 2,000-year-old Linzi population had features that were intermediate between the present-day European/2,500-year-old Linzi populations and the present-day east Asian populations. These relationships suggest the occurrence of drastic spatiotemporal changes in the genetic structure of Chinese people during the past 2,500 years.[38]

Those researchers point out that "the three smallest genetic distances for the 2,500-year-old Linzi population were from the Turkish, Icelander, and Finnish, rather than from the east Asian populations."[39] Not only did a 2,500-year-old population with strong European genetic features live in central China, but these people appear to be the oldest inhabitants of China yet identified. Geneticists are aware of this group, whose genetic features seem to be almost entirely absent in

37. "Summary of Mitochondrial DNA New World Haplogroups."

38. Li Wang et al., "Genetic Structure of a 2,500-Year-Old Human Population in China and Its Spatiotemporal Changes," *Molecular Biology and Evolution* 17/9 (September 2000): 1396.

39. Wang et al., "Genetic Structure," 1398.

the modern Chinese population, only because of a relatively unique, recent study.[40] If we were to imagine a hypothetical Linzi group that might have emigrated to an isolated island in 500 BC, the DNA of their descendants would be completely unrelated to that of modern Chinese and would be classified by proponents of regional affiliation genetics as belonging to a European culture group. Self-proclaimed experts would undoubtedly claim that this group had been "proven" not to have originated in China at all. The Linzi data challenge the theories of those who indiscriminately extrapolate the genetics of the modern inhabitants onto ancient peoples without supporting DNA evidence.

Genetics, History, and Scripture

Critics have largely failed to consider scriptural and historical explanations for modern DNA observations. Abraham was a migrant from Ur of the Chaldees and not a native Palestinian. The Lord explicitly forbade intermarriage between Israelites and the native inhabitants of Palestine, commanding: "Neither shalt thou make marriages with them; thy daughter thou shalt not give unto his son, nor his daughter shalt thou take unto thy son" (Deuteronomy 7:3). The spiritual and social separation between Israel and the surrounding nations is a frequent scriptural theme. Limited intermixing occurred between Israel and surrounding kingdoms during the captivity in Egypt and the early period of the kingdom of Israel, mainly consisting of the assimilation of foreign wives. Nonetheless, the continued emphasis on separation between Israel and its neighbors would make it foolish to expect genetic regional affiliation markers gathered from a composite of Canaanites, Syrians, Egyptians, Phoenicians, and other groups then inhabiting the ancient Near East to represent a definitive test of early Israelite ancestry.

The Assyrian captivity of the northern ten tribes and the Babylonian captivity of the kingdom of Judah marked turning points of genetic divergence between the Jews who returned to Jerusalem and other Israelite groups. The Jews who returned from the Babylonian

40. Wang et al., "Genetic Structure," 1396–400.

captivity found a land with a markedly different ethnic makeup from the predominantly Canaanite Palestine of early Israel. Many of the Canaanite tribes had been completely destroyed, while the Assyrians had resettled "men from Babylon, and from Cuthah, and from Ava, and from Hamath, and from Sepharvaim, and placed them in the cities of Samaria instead of the children of Israel: and they possessed Samaria, and dwelt in the cities thereof" (2 Kings 17:24). Other groups migrated into Palestine during and after the Babylonian captivity. The returned Jews mixed among a population of Babylonians, Palestinians, Edomites, Moabites, Ammonites, Syrians, Assyrians, and others until after the time of the Savior. These intervening centuries provided abundant opportunities for the introduction of numerous regional haplotypes that were not necessarily present in ancient Israel. Continued intermarriage with foreigners would have progressively diluted the Jewish genome to the point where many of the original haplotypes may no longer have been detectable. The Jews who lived in the Near East until after the destruction of Jerusalem circa AD 70 and then gradually made their way into the Diaspora should be expected to share vastly greater genetic commonalities with modern Syrians, Arabs, Palestinians, Kurds, and Iraqis than the Lehites, who left Jerusalem approximately 600 BC, or the ten tribes from the northern kingdom who were carried away by the Assyrians between 744 and 721 BC and then lost to history.

Rates of intermarriage increased significantly during and after the Babylonian captivity. Transplanted minority groups are generally more likely to intermarry with other groups than more homogenous ethnic groups in their own societies because of both external cultural factors and limited internal marriage options. The prophet Ezra initiated separations on a massive scale between Israelite men and their foreign wives (Ezra 10), but it is unlikely that restrictions on the ubiquitous challenge of intermarriage were consistently enforced so zealously in subsequent generations. The Jewish prohibition on intermarriage has rarely been consistently achieved. One source reports that since 1985, 52 percent of North American Jews who married

have married non-Jews.[41] Just a few generations of such widespread intermarriage can result in almost a complete loss of initially defining genetic data. Even if the low 10 percent intermarriage rate reported prior to 1965 had been maintained for twenty-six hundred years, modern Jewish populations would bear little genetic resemblance to ancient Israelites.

The Bible reports some 600,000 able-bodied footmen among the Israelites at the time of the Exodus, in addition to women and children (Exodus 12:37; Numbers 11:21), suggesting a likely population of at least 2 million. Throughout history, the Jewish population was reconstituted from only a fraction of its former people on at least several occasions, often with considerable influx of non-Jewish genes. Hebrew scholars estimate that the Jewish population had fallen to approximately 300,000 a century after the Babylonian captivity, increasing to between two and five million by the time of Christ and falling to less than a million following the Roman-Jewish wars.[42] Only a fraction of the Jews returned from Babylon, only a portion of the Palestinian Jews survived the Roman counterattacks leading to the destruction of Jerusalem in 70 AD, and many Jews perished in European pogroms. The asymmetric nature of all of these events would have resulted in the loss of many "Israelite" genes from the Jewish gene pool.

Robert Pollack observes that Ashkenazi Jews, who constitute 80 percent of the modern Jewish population, "descend from a rather small number of families who survived the pogroms of the mid-1600s."[43] Behar reports that "from an estimated number of ~25,000 in 1300 AD, the Ashkenazi population had grown to more than 8.5 million by the beginning of the 19th century."[44] Daniel Elazar of the Jerusalem Center for Public Affairs wrote that at the end of the eleventh century, 97 percent of the world's Jews were Sephardic and only 3 percent were Ashkenazi. He reports that in "the mid-seventeenth

41. See www.whymarryjewish.com/j2k.html (accessed 5 May 2006).

42. See Simon Burckhardt in *A Historical Address of the Jewish People,* ed. Eli Baranavi (New York: Schocken Books, 1992).

43. Robert Pollack, "The Fallacy of Biological Judaism," *Forward,* 7 March 2003, at www.forward.com/issues/2003/03.03.07/oped4.html (accessed 5 May 2006).

44. Behar et al., "Contrasting Patterns of Y Chromosome Variation," 354.

century, Sephardim still outnumbered Ashkenazim three to two. . . . The Ashkenazic high point came in 1931 when they constituted nearly 92 percent of world Jewry."[45] Ethnohistory repeatedly documents the amplification of a small subset of precursor DNA in modern Jewish populations, the inevitable loss of many Israelite haplotypes altogether, and the introduction of large amounts of non-Israelite DNA. Such ethnohistoric data resoundingly repudiate critics' assumptions that modern Jewish groups represent a comprehensive and valid control of the genetics of ancient Israel. Pollack further notes: "Though there are many deleterious versions of genes shared within the Ashkenazic community, there are no DNA sequences common to all Jews and absent from all non-Jews. There is nothing in the human genome that makes or diagnoses a person as a Jew."[46]

There is no evidence that any of the so-called regional affiliation haplotypes shared by some modern Jews and Palestinians reflect ancient Israelite genetics rather than sequences assimilated from non-Israelite groups over centuries of intermixing. Historical and genetic evidence suggest that modern Jewish populations cannot possibly contain all the genetic material present in predispersion Israel and that few modern Jewish haplotypes are even plausible candidates for ancient Israelite origin.

Alternative Theories

While some claim that the DNA similarities between Native Americans, Mongolians, and Siberians discredit Latter-day Saint teachings, I find just the opposite: the consistency between genetic data, scripture, history, and modern patriarchal blessings is remarkable. Current DNA studies provide no evidence that the haplogroups shared between Siberian and Native American populations were found in Siberia or east Asia before the dispersion of Israel. Existing data also suggest that the prevalence of these haplotypes among central Chinese and other Asian populations may have increased

45. Daniel J. Elazar, "Can Sephardic Judaism Be Reconstructed?" Jerusalem Center for Public Affairs, at www.jcpa.org/dje/articles3/sephardic.htm (accessed 1 June 2006).

46. Pollack, "Fallacy of Biological Judaism."

significantly over time. Could there have been a common origin outside of Mongolia for both Native Americans and many modern Mongolians? Virtually nothing is known about the genetics of ancient Israel. The Bible declares that the ten tribes were dispersed to the "land of the north" (Jeremiah 3:18)—a designation for which few lands seem as appropriate as the vast steppes of Siberia and Mongolia. The DNA commonalities between modern Siberian and Native American populations may not have been indigenous to the predispersion inhabitants of east Asia but could have been introduced to both locations by migrants from ancient Israel: to east Asia by dispersed lost tribes of the northern captivity and to the Americas by the Lehite and Mulekite groups described in the Book of Mormon.

Patriarchal blessings of the overwhelming majority of Native American converts in areas without significant post-Columbian admixture cite lineage from Manasseh, consistent with the Book of Mormon teaching that Lehi was a descendant of Joseph (1 Nephi 5:14). Well before Murphy's criticisms of traditional Latter-day Saint views hit the popular press, I had confirmed from missionaries and members that modern patriarchal blessings have identified members of all the tribes of Israel in Mongolia—a greater number than I am aware of being found in any other country to date. These blessings were given independently by Latter-day Saint patriarchs in stakes throughout the world where ethnic Mongolian missionaries served, as Mongolia had no stakes or patriarchs at the time. More recently, a similar phenomenon has been reported from Siberia. A recently returned missionary from the Russia Novosibirsk Mission wrote: "While there, I had the unique opportunity to be present for the coming of two American patriarchs who delivered the first-ever patriarchal blessings to Siberian Saints on two separate occasions. What turned up was a staggering number of representatives from every single tribe in the relatively few blessings given."[47] My research into patriarchal lineage declarations has consistently found a strong correlation between specific tribal lineages and certain ethnonational groups, and so I con-

47. Jeffrey Carr, personal correspondence, 28 July 2006.

sider this finding significant. While this does not offer any kind of scientific proof, it should at least open our minds to consideration of the possibility of a common origin for Native Americans and many modern Mongolians outside of east Asia, perhaps in ancient Israel. One wonders if at least some elements of the genetics of these groups may not represent the genetics of ancient Israel better than do many of today's Jewish populations, which have extensively assimilated the genes of their neighbors.

Dating the DNA

The only part of the data that has not yet been explained in harmony with the Book of Mormon story is the timing. Many scientists date the genetic divergence of modern Native Americans as having arisen from migrations between 10,000 and 15,000 BC, rather than shortly after 600 BC, as the Book of Mormon account claims. Mitochondrial studies of New World DNA have led to vastly discrepant estimates of time of divergence. According to Ann Gibbons, "All this disagreement prompts [Stanford University linguist Dr. Joseph] Greenberg to simply ignore the new mtDNA data. He says: 'Every time, it [mtDNA] seems to come to a different conclusion. I've just tended to set aside the mtDNA evidence. I'll wait until they get their act together.'"[48]

LDS apologist Martin Tanner explains:

> The idea that haplogroup X has been in the Americas for 10 to 35 thousand years is based solely upon the assumptions of the Hardy-Weinberg equilibrium, which include: (1) completely neutral variants, (2) no mutation, (3) no migration, (4) constant near infinite population size, and (5) completely random mate choice. In the Book of Mormon account, most of the Hardy-Weinberg equilibrium assumptions are inapplicable. The wilderness journey, the ocean voyage, and the colonization of the New World result in patterns of genetic selection and DNA migration different from that found in

48. Cited by Ann Gibbons, "The Peopling of the Americas," *Science,* 4 October 1996, 33.

> Lehi's home environment. Closely related individuals married, and we are dealing with an [initially] very small group, not a nearly infinite population which would dramatically alter DNA marker distribution and inheritance over time. If we take these assumptions about haplogroup X instead of the Hardy-Weinberg assumptions, haplogroup X could have been introduced into the Americas as recently as one to two thousand years ago, far less than the ten to thirty-five thousand years under the Hardy-Weinberg assumptions.[49]

DNA researcher Mark Seielstad and colleagues note some of the problems with early dating:

> Our results do not contradict earlier studies of mtDNA and the autosomes, whose standard errors were large and whose authors noted several reasons to expect their dates to overestimate the timing of the first human arrivals to the Americas. In addition, a more recent time of entry into the continent makes the proposal of the Amerind language family more plausible; or, conversely—given the rapidity of linguistic change—the existence of a unified Amerind family would itself imply a fairly recent settling of the Americas, as we have suggested here.[50]

Although consensus science still dates the peopling of the Americas well before the Lehites, dating methods depend highly upon assumptions that may not be universally valid and have a wide margin of error. Many estimates of the time of the settling of the Americas have been shortened greatly in recent years. Time will tell whether current calculations will hold or whether continued revision may be required.

Amerindians, Native Americans, or Lamanites?

Whatever one's beliefs on the DNA issue, critics' attacks on Latter-day Saint scripture for describing Native Americans as "Lamanites" can only seem hypocritical when these peoples continue to be errone-

49. Martin S. Tanner, personal communication, April 2004.
50. Seielstad, Yuldasheva, and Singh, "Novel Y-Chromosome Variant," 704.

ously referred to as "Indians" more than five centuries after Columbus. The pseudoscientific term *Amerindian* used by Murphy does not get around the problem that Native Americans are not Indians at all. Even the terms *Native Americans* or *indigenous peoples* are problematic, as migration from a homeland in the eastern hemisphere is acknowledged by gentile scholars and Latter-day Saints alike. For modern mixed populations, terms such as *Latino* or *Hispanic* are based entirely upon the European admixture while conveying nothing about pre-Columbian roots. While the word *Indian* was used on many occasions by Joseph Smith and other early church leaders, this term does not occur in Latter-day Saint scripture at all. Perhaps the use of the term *Lamanite* reflects the fact that their creator understood their origins in a way that most scientists still do not.

Facts, Theories, and Consensus

When I was in medical school, physicians believed that hormone replacement therapy (HRT) offered substantial cardiac benefits with no increase in cancer risk for the average postmenopausal woman. Numerous seemingly well-designed, large-scale studies had corroborated these findings. While conducting public health research in an eastern European country, I was informed by a local cardiologist that they did not use HRT because of the belief that it increased cancer risk. At the time, I felt that his community was primitive for harboring views in opposition to abundant medical literature. Yet more recent United States studies have concluded that traditional HRT regimens incur significant cancer risks while failing to provide cardiovascular benefits, leading to a sweeping reversal of prior teachings that had served as the basis for the medical care of tens of millions of women. The initial HRT studies were much more rigorous than many ethnohistoric and anthropologic studies, which draw from far fewer data points.

Numerous other examples could be cited of theories once widely considered to have been rigorously proven but that have since been almost completely repudiated by subsequent findings. Almost every year brings unanticipated findings that require drastic revision of

existing theories. Most individuals would be surprised to learn how few data points current consensus theories for the peopling of the Americas such as the Bering land bridge theory are based on and how many scholars in the field hold widely different views. Recent archaeological finds in South America that appear to be older than those in North America have led some scholars to champion the Pacific colonization theory, while others note that the data are too sparse to settle the debate.

It is fascinating to consider not only how frequently science has changed its pronouncements, but also the societal amnesia that leads each new theory to be proclaimed as fact as definitively as those it supplanted. While the real experts acknowledge the limitations of their data and theories, the popularization of such theories often overextends their mandates. One observant cartoonist quipped: "My opinions may have changed, but not the fact that I am right."[51] The innate human desire for answers has always led to overextended conclusions in the face of inadequate evidence. Few individuals are able to acknowledge multiple feasible possibilities or to defer judgment until better data becomes available.

The real test of our insight as scientists and of our discernment as Christians is not in our acknowledgment of past findings that are already widely accepted, but in our ability to correctly identify present truths. The Pharisees claimed to acknowledge ancient prophets while rejecting the living Christ of whom the prophets testified: "We know that God spake unto Moses: as for this fellow, we know not from whence he is" (John 9:29). Many professed scholars today are happy to claim the mantle of science for their acceptance of that which is already well-known, while demonstrating a lack of understanding of the principles on which prior discoveries were made by rejecting possibilities that do not fit with their personal assumptions. We are all beneficiaries of theories and principles that have overcome great resistance before eventual acceptance. Great scientists and inventors have always possessed the ability to separate the real facts from unproven assumptions of popular consensus and have pursued their own vision

51. From Ashleigh Brilliant in her "Potshots" series, undated.

without regard to the deprecations of short-sighted critics. While much can be learned from consensus, those who rely upon it exclusively ultimately perish when the floods descend. Rather than placing our faith in ever-changing popular and academic consensus—the shifting sands of tiny minds—Christ invites us to build upon his rock. He declares: "I am the Lord thy God, I am more intelligent than they all" (Abraham 3:19).

Evangelical Christianity's "Suicide Bombing"

Some evangelical critics have latched onto the claims of dissident and ex-Mormon scholars that modern DNA evidence "disproves" Book of Mormon historicity in their effort to discredit the faith of the Latter-day Saints. DNA and dating arguments do not, however, represent an exclusive challenge to Latter-day Saint teachings, although critics would like to paint it as such. Rather, such arguments produce issues for the biblical Judeo-Christian worldview in general. Strict biblical chronology suggests that man has been on the earth for only six thousand years and that a universal flood occurred approximately 2350 BC. If all mankind is descended from Eve, why do not all humans share the same mitochondrial DNA? Where is the archaeological evidence of a great worldwide flood? God promised Abraham: "I will multiply thy seed as the stars of the heaven and as the sand which is upon the sea shore" (Genesis 22:17), yet no Abrahamic Y-chromosome has been identified among modern Jews, who consider themselves to be children of Abraham. While addressing such topics is beyond the scope of this article, the attempts of critics to characterize Latter-day Saint teachings as unscientific and irrational while failing to apply similar standards of objective validation to their own tenets amounts to a "suicide bombing." There is something distinctly bizarre about evangelical groups like Living Hope Ministries enlisting agnostic evolutionist scholars as their experts to challenge the Church of Jesus Christ over DNA and the Book of Mormon. If one could continue the interviews by asking these same scholars about many events described in the Bible, one wonders if their admirers would continue to accept their pronouncements with such credulity. Every faith accepts some

beliefs that lie outside of the ever-changing scientific and societal consensus. If one were to use popular consensus as the basis for religious belief, what would be left? Studies show that today, most Americans do not believe in the resurrection.[52] Arguments that Latter-day Saint beliefs are scientifically untenable while those of other faiths are well-documented are intrinsically dishonest.

Observations on Anti-Mormonism

My interest in Book of Mormon DNA issues began several years ago when my bishop in Texas asked me to help a less-active young man who was struggling with this topic. I open-mindedly and carefully studied the data and wrote a detailed article to highlight the fallacy of critics' arguments. We established several appointments, but he never appeared. When I finally reached him by phone, he promised to come by to pick up the article when he was interested. I never heard from him again. I have often found that addressing an individual's alleged concerns on one topic only brings forth a litany of others. Many don't want to have their concerns answered. Many have already made a decision to distance themselves from the church on personal grounds but like to flatter themselves that they are doing so for compelling scientific reasons. Attempts to correct their misunderstanding of science are often met with evasiveness or hostility.

Over the past year, I have received many profanity-laced tirades from critics and disaffected ex-Mormons over my writing on the DNA issue. The logic and language of these is not worthy of repetition. Throughout my life, I have had many non-LDS friends and acquaintances who held religious or personal views that I considered to be unsupportable or even bizarre, yet I have never felt threatened by allowing them the right to believe as they wish. Beyond the desire to defend my own faith from false accusations, I have never felt any desire to discredit other beliefs. The New Testament teaches that those of different beliefs should be left alone instead of persecuted. Doctrinal criti-

52. Thomas Hargrove and Guido H. Stempel III, "Most Don't Believe in the Resurrection," *Detroit News,* 9 April 2006, at www.detnews.com/apps/pbcs.dll/article?AID=/20060409/LIFESTYLE04/604090330/1041 (accessed 7 July 2006).

cisms of the Church of Jesus Christ by evangelical hirelings can only be considered capricious when viewed in the context of studies that have repeatedly documented that massive percentages of their own pastors do not believe in the physical resurrection of Jesus Christ, that Jesus was the son of God, or that God communicated with ancient prophets. Even from a born-again evangelical viewpoint, Christian researcher George Barna has found that the "biblical purity" of teachings acknowledged by Latter-day Saints is above-average for Christians in general.[53] In his *Scandal of the Evangelical Conscience,* Ronald Sider has documented that the lifestyle of most evangelicals is strikingly discrepant from scriptural standards.[54] Christ taught, "Why call ye me, Lord, Lord, and do not the things which I say?" (Luke 6:46). He declared, "Why beholdest thou the mote that is in thy brother's eye, but perceivest not the beam that is in thine own eye?" (Luke 16:44). While Latter-day Saints are not perfect and some negative exceptions exist in any large group, the remarkable record of Latter-day Saint society on the whole for scriptural living and morality has been repeatedly documented by sociologic studies. Critics are not objective evidence seekers or fair-minded scholars, but mere cafeteria sophists, playing up findings that they believe they can present to their advantage while ignoring data they find problematic.

Scientists or Partisans?

To my knowledge, critics to date have not been able to generate a single peer-reviewed publication in a scientific journal on Book of Mormon DNA issues. Although validation of study controls is critical to the testing of any scientific hypothesis, Murphy and other critics have accepted without validation the assumption that modern Jewish populations represent a comprehensive control of ancient Israelite genetics. This assumption in itself demonstrates profound ignorance

53. George Barna, "Religious Beliefs Vary Widely by Denomination," Barna Research Group, 25 June 2001, at www.barna.org/FlexPage.aspx?Page=BarnaUpdate&BarnaUpdateID=92 (accessed 11 July 2006).

54. Ronald J. Sider, *Scandal of the Evangelical Conscience: Why Are Christians Living Just Like the Rest of the World?* (Grand Rapids, MI: Baker Books, 2005).

of Jewish ethnohistoric dynamics. It is rather shocking that while the original study authors repeatedly comment explicitly that their studies of Jewish populations do not necessarily demonstrate that the haplotypes in question reflect early Israelite genetics, Murphy and other critics have conveniently omitted mention of these cautions.

Murphy fails to disclose the lack of any meaningful mtDNA homology among modern Jewish groups that undermines one of his foundational arguments attacking Latter-day Saint views. The internal control he mentions of the Lemba is not comparable to the Lehite colony or lost tribe groups because of its very recent origin, and it fails the mtDNA test he imposes on Native Americans. He fails to mention that there is no reason to expect Cohen priests carrying the CMH, the only haplotype demonstrating significant homogeneity among Jewish populations worldwide, to have been present among the Lehites. Murphy fails to acknowledge the presence of a founding Y-chromosome haplotype present among Jewish communities worldwide and in Native Americans at a high frequency. He presents no data to support his assumption that ancient Mongolians and Siberians share similar genetic makeup to modern peoples and ignores both ethnohistoric and genetic data from other Far Eastern populations demonstrating drastic genetic change over time. His writing demonstrates no evidence of any serious attempt at analysis of events described in the Book of Mormon and Bible texts that might impact genetics, instead relying upon assumption and caricature. Murphy might do well to educate himself regarding Jewish ethnohistory, genetics, and scripture before attempting to tackle claims of Israelite origin for other groups. Murphy's authoritative pronouncement that "The BoMor [Book of Mormon] emerged from Joseph Smith's own struggles with his God"[55] and many similar statements[56] demonstrate his bias and agenda. He mischaracterizes Latter-day Saint policies toward Native

55. Thomas Murphy, "Lamanite Genesis, Genealogy, and Genetics," found at www.mormonscripturestudies.com/bomor/twm/lamgen.asp (accessed 30 May 2004).

56. The published version in *American Apocrypha,* 68, has been rephrased to say: "The Book of Mormon emerged from an antebellum perspective, out of a frontier American people's struggle with their god, and not from an authentic American Indian perspective."

Americans[57] and ignores the church's strong and consistent record of serving Native American interests dating back to times when Native Americans were scarcely considered human by the U.S. government. A review of some of the major problems with Murphy's claims suggests that his writings are unlikely to pass muster with those familiar with genetics, history, and scripture and that critics will likely continue to find their primary audience among disaffected ex-Mormons and anti-Mormon groups. Claims of critics like Simon Southerton that modern Jewish and Native American DNA data represent the most devastating "scientific evidence facing the LDS Church today"[58] only demonstrate the profound intellectual poverty of critics' arguments.

When I was a missionary in Russia, atheists frequently cited to me cosmonaut Yuri Gagarin's reported statement after traveling into space—"I didn't see any God up there" and his conclusion that "therefore God does not exist." Ill-founded DNA criticisms of traditional Latter-day Saint teachings arise from the same level of simplistic ignorance, erroneous assumptions, and non sequitur logic. The critics' charges that DNA data refute Latter-day Saint teachings do not present the thinking man's conundrum of conflict between science and religion but are rather made-for-media claims that excite sensational headlines for the uninformed while failing rudimentary scientific standards. Critics demonstrate that a little knowledge is a dangerous thing.

The individual who does not understand the limitations of the few data points he possesses and who is unable to separate his assumptions from fact—one with learning, but without wisdom—is often more hopelessly ignorant than the individual who knows nothing at all. Truly, God is "able to show forth great power, which looks small unto the understanding of men" (Ether 3:5). The inability or unwillingness of many to recognize his power ultimately demonstrates their small-mindedness rather than erudition. We do not need to apologize for our prophets. We can learn much about our world from them. Many

57. Kevin L. Barney, "A Brief Review of Murphy and Southerton's 'Galileo Event,'" at www.fairlds.org/Book_of_Mormon/Brief_Review_of_Murphy_and_Southerton_Galileo_Event.html (accessed 24 July 2006).

58. Simon Southerton, as quoted by Murphy in "Skin, Seed, and the Mistakes of Men."

items in the Book of Mormon that critics had previously claimed to be impossible or anachronistic in ancient Mesoamerica have since been shown to have existed.[59] Many teachings currently presented by critics as "proof" of Mormonism's falsehood will one day be recognized as some of the most remarkable evidences of Joseph Smith's prophetic mission. We can take comfort that many honest and perceptive people see through the hypocrisy of those who "lie in wait to deceive."

Conclusion

The recent explosion of molecular DNA data has led to a considerable increase in knowledge about our roots. However, some individuals have drawn, and widely publicized, conclusions far beyond those validated by the existing data. The claims of critics that DNA evidence disproves traditional Latter-day Saint teachings about Native American ancestry are based in a misunderstanding or misrepresentation of science and an ignorance of history and scripture. There is still much that we do not know about the genetics of ancient and modern populations, but a careful examination of existing DNA data demonstrates that the teachings of Latter-day Saint prophets are fully consistent with existing DNA data.

59. See Matthew Roper, "Right on Target: Boomerang Hits and the Book of Mormon," at www.fairLDS.org/pubs/conf/2001RopM.html (accessed 15 May 2006); John E. Clark, "Archaeology, Relics, and Book of Mormon Belief," *Journal of Book of Mormon Studies* 14/2 (2005): 38–51; and John L. Sorenson, "How Could Joseph Smith Write So Accurately about Ancient American Civilization?" in *Echoes and Evidences of the Book of Mormon,* ed. Donald W. Parry, Daniel C. Peterson, and John W. Welch (Provo, UT: FARMS, 2002), 261–306.