Conclusions

In Gulliver’s Travels, Jonathan Swift suggested that the only allowable way to crack an egg in Lilliput was from the small end. Those who surreptitiously cracked eggs from the big end against the prevailing cultural and political standard were known as “big-enders.” This human effort to provide a structure—even a seemingly arbitrary one—for relating to the natural world transcends any particular culture. Social philosophers have tried to capture the underlying frames of reference that govern these human interactions—such as Martin Heidegger and enframing; Michel Foucault and episteme; Sandra Harding and situated knowledge; and Vine Deloria Jr. and American Indian creationism. Despite their many differences, both myth and science share the common attribute of being cultural frames of reference that address human relationships with the material world.

For American Indian, feminist, anticolonialist, Marxist, and other historically non-mainstream Western theorists—those who might be considered modern big-enders—the practice of science has been a hegemonic reflection of the values of a culturally dominant bourgeois/masculine/imperialist class. In their views, scientific statements reveal as much about political reality as they do the physical universe. The difficulty, however, faced by these modern big-enders is that their logic for denying an epistemological advantage to a culturally dominant science also supports not awarding a privileged position to their own epistemology. To argue that First American science provides only one of many epistemological vantage points is to argue that there are no privileged vantage points. This is the challenge faced by both American Indians and First American science in an intellectually pluralistic American culture. This does not mean that the modern big-enders are all situated external to the practice of science. Within mainstream First American science there are epistemological confrontations that are just as fierce as those between science and American Indian traditions. As was discussed earlier, archaeology and anthropology—and to much lesser extents, linguistics, physics, and genetics—jockey for the pole position in being the cultural authority for First American science. In the postmodern world everyone is a big-ender; there is no stable ground on which to place an epistemological fulcrum.
Much of the conflict between the practice of First American science and the oral traditions of American Indians is conducted in the material world; it is seemingly a confrontation over control of human remains and artifacts. However, at its core, it is an epistemological conflict over how a heritage is to be valued, whether the applied epistemological metric is to be the material quantifications of the Enlightenment or the myths of ancient culture.

The social and scientific politics surrounding the First Americans has made it difficult to separate the issues associated with the original “those people,” whoever they were, from the modern American Indian “these people.” Consequently, addressing the original First American migration to the New World necessarily means that a First American scientist is, presumptively, also addressing the origins of the modern American Indian. Before concluding that a First American arrival is also a modern American Indian arrival, a scientist would typically require a material basis for such a conclusion. However, because of the unique cultural authority granted by American society, American Indian traditions and oral histories, that is, their cultural myths, have legally been accorded equal epistemological status with the findings of science in the disposition of many ancient human remains and funereal artifacts.

The distinction between myth and science that the Western world has commonly believed to exist is not always apparent in the search for the First Americans. Until the mid-twentieth century, First American science was able to produce material evidence with supporting theories that explained the inherent intellectual superiority of the genetic stock of white Europeans. In this instance, there was a convergence between the findings of modern science and the dominant cultural myth of white superiority. Now that racial science has been discredited, the modern world is left only with a myth of racial inequality. Similarly, Plato’s myth of Atlantis endured and was legitimized as the source of the First Americans by prominent nineteenth-century scientists. Now Atlantis has also lost its aura of scientific acceptability.

For those who discount the social utility of myths, this occasional blurring between science and myth weakens the credibility of science as a reliable mechanism for relating to the natural world. This should not, however, be interpreted as endorsing an equivalence between science and myth. As difficult as it may be to dislodge scientific theories such as Clovis-first that no longer are supportable, science does espouse a methodological mechanism for change. Creation myths—the conservation of a particular heritage—has no such accepted process for change. As resistant to change as First American science appears to be, there does reach a tipping point when a theory such as Clovis-first is acknowledged to be wrong.
Although existential myths can certainly evolve over time, they typically have no agreed-upon set of procedures through which they might be disconfirmed.

There is a comforting totality in American Indian myths that is absent in First American science. As laid out by the archaeologist James Adovasio, the puzzle to be addressed is: “who the hell are these people, where did they come from, and when did they get here?” American Indian myths provide complete answers for all questions. One tribe’s myth may differ from that of another, but that is acceptable since the myths are typically particular to that specific tribe. Each culture’s answers may be different. Science has a larger challenge. It cannot tolerate different answers. Where American Indian myths can be particular, First American science must be universal. Moreover, First American science is preserved via the written report; its methods are preserved in situ at the excavation site. American Indian myth at its heart is preserved orally; there is little of material substance to be preserved. When myths are committed to writing, all literate people can share and interpret them. For cultural authorities who are empowered to make and interpret truth statements, a source of power can then be challenged.

American Indian myths and First American science have such substantive differences that it is difficult to imagine a circumstance under which there could be an epistemological reconciliation. For American Indians, their existential myths are statements of truth. Each tribe can have its own myth that provides it an ontologically stable answer to the Adovasio questions. For First American science, however, the answers may (and do) change, but there is only one truth permitted at a time; scientists are serial ontologists. It is the scientific methodology that is enshrined as the stable element. For American Indians, it is the answer that is to be culturally protected; for First American scientists, it is the path that is critical. This seeming clarity in differences is, unfortunately, frequently blurred when one domain attempts to co-opt the authority of the other. When nineteenth-and early twentieth-century scientific methodologies were used to support the racist doctrines of the dominant culture, the hierarchy of races was a cultural truth; the then-methods of science were used to validate what was believed already known. The history of science would indicate that it may only be in distant retrospect that it is possible to distinguish between myth and science.

A second area of apparently irreconcilable difference between American Indian myths and First American science is that they are not actually addressing the same questions. Adovasio’s first question—“who the hell are these people”—appears straightforward. The answer requires situating “these people” between their ancestral home and their modern descendants, if any. Yet for American Indians, the answer is typically couched in terms of cultural relationships; for First
American scientists, the answer is principally one of biology. Proving a cultural continuity does not address a biological relationship, and vice versa. That the two domains are talking past each other was readily apparent in the confrontations over control of the remains of the Kennewick Man. For First American scientists, there was initially sufficient anatomical variation between the Kennewick Man and modern American Indians to question a relationship. For American Indians, their myths confirmed that they, and only they, had inhabited the area where the remains were found, so that there was an established cultural continuity; there could have been no European ancestral interloper.

There is an inherent culturally based distinction between American Indians and modern, scientifically based society. American Indian myths are a part of their social fabric and are not discoverable. They have a status that is believed to be independent of any human process for acquiring knowledge. There is a social value to their creation myths that structure and stabilize their society. Something accorded the status of a creation myth is not irrational but is considered a fundamental part of reality. For such cultures, myth creation is an ontologically definitive event. Myths are nonargumentative. What initially may have been figurative is now imbued with literality. American Indian myths and First American science each represent a particular approach to existence. It is doubtful that the cognitive values important to either could be shown to be commensurate with the other.

In the search for the First Americans, American Indian tribes are concerned with protection of their existential myths; they wish to conserve a particular heritage. Although scientists portray their discipline as one that is open to change, the actual practice of First American science has been one that is significantly resistant to change. There is a great body of science studies literature that describes scientific change as occurring in paradigm shifts, epistemological ruptures, punctuated equilibria, and discontinuities.² It is difficult to envision revolutionary creation myth changes except, perhaps, when externally imposed by an alien cultural authority. For American Indians, First American science is just such an unwelcome external mechanism that attempts to destabilize their existential myths.

It has been suggested that science is a form of metaphysical and methodological commitment.³ There is also a metaphysical and methodological commitment associated with any particular myth. Michel Foucault coined the term epistemological grid to define the underlying, and often unacknowledged, value structure against which these cultural commitments are made. Neither First American science nor American Indian myths can be considered to be situated
Conclusions

independently of such a pervasive grid; the challenge in the search for the First Americans is that these epistemological grids are not identical and are most likely incommensurable. Furthermore, both science and myth are frequently uncooperative in that they do not stay ontologically stable. As the social context changes, the values embedded in the epistemological grid change as well—whether for science or myth.

Methods constrain truth and are culturally and historically contingent. Verisimilitude—Foucault’s regimes of truth—is a human endeavor and is subject to human foibles. That does not, however, translate “wrong” into a constructivist’s belief that all social solutions are equally acceptable. First American science, more so than American Indian myth, is still bound by the modern perception of the physicality of nature. In American society, numbers are the ultimate scientific method, the universal approach for unraveling the mysteries of nature. It is difficult to imagine a method for mathematizing a myth.

Scientists organize themselves separately from the engineering disciplines, and further divide themselves into separate domains such as physics, biology, and chemistry. This structure is evident in the departmental divisions in academia. These socially constructed groupings of concepts and human skills, however, do not reflect how science is actually practiced. Science studies has not only documented that the practice of modern science cannot be conducted without crucial contributions from the technologies of the engineering disciplines, but also shows that the scientific approaches to understanding the natural world consist not just of physics or archaeology, but rather suites of sciences addressing specific puzzles and research programs. Despite the declarations by archaeologists that the search for the First Americans is inherently an archaeological issue, solving the conundrum of the First Americans requires not only the application of subsets of archaeology, anthropology, linguistics, bioanthropology, and physics, but also requires an epistemological grid—the context of a specific set of dominant cultural values—that will accept the results of science. American Indians would certainly not agree that the search for the First Americans is solely an archaeological issue, nor even solely a science issue. In the Native American Graves Protection and Repatriation Act (NAGPRA), the US Congress has, in fact, dictated in law that the search for the First Americans is not to be solely a matter for First American science.

In spite of the intellectual force brought to bear from the application of an entire ensemble of sciences to the First American puzzle, for seventy years the now-discredited Clovis-first theory was repeatedly validated. In retrospect, First American scientists appear to have been more focused on continuously
confirming the Clovis-first model than searching for material artifacts and constructing testable alternative theories. Clovis-first became so dominate (or more likely, the fear of challenging the elite First American scientists that supported the theory was so great) that it became a part of the *episteme* of the First American search. Helen Longino concluded that the results of a scientific investigation “can be taken as evidence for hypotheses only in the context of some set of background beliefs,” a part of the epistemological grid. So objectified did the Clovis-first model become, so blurred was the distinction between theory and material evidence, that it assumed the authority of an artifact itself.

The questionable nature of scientific conclusions has become an increasingly popular research topic. In his thirteen-year study of medical research, “Why Most Published Research Findings Are False,” John Ioannidis concluded that “for most study designs and settings, it is more likely for a research claim to be false than true. Moreover, for many current scientific fields, claimed research findings may often be simply accurate measures of the prevailing bias.” In *Wrong*, David Freeman explained that researchers at Harvard and the National Bureau of Economic Research “examined papers from a range of economics journals and determined that approximately none of them had conclusively proved anything one way or the other.” Moreover, the proof of many scientific findings is inextricably intertwined with the acceptance of the methods through which the findings are produced. In some First American sciences such as archaeology, the only basis for validating the findings may well be legitimization of the methods employed, not validation of the findings. Echoing Polanyi’s theory of tacit knowledge, Richard Feynman concluded that “we have a habit in writing articles published in scientific journals to make the work as finished as possible, to cover up all the tracks, to not worry about the blind alleys or describe how you had the wrong idea first, and so on.” The economic theory of suboptimization describes how a person strives to maximize an individual gain that may ultimately be to the detriment of a larger and more important interest. How First American scientists practice their discipline demonstrates a form of suboptimization. An overzealous protection of one particular theory may well be to an individual’s benefit; however, First American science may well be the ultimate loser through an erosion of confidence in science as a whole.

There is a continuity in how observations occur in science that ranges across the material spectrum of static display, controlled demonstration, and theoretical experimentation. A commonly held belief is that the practice of science must involve some form of experimentation. In First American science there is certainly a form of observation, but it is difficult to identify a practice that might be
considered experimentation. In the domains of bioanthropology, physics, genetics, and linguistics that support First American science, there would appear to be no experimentation. Craniometry, carbon dating, DNA typing, and language analysis are sufficiently routine to be considered technological measurement demonstrations rather than scientific experiments. For archaeology and anthropology there is little distinction that can be made between what constitutes a First American science laboratory and what is a museum. An excavation site has the characteristics of both display and demonstration, but it is doubtful that it can be considered experimentation.

Further compounding what constitutes an observation in First American science is that exactly where an observation may be made is critically dependent on who owns the land. Many of the potentially best excavation sites are located on land controlled by American Indian tribes or federal agencies that frequently accommodate American Indian interests. As a result, the location of a First American laboratory is not a value-neutral process. The context through which the First American search occurs is the result of a social negotiation between First American scientists and the very groups that frequently oppose them.

The application of molecular analysis in physics has greatly strengthened the capability of First American science to provide dates for its material artifacts. With physics widely regarded as the archetype of the hard sciences, this physics-associated dating capability is also associated with an increase in public acceptance. Yet, there are substantive limitations to the contribution that physics has made. Typically, the popular press reports the results of First American science carbon dating as a relatively precise number. It is doubtful, however, that this same public understands that the carbon dating of an ancient human bone, for example, is dependent, initially, on what is most likely: (i) a very accurate calculation of carbon 14 decay in the bone but that, unfortunately, (2) can only be converted to a chronological age by estimating that ancient human’s dietary consumption of plants, which in turn (3) is dependent on an estimate of the food-plant’s air-temperature-dependent rate of consumption of carbon 14 from the atmosphere, which in turn is (4) dependent on an estimate of the rate of creation of carbon 14 through ionization of the Earth’s upper atmosphere by the variable electro-magnetic radiation from the sun, which in turn is (5) calibrated using estimates from the growth cycles of tree rings and from the chemical composition of core samples from the ice caps in Greenland and the Antarctic. This does not mean that carbon dating is not of value; it has provided an invaluable mechanism for improving the chronological estimates associated
with the search for the First Americans. It does, however, mean that there are caveats, frequently unarticulated, that should be remembered when considering First American chronologies.

First American science and American Indian myths are each, in its own way, an example of cultural hegemony. However, in the context of modern American culture, a belief in the preeminent value of science has the luxury of being firmly embedded in the general American epistemological grid, while an American Indian myth has social value only in the context of a particular tribe. If a truth statement of either First American science or an American Indian myth was always confirmed, then there would be little controversy; an ontological winner could be declared. Obviously, however, this is not the case. It is difficult to provide scientifically acceptable legitimization for a myth, but science has also demonstrated its own set of challenges. It is these interstitial ontological voids between First American science and American Indian myths that provide an opening for the exercise of political power.

One need not favor American Indian traditions over the findings of First American science to recognize that there is a subtle, but pervasive, cultural grid in the United States against which all values are calibrated. For example, during my vacation stay at the Mountain Creek Lodge at Pipestem State Park in West Virginia, there was a display of American Indian jewelry from prior to the arrival of Europeans that described the makers of the jewelry as “early visitors” to the area. If the dominant American culture can be successful in denying ownership by the American Indian of the material world that they inhabited, whether land or jewelry, then they can also be denied ownership of the ontological.

Politics is a process for resolving unstabilized power relationships, and the United States is not alone in its expression of political power through its search for first inhabitants. For decades, the Chinese government, dominated by the Han ethnic majority, deliberately blocked an open examination of the origins of the four-thousand-year-old European-appearing mummies in the Tarim Basin in China’s Xinjiang Uyghur Province because such an investigation has the potential to prove that at least a portion of what is now modern China was initially populated by a people who were both genetically and culturally not east Asian. There is more at stake for the Chinese government than simply losing the epistemological high ground. The Uyghurs—who are predominately Muslim and claim to be the descendants of the Tarim culture—express a desire for independence from Communist and Han China. Denial of an open examination of the mummies is a reflection of power relationships. The politics of power in
Conclusions

China intercede in the scientific examination of ancestral roots. In China, the power to control the epistemological debate has been stabilized in the hands of an authoritarian government.

In the democratic United States, power has been directed through the political process in the search for the First Americans more ambiguously than in the Chinese instance. Science has historically played a significant advisory role to the US government; it not only helps to define the problems, but it also provides answers. However, unlike in China, the pluralistic manner in which power is expressed in the United States has resulted in enactment of the Native American Graves Protection and Repatriation Act (NAGPRA) that, in law, grants epistemological equality between American Indian traditions and science in determining the disposition of many ancient human remains and funerary objects. As shown in the United States and Chinese examples, governmental involvement is one of the most blatant external interventions that can be imposed on the scientific process in the search for the First Americans (and Chinese). Governmental power can, and does, dictate the cultural rules that define acceptable epistemological approaches. In enacting NAGPRA, the Congress has decided who gets to assert truth. Political power not only speaks to truth, but truth can be forced to obey.

The politics of power has resulted in First American science being accused of having historically supported an agenda of racism, nationalism, imperialism, and colonialism. With at least some of the historical charges having been substantiated, it is difficult to determine what a proper role might be for First American science in defining and maintaining American existential myths and self-identity. If some subjects are to be off-limits for examination, then it is not clear what First American science has become. Leaders of the American Anthropological Association unsuccessfully attempted to delete science from their mission statement in order to permit non-science-based epistemological approaches and to preclude the continuing accusations of being a tool of an imperialist American culture. This would appear to be an admission by elite anthropologists of AAA that at least the anthropological element of science, as an independent entity, could no longer be trusted to freely examine First American myths and identities with the methodologies of science.

Who owns the past is a function of who owns the power for defining the process for determining the past. Creation of a past is of value as a mechanism for controlling the future. With the legislative provisions included in NAGPRA and with the creation of, and substantial funding provided by, the American Indian heritage preservation offices, there has been a significant shift in the
Conclusions

balance of political power between First American science and American Indian traditions. Academic First American scientists now appear at odds with their business counterparts who are responsive to the heritage offices that form their customer base and who are less enamored with the traditional peer review process revered by the academic community. The erosion of the power of First American science is also reflected in the occasional appearance of tribal affiliations of authors as a credential worthy of note in academic publications. At stake is nothing less than control over interpretation of the American past.

The substantial distrust between many First American scientists and American Indians has manifested itself in a very public manner. The confrontation over the remains of the Kennewick Man was worthy of a Greek passion play. The ancient human remains were discovered by two inebriated men during an attempt to avoid paying an admission fee, and subsequently included elements of racism, federal agency bias both in favor of and against American Indians, misplaced artifacts, a contest between biology and culture, and an ultimate determination by a federal court.

Archaeology is the discipline most central to the success of First American science, but simultaneously also its weakest link. First, it is widely acknowledged, even among archaeologists, that there is little independent archaeological theory; the discipline must borrow from anthropology for its doctrine. Second, the premier professional association of anthropology, which supplies the intellectual basis for archaeological investigations, considered declaring that the profession is no longer a science. Third, prominent archaeologists have charged that graduates of archaeological programs are sufficiently deficient in science training that they cannot communicate adequately with the physicists and geneticists that are critical to supporting their discipline. Fourth, science has aspirations to more than merely describe the physical world; it endeavors to explain. A central part of that effort is experimentation and repeatability of results. What in archaeology constitutes an experiment? What can be replicated? Fifth, many of the most suitable sites for archaeological excavation cannot be accessed without permission either from American Indian tribes themselves or from federal agencies that have historically shown a propensity to support the political agendas of American Indian tribes. Sixth, funding available for archaeological searches related to the First Americans increasingly has come from the Cultural Resource Management offices of American Indian tribes and these same federal agencies. Seventh, even acknowledging that scientists do not always welcome challenges to their ideas, the archaeology associated with the First American search of the past 150 years appears to have been particularly susceptible to a theoretical rigidity
enforced by a small group of prominent scholars variously referred to as “police,” or the “bête noire” of new theories. Finally, the archaeology profession associated with the search for the First Americans has fractured. On the one side are the university-based scholars who continue to espouse the traditional science mantras of peer review, objectivity, and a tenure system designed to separate remuneration from scholarly results. On the other side is the ever-increasing number of business-oriented archaeologists that operate in a financially competitive environment, must accommodate a customer base composed in substantial part by American Indian organizations, and whose intellectual products are not peer reviewed.

The practice of science in the search for the First Americans is a complex and flawed process. It must survive in an environment of shifting centers of political power, some of which are inherently hostile to the scientific enterprise. A case can be made that some of the critical elements of First American science, especially archaeology, may no longer even be a science. What is clear, however, after five hundred years of interest by the dominant Euro-American culture—the last 150 years of which have employed the tools of modern science—is that America has made very little progress identifying its first inhabitants. The speculations of an Asian source for the First Americans by José de Acosta in 1590 or by Thomas Jefferson in 1784 may be couched in different terms than those used today, but First American science is not yet able to either confirm or refute their centuries-old opinions. Whether one believes American Indian creation myths or not, it is obvious that there was a First American. What remains unsettled is not only who these people were and when they came, but also the very science associated with the search for the First Americans.